Abstracts Collection

Colegio de Ingenieros en Energías Renovables de Querétaro. A.C.

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Abstracts Collection

Objetivos Científicos

Apoyar a la Comunidad Científica Internacional en su producción escrita de Ciencia, Tecnología en Innovación en las Áreas de investigación CONACYT y PRODEP.

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Alentar la interlocución de la Comunidad Científica Internacional con otros centros de estudio de México y del exterior y promover una amplia incorporación de académicos, especialistas e investigadores a la publicación Seriada en Nichos de Ciencia de Universidades Autónomas - Universidades Públicas Estatales - IES Federales - Universidades Politécnicas - Universidades Tecnológicas - Institutos Tecnológicos Federales - Escuelas Normales - Institutos Tecnológicos Descentralizados - Universidades Interculturales - Consejos de CyT - Centros de Investigación CONACYT.

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Volumen IV

El Abstracts Collection ofrecerá los volúmenes de contribuciones seleccionadas de investigadores que contribuyan a la actividad de difusión científica del Colegio de Ingenieros en Energías Renovables de Querétaro A.C. en sus áreas de investigación en Ciencias de la Ingeniería y Tecnología, Educación, Potencia y Energía, Ciencias de la Computación, Mecatrónica, Aplicaciones Industriales y Comunicaciones, Gestión de la Tecnología en la Industria y en la Educación, Nuevas Tecnologías, Informática, Desarrollo de aplicaciones, Seguridad Informática, Tecnologías de la Información y Comunicación, Mantenimiento Industrial, Subestaciones Eléctricas, Motores Eléctricos, Termografía Infrarroja, Ahorro de Energía, Análisis de Vibraciones, Automatización, Cocinas Solares, Biomasa, Biocombustibles, Sistemas Fotovoltaicos, Celdas de Combustible, Energía Solar, Educación, Generación de Energía, Eléctrica, Transmisión y Distribución de Energía Eléctrica, Gestión de Sistemas de Energía Eléctrica, Sistemas de Información, Energías Renovables, Aplicaciones Computacionales, Instrumentación aplicada a la industria, Telecomunicaciones y protocolos de seguridad. Además de tener una evaluación total, en las manos de los directores del Colegio de Ingenieros en Energías Renovables de Querétaro A.C. se colabora con calidad y puntualidad en sus capítulos, cada contribución individual fue arbitrada a estándares internacionales (LATINDEX-DIALNET-ResearchGate-DULCINEA-CLASE-HISPANA-Sudoc- SHERPA-UNIVERSIA), el Collection of abstracts propone así a la comunidad académica , los informes recientes sobre los nuevos progresos en las áreas más interesantes y prometedoras de investigación actuales.

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Congreso Interdisciplinario de Energías Renovables - Mantenimiento Industrial - Mecatrónica e Informática

Colegio de Ingenieros en Energías Renovables de Querétaro A.C. Octubre 24-25, 2019.

Prefacio

El Colegio de Ingenieros en Energías Renovables de Querétaro A.C. (CIER-QUERÉTARO), y sus capítulos de Energía Renovable, Mantenimiento industrial, Mecatrónica e Informática, patrocinadores técnicos del Congreso Interdisciplinario de Energías Renovables, Mantenimiento, Mecatrónica e Informática, CIERMMI 2019, se complacen en invitarlos a la 4ta., edición de este congreso, que se llevará a cabo del 24 y 25 de octubre de 2019, en la ciudad de San Juan del Río, Querétaro, México.

El objetivo general establecer un espacio de discusión y reflexión en temas relacionados con las áreas de: energías renovables, mantenimiento industrial, mecatrónica e informática con la participación de estudiantes, profesores, investigadores y conferencistas nacionales e internacionales, promoviendo la conformación y consolidación de redes de investigación. Contribuyendo a brindar un espacio de divulgación y debate de las ponencias de estudiantes, egresados, académicos e investigadores, representantes de las distintas instituciones de educación superior y centros de investigación de nuestro país. Promoviendo la conformación de redes de investigación entre diferentes instituciones. Ofreciendo un espacio para los estudiantes de licenciatura, maestría, doctorado y de posdoctorado, en el cual puedan dar a conocer el avance de las investigaciones que llevan a cabo como tesis o trabajos de grado. Brindando un espacio en el cual los grupos de estudios e integrantes de cuerpos académicos, vinculados al programa curricular de las carreras de energías renovables, mantenimiento industrial, mecatrónica e informática, den a conocer los trabajos de investigación desarrollados al interior de su institución y en colaboración con otras instituciones educativas nacionales o internacionales. Estableciendo un espacio de capacitación para los (las) asistentes, mediante el desarrollo de ponencias y conferencias específicas. Este volumen IV-2019 contiene 337 participaciones arbitradas que se ocupan de estos asuntos en elegidos de entre las contribuciones, reunimos algunos investigadores y estudiantes de posgrado, a partir de 32 estados de México. Agradecemos a los revisores anónimos por su retroalimentación que contribuyeron en gran medida en él mejoramiento de los artículos, para la publicación en estos procedimientos revisando los manuscritos que fueron sometidos. Finalmente, deseamos expresar nuestra gratitud al Colegio de Ingenieros en Energías Renovables de Querétaro A.C. en el proceso de preparar esta edición que podras consultar en http://ecorfan.org/ collections.php

Santiago de, Qro.
Octubre 24-25, 2019

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1 Ciencias Agropecuarias y Biotecnología

Bioenergía a partir de microalgas en México

Bioenergy from microalgae in Mexico

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Abstract

The energy demand of the world population is increasing due to population growth and technological development. The current energy base is a generator of CO_2 emissions, the most abundant and main greenhouse gas responsible for global warming, as well as pollutants, sulfur oxides and nitrogen oxides. The environmental deterioration and the increase in fossil fuel prices make it necessary to investigate less aggressive energy sources with the environment at competitive costs in the market. Biofuels are an alternative for energy production due to their origin in the short carbon cycle, their emissions are considered almost zero, including biodiesel and bioethanol. The latter can be obtained from microalgae rich in carbohydrates and lipids, easy to grow in short periods of time. The objective of this research is to summarize the findings made about the existence of useful microalgae as raw material to produce biofuels in Mexican territory. An exhaustive review of the literature was carried out, which contributed to estimate the microalgal diversity in the country and its lipid contents as well as carbohydrates, with different species of the genera Chlamydomonas, Chlorella, Scenedesmus, Desmodesmus being found mainly.

Microalgae, Biofuels, Bioenergy

Capacidad de retención de antioxidantes de maltodextrina en jugo de arándano en polvo secado por aspersión

Retention capacity of maltodextrin antioxidants in blueberry juice by spray drying process

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Abstract

A group of four maltodextrins with different degrees of dextrose equivalent (DE) was used as carriers for the spray drying of blueberry juice, with the objective of evaluating the effect of drying temperature, DE grade and concentration of maltodextrin on the performance of blueberry juice powder and the ability to retain antioxidants. For this purpose, the conditions of the spray drying process were: inlet air temperature: 170-210° C, maltodextrin type (Mc, M10, M20 and M40) and maltodextrin concentration: 10-30% w / w. The different powders obtained from the spray drying were analyzed by high performance liquid chromatography (HPLC) for the quantification of antioxidants (resveratrol and quercetin). The analysis of the data was carried out from a design of D-Optimo experiments. The results of the analysis showed that the highest yield of blueberry juice powder is achieved by using 30% w / w of M10 at a drying temperature of 193 ° C. Such conditions allowed a retention of antioxidants in the powder of 20% and 30% of resveratrol and quercetin, respectively.

Antioxidants, Blueberry, Spray drying process

Bombas solares: Una alternativa sustentable para los sistemas agropecuarios en zonas de alta marginación

Solar pumps: A sustainable alternative for agricultural systems in areas of high marginalization

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Abstract

Access to water in areas of high marginalization is undoubtedly one of the main problems to be solved. The objective of this study was to design two photovoltaic systems with solar pumps, the first to establish a planting area for vegetables, and the second with the purpose of bringing water for livestock consumption. The works were developed during the years 2015 and 2017 in the towns of Vicente Guerrero and Lázaro Cárdenas, municipalities of San Juan de Guadalupe Victoria, Durango, Mexico. In the first municipality there is a pond with a capacity of 50,000 cubic meters and in the second, there is a well. According to the maximum demands of crops 6.6 mm d-1, a pump was designed with a capacity of 221.6 m3 d-1 and a total dynamic load of 25 m with 20 solar panels. In the second case, it consists of moving the water at a distance of 4.5 km and 62 m against the slope, for which a pump with a capacity of 30 m3 d-1 and a dynamic total load of 93.3 m was designed with eight solar panels.

Photovoltaic systems, Marginal areas, Agriculture

Tratamiento de la biomasa lignocelulósica mediante la pirolisis lenta y a baja temperatura para la producción de biocombustibles

Treatment of lignocellulosis biomass through slow and low temperature pyrolysis for the production of biofuels

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Abstract

Transforming residual biomass into valuable energy compounds is important due to the problems of the energy crisis and environmental pollution, the biofuels produced are a valuable substitute for liquid or gaseous fuels for the transport sector becoming a cheap raw material, It reduces the concentrations of polluting gases, disposal problems and greenhouse effect emitted into the atmosphere.The object of study was the processing of residual biomass, to determine the optimal conditions of slow and low temperature pyrolysis to generate the highest volatile matter yield of lignocellulosic biomass; in addition to quantifying the Condensible Volatile Matter and the Non-Condensible Volatile Matter obtained from the pyrolytic reaction.According to D. Chiaramonti, et al., 2007, a higher liquid yield is obtained when the amount of volatiles is higher, the high MV content makes residual biomass a candidate with high potential for biofuel production, demonstrating that the highest yield of volatile matter during the pyrolysis the final temperature must be higher than 350 ° C, using a heating rate of 5 ° C / min, a residence time of 60 minutes and a particle size of 150 mc.

Biomass, Pyrolysis, Biofuels

Producción de hidrógeno mediante digestión anaerobia de residuos de planta de jitomate

Hydrogen production from anaerobic digestion of tomato's plant waste

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Abstract

Hydrogen (H_2) is recognized as a promising energy carrier among the alternatives for obtaining clean energy, since it has a high energy efficiency (122 kJ / g) and can be obtained from lignocellulosic waste through a biological process. In the state of Guanajuato, high amounts of plant waste derived from tomato cultivation are generated because this is the crop mostly produced through protected agriculture. So, the objective of the present study was to consider tomato plant residues for the generation of hydrogen through the anaerobic digestion process. Two sources of inoculum, native microflora of the tomato plant and anaerobic sludge pretreated at 100 ° C for 24 h; and four mineral media at an initial pH of 6.5 ± 0.2 in batch experiments, were evaluated. The highest yield was 37.4 mLH_2 / g SV using native microflora and mineral media with yeast extract. Hydrogen production was found like those reported in the literature for other type of waste, highlighting the no-need to pretreat the substrate or inoculum. Therefore, the methodology propose is efficient to the hydrogen production from tomato plant residues.

Hydrogen, Anaerobic digestion, Tomato

Desarrollo del cultivo de cacao *Thebroma caca L*, en Úrsulo Galván

Development of the cocoa crop *Thebroma cacao L*, in Úrsulo Galván

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Summary

In areas or areas where monocultures predominate, it is very important to introduce species with agronomic potential to diversify the crops that are counted and improve the socioeconomic level of the producers, as well as to provide more appropriate and suitable habitat for the species that are found. One of the errors has been for a long time the introduction of these species without a previous investigation where their adaptation is validated or evaluated, so in the Institute of Ursulo Galván a research is carried out prior to the adaptation of four Cocoa varieties (Theobroma cacao L), the tested materials are: Inifap 4, Inifap 8, Inifap 9 and White Almond, obtaining so far that in terms of the variables: Plant height, stem diameter and number of leaves does not exist statistical difference, while for the variable number of branches, only difference is presented in the first sampling. The above is quite logical because the management is given to plants is homogeneous and only the adaptation is evaluated after two years of established.

Research, Adaptation, Cacao

Método de bajo costo para la cuantificación de hidrógeno y metano en bioreactores de flujo continúo

Low cost method for quantification of hydrogen and methane in continuous flow bioreactors

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Abstract

Bioreactors of industrial scale for gaseous biofuels is a field of research worldwide. Automation at a profitable technical and economic level has not been possible because of fluctuating biological systems. The quantification of biogas in continuous flow is difficult to implement by Gas Chromatography and very expensive from special sensors. In this work we developed a system with MQ8 hydrogen and MQ4 methane sensors, used in the detection of industrial leaks, for the determination of the concentration. The sensors were installed on Arduino cards and programmed to plot the concentration in real time. Calibration curves were made for these sensors making use of a standardized mixture of gases, in hermetic bottles of known volume. The response is exponential and reproducible, and when using real biogas samples, no problems of interference with other gases are observed. The prototypes are very low cost with respect to the CG equipment and can be installed at the gas outlet of the bioreactors, with a mechatronic system that allows the monitoring of the composition in real time, which will allow to obtain microbial kinetics in semi-continuous flow, very economically.

Sensors, Hydrogen, Methane, Economical, Bioreactors, Continuous flow

Propuesta de materiales termoaislantes para desarrollo de casa-habitación adecuada a cambios climáticos con eficiencia energética

Proposal of thermal insulating materials development of house suitable for climate change with energy efficiency

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Abstract

The condition of climate change is attributed directly or indirectly to activities related to the human being, as a more transcendental effect the increase of temperature is highlighted. Such a condition is not taken into account in the development of current constructions, so it is sought to propose the use of thermal insulating materials that will give a thermal comfort to the user and a reduction of energy use, which in turn will be an environmental advantage. There are various types of thermal insulating materials, however, it is proposed to be sustainable, as it is intended not to contribute to climate change and to meet the appropriate specifications of the building envelope, in order to ensure the users comfort of current and future dwellings, different factors, such as orientation, as well as specific parameters, will be taken into account as part of the development of the aforementioned ones. The construction development of the current house-room does not take into account the continuous thermal alterations that occur by the continuous climate change, ignoring the basic needs of the thermal comfort of the user; so sustainable materials are recommended, which meet thermoinsulating properties without causing an environmental impact.

Materials, Thermal Insulating, Sustainable

Manejo tradicional de los Agaves mezcaleros y su conocimiento asociado: El caso de Oaxaca y Aguascalientes, México

Traditional management of Agaves used for mezcal and associated knowledge: The case of Oaxaca and Aguascalientes, México

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Abstract

Maybe the most known and diffused use of Agave genus plants is the production of alcoholic beverages,with mezcal and tequila as the most consumed. As a matter of fact, increased demand for these beverages has led to important pressures in the ecosystems from which the Agave is obtained. In the present article, I compare management practices carried out by mezcal producers in Oaxaca and Aguascalientes, contrasting the state that produces the most volumes of mezcal with a state that is new to that industry. I define as managment "the interventions, transformations or decisions over natural or artificial systems, its elements and its functional processes with explicit purposes", according with Casas et al (2014). I also explore the expresions of management, as the ways to take advantage, preserve, restore or take back the vegetable elements of the ecosystem and the agroecosystem, finding important differences in terms of future sustainability for the alcoholic beverage industry.

Agave, Management, Cultivation

Estudio de la evolución de c:n:chl en microalgas verdes considerando la irradiación solar a través de un modelo dinámico / Study of the evolution of c: n: chl in green microalgae considering solar irradiation through a dynamic model

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Abstract

Increasing the use of solar irradiation by the photosynthetic metabolism of green microalgae is necessary to exploit its potential as a source of lipids, carbohydrates, pigments or aromatic compounds as a source of biofuels or products of interest. Microalgae exposed to sunlight are able to adapt by synthesizing a greater amount of pigment to dissipate the incident light energy, controlling the supersaturation of cellular photosystems but reducing the efficiency of the use of light. The photoacclimation is described by the content of chlorophyll mass in relation to the carbon content in the biomass (g Chl / g C). In an outdoor photobioreactor, irradiance depends upon geographical location, time of year and atmospheric conditions. In the present proposal, the generation of biomass is established as a dynamic function of the nutrients, represented as C: N:Chl and the primary assimilation of nutrients as Nitrate (N) and Ammonium (A). The results of this research show an evolution of G: C, N: C, Chl: C and biomass as C (carbon) in different scenarios of parameterization showing consistent results.

Microalgae, Biomass, Modelling

Análisis de los factores que inciden en la competitividad de una empresa proveedora de insumos en el sector petrolero, en el estado de Tabasco, generando una propuesta de desarrollo

Analysis of the factors that affect the competitiveness of a supplier of inputs in the oil sector, in the state of Tabasco, generating a development proposal

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Abstract:

Objective: To detect the factors that are affecting the competitiveness of the important hydrocarbon sector from the study context. In order to generate a proposal for improvement for that sector. Methodology. Through work with experts it is possible to interrelate information that allows to visualize in a global way the study problem. This is through the study of the context variables (six), with support from the structural analysis scheme that will generate the four potential areas where the conflict zone, power zone, zone of autonomous problems and exit zone are located, allowing the clear detection of the incident factors. Results Given the previous scheme and with an in-depth analysis it allows us to propose a model that generates the strengthening of the key factors (power zone), also to look for a route for the stability of the factors of the zone of conflict, all this will come to consolidate the work of the type of organizations studied that allows them to be competitive in a globalized environment.

Competitiveness, Context variables, Key factors

Liberación de Ibuprofeno Usando la Red Metalorgánica de Zirconio UiO-66

Release of Ibuprofen Using a Zirconium Metal Organic Framework UiO-66

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Abstract

In the present work, a type of zirconium metal organic framework known as UiO-66 (reported by researchers from the University of Oslo, for which it is called acronym) was used to adsorb ibuprofen and release it in a medium simulating the blood pH. The bioviability and low toxicity of the UiO-66 are the characteristics by which this nanomaterial was chosen to transport a drug. This project implemented a methodology for the synthesis of UiO-66 at room temperature; it was also achieved to adapt the techniques of in vitro release of drugs reported in the literature, to the simulated release of ibuprofen using the UiO-66 framework. The aim of the in vitro simulation was to determine the efficiency with which this material transports and releases ibuprofen to the blood. Therefore, the simulation conditions considered a physiological temperature of 37 ° C and a release medium (buffer solution of phosphates) with pH similar to the blood. The results show that the release was carried out gradually during the first 24 h. In addition, regardless of the initial concentration, the amount of ibuprofen released was the same.

MOF, Ibuprofen, UiO-66

Análisis de la calidad de los servicios de la biblioteca en la facultad de ingeniería mecánica y eléctrica de la universidad veracruzana en Poza Rica Veracruz, México

analysis of the quality of the services of the library in the faculty of mechanical and electrical engineering of the veracruzana university in Poza Rica Veracruz, Mexico

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Abstract

Evaluating the quality of the services provided by the Library is important for any educational institution as this allows knowing the degree of satisfaction of the users and the needs required under demand of opinion with the objective of subsequently carrying out a planning with strategies and actions that support the improvement of them. The present research work is an analysis study made to the services provided by the Library to users of the Faculty of Mechanical and Electrical Engineering of the Universidad Veracruzana in Poza Rica Veracruz, Mexico, using an opinion survey applied to a sample. of 150 people (students and academics). The opinion survey allows the identification of attention and orientation indexes, security in shelters, shelving services, bibliographical stock, comfortable spaces and equipment, application of regulations, virtual library support and the conservation of bibliographies, among others. The results obtained from the study provide different degrees of satisfaction of the services provided by the library and also show aspects that require planning and implementation of strategies and actions to improve the quality of the same.

Library Quality, Planning, Opinion survey, Bibliographical stock

Sistema ERP para el seguimiento de órdenes de producción / ERP system for tracking production orders

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Abstract

In an increasingly competitive business world, we live with the constant need to speed up, improve and potentiate the productivity of our resources and our organization, to turn our information into intelligent knowledge. For this, it is ideal to have this information online, in real time, from any device and from anywhere in the world. These conditions allow to make assertive decisions in a much more agile way.The development of the ERP for the control of order tracking in the company Zetrak S.A de C.V. Its purpose is to automate production processes through access to information in a reliable, accurate and timely manner, resulting in the reduction of time and costs in each of the processes involved in the production and distribution operations of the company. The Spiral Model was used as a development methodology, which allows producing more and more complete versions during the development of the system, until generating the final iteration. The system is formed in its first stage by the modules: Shipments, Engineering, Sales, Billing and Quality Control.

ERP, Database, Server, Php, Html, Module, Methodology

Base de datos para agenda electrónica para pacientes de clínica psicológica

Database for electronic agenda for patients of psychological clinic

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Abstract

This paper presents the development of an application for the management of patients of a psychological clinic, with an online database.Nowadays, the use of technology is expanding more and more, integrating itself in the different aspects of society, both in everyday life and in the workplace and industry.Businesses that do not apply new technologies or update themselves run the risk of falling behind competitors that adapt new technologies or exit completely from the market.To implement these technologies, software, desktop applications, mobile or internet integration, it is not always necessary to invest many resources or hire new personnel to maintain new equipment. With the simple installation of a computer equipment or implementation of a specialized software you can maximize business profits or facilitate the workload in an obvious way.
The methodology to be used is:
1. Creation of a desktop application based on Java.
2. Integration of the application with online database.
This project seeks to update the way the PSM Psychological Clinic keeps and organizes the data of its patients.

Desktop application, Database, Learning of IT

Análisis de capas PML en una región de campo electromagnético utilizando el método de diferencias finitas en el dominio del tiempo

Analysis of PML layers in an electromagnetic field region using the finite differences in the time domain method

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Abstract

The Finite Difference in Time Domain (FDTD) method is currently one of the most used electromagnetism methods in electromagnetic field simulation, however, in order to obtain reliable results from this simulation it is necessary to have optimal boundary conditions. Perfectly Coupled Layers (PML) is characterized by the decomposition of the transversal field to the direction of propagation in its rectangular projections, and the use of both electrical and magnetic conductivity in the numerical layers for the absorption of electromagnetic fields. The PML layers are characterized by values of permittivity, permeability and conductivity that are assigned to each of the equations according to their position in the region. Because it is the same set of equations there is no need to use connection conditions at the junction of the analysis region with the PML absorption region, which provides a natural transition throughout the region. This paper presents the study of the difference between the calculation region with and without PML layers.

FDTD, PML, Electromagnetism

Desarrollo en Blender del gemelo digital de una estación electro-neumática para su aplicación en laboratorios virtuales

Development in Blender of the digital twin of an electro-pneumatic station for its application in virtual laboratories

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Abstract

This paper presents the development of the digital twin of an electro-pneumatic station composed with 3 pistons, to implement this station in virtual laboratories. The objective of this station is to have an economical alternative for the accomplishment of practices of automation that counts on the capacity to connect through Ethernet with PLCs of the mark of Allen Bradley and with all the PLCs that communicate under the protocol Modbus TCP. Later, in order to develop the digital twin presented in this paper, an electro-pneumatic physical station was taken from the Mechatronics laboratory at the Universidad Tecnológica de Queretaro, the development of this digital twin was done through the free software Blender, complementing it with programming in Python for the Ethernet TCP communication with the different programmable logic controllers. Finally, we carried out the validation of this project through the connection of both the digital twin and the physical station taken as a model, with a ControlLogix PLC. This work will allow the future to implement low-cost virtual laboratories in universities, training centers and interested institutions. The laboratories will have multiple practice scenarios that result in students better prepared in the programming of automated systems in the industry.

Digital twins, Virtual laboratories, Blender

Comparación entre la función de cole-cole y la función de debye para modelar el tejido biológico

Comparison between the cole-cole function and the debye function to model the biological tissue

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Abstract

The study of the biological tissue varies its behavior, in function of the frequency to which it is subjected. The functions of Cole-Cole, Debye and Lorentz are considered the most used to study the parameters of conductivity and permittivity of biological tissue such as: liver, stomach, gray matter, pancreas, blood, breast tissue to name a few. Depending on the frequency, there may be three different relaxation times. These depend on the nature and physical characteristics of the tissue and its effect in the presence of an electromagnetic signal. The Cole-Cole function is most appropriate when considering a study in the frequency domain, and the Debye function is established to perform the study in the time domain. It is of particular interest to make a comparison between the methods of Cole-Cole and Debye, to define the advantages and disadvantages of each of them. The Lorentz function is used for frequencies of the Tera-Hertz order. Comparative graphs are obtained between both for the biological tissues mentioned above. For each of them the electrical parameters are calculated in a frequency range between 100 Hz and 10 GHz.

Cole-Cole, Debye, BiologicalTissue

La tutoría como estrategia de la programación académica en la Facultad de ingeniería mecánica y eléctrica de la universidad veracruzana en Poza Rica Veracruz, México

Mentoring as a strategy of academic programming at the faculty of mechanical and electrical engineering of the universidad veracruzana in Poza Rica Veracruz, Mexico

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Abstract

Academic tutoring represents a strength of support for all students in their Educational Programs (PE) that they have chosen to complete their professional studies for all higher education institutions. The Faculty of Mechanical and Electrical Engineering of the Universidad Veracruzana in the city of Poza Rica Veracruz, offers 3 PE of Engineering: Mechanical, Electrical and Industrial and in these there is an institutional program of tutoring that contributes in the orientation and advising of the tutorados for the decision making in the academic programming of each school period. The academic programming based on tutoring allows the Faculty to know the demand according to the needs of the students of the Educational Experiences (EE) that they require for a school period. The present work of analytical and descriptive study, shows the processes that are carried out in the Faculty towards an adequate academic programming and implementing with the tutors interview-survey work sessions to gather the required information so that each tutor can program the assignment of their EE For studying, in this case study the sample is a Mechanical Engineering group for the school period February-July 2019.

Academic tutoring, Academic Programming, Educational Offer

Efecto de la densidad de energía en las propiedades de películas delgadas de Sb_2S_3 preparadas por baño químico asistido con láser pulsado

Laser power density effect on the properties of Sb_2S_3 thin films prepared by chemical bath deposition assisted by pulsed laser

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Abstract

Antimony Sulfide thin films (Sb2S3) were prepared using the laser assisted chemical bath deposition technique. The precursors used in the chemical bath were antimony chloride and sodium thiosulfate, the deposit was made at the room temperature on glass substrate while it was irradiated with the wavelength of 532 nm of the pulsed Nd:YAG laser. In this work we studied the effect of energy density (1.97 x 107 and 7.07 x 106 W/cm2) and the irradiation time (30, 45 and 60 min) during the deposition process, on the structure and the optical and electrical properties of the antimony sulfide films. The structure, composition optical and electrical properties were analyzed by X-Ray Diffraction (XRD), Raman Spectroscopy and X-Ray Emitted Photoelectron Spectroscopy (XPS), UV-Vis spectroscopy and photoconductivity. The results showed that the laser assisted chemical deposition technique is an effective synthesis technique for obtaining thin films of antimony sulfide for optoelectronic applications or in solar cells.

Thin Films, Laser, Power density

Aplicación móvil para el seguimiento de los cursos de la plataforma de ambiente virtual de aprendizaje

Mobile application to follow the courses of the virtual learning environment platform

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Abstract

Currently, mobile applications have increased their use in all areas of daily life. Among other things, the above is due to the ease in the exchange of information. The Institute Technologic de Oaxaca proposes a mobile application that complements the Virtual Environment Platform for Professor Training. This application allows the connection with the platform, enter the course where the user is registered; and in this way, the user receives notifications of important dates such as dates of delivery of tasks and activities. The above is possible, since the application links directly to the Google calendar. With these functions, as an extension of the virtual platform, it facilitates the course participant to develop the activities in a timely manner. The application is developed based on incremental model.

Mobile app, Courses, Notifications

Sistema experto para la rotación de cultivos en un invernadero

Expert system for the rotation of crops in a greenhouse

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Abstract

The production of greenhouse crops is one of the most modern techniques currently used in agricultural production. Crop rotation is an agricultural practice to increase the productivity of the land and optimize the use of resources by alternating different types of crops in the same soil. The project called "Expert System for the rotation of crops in a greenhouse" was developed with the aim of making the decision of the type of suitable crop to be planted in the "San Sebastian" greenhouse. Since the risk of production loss is considerably reduced , so that it helps the producer to know which is the suitable crop to sow according to the experience of an agricultural expert; using physical sensors, the registration of ambient and humidity temperatures is obtained in real time; the software was developed by the prototype model.

Expert system, Rotation of crops, Greenhouse

Sistema de optimización en el departamento de control vehicular para el control y manejo de los vehículos de la empresa

Optimization system at vehicle control department for the control and management of the company's vehicles

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Abstract

This project proposes a solution to an internal problem of an organization when managing its vehicles.A web system will be developed, for the control and management of information, procedures and functions of the company's vehicles, in an efficient way and thus have a better development optimizing times.The objective is to facilitate the management of information, improving the control of activities, internal functions and support in order to speed up processes through the use of the computer system.The methodology to be used is Scrum, since it provides optimal options, such as Sprint, work boards at a certain time for the development and proper functioning of the system, constant revision, avoiding errors and improving development times.The Scrum methodology provides an agile process to develop software that was first applied by Ken Schwaber and Jeff Sutherland, who documented it in detail in the book Agile Software Development with Scrum.

1. Analyze and investigate the different development tools.
2. Select the tools that generate the greatest advantages for the project.
3. Make a work plan for the implementation and implementation of the System.
4. Perform tests and carry out adjustments for the final implementation.

Vehicle control, Computer system, Automation

Generación de energía eléctrica usando afluente de agua natural mediante el diseño de un prototipo de turbina

Generation of electric energy using natural water affluent through the design of a pelton turbine prototype

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Abstract

Agriculture in Mexico is an economic activity that allows for the livelihood of the most vulnerable families. However, the economic development of producers is reduced by the energy costs generated in the work, for this reason a prototype was developed of Pelton turbine specially designed to take advantage of natural water fall and thus take advantage of the energy that this fall through the prototype can generate, in this way clean energy is generated that is used in own articles for the same agricultural activity, the prototype comes to be a low-cost solution option to reduce energy costs in small Mexican agricultural producers. The prototype is designed for a non-industrial water affluent but natural fall, the prototype was field tested measuring performance results having a substantial contribution to a possible energy saving.

Turbine, Generation of energy, Clean energy

Análisis tecno-económico de gasificación de polietileno, caso en México

Techno-Economic analysis of polyethylene gasification, Mexican case

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Abstract

As a way to encourage the use of new technologies for the recycling of plastic, the research will obtain techno-economic data for the possible chemical recycling of plastics, the gasification of polyethylene.MethodologyIt was simulated in ASPEN PLUS parcel to technically and economically analyze the viability of the gasification process, taking into account the restrictions and considerations of said process.Contribution The main plastic waste that is disposed of in landfills are polyethylene terephthalate, polystyrene and low and high density polyethylene. Gasification is a thermochemical process in which a carbonaceous substrate (in this case plastic) is transformed into a combustible gas through a series of reactions that occur in the presence of a gasifying agent (usually air) in an oxygen-poor environment. The work demonstrates the viability of this type of processes used in plastics such as high and low density polyethylene

Gasification, Polyethylene, Aspen Plus

2 Biologia y Quimica

Rendimiento académico universitario en países latino americanos bajo la neurocomputación biológica

University academic performance in Latin American countries under the biological neurocomputing

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Abstract

Goals**.** First, that it can be identified if academic performance and psychosocial skills, under the Latin American identity in the university concept in Argentines, Peruvians, Costa Ricans and Mexicans, increase for their students, considering the improvement in the development of the academic study; second, to analyze that academic achievement when considering biological neurocomputing allows to identify the degree of anxiety in students; third, measure the different indicators between social skills and academic averages among students. Methodology**.** Through its multicenter observational design focused on biological neurocomputing, a measuring instrument was used on the MEDMAR scale, with a finite sample of the student universe of 1500, with different school environments in the universities of the National University of Rosario (Argentina), National University Mayor of San Marcos de Lima (Peru), University of Costa Rica (Costa Rica), University of Guadalajara (Mexico), University of Aguascalientes (Mexico) and Autonomous University of Tamaulipas (Mexico) in 2018. With indicators on the affective / emotional. Contribution**.** The academic performance and behavior of the students, it was detected that 20% of students with lack of motivation for their learning. Situations of computational neurobiological character were defined with interaction towards educational programs, when managing the optimal academic performance and the constant lack of interest in the new knowledge to acquire with data of internal consistency, test-retest reliability and concurrent validity.

Learning, Risk factors, Academic performance

Características de la glicerina obtenida del proceso de la reacción del metóxido de sodio en la producción del Biodiesel

Characteristics of glycerin obtained from the reaction process of sodium methoxide in the production of Biodiesel

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Abstract

Biodiesel is one of the alternative sources of energy obtained from the edible oils used in different types of kitchens as a renewable resource. The by-product derived from the reaction process transesterification in the production of biodiesel is glycerin the aqueous glycerin solution is filtered to remove the impurities and then neutralized with 1N NaOH. The objective of this work was to identify the characteristics of this glycerin and its applications and future use, the characterization made of this by-product from which it was collected. liters in amber bottles, the pH range between 6 and 7, density 1.24 g / l, viscosity .897 pascal sec., it is possible to recover methanol to a purity of 58% by weight, glycerin is used in many products of consumption, has a low toxicity, its properties are stability and compatibility towards other chemical compounds. The applications of this by-product are the manufacture of liquid soap, degreaser, floor cleaning, it is a non-irritating, biodegradable and recyclable compound.

Gliceryn, Use, Biodiesel

Síntesis de nanopartículas de plata reducidas con desecho producido por el insecto *Ulomoides dermestoides*

Synthesis of silver nanoparticles reduced by the waste produced from *Ulomoides dermestoides*

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Abstract

The scale of nanotechnology goes from 0.2 nm to approximately 100 nm and is used in many different disciplines. U.dermestoides is a beetle belonging to the family Tenebrionidae,commonly known as darkling beetles, it has phytophagous habits. In its waste have been identified the following organic compounds: Saponins, coumarins, steroids, phenols, alkaloids, proteins and amino acids. The synthesis of silver nanoparticles was done using colloidal solution from the reduction of silver nitrate at different concentrations, using U. dermestoides waste from three different diets: Rye and Apple; oats, bread and Apple and finally bread and Apple. Series of qualitative tests were done to determinate the presence of phenols, alkaloids carbohydrates, proteins and amino acids. UV-vis spectrophotometry was used in a range from 200 to 800 nm. The results show that between 400-450 nm there is a surface plasmon resonance peak, indicating the formation of silver nanoparticles. By scanning electron microscopy (SEM) the presence of spherical silver nanoparticles was observed and by transmission electron microscopy (TEM) was confirmed the presence and shape of nanoparticles.

Nanoparticles, Ulomoides, Green synthesis

Análisis experimental de la difusión salina durante la desalación por congelación

Experimental analysis of saline diffusion during freezing desalination

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Abstract

The consequences on health and low life quality caused by the problem of water scarcity, as well as the interrelation between energy and water supply, call attention to water desalination by Freezing Melting (F/M), which is a well-known technique but unfortunately, not used for this application, which is considered the most sustainable, in terms of its lower energy demand compared with commercial desalination techniques (about 70% less than thermal desalination). However, it presents some problems regarding the saline trapping in the ice, therefore, in this work, an experimental analysis is carried out to achieve a better understanding of the saline displacement, using an aqueous solution of sodium chloride, frozen at different temperatures, and configurations containers, with a F/M progressive desalination. It has been found that, at a freezing temperature of 8oC, it is possible to purify up to an average of 78.12% of the frozen salt solution, obtaining an easy-to-separate brine.

Freezing desalination, Brackish water, Experimental analysis

Enzimas proteolíticas: Generalidades y la importancia de las aspartil proteasas fúngicas

Proteolytic enzymes: Generalities and the importance of the fungal aspartyl proteases

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Abstract

Proteases also known as peptidases, are capable of hydrolyzing peptide bonds of other proteins. These enzymes are widely distributed in animals, plants, and microorganisms and have great commercial importance, because they occupy the highest percentage of worldwide sales. Its applications range from medical and pharmaceutical, to the food and detergent industry. Proteases are classified into exoproteases and endoproteases, among the latter are acidic proteases better known as aspartyl proteases, which are of great industrial interest, mainly in the food and beverage industry. Aspartyl proteases of fungal origin are the most used due to the characteristics they possess, because of this, they have a great demand in the global enzyme market, so different methods have been developed to increases its production. The objective of this literature review is to publicize the generalities of proteases of fungal origin specifically of the aspartyl type, as well as its importance and biotechnological applications in medical, pharmaceutical, the beverage, industry, and mainly in the food industry. In addition, mention the progress made in recent years of the methods reported so far to obtain the production of these proteases.

Enzymes, Proteins, Aspartyl proteases

Biofloculación de la microalga de agua dulce *chlorella sorokiniana* asistida por hongos filamentosos

Bioflocculation of the freshwater microalgae *chlorella sorokiniana* assisted by filamentous fungi

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Abstract

Nowadays, co-cultivation of fungal and microalgal cells is considered as a potential technology that could be able to minimize the harvesting cost and energy inputs in the algae-to-biofuel approach. In the present study; co-cultivation of five selected filamentous fungus and microalgae Chlorella sorokiniana to form cell pellets was evaluated under different conditions such as organic carbon (glucose, fructose, sucrose, and maltose) and nitrogen (urea, peptone, yeast extract and sodium nitrate) source content with and without the presence of alternative carbon source (wheat straw); and initial fungal/microalgae cells ratio for mixotrophic growing. In addition, cellulase activity and zeta potential measurements were carried out in order to get a better understanding of the pelletization process. Aspergillus flavus was found most efficient for pelletizing in the nutrient supplemented spent BG-11 in spite of its alkaline pH (7.5-8.3) under mixotrophic growing, being able to harvest up to 96% of the microalgal cells (4.2 x 107 cells mL-1 initial algal concentration) within 48h at supplementation of 5, 10 and 1 g L-1 of fructose, NaNO3 and KH2PO4, respectively. The harvesting efficiency in terms of optical density at 750 nm as well as the variation of residual sugars, pH, and cellulase enzyme activity (2.3 U mL-1 maximum value) with time was also studied. A. flavus strain investigated in this work could emerge as an efficient, and economically viable method in microalgae harvesting for biofuel production as well as in the production of other valuable compounds from extracellular fungal metabolites.

Co-culture, Co-pelletization, Filamentous fungi, Microalgae harvest

Adaptación de higuerilla (*Ricinus communis* L.) Bajo condiciones de invernadero

Higuerilla (*Ricinus communis L.*) Plants adaptation under greenhouse conditions

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Abstract

Higuerilla plants (*Ricinus communis* L.), also called castor plants, are non-edible energy crop, and all parts of the plant can be used for multiple biofuel production. Higuerilla plants possess an enormous adaptive potential in diverse habitats including problematic sites due to their plasticity, however in México central region the available crops are wild. Greenhouse technology is becoming an increasingly indispensable and a viable solution for modern methods of crop production. Present chapter highlights the work carried out on different aspects of higuerilla plants adaptation under greenhouse conditions. Was evaluated the growth and production yield of four varieties (Guanajuato Oíl, RC-40, K855 and Criolla) of higuerilla plants into naturally ventilated greenhouse, driven by pressure difference. 40 plants were cultivated in an area of 70 m^2. The *tezontle* (in Nahuatl, *tezt* means stone and *zontli* means hair) was used as substrate, which is a native volcanic stone. Steiner's nutritional formulation was used to provide the necessary elements for the development of the plant. Drip irrigation method for all the plants was used. The one-way analysis of variance (1W-ANOVA) and Tukey's range test were applied. Favorable and optimal results were obtained in the growth and production yield of at least one variety of Higuerilla plants.

Higuerilla plants, Bioenergy alternatives, Greenhouse production, Plant growth, Production yield

Investigación en México sobre medicamentos biotecnológicos, ingeniería de tejidos y biosensores para diagnóstico

Research in Mexico regarding to biotechnological drugs, tissue engineering and biosensors for diagnostics

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Abstract

Research groups who develop scientific advances in bioinformatics and biotechnological drugs, biomaterials for tissue engineering and diagnostics methods based in nanotechnology already exist in Mexico. This chapter presents basic and introductory aspects of the definitions and outreach of each discipline, as well as an extensive list of the research groups and institutions where pertinent studies are carried out to provide an update about the main focus of each investigation team. The information provided may be useful to create inter and multidisciplinary teams and thereby foster substantial improvements in these research areas. In addition, national regulations required on the field of biotechnological drugs, biomaterials for tissue engineering and diagnostics devices are presented with the objective that related and innovative projects could be taken to the market for the benefit of our society.

Bioinformatics, Biotechnological drugs, Tissue engineering, Diagnostic devices, Innovation, Research lines

Factores humanos y ambientales que influyen en el autocuidado de enfermería en la aplicación de la mecánica corporal

Human and environmental factors that influence nursing self-care in the application of body mechanics

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Abstract

In hospitals there are human and environmental factors that influence so that nurses do not have self-care when applying the fundamental principles of body mechanics when mobilizing or transferring patients, it is important to identify them and establish actions that contribute to self-care; with the intention of promoting the health of the nursing professional and avoiding injuries, guaranteeing a safe work practice. Objective. Analyze human and environmental factors from the perspective of Orem that influence the self-care of nursing professionals, in the application of body mechanics at the General Hospital of Pénjamo, Guanajuato. Methodology. Non-experimental, descriptive, correlational and cross-sectional study. Non-probabilistic sampling of 72 professionals, the questionnaire had 29 items Cronbach's internal reliability α of 0.840. Results 43.1% (31) mentioned that sometimes the stretchers used to transfer the patient are in good condition and with safety measures; 34.7% (25) stated that they only sometimes have stretchers to help them in mobilization and transfer. Conclusion. The human and environmental factors that influence self-care are mainly when mobilization procedures or patient transfer are performed; The lack of resources and the stretchers are not in good condition.

Occupational risk, Risk prevention, Body mechanics

Tecnologías socioambientales con energía limpia. Filtro de Agua Gris Reciclada (FILAGREC)

Socio-environmental technologies with clean energy, Recycled Gray Water Filter (FILAGREC)

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Abstract

This innovation to transform residual or gray water to one ideal to irrigate family orchards/gardens that produce edible or ornamental plants. The innovation, named FILAGREC, promotes collaborative labor and efforts in rural and semi-urban communities. First, we present our reflections and lessons learned about the implementation and management of FILAGREC's filter system in several states in Mexico, especially in Morelos. Next, we include a literature review of the renewable energy systems and water treatments that are currently used in different countries across Latin America; we highlight the use of FILAGREC as a water treatment alternative. We emphasize how FILAGREC's filter operates, how it is installed and maintained. We explain how the use of the system promotes the participation of the community, and we provide examples of the types of communal projects that occur because FILAGREC is used. Communities with FILAGREC in place develop an awareness regarding the use of water, and moderate their consumption. As an annex to the article we include the notes of the workshop that was offered to train the communities about FILAGREC.

Energy saving, Recycled water, Ecological awareness, Community participation

Estudio y comparación de las partículas PM_{10}, de las estaciones de muestreo en el estado de Tabasco, y su comportamiento respecto a la NOM-025-SSA1-2014

Study and comparison of the PM_{10} particles of the sampling stations in the state of Tabasco, and their behavior with respect to the NOM-025-SSA1-2014

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Abstract

Air pollution is a persistent problem that has implications for the environment and the health of the population; There is a great diversity of sources that emit pollutants in the air, including industrial and mobile sources. One of the main pollutants found in the atmosphere is particulate material, which is a complex mixture of substances in a liquid or solid state, which remains suspended in the atmosphere for varying periods of time. The purpose of this research is to evaluate the air quality, based on the PM10 pollutant criteria for the year 2018, using data from the "Tabasco State Atmospheric Monitoring Network". The municipalities that will be considered in this study are: Balancán, Centla, Centro, Comalcalco, Cunduacán, Huimanguillo, Macuspana and Paraíso; which were sampled in accordance with the provisions of NOM-035-SEMARNAT-1993, and the results obtained were compared with the LMP established by NOM-025-SSA1-2014. Therefore, the results of the monthly averages that were obtained from the monitoring stations indicated that for the year 2018 the month of July was the one that registered the highest concentrations of the PM10 pollutant, however, the MPL established by the standard.

Particulate matter, Air quality, Air pollution, Criterion pollutant

Material Particulado Fino (PM_1) y fracción orgánica

Fine Particulate Matter (PM_1) and organic fraction

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Abstract

PM_1 are the most cytotoxic ambient particles. To date, few studies conducted around the world have focused on ambient PM_1 due to the unavailability of air monitoring equipment. Therefore, the organic composition of a significant fraction of respirable PM is unknown. Polycyclic aromatic hydrocarbons (PAHs) and quinones in fine particulate matter raise concerns due to their potentially carcinogenic and mutagenic properties. In the aerosol (mix of particles and liquids in a gas phase), sorbed PAHs and quinones are produced from incomplete combustion or pyrolysis of organic material, and can be formed also by atmospheric processes. Gaseous and heterogeneous atmospheric processing of PAHs can yield further quinones via photochemistry and reactions with atmospheric oxidants including $^{\bullet}OH$ free radicals, O_3 and NO_3. There is an overall lack of information about levels, sources, and exposure to these pollutants. Therefore, regulations and control strategies are still non-existent.

Fine particulate matter, Quinones, PAHs, Atmospheric pollutants

Energías renovables enfoque ambiental

Renewable energies environmental approach

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Abstract

The East Zone of the Valley of Mexico, is now considered an Urban Zone due to the influence it has with the limits of the CDMX, and because of its high population growth that is not territorially ordered it alters the ecosystem, thus suffering a socio-economic transformation, which requires instead of more public services and a high energy demand that tend to be insufficient, which leads to try to implement the use of alternative energies using photovoltaic cells. To do this, a population study was conducted to analyze their perception of the energy transition in the East of the Valley of Mexico based on solar panel technology using socio-statistical techniques. The social evaluation and the environmental and economic perception of the use of solar energy, showed that the level of marginalization, energy costs and lack of knowledge on the subject limits in this area the implementation of new technologies that reduce the great environmental problem that lives today due to the mismanagement of natural resources.

Energy transition, Society perception, Environment

3 Ciencias Sociales

Caracterización de usos de las nociones trigonométricas en la ingeniería mecatrónica desde la matemática educativa

Characterization of uses of trigonometric notions in mechatronics engineering from mathematics education

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Abstract

From the Socioepistemological Theory we propose that even with the curricular articulation presented in school programs of Engineering it exists a disarticulation of uses of mathematical knowledge, this is displayed more emphatically when a student takes professionalizing courses. We proposed the research question of: what uses of trigonometric notions are given in Mechatronics Engineering when students solve problems in Robotics? we use the Socioepistemological Theory in tandem with the ethnographic method to identify and characterize them in their cultural framework. By the delimitation of the study to a community of Mechatronics Engineering in a Mexican university and the direct kinematics problem in the subject of Industrial Robotics, we characterize that trigonometric notions are given an arithmetic, metric, quantitative and algebraic usage, and by them, the Trigonometry acquires more significates aided by the construction of visual references that allow the mathematical modelling that was done, and from which we recognize in the pseudo-concrete models (drawing and kinematic schemes) the reason to be for Trigonometry as a tool for Robotics: the determination of the position in a circle or circular sector.

Mathematics Education, Engineering education, Trigonometry

Elementos históricos-epistemológicos para el diseño de una situación de aprendizaje desde la Socioepistemología. El caso del estado estacionario y la ingeniería eléctrica

Historical-epistemological elements for the design of a learning situation from Socioepistemology. The case of steady-state and electrical engineering

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Abstract

In this article, we present the results of a research in Socioepistemology (a theoretical framework in Mathematics Education), in which by the theorical-methodological tool of the problematization of mathematical wits identifying elements for the social construction of mathematical knowledge related to steady-state in the works of 19th century scientists (Ohm, Thomson and Maxwell), these elements help in broadening the school promoted notions related to the mathematical wit of steady-state, considering the problems, paradigms and analogies created by the scientists as the situational context, and the steady-state as a signification context for the trigonometric Fourier series. These elements are used for the design of a learning situation in electrical engineering to study the steady-state in the static and dynamic scientific paradigms by working with analogies between steady-state heat propagation and diverse electrical phenomena. With the conclusion that these elements can be used to broaden the notion of steady-state from static to dynamic.

Mathematics Education, Steady-state, History and epistemology

Tecnologías emergentes y su aplicación en la educación superior

Emerging technologies and their application in higher education

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Abstract

The usefulness of Information and Communication Technologies (ICT) as pedagogical tools have been widely studied, where the need for didactic planning arises so that they become resources for improving educational quality.Emerging technologies are new creations, scientific innovations that can create a new industry or transform an existing one with new technologies, or also allow the use of existing ones mixed with new ones, or improve them based on new requirements.These technologies have some tools such as those listed below: Cloud Computing, Collective Intelligence, Nashua Data, Collaborative Web.The aim is to identify the knowledge that the teachers of the UAEM Valle de México University Center have, regarding emerging ICT, describe the uses that they give to some of these tools and determine their level of updating.We used a mixed methodology, to know, how are they integrated in teaching? What cognitive skills have been promoted with them?

Emerging technologies, Higher education, Strategies, Learning

Evaluación del capital intelectual en una PyME en la ciudad de Puebla, México; aplicando el modelo Skandia

Evaluation of intellectual capital in a SME in the city of Puebla, Mexico; applying the Skandia model

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Abstract

The present article proposes to evaluate the Intellectual Capital (CI) in a Small and Medium Company (SME) located in the city of Puebla applying the methodology indicated by the Skandia model. The focus of the present study is quantitative and qualitative descriptive type; through this approach, the performance on the investment made in an administrative system by the company in the 2017 study year can be observed, with the purpose of improving its processes, controlling them and offering better service to its clients. The methodology followed in this work is the one proposed by the Skandia model, going through its different approaches and calculating the respective indicators according to the information available in the company. In the final part of this paper, the conclusions are presented from two perspectives, the first from the perspective of the managers of the company object of this study and the second from a generalized position for SMEs.

Intellectual Capital, Small and Medium Company, Skandia model

Estrategias para disminuir la rotación de personal, caso de estudio en el sector hotelero

Strategies to diminish the rotation of personal, case of study in the hotel sector

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Abstract

With the determination of this work, the company will bear in mind which are the indicators (conditions of position, salary, motivation, labor environment and training) that they affect directly to the job turnover and this way to be able to give him emphasis in the indicators that one is not working correctly, allowing to reduce this way the rate of current job turnover in the company. Each of the indicators was effected by means of the design of questions in such instruments as; interview applied to the manager of human resources and survey directed the collaborators alone where it was considered to be the sample of 255 collaborators of the diverse working places of the organization. The results obtained in the interview and surveys show in precise form the principal problems that the organization has, giving as reference where improvements have to be realized with I am of benefit so much for the company and as the collaborators. By means of to the analysis of the results was observed that the indicator of labor environment that exists in the organization presents deficiencies in the strategies that develop.

Rotation, Personal, Strategies

Cálculo mental como estrategia para el aprendizaje de los contenidos matemáticos en la educación primaria

Mental calculation as a strategy for learning mathematical contents in primary education

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Abastract

This article describes a proposal for the implementation of mental calculation as a strategy for learning mathematical contents in primary education. The mental calculation as an important part in mathematics gives the students an opening to new ways of thinking and gives him the mental agility that helps him to solve problems in a more competitive, quick and easy way. That is why the interest to train the student from an early age to boost the exercise of his mind, proposing strategies that make more efficient teaching-learning process and increase their academic performance in the subject of mathematics. On the other hand, nowadays the profile of the students is valued according to their competences and these must be demonstrated in solving problems of daily life. However, at this moment in history the student is surrounded by information and communication technologies, very effective for the advances that they bring with them, but they generate greater dependence on him, so that now he avoids using more of his reasoning, because most solutions are found by clicking a button.

Mental calculation, Learning strategies, Mathematics and academic performance

Gestión de estrategias y tecnologías en la formación de perfil y cultura de emprendimiento, el desarrollo para regional

Management of strategies and technologies in the formation of profile and culture of entrepreneurship, development for regional

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Abstract

Baja California Sur has areas of opportunity promote alternative tourism given the orographic conditions and characteristics of the environment, there are differentiated and distinctive attractions in rural areas such as the South Micro Region of La Paz, however, these attractions have not been taken advantage of. as development strategies and for the benefit of residents, there is little influx of local, national or foreign tourism, this negatively impacts regional development, given that the tourism that is practiced today is organized and carried out by people who do not inhabit the place, they take tourists for a while and the benefit does not permeate the population. Business strategies such as the formation of the tourism cluster, encourages the active participation of residents as their own beneficiaries, the formation of profile and culture of entrepreneurship is important and enables the participation of local businessmen. Thus, we see that the objective is to design a proposal for the formation of entrepreneurship profile and culture in the settlers, including aspects related to relevant information on the profile and culture of entrepreneurship, as well as information related to organizational culture, methodological aspects: collection instruments, processing and analysis of information, closes with proposal, conclusions and recommendations.

Cluster of alternative tourism, Technologies for regional development, Profile and culture of entrepreneurship

Plan estratégico para la estructuración de una red de productos y servicios para el desarrollo del triunfo, B.C.S

Strategic plan for the structuring of a network of products and services for the development of triunfo, B.C.S.

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Abstract

A strategic plan is presented, where the characteristics of the structure of the infrastructure and the implementation of a network of products and services that allow the economic reactivation of the inhabitants of El Triunfo, Baja California Sur. For the development of this project, the documentary research is redirected and the field obtains data related to the economic activities, traditions and customs of its inhabitants. The definition of the project and establish the relevant commitments with them. Subsequently, zoning activities were carried out, inventory inventories and efforts in the area were carried out, the results of which were extremely important and a key piece for this investigation. The general objective has been fulfilled in its entirety and has resulted. The result has been achieved.

Planning, Networks, Services

Impacto de la capacitación del programa de formación de académicos en la facultad de mecánica y eléctrica de la universidad Veracruzana, Zona Poza Rica Tuxpan.

Impact of the training of the program of training of academics of the faculty of mechanics and electricity of the universidad Veracruzana, Zona Poza Rica Tuxpan.

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Abstract

The Universidad Veracruzana, through its academic training program (PROFA), provides training courses and / or disciplinary and pedagogical updates to academic staff at the Faculty of Mechanical and Electrical Engineering of the Poza Rica-Tuxpan area, which counts with 38 teachers, to whom, every semester period, they are offered and implemented training courses. This article aims to demonstrate how relevant and sufficient these courses have been, from the academic perspective. To do this, quantitative field research was carried out through surveys applied to 20 teachers equivalent to 52.6% of the population. Of this sample, 50% think teachers training is more focused on pedagogical than disciplinary courses. 65% of the teachers surveyed mention that the training has met their expectations and the 95% that has had a positive impact on their teaching practice. It is concluded that the areas to be reinforced are the management of software and TIC, sustainable development, administrative scope and disciplinary area, which defines a precise panorama on the next courses to be offered.

Training, Impact, Courses

Desarrollo de habilidades digitales e impacto en el aprendizaje de excel avanzado a través del uso de plataforma virtual edmodo

Development of digital skills and impact on advanced excel learning through the use of edmodo virtual platform

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Abstract

The teaching - learning process that can be implemented in a Higher Education institution for a student to assimilate the knowledge and skills necessary for the use and mastery of a software as commonly used as the Excel spreadsheet, should consider the use of techniques , strategies and particular methodologies if it is to develop skills for the management of this software at medium and advanced level. This research presents the results obtained having used as a strategic tool the virtual platform Edmodo within the course of Computer Science II for the Accounting Education Program, so that the student acquires on one hand the necessary knowledge for the management of the mentioned software, the development of digital skills, the motivation to learn, the promotion of responsibility and proactivity for the study, as well as the acquisition of different habits to those that can develop without an information technology like this.

Excel, Edmodo, Digital Skill

Aplicación del Balanced Scorecard en la veterinaria e insumos Pa´lante S.P.R de R.L. de C.V.

Application of the balanced scorecard in the veterinary company and Supplies Pa'lante S.P.R of R.L. of C.V.

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Abstract

The objective of the application of the Balanced Scorecard methodology in the Veterinary and supplies PA`LANTE S.P.R. OF R.L. DE C.V. In the area of production and repair of trailers is to identify exactly what should be monitored to introduce a reliable measurement strategy that provide information on performance and understand why they are giving certain results, the methodology is to align the companies towards the achievement of business strategies, through tangible objectives and indicators as it converts the vision of companies into action through a coherent set of indicators grouped into four business perspectives that are: Financial, Clients, Internal Processes and Training and Growth since this methodology suggests that these perspectives cover all the processes necessary for the proper functioning of a company. The contribution of the methodology is to determine what factors are influencing the area of production and repair of trailer that are affecting the production times considering the last three quarters of the year 2018.

Balanced Scorecard, Indicators, Perspectives

Educación autónoma y su inclusión actual en la educación superior

Autonomous education and its current inclusion in higher education

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Abstract

This paper presents the comparative study of Autodidacticism and self-regulated learning, its role in higher education today and how their autonomous qualities should be a factor of interest for participants in a learning process, in addition to suggest autonomous learning as a curricular policy of higher education. It is carried out through a strategies comparison made in undergraduate students in a specific subject to homogenize the context. Evaluations were carried out simultaneously in the different moments of the learning process that allowed defining the advantage of one modality over another. Success cases and the effectiveness of the self-regulated approach were found, wich is increasing today with the help of Information technologies and educational platforms. It culminates with a proposal as part of the results obtained from some strategies used that increase the autonomy of thought and action with the aim of building a critical and universal learning process within the competitive requirements within society. It is important to recognize, therefore, how the autonomy and the necessary indicators are carried out for its effective implementation within the change of perspective of higher education.

Autonomous learning, Higher education, Curricular proposal

Crecimiento económico y sector servicios en países de Iberoamérica 1960-2010

Economic growth and services sector in Latin American countries 1960-2010

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Abstract

The organizations of the service sector have been little studied; despite the fact that they have a great influence on the economic activity of the Latin American countries (in the labor force -mainly). The purpose of this research is to analyze growth in Ibero-American countries (1960-2010) through an econometric model of panel data by means of variables from the services sector. We want to test the hypothesis that the service variables have positive and statistically significant effects on the economical growth. The empirical evidence from the results obtained in this study suggests that two of the variables of the sector (business services and government services) have positive effects on economic growth in these countries. This is explained primarily by the growth of financial intermediation services (income and business activities) and secondly by the growth of government services (public administration and defense, education, health and social work). In general terms, in this study there is statistical evidence that supports the hypothesis of Ghani and Kharas, (2010), who proves that services cause growth in a globalized and technologically developed world. In this sense, Ghani, (2011), also affirms that services be a driver of sustained growth in organizations.

Sectoral studies, Economic Growth, Iberoamerican Countries, Econometric Models. JEL C23, L80, O41, O54

Valoración del impacto del capital intelectual en la generación de valor en empresas de la red sinergia academia-empresa mypymes de México, con base en el modelo del navegador skandia

Assessment of the impact of intellectual capital on the generation of value in companies of the sinergia academia-empresamypymes network in Mexico, based on the skandia navigator model

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Abstract

This paper analyzes the impact ofintellectual capital considered as the new paradigm of competitiveness (Bueno, 2008, Villegas-González, Hernández-Calzada and Salazar-Hernández, 2017), through the implementation of a comprehensive web system for Academic Management and Linking of the Collaborative Thematic Network, on the companies in the SinergianetworkAcademia-EmpresaMyPymes de México, from the area of influence of the Technological Universities, integrated by the Academic Bodies: UTBB-CA-1 Information Technologies for the technological development of Bahía de Banderas and the UTJAL-CA-2 Social Responsibility, Sustainability and Integral Development for SMEs of the Technological University of Jalisco, same that served as coordinator of the Thematic Network of Academic Collaboration.Basis in the Skandia on companies of the SinergiaAcademiaEmpresa network of MyPymes in Mexico, based on the Skandia Navigator Model, which is tropicalized, assessing relationships between pairs ofvariables, through cross-checking or contingency tests,followed by discriminant analysis; to finally recognize therelationship between the variables "How many employees of your company are satisfied with work?" and "What is the rate of satisfaction of your customers?", as the one that has the best association to promote the generation of value.

Intellectual capital, Human capital, Value creation

El entorno competitivo del mezcal: La estrategia de las grandes compañías de bebidas espirituosas frente a los pequeños productores de mezcal

The competitive environment of mezcal: The strategy of the large spirits companies vis-à-vis small producers of mezcal

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Abstract

The purpose of this paper is to analyze growth strategies from large spirits companies, their impact on mezcal market and the implications on local artisanal mezcal producers in Oaxaca, Mexico. As a case of study, the competition strategies of the main spirits companies are analyzed globally through reports and different databases, information that is complemented and related to interviews conducted with different mezcal producers and marketers in the State of Oaxaca, Mexico. It is considered that the best strategy that mezcal producers can follow is to direct the product directly to the final consumer highlighting socio-cultural elements incorporated in the product.

Competition, Oligopoly, Market Analysis, Pymes, Spirits, Mezcal

La tecnostress: Su influencia en el entorno de aprendizaje relacionado con el uso de las tecnologías de la información

The technostress: Its influence in the learning environment related to the use of information technologies

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Summary

This educational research is carried out to know and rate the level of technostress that the students of bachelor degree may have in order to analyze the presence of this factor of psychosocial risk and its relation to the degree of dropping out and failing that is currently presented. This is accomplished with the objective of the TecNM, of being an institution for the integral formation of competent professionals, and for the implementation of the necessary learning strategies for its achievement. A questionnaire (Cronbach's alpha: 0.913) was designed and administrated to students of 2 different programs, one of them with the obligatory use of ICT (Information and Communication Technologies), who during their training use ICT in almost all their subjects. The other was the control group composed of students who use ICT not that often. The applied survey tries to find out positive and negative aspects related to the use of technologies such as attitude, efficiency and anxiety. The initial results show little differences between the two programs, high level of addiction and anxiety which could be a matter to be considered within options to improve or design alternatives to avoid its development, so that it doesn't influence the raising of indicated rates.

Techno stress, strategies, learning, ICT

Determinación del grado de satisfacción estudiantil en una institución pública de educación superior

Determination of the degree of student satisfaction in a public institution of higher education

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Abstract

Excellence in service is more than a competitive advantage, a requirement for any organization. The service industry has undergone a change in recent years and the institutions of higher education have not been left out of this requirement. The present study seeks to identify the level of satisfaction of the students of the Technological Institute of Toluca with the services offered. The type of research that is addressed is of a descriptive type; the information is obtained through the collection of primary data through the application of a survey, sampling is carried out by strata, considering each career offered by the Institute as a stratum. The questionnaire includes questions on a five-level Likert scale. The factors that are considered are: teaching, infrastructure and administrative services. The results obtained reveal the areas that require immediate attention from the client's perception (students), this information is the basis for developing strategies for continuous improvement. The conclusions are presented in terms of relevance to the student body, that is, the level of satisfaction as an indicator of the quality of the service provided by the Institution

Satisfaction, Student, Service

Desarrollo tecnológico de las mipymes de servicios de alimentos de Matamoros desde una perspectiva sistémica

Technological development of the food service mipymes of Matamoros from a systemic perspective

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Abstract

The present investigation shows the results of a study focused on the technological potential of the MiPyMes of food service in the municipality of Matamoros. The research is carried out with a quantitative approach, through a transversal design- Descriptive. A questionnaire prepared by the Latin American Administration and Business Network (Aguilar Rascón, Oscar, Posada Velázquez, Rafael, and Peña Ahumada, Nuria Beatriz: 2018) was used as an instrument, applied to 60 business owners of food services. According to the results, a use of the technologies is concluded more in personal than in commercial purposes. Currently, companies are forced to choose to seek and optimize their processes to be more efficient in the production of their products or services, as well as managing finances and improving customer relations. In order to be able to improve both the operation and reduce costs, innovation or support with technology is necessary. Of the systemic analysis in inputs (Human Resources) more weakness, in Processes in the handling of cash and not to get indebted with the institutions are the vulnerable points. In results there is little importance of the environment and CSR.

Technological Potential, Mipymes, System

Relación predictiva de la gestión del conocimiento y la innovación empresarial: Un modelo basado en ecuaciones estructurales PLS

Predictive relationship of knowledge management and business innovation: A model based on PLS structural equations

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Abstract

In this study we describe flexible modeling using structural equations of partial least squares (PLS) based on the analysis of variance, to predict the dependency relationships of a theoretical model supported by internal and external conditions for the development of innovation capabilities that they include the endogenous variables; organizational culture, exploitation innovation, exploration and ambidestreza, innovative performance, competitiveness, University-Business collaboration and business innovation, and its relationship with the exogenous variable; knowledge management practices. In the method, three phases were applied; the consideration of the theory and previous investigations for the construction of the conceptual model, the application of the measurement model related to the attributes of validity and reliability of the constructs, the structural model that evaluates the weight and the magnitude of the relationships between variables. Out of the main results, values higher than the minimum variance value explained were obtained, which is recommended to be Falk ≥ 0.10 and a model adjustment value greater than 0.50, thereby inferring the existence of a positive relationship of predictive interdependence and significant variance of the variables, which favor the creation of product, service or process innovations in companies.

Structural equation modeling, Knowledge management, Business innovation

Aplicación móvil para aprender lengua de señas Mexicana

Mobile application for learning Mexican sign language

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Abstract

This article presents the model of a mobile application, as a learning support tool, for children and adults who have a hearing disability or not, learning the Mexican Sign Language. This is to be achieved by means of animated images, a game and a translator who spells the words by means of the dactylographic alphabet. Supported by the Regular Education Support Services Unit (USAER), which is incorporated into the SEP, located in Morelia, Michoacán. Also like the Civil Association "My hands speak to help", which is located in Zitácuaro, Michoacán. Facilitating learning with this mobile application that is designed ad hoc to the eastern region of Michoacán, supported by sign language interpreters. The use of mobile technology allows more people to have access to this type of tools, facilitating learning and teaching. This is intended to human thinking to evolve so that people who have this condition can then contribute their ideas and knowledge in the future.

Disability, Mobile, Learning

Red de distribución logística de jitomate en México

Logistics distribution network of tomato in Mexico

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Abstract

In this investigation, the shortage at national level of tomato is solved, where its logistics is scarce in its supply chain towards the demanding states that do not cultivate or harvest small quantities. The 32 states of the Mexican Republic are contemplated.The methodology is based on modelling on linear programming as an analysis tool, where tomato claiming states and supplying producer states are identified, to later identify the supply connections with the calculation including the logistics of transport costs between these states.By analysing and applying the method, results are obtained that demonstrate the optimization of the amounts to be distributed among the states (equilibrium between supply and demand), where one or more supplying states can supply the demanding state, minimizing transportation costs within its supply chain.The model determines the optimal connections between bidder-consumer, allowing the design of a Distribution Network in Mexico optimizing the supply of logistics in the supply chain.

Tomato, Logistics, Supply chain, Linear programming

Análisis técnico-económico de la erosión del suelo y su impacto en el bienestar de productores

Technical-economic analysis of the soil erosion and its impact on the well-being of producers

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Abstract

Soil erosion in rural agricultural communities in Mexico and low yields is the subject of the present work, places where production has stopped due to the low profitability and productivity generated by the loss of nutrients as a result of natural phenomena, as well as by the action of man.The objective is to identify the current condition of the soil and its impact on agricultural production, in order to suggest soil improvement and conservation techniques appropriate to regional characteristics, to raise the income level of producers in a rural community of Hidalgo, Mexico.The work is divided into three stages: the first consisted of identifying the predominant agricultural crops; the second, sampling to develop the soil analysis; the third, to evaluate economically the income that currently generates the agricultural activities that are practiced in the community and later to evaluate the changes that could be generated when applying measures of soil conservation; as well as the application of the methodology to identify the profitability and the products.

Agricultural Soil, Erosion, Soil conservation

Aplicación web como plataforma de gamificación para una asignatura de licenciatura a través de una red social

Web application based on a social network as a gamification platform applied to a university course

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Abstract

In our days, social networks are used daily for a huge amount of people, which are used for communication and socialization. Some of these people, are university students, reason why those technologies can be used in education. In present work, the use of Facebook API in the development of a web application, is presented. This application allows to share class related content, to set challenges, peer evaluation activities and others. The purpose of the application is to support professor in teaching-learning process, using a gamification technique helping in the acquisition of knowledge taking advantage of the ludic approach of the technique, generating a positive experience in the students. The combination of the above and the use of one of the favorite social networks motivates students, generating a greater commitment to the subject. The development of the software application included the use of PHP, JavaScript, Bootstrap and MySQL. The developed application was used in a course obtaining favorable results, due to the raising in the level of participation of the students.

Gamification, Social network, Learning

Estrategias para la evaluación de actitudes y aptitudes en estudiantes de nivel superior, aplicadas a un proyecto de u-learning

Attitudes and aptitudes evaluation strategies on higher education students applied to a u-learning project

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Abstract

A commitment of Higher Education Institutions, is to provide the labor market graduates who besides having engineering knowledge, also possess the skills and attitudes necessary to achieve an integration in work teams.On the other hand, in the university sphere the measurement of the academic performance of some subjects is directly related to the aptitudes to solve in a collaborative way the practical problems, that is to say, with "know-how".Our contribution consists in the creation of a ubiquitous learning environment, which, based on a series of multimodal interfaces developed for an Environment Intelligence Environment and context sensitive applications, aims to influence the teaching-learning process through a laboratory collaborative practice. The objective of the proposal is to generate and implement strategies for the evaluation of attitudes and aptitudes in the field of Ubiquitous Learning, as well as to provide the student with a conducive space to generating knowledge and encouraging the development of cognitive skills.For this purpose, it is necessary to discuss the strategies that will be used to evaluate attitudes and aptitudes of a work-team members.

U-Learning, Attitudes and aptitudes, Evaluation and teamwork

Instalación Fotovoltaica: El escenario en educación superior del aprendizaje basado en proyectos para alumnos de energías

Photovoltaic installation: The scenario in higher education of the project based learning for energy students

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Abstract

This article presents a learning experience focused on the student, developed through project-based learning and collaborative learning.The primary objective is oriented to the acquisition of cognitive and pragmatic skills in one of the most common aspects of solar energy use, to say, the photovoltaic installations. Therefore, the learning experience is described in the process of installing 194 solar panels with the project Photovoltaic installation in a poultry farm in the community of Tapias Viejas in Aguascalientes.The observation technique is used in the behaviors of the students, as well as the request for a written report as a product of the project; in this, the students express their opinion and learnings, which have been included literally in the Results section.It is worth mentioning the motivation and pro activity that the students manifested during the development of the project; of their opinions, emphasizes the importance of situated learning methodologies, which promote in the student the opportunity to apply knowledge, develop skills and strengthen attitudes, necessary for their professional training.

Learning, Projects, Photovoltaic

Industria 4.0 en México, la administración inteligente en sistemas productivos

Industry 4.0 in Mexico, intelligent management in productive systems

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Abstract

Industry 4.0 in Mexico, intelligent management in productive systems A disruptive business model is that scheme that has changed according to the new consumer trends of the customers, turning a physical production industry into a form of electronic production, opening new opportunities for the industry in Mexico and becoming an element economic and social transformer that have allowed to change the rules of the game, through implementation of technological developments, which are creating an impact on the way of doing business, through technologies such as artificial intelligence (with machines capable of learning), Robotics (enhancing Automation), Internet of Things (with an interconnected world), Digital Manufacturing (with new forms of design and manufacturing), R-FID (Satellite Tracking, Logistic) in production chains, VAT (Drones with a variety of industrial uses) fostering an improvement through the implementation of Intelligent Management, which serves as an strategy to consolidate the technological and knowledge society in Mexican productive systems.

Disruptive business model, Artificial intelligence, Digital manufacturing

Sistema "PYME Online" para redes de colaboración en Mixquiahuala: Principales hallazgos

"PYME Online" System for collaboration networks in Mixquiahuala: Main findings

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Abstract

The main objective of this article is to publicize the progress made on the "SME Online" platform, which is based on the idea of fostering collaborative networks through e-commerce between consumers and local micro-businesses in the municipality of Mixquiahuala de Juárez, Hidalgo and neighboring municipalities.Within this process, the use of quantitative research methodology was used in the integration of system relevance surveys and for which the spiral programming methodology was used. And the use of qualitative methodology to know the personal data that would be required of users to fill the concentrate to access the platform.That is why this article contributes to arouse interest and knowledge on the importance of managing and promoting collaborative networks, to generate competitive advantages that entail a benefit for society in general and to facilitate daily life.

Local growth platform, Technology, Communication

Formalism of E-Commerce for SME of pottery

Formalismo de comercio electrónico para PyMES de alfarería

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Abstract

This work presents the essential elements that must be contained in marketing strategy oriented to virtual commerce, which is colloquially known as e-commerce. The presentation of the mentioned elements is done from a reflexing of some concepts that are formally showed. It is to say that the dissertation on the validity of the proposal is supported by mathematical approaches. Although the exhibition of this research is acceptable for all types of *Small and Medium Enterprises* (SME), it is focused on the characteristics and needs of the pottery industry. The elements of the proposed marketing strategy are aimed at maximizing the customers shopping experience. The essential questions addressed are 1) How to keep customers to contact with products? 2) How to make customers feel that they are served? 3) How to get buyers to remain as customers and attract more? 4) How can buyers help to improve e-commerce? 5) What is the trend of the marketing strategy for e-commerce?

E-commerce, ICT, SME

La sustentabilidad en las escuelas de educación superior en México

Sustainability in higher education schools in México

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Abstract

The increase of gases in the ozone layer is an important issue nowadays in the Universities of Higher Education in Mexico; there is a great interest in contributing to the reduction of the carbon footprint, therefore, a study was carried out to calculate the footprint generated by the students of the Polytechnic University of Guanajuato through the use of software. The participants were 27 students of the Automotive Engineering degree of the sixth semester, which during this period kept a record of the consumption of PET bottles in their various presentations. The main findings were that the total CO2 they produce is 131.7 Kg, which would be equivalent to 0.176 barrels of oil and 1.19 m3 of space saved in landfills. Now, taking into consideration the entire student population (3,899), the calculation was projected annually and estimating the same consumption patterns, would save 76.3 barrels of oil against 515.55 m3 of space in sanitary landfills.

CO2, Carbon Footprint, Universities of Higher Education in Mexico

Aplicación de un modelo de cambio, en la industrializadora de la madera colibrí, S. de R.L., a fin de rediseñar la línea de producción

Application of a change model, in the industrializer de la madera colibrí, S. de R. L, in order to redesign the production line

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Abstract

The organizational culture of the zone, the micro and medium company does not have any kind of specialized technical advice, much less with the application of integral collaborative consulting The model is related in parallel with applied research, thus providing an alternative solution or guide for people who are going to be venturing into the development of Action- Research, whatever the field of application, and which is difficult to find the characteristics special, applied in the field of work, and above all, click on the results of that application. It can also be modified by its components, since it must have particularity that each company requires to operate or solve a problem at any level and what this entails, since it mainly focuses on Quality as a tool, not as an end; because the end of the first achievement of any organization will be just the certification to venture into new stages that the total quality demands

Model, Quality, Tool

Acciones de mejora en una empresa distribuidora de semillas y fertilizantes del valle del Yaqui, Sonora

Improvement actions in a seed and fertilizer distribution company in Valle del Yaqui, Sonora

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Abstract

This research is carried out in a company that manufactures inorganic fertilizers and addresses the need to acquire a sanitary license for the mixing and packaging of fertilizers. For this, it is required to comply with the regulatory requirements established by COFEPRIS and STPS in the area of industrial and toxic waste management with code (CRETIB) Corrosive, Reactive, Explosive, Toxic, Flammable, Infectious-Biological. Currently there is a 17% regulatory compliance representing a risk to the integrity of employees and the revision of the license. The objective was to carry out improvement actions through the guidelines established by COFEPRIS to increase the percentage of compliance with them. The procedure was: Describe the area under study, prepare a list of requirements, security measures, document with training and dissemination to workers, technical information card, inventory of raw materials, personal protective equipment and determine the compliance of requirements. Eight documents were delivered which were necessary to comply with the requirements established in compliance with the objective and increasing the percentage from 17% to 83% compliance.

Risk, Security, Improvement

SisCuentos: Herramienta de apoyo para el aprendizaje de compresión y lectura para niñas y niños de primer grado de primaria

SisCuentos: Support tool for learning compression and reading for girls and first grade primary school

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Abstract

Nowadays, girls and boys manage their own learning, therefore, learning is never as great as when a teacher is present, since it is in charge of mediating, transferring and translating each stimulus to girls and boys. This research highlights the general objective to develop a support tool for learning compression and reading for children of first grade of primary school General Lázaro Cárdenas de Tejupilco, State of Mexico. The methodology used is based on research "Apply in practice the lessons learned to achieve the transformation of the practice itself and that of the subjects of study". (Barabtarlo Y Zedansky, 2002). In conclusion, a positive result was achieved where the students were able to develop and improve Reading Comprehension, in addition that the stories not only promote access to the contents of the culture, knowledge, values, but also, put in motion important mechanisms linked to cognitive, linguistic and creativity development in girls and boys.

Education, Development App, M-Learning

Profesionalización docente en el nivel superior, bajo el enfoque de competencias

Teacher professionalization at the higher level, under the competence approach

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Abstract

This paper deals with a partial study that is being carried out on teaching strategies that are used in the teaching practice of some institutions of higher education, which work under the competence approach. Likewise, an analysis is made of the basic competences that teachers must possess to work on any subject of the curricular maps established at a higher level under this same approach.Through this study and analysis the reality of teaching practices is exposed once educational reforms focused on the professionalization of teachers have been approved, showing the challenges, advances and areas of opportunity in the short term. Evidencing that although the educational approach by competences is currently being worked on at all levels, from basic education to higher education, there are still many gaps between the links that make up the education system chain

Tecaher, Professionalization, Higher education

Análisis y propuesta de herramientas digitales aplicadas en la mercadotecnia en las medianas empresas de servicios restauranteras

Analysis and proposal of digital tools applied in the marketing in the restaurant services companies

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Abstract

Digital tools (DT) today have become indispensable in the business world, the growth of the country has a direct reference to the creation and strengthening of the MPyMES, with the services sector having a strong presence in local markets and restaurants Being a company of reliable utilities usually consolidate as a formal business, when identifying these aspects, it was decided to carry out this research with the objective in the first instance of obtaining data on the diagnosis in the use of DT, for which a methodological aspect is highlighted from the conceptual and theoretical part allowing to carry out the conceptualization, under a deductive process, carrying out the process of conceptualization to operationalization following the phases of theoretical representation of the concept, specification of the concept for the identification of the dimensions and of each dimension its indicators, resulting in an instrument was done with validity and reliability that was applied to a sample so that, based on the diagnosis and as a second instance, the proposal of the use of DT would be made to improve the marketing aspects in benefit of the consolidation of this type of companies.

Digital tools, Marketing, Restaurants

Software para el aprendizaje de operaciones aritméticas a través de los ábacos Cranmer para débiles visuales

Software for learning arithmetic operations through the Cranmer abacus for visual weaks

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Abstract

This article proposes a software development to help the sightless people learning arithmetic operations using the Cranmer abacus.To create this software was considered that the sightless person could not read the screen; for that reason, it was implemented a screen reader and navigation through the scroll and click, so the person can choose menus and options. It was used the prototypes methodology to improve each one of the versions and adapt them to the needs of the users.The user has to have a Cranmer abacus where he will represent numbers and do arithmetic operations, later through the use of a camera, the software will recognize the numeric values represented in the abacus. The first level is to represent numbers, later the software proposes a series of arithmetic operations, that the user has to solve and use the abacus to represent the result; the software checks if the answer is correct or gives orientation with a voice to help the user respond accurately. There are talking calculators, but this software proposes the learning with the abacus because it allows to develop mathematic skill needed for the sightless people.

Cranmer abacus, Learning, Sightless, Blind

Recursos didácticos para el aprendizaje de la lectura a través del método Gleen Doman utilizando realidad aumentada / Teaching resources for learning to read through the Gleen Doman method using augmented reality

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Abstract

This article presents the results of the tests carried out as well as the redesign of the educational material and the mobile application of the project "Teaching resources for learning to read through the Gleen Doman method using augmented reality". The teaching resources have three levels: 1.-words (through cards) and traditional board games 2.-relation of words in sentences 3.-stories at the moment to apply the tests in the kindergarten, it was found that there was conflict since the application was designed, because it sometimes did not recognize the associated QR code, due to the distribution within the board game, for this reason it was changed to an RA code. The distribution of the game boards was modified, the material in which they were made was changed, new categories were added based on semantic fields that children could handle. This project is based on a global method of reading learning, which is characterized by the fact that children learn complete words grouped in semantic fields. An online sales system was also developed (and with this different sales packages, according to the customer's needs), as well as technical support for the use of the product.

Glenn Doman, Traditional games, Mobile application

Aspectos psicosociales en la configuración de la dinámica social en comunidades originarias

Psychosocial aspects in the configuration of social dynamics in native communities

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Abstract

Faced with this global reality characterized by inequality and abuse, it was highly interesting to inquire about the situation of some indigenous communities and the way in which their structure is configured, as well as what the implemented conditions have allowed them to coexist before the multiple theoretical globalizing development proposals that seek to homogenize markets and culture. For this purpose, a qualitative quantitative mixed methodology was used, from a humanistic approach, which corroborated interesting results regarding the structure and functioning of the social dynamics of the community, allowing to evaluate and analyze the change and evolution of social organizations and institutions as well as of its interaction with the social reality, the modes of production, economic, cultural, political, ecological, etc., centered on the interaction of the individual with his environment, where all the possibilities of evolution or involution of the same are gestated, being It is possible to identify achievements and social possibilities for the improvement of community life as well as the generation of its history.

Social Dynamics, Psychosocial aspects, Original communities

Estudio del capital intelectual en el área académica de una institución de educación media superior, en el estado de Tabasco, para el desarrollo de una propuesta de mejora

Study of the intellectual capital in the academic area of a higher education institution, in the state of Tabasco, for the development of an improvement proposal

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Abstract

At present, intellectual capital is the most important resource for all organizations. Therefore, in the present research work the integral study will be carried out in the academic area of an institution of higher secondary education, in the state of Tabasco. It is proposed to design an instrument, which is considered a hybrid as it is formed by intangible information that is interpreted by the researcher and translated through a Likert scale to a quantitative data that allows to locate the study factor in a clear way to determine its degree of influence in the generation of intellectual capital. In addition, these factors are taken from experts in the study context whose experience allows them to give their opinion. This information is included in a double entry table that allows to find the key factors of incidence in the subject of study. The study is duly justified because it allows us to find the key factors that have the development of human resources to intellectual capital, which greatly benefits the context of study, in addition that an integral evaluation instrument will be provided since it covers tangible and intangible aspects in the measureme

Intellectual Capital, Intangible, Likert

Desafíos en la academia e investigación para las mujeres

Challenges in academia and research for women

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Abstract

Since the beginning of the 20th century, when the manifestos began for the rights of women, the access of women to various media has been periodic and growing but not considerable. Currently, noting only the area of science and engineering, there is still a low presence of leadership. This absence is more accentuated in scientific research with a percentage lower than 10%. In this work is presented a revision of literature about the presence of women and their participation in the academy and investigation. From a qualitative methodology based on a documental technique is realized the analysis of the information of diverse reports of the National System of Investigators and of documents, obtaining the evidence of the situation of the woman in the investigation of Mexico. Likewise, is exposed in general the experience of the woman in the sciences of the Engineering area of the Benemérita Universidad Autónoma de Puebla. Finally, are presented the conclusions and the proposal of the formation of the woman in the academy and investigation to highlight their positioning as investigator.

Engineering, Inclusion, Investigators, Equity, Formation

Dinámica Social y Resiliencia Comunitaria: Caso Cuetzalan del Progreso, Puebla

Social Dynamics and Community Resilience: Case Cuetzalan del Progreso, Puebla

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Abstract

Given the world reality, it is highly interesting to find out what the real situation is with respect to the development and quality of life of its inhabitants, in some communities originally from Mexico and, mainly, for this study, Cuetzalan del Progreso, Puebla, and what are the conditions that has been implemented to coexist with the globalization proposals of development since at present, the current world panorama, is characterized by injustice, inequality and indifference, in the era of knowledge and information, where scientific theories point towards a well-being social and human development and the results obtained within societies are not those predicted by the established models. In such a way that the main objective was the study of how the Social Dynamics favors the Community Resilience, allowing to understand the internal processes of the community objects of study, and how the formation of flexible people in a world ruled by the change, the uncertainty, globalization and competitiveness in different areas and turn them into protagonists; for this it was necessary to use a mixed qualitative-quantitative cross-sectional method, which allowed to approach, from an ethnographic methodology in its first phase, and in the second through quantifying the data, obtaining interesting and revealing results.

Social Dynamics, Community Resilience, Original community

Identificación de recursos didácticos digitales conocidos y aplicados por docentes del área de biología de la UPIIZ

Identification of digital teaching resources known and applied by teachers in the biology area of UPIIZ

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Abstract

This document presents the results of a qualitative exploratory analysis on an objective teaching population, in this case the professors of the biology area of the Unidad Profesional Interdisciplinaria de Ingeniería Campus Zacatecas (UPIIZ), of the Instituto Politécnico Naional. The analysis was made around the knowledge and application of digital teaching resources in their teaching practice. The above considering the current institutional context where as part of the strategies to improve academic coverage and respond to a knowledge society that imposes innovations considering ICTs within the university functions for the transmission of knowledge. The results show that the teaching population in which this study was focused requires a process of formal professionalization in the knowledge and use of digital tools for the creation of didactic material.

Digital resources, High education, Teachers

Impacto social sobre la mala aplicación de las tutorías a nivel superior

Social impact on the bad application of higher-level mentoring

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Abstract

Higher education has focused on student-centered learning systems giving a space to the so-called "Mentoring", understood as a function of accompaniment, guidance and support for students in the process of personalization of learning and development of skills, in the area of personal life as well as in professional practice, in order to improve their academic performance, develop good study and work habits to meet graduation profiles. Mentoring appears to be one of those good, win-win ideas we affirm but have difficulty implementing. Mentoring is good for the mentor, the mentee, and the organization. The benefits and obstacles in the mentoring program in their majority presented in mentor and mentee, but not in the systems with which its work like the universities is linked. Therefore, the objective of this work was to conduct a systematic review of the literature and an empirical approach to examine the effectiveness and application of mentoring programs in higher education through the evaluation of origins, attributes and difficulties faced by students.

Mentoring, Higher level, Mentor, Skills

Pronóstico de la demanda en la Veterinaria e Insumos Pa´lante S.P.R. de R.L. de C.V. mediante regresión lineal

Prognosis of the demand in the Veterinary and Inputs S.P.R de R.L. de C.V. through linear regression

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Abstract

The present study includes the application of the Simple Linear Regression model, to try to explain the relationship between the amount of sales (response variable) and their period (explanatory variable) of the Veterinaria Pa´lante S.P.R. from R.L. from C.V. Analyzing the earnings of the last nine quarters for the calculation of the projections for the next three months, the methods used to conduct the research were the quantitative and analytical method. To obtain the results, the least squares model was used to formulate an equation of the line that fits the data of the company, providing a way to find the best estimate that will help the veterinarian to make decisions.

Lineal Regression, Estimation, Ventas

Propuesta de Test de Percepción de Educación Financiera (T.P.E.F) a partir del modelo de Vallejo-Trujillo

Proposed Financial Education Perception Test (T.P.E.F) Based On The Vallejo-Trujillo Model

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Abstract

This chapter presents the proposal of the perception test of financial education - TPEF, as a tool to interpret, analyze and understand the unconscious world of the subject of study around the answers evoked on the topic of financial education from the presentation of visual stimuli, in confluence with the variables of the five dimensions reflected in the financial education model of Vallejo-Trujillo (2018a). The analysis is based on the unconscious perceptions that each person is conforming to the reality; a complex understanding although transduced and interpreted automatically by the individual from formal or informal learning around the subject. The empirical, qualitative research supported in content analysis, documentary, exploratory and descriptive was carried out in 150 students between 18 and 25 years of age from a Private University in Medellin - Colombia, finding that 83% of the visual stimuli makes it possible to analyze and understand the unconscious world of the subjects of study and interpret the responses evoked around knowledge in personal finance.

Financial education, Decision-making, Visual stimuli, Personal finances, Perception

Trayectorias académicas en nivel superior

Academic trajectories in higher level

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Abstract

General Objective: Quantify the pursuit of academic trajectories in the educational programs of the Faculty of Nursing of the Michoacán University of San Nicolás de Hidalgo. Specific Objectives: Establish a methodology to follow up on the educational programs the student is studying. Design the database to make comparisons of the 2008-2012 and 2012-2016 school years of the School of Nursing. Methodology: a quantitative, descriptive, observational, longitudinal cohort approach was used taking into account the academic indicators of the Faculty of Nursing: 1 Absorption, 2 Reprobation, 3 Dropout, 4 Retention of students, 5 Degree of titration. Contribution: Establish reference standards, in order to evaluate all aspects related to the phenomenon of school trajectory.

Students, Academic trajectory, University

4 Ciencias Fisicomatemáticas y Ciencias

Sistema de cifrado parcial dinámico para imágenes digitales

Dynamic partial encryption system for digital image

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Abstract

The present investigation is proposing a new partial encryption algorithm for digital image, using the synchronization of cellular automata based the local rule 90. To difference the other partial encryption algorithm, which become vulnerable attacks as Replacement Attack or reconstruction Attack, this system cypher different bit planes, in function secret key, that is for each block of clear text different bits are encrypted, to avoid that whit an operation for the elimination the encrypted bits information can be revealed, the synchronization of cellular automata has proven to be a useful tool for data encryption because is sensitivity to initial conditions and that rule 90 is considered a chaotic standard, both characteristics allow to comply with cryptographic and perceptive security , based on the results of the security analysis, in this proffer could be an attractive option for image encryption with a less computer cost without compromising the confidentiality of the information.

Cellular automata, Rule 90, Chaotic

Los armónicos que aportan los sistemas fotovoltaicos interconectados a la red un problema latente

Harmonics that provide the solar photovoltaic power supply systems interconnected to the electrical grid, are a latent problem

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Abstract

The electric power that generators supply to users (in Mexico, CFE), requires specifications for the safe and efficient operation of equipment and machinery. An important part of an interconnected photovoltaic system is the inverter and because it is a non-linear load, it will inevitably distort the voltage sine wave, whose components can be harmful for the aforementioned equipment, depending on the degree of total harmonic distortion that results from the operation of these investers The problem of the harmonics originated by the SFVI increases because of two situations: 1. The current trend of the use of this type of systems is increasing, due to the economic, environmental and social benefits. 2. the way of connection for SFVI called distributed generation, produce electricity close to the end users of power, means the harmonic components of the distorted wave will have greater impact. This study of harmonic distortion generated in the invester, it is urgent to analyze and determine procedures and specifications to select the best equipment and to minimize this latent phenomenon, which unfortunately can not be eliminated, but only to reduce its effects.

Photovoltaics, Inverters, Harmonics

Visualización de un flujo de convección mediante un arreglo tipo Schlieren

Viewing a convection flow using the Schlieren technique

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Abstract

In this work a Schlieren system is proposed. It is used to visualizing a convection flow, caused by the cooling surface a Peltier cell. The experimental assembly elements are a white LED light source (450 nm – 650 nm) that consumes 300 nW of measured electrical power, a Z-type optical reflective relay, a knife, an image acquisition system based on an Edmund EO02018C camera with CMOS RGB sensor and optomechanical components. A program for the analysis of the reference and the convection flow video was designed. As a first step, numerical integration and the phase unwrapping were carrid out to obtain the temperature gradients of the phenomenon under study and its temporal evolution. Then, each detection layer was analyzed, processing the data that provide more information on this phenomenon. It is important to note that the red layer of the camera has a better contrast in the visualization of the phenomenon, however, it is more affected by undesirable light diffraction. Therefore, the green layer of the camera is optimal for analyzing the phenomenon, this study confirms that that the Schlieren technique is ideal for observing phenomena where the temperature gradient is small and there are convection flows.

Convection flow, Diffraction, Visualization

Estudio de la interacción de luz con sustancias con alto contenido de sacarosa y fructuosa

Study of the light interaction with substances high in fructose and sucrose

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Abstract

In the teaching-learning process at the upper and upper secondary levels, it is difficult to motivate students about the importance of knowing and applying basic concepts in industrial processes. Therefore, it is proposed how to apply the concept of light polarization and spectroscopy to visualize the differences between substances based on sucrose or fructose. Both techniques have been applied in various industrial processes; their cost is regularly high and require extensive training. In this paper, we present the results of the implementation of a low cost linear polariscope for the analysis of natural bee honey and syrups based on sucrose. The arrangement consists of a semiconductor laser, a photodiode, two polarizers, a stepper motor and some mechanical elements, all controlled by the computer through a graphical interface. To validate the results, an optical array based on a low-cost commercial spectroscope is used. By implementing this experimental arrangement, the concepts of polarization, optical activity, atomic-molecular physics, electronic instrumentation and principles of equipment design and construction are involved.

Honey, Polarization, Optical activity

Simulación en la ingenieria

Simulation in engineering

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Abstract

Simulation is a method by which you can test, experiment or predict results in a certain process, scenario or object without the risk of real consequences. The objective of this research is to demonstrate how simulation is one of the greatest tools in engineering, which is used to represent a process through another and makes it much simpler and more understandable. This simulation is, in some cases, almost indispensable. In the simulation work, a methodology for design, development and evaluation is proposed. It is based on the synergy of two apparently dissimilar fields of knowledge: software engineering on the one hand and modern learning theories on the other, but which converge on the generation of a desirable product: simulation software. This methodology is based on the application of existing rules in both fields. As a result we have the use of simulation software, as a numerical technique to conduct experiments in a digital computer. These experiments involve certain types of mathematical and logical relationships, which are necessary to describe the behavior and structure of complex real-world systems over long periods of time.

Simulation, Program, Variables

Detección de anomalías en redes de sensores inalámbricos

Detection of anomalies in wireless sensor networks

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Abstract

Over time, wireless sensor networks (WSN) have been used for a variety of applications. Extensive work has been dedicated to various WSN applications. It is important to note that, due to their physical limitations, the sensors are prone to several types of faults. These restrictions can pose serious problems in event detection applications. Especially if the WSNs are deployed in hostile environments, such as the industrial or environmental sector. The detection of anomalies has recently attracted the attention of the scientific community, due to its relevance in real-world applications. The proposed solutions depend to a large extent on supervision and communication, using techniques based on tools such as Machine Learning and Neural Networks. In this context, we introduce the most commonly used anomaly detection techniques in WSN. Compiling and comparing the main methods applied in specific scenarios, we analyze the advantages and conveniences of using any of them.

Sensor Networks, Anomalies Detection, Machine Learning

Políticas de control de inventario para una fábrica de poliéster

Inventory control policies for an polyester´s company

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Abstract

In this paper, we study an inventory control model, which is analyzed by means of a difference equation. This model is applied to study the stock of a polyester's company. In this company two types of polyester are manufactured, and it is considered a stochastic demand. In the paper, an optimal policy of production is determined, which minimizes the total expected discounted cost. The one-step cost function is integrated with the following components: production, storage and sale lost. The methodology consists on applied the dynamic programming approach and some results of convex analysis to determine a (R, Q)-optimal policy, where R and Q are positive numbers. R represents the maximum level of production and Q is the minimum stock. Finally, with a company database of monthly sales, we adjust a probability distribution and a numerical implementation of the optimal policy is presented. Furthermore, simulations to observe the asymptotic behavior of the stock are illustrated.

Inventory control systems, Markov decisions processes, dynamic programming

Estrategia para mejorar el desempeño académico de los estudiantes de nuevo ingreso en facultades de ingeniería mediante el uso de plataformas de aprendizaje virtuales

Strategy to improve the academic performance of new students in engineering faculties using virtual learning platforms

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Abstract

One of the problems that occur most frequently in higher education institutions, specifically in engineering schools and faculties, is the high rate of failure in the basic science and mathematics subjects of their new students. Some of these educational institutions counteract this problem with a propaedeutic course and / or face-to-face counseling programs, but it is important to mention that the easy access to technology nowadays, has allowed conventional study techniques to evolve in a completely digital environment.The present project, documents and presents the results of the process carried out in the Engineering Faculty of the Universidad Autónoma de Campeche, in which a preparatory leveling course for the 285 new students was designed and implemented through the platform of virtual learning Khan Academy.This strategy not only offers a solution to this problem, but also offers students a powerful learning tool carried out in an environment in which they feel comfortable: the virtual world.

E-learning, Educational innovation, Mathematics

Índice de calidad de aire para Ciudad Juárez basado en un esquema de colaboración comunitaria

Air quality index for Ciudad Juárez based on a community collaboration scheme

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Abstract

There is a global concern for the increase in health costs in a poor air quality relationship especially in urban environments. In Ciudad Juárez, Chihuahua, although it has a discontinuous monitoring of air quality, there is no air quality program that includes thresholds and contingencies for poor quality. This article proposes an environmental quality index based on the algorithms of other entities and climatic variables typical of the characteristics of the city of Ciudad Juárez and El Paso. The system is in the way of integrating the measurements of gases such as Ozone, CO and PM2.5 as well as the meteorological variables of humidity, wind speed and temperature. To obtain the above, it is necessary to strategically install sensors in different areas of the city, extract their information, store them in databases, analyze the data and create a citizen warning mechanism when the value of the index can harm the health of people. Citizen participation is a fundamental element in the development of the project. This article shows the development of the environmental quality index for Ciudad Juárez and the results of the project.

Community-based monitoring, air quality index, Climatology

Oscilación de un péndulo sujeto a una trayectoria horizontal con diferentes clases de movimiento

Oscillation of a pendulum subject to a horizontal trajectory with different kinds of movement

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Abstract

In a children's movie there is a scene, Mr Incredible faces Bomb Voyage, the boy Incredi Boy wants to help Mr Incredible, Incredi Boy flies with Mr Incredi, who holds on to the hero's cloak, affecting the Incredi Boy flight plan. To understand how an oscillatory movement affects non-oscillatory movement, an experimental prototype is constructed with a particle of mass m, attached to a rigid rod and without mass of length l, to a patella of negligible mass, which is subject to a mass M. The patella remains at all times on a horizontal plane and allows the oscillatory movement of mass m. Experimental results are obtained that are obtained by means of wireless sensors that allow the obtaining of spatial coordinates of the mass m. Using Lagrangian mechanics we obtain the equations of motion, we express the possible first integrals of movement, when the movement of the mass M is: uniform rectilinear, (MRU), uniformly accelerated, (MUA) uniform circular (MCU), circular accelerated (MCA)) and forced circular (MCF). The dynamics are analyzed, the equations of movement are obtained, they are solved numerically, and the experimental results are contrasted with theoretical and numerical results.

Mechanics, Simulation, No-inertial-Movement

Optimización del proceso industrial del poliuretano a través del diseño estadístico de Taguchi

Optimization of the industrial process of polyurethane through the statistical design of Taguchi

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Abstract

In a company of the polymer branch, located in Jilotepec, State of Mexico, presents the need to solve some problems in the manufacture of polyurethane foam such as codes 25 STD BCQ and 64 FB, which must comply with a density and compression specific. We used the experimental design of Taguchi, which allows to design experiments that usually require only a fraction of the complete factor combinations, each factor can be evaluated independently, so that the effect of one factor does not influence the estimation of another factor. Seven factors were evaluated with two levels each: index of TDI, water, polyol, amine, catalyst Z-7, silicon and methyl chloride. To calculate the density (kg/m3), each of the samples obtained was weighed on an analytical scale and the volume of each one was obtained. The compression was measured on an Instron® universal machine. The new formulation optimized for the foam 25 STD BCQ achieved a density of 14-15 kg / m3 and a compression of 27-33 lbf., While the foam 64 FB achieved a density of 23-25 kg / m3 and a compression 58- 68 lbf., These results satisfactorily meet customer specifications.

Polyurethane, Taguchi, Density

Efecto de la aceleración de carácter central sobre el crecimiento de una planta

Effect of central acceleration on the growth of a plant

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Abstract

In 2013, NASA conducted a series of experiments to study the growth of plants in microgravity. The interest of replicating the experiment is to study the relationship of acceleration with plant growth. Which is achieved by the construction of an accelerometer and the germination of different plants, under certain conditions. In this paper, the effect of different gravity values on the growth of a plant is presented. To make the changes, the basic concepts of central acceleration (centripetal acceleration) are taken into account, with the help of a centrifuge any gravity value is simulated, for this, it is necessary to place the seeds at different distances from an axis of rotation which is rotated continuously for several days, two different systems are considered: a) place the axis of rotation vertically, this will be observed its growth over the course of days, where the effects on the auxins will be observed, which they are responsible for geotropism, that is, the extraction of auxins from the plants placed in the centrifuge is done, determining the influence of the rotation effect on the concentration of auxins and b) the growth in the direction of gravity is affected according to the distance taken from the center of the axis of rotation. The comparison of the growth of said plants in a natural stimulus and those affected by the force of central character is also carried out.

Mechanics, Plant growth, Auxin concentration, Central field

Tensión superficial de las mezclas O2-Ar, N2-Ar Y O2-N2-Ar

Surface tension of O2-Ar, N2-Ar and O2-N2-Ar mixtures

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Abstract

The surface tension of some binary and ternary mixtures was calculated by means of molecular dynamics simulations in a canonical ensemble. The analyzed mixtures were oxygen-argon, nitrogen-argon and oxygen-nitrogen-argon. The force field for argon was re-estimated here in order to reproduce the experimental surface tension. The corresponding force fields for O2 and N2 were taken from a previous work [Mol. Simul. 45 (2019) 958-966], where it was shown that such force fields reproduce the experimental surface tension curves, as pure fluids. The nitrogen-argon surface tension was calculated for several mole fractions of argon. The obtained curve was compared with those experimental data and a good agreement was found. The standard Lorentz-Berthelot combining rules were used. For oxygen-argon mixture it was necessary to modify the cross term of the combining rules in order to reproduce theoretical and experimental data. The surface tension of the ternary mixture was also estimated varying the mole fraction of argon at a certain concentration of oxygen and nitrogen fitted previously. It was explored several temperatures in order to show a tendency mostly at relatively low temperatures. After to compare with the available experimental data, which are scarce, it was observed a good agreement.

Surface tension, Molecular dynamics, Force field

Thin-films microstructuration through photolithography

Microestructuración de películas delgadas mediante fotolitografía

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Abstract

In recent years, micro and nanotechnology have undergone a rapid development due to their applications in different scientific areas such as metaphotonics, an emerging branch of optics that studies the interaction of light with micro and nanostructured metamaterials. Our particular interest is the development of integrated metaphotonic devices for lab-on-a-chip biosensing applications. A widely used technique for the manufacture of integrated optical devices is photolithography, which is based on the processing of UV-light-sensitive photoresists to create masks for the deposition of thin films and generate the desired devices. In this contribution, we present an experimental methodology for the patterning of plasmonic waveguides using a photolithography system for printing SU-8 photoresist masks on glass substrates. We show the necessary parameters to optimize the photoresist printing (beam waist, focal distance and fluence) under normal conditions and the characterization of the samples through atomic force microscopy. Due to the aspect ratio between the width of the waveguides and thickness of the photoresist, the obtained results approach us to the development of multilayered systems for new integrated metaphotonic devices.

Photolithography, Metaphotonics, Integrated optics

5 Humanidades y Ciencias de la Conducta

La modalidad mixta una alternativa de continuidad de estudios para egresados inmersos en el campo laboral

Mixed-mode instruction Blended learning, an alternative to continue higher education studies for associate's degree graduates immersed in the labor market

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Abstract

The mixed methodology (Blended Learning) seeks to implement the use of Information and Communication Technologies (ICT) to provide studies of Technological Higher Education to people who are immersed in the labor market. This modality was implemented for the first time at the Universidad Tecnologica La Selva, located in the city of Ocosingo, Chiapas, for the educational program of Information Technology Engineering. This research focused on knowing the perception of the students who pursued their professional career under this modality and who are currently employed, the study was carried out under a non-experimental quantitative approach with descriptive transactional design, which evaluated the educational platform used, the teachers and the study modality. A survey with closed questions under the Likert scale and an open question for suggestions that allowed improving this modality were used as an information collection tool. The results show that for students who are immersed in the labor field, blended learning is excellent to continue with their professional studies since they can manage their time, moreover, they hope to improve their professional performance as well as their economic conditions when getting a professional engineering degree.

Mixed mode (blended learning), Educational platform, Didactic resources

Usando tecnología móvil para el aprendizaje de la estructura de los elementos químicos

Using mobile technology to learn the structure of chemical elements

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Abstract

In Mexico the use of mobile telephony has increased in recent years, which gives the idea of the impact they have on daily life, encouraging the user not to be in a predetermined place and are a step towards learning at any time and in any place. It is important to create applications using this type of technology, to support the education sector. This research, which was conducted under a mixed-type approach, used as tools for data collection to the questionnaire, observation and interview, resulting in an application that made use of mobile technology, focused to promote the learning of the structure of the chemical elements, as support to the students of baccalaureate, in the subject of Chemistry; This is because young people depend on the printed format that contains the general scheme of all the symbols or memorization to learn each of the elements and their parts. Although on the Web there are several applications that circulate for free on the same subject, some are restricted to computer equipment and others were created for smartphone phones that require a payment to download them.

Mobile technology, Learning, Chemical elements

Estudio del Impacto de la experiencia adquirida en las estancias y estadías, que inciden en las competencias del perfil de egreso, en el programa de ingeniería industrial, de la uppue

Study of Impact of the experience acquired in the profesional practices, that affect the competences of the graduate profile, in the industrial engineering program of the uppue

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Abstract

The Educational Model of the Polytechnic Universities of Mexico is characterized by flexibility in its academic programs; the professional practices in enterprise 1, the professional practices in enterprise 2 and the professional practices in enterprise 3 are subjects that are part of the study career program; the professional practices in enterprise, are a non-schooling training process with the purpose of the student developing practice activities in the workplace; the professional practices in enterprise 3 is the practice of the skills acquired in a real work environment. The professional practices in enterprise 1 and 2 are taken at the end of the first and second year career program, and the professional practices in enterprise 3 is taken at the end of the third year career program. The objective of this study is to determine the formative impact of the professional practices from the perspective of the students of Industrial Engineering. The research scope is descriptive with a quantitative approach. The result of this research will allow proposing to Design Program Career Committees of Industrial and Financial Engineering of the CGUTyP the improvement guidelines for the professional practices process, in order to achieve the competences acquired in each formative cycle.

Professional practices, Professional skills, Engineering

Análisis de la práctica educativa en secundaria de talleres, tecnologías y clubes a través de la historia de reformas y planes y programas

Analysis of the educational practice in secondary workshops, technologies and clubs through the history of reforms and plans and programs

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Abstract

The purpose of this article is to analyze changes in plans and programs with the implementation of educational reforms in the area of workshops, technologies and clubs since the beginning of middle school.It shows how workshops and technologies were subjects that impelled the student in the preparation of a trade. In the reform of 2006, with the articulation of basic education and the curricular approach of 2011, whose purpose in the subject of technology was to take the student of know-how to know the processes necessary for the production of a service or product, and promoted the student to be analytical, conscious and enterprising. The last educational reform of 2013, applied in the plans and programs of 2017 that places the clubs to be determined to be carried out in four hours per week.The fundamental purpose then of this analysis is to glimpse the process of historical development that the reforms of the workshops, technologies and clubs in the middle school.

Workshops, Technologies, Club

Una experiencia de aprendizaje combinado a través de proyectos

Blended learning experience through projects

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Abstract

This research applies the method of learning combined with project-based learning as a teaching strategy. The main objective was to identify the didactic contribution of the combined learning method through the solution of problems in the university context as a mechanism to support the development of student competencies. The achievement of these competences was valued through face-to-face sessions and online interactions that sought to grant technological solutions to real organizations. Thus, through the Canvas model, the student carried out the creation of a business in a collaborative, distributed and integral manner as part of the educational experience called Technological Solutions applicable to organizations, taught at the Universidad Veracruzana in Mexico. The research question is: What is the didactic contribution of the combined learning method through problem solving in the university context? As a result of this mixed study, the significant contribution of the teacher is determined by coordinating, organizing, investigating and preparing the appropriate educational materials and technological resources for maximum use in student learning. A primary role of the teacher was to motivate the student to make a final product that can connect their educational activities with real-life situations.

Blended learning, Project-based learning, Higher education

Modelo didáctico para matemáticas básicas en el programa de ingeniería química

Didactic model for basic mathematics in the chemical engineering program

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Abstract

The problems of learning mathematics are a particularly important field in the educational relationship. In the degree of any engineering and specifically in Chemical Engineering (IQ) requires a series of mathematical skills for learning and problem solving. By virtue of having made a revision on the indices of failure in the educational experiences of the IQ program, it was detected that the highest values were precisely the basic mathematics, this led to propose the solution proposing a change in the teaching with the objective of improve learning and with it, reduce failure rates from the use of a didactic model. The didactic model is based on 3 stages that include bibliographic, documentary and statistical information, for the intervention part, framed within the quantitative field research modality of descriptive type, with characteristics of participant observation. When implemented, it allowed to observe some significant changes in reference to the habits of study and attitude that the students present before the mathematics and on the styles adopted by the professors for this chair, with which finally it was evaluated concluding that it effectively improves the indexes of approval and meaningful learning.

Mathematics, Learning, Engineering

La gamificación como estrategia para el aprendizaje de física

The gamification as strategy for the learning of physics

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Abstract

Numerous studies show the disinterest or the negative evaluation that students have towards the learning of the subject of physics and although this perception is provoked by diverse situations, it can´t be left aside that this affects the motivation of the students and consequently in learning. For this reason the objective of this study was to identify if the use of gamification in the classes influences the motivation of young people and thus be able to encourage them a positive view of the subject of physics, therefore in this investigation implemented a methodology based on gamification which includes the planning, design and application of three games over a semester in which participated 50 students of the subject of Physics II of the Escuela Nacional Colegio de Ciencias y Humanidades plantel Vallejo, obtaining as a result that the use of gamification indicates that it is a motivating element since it provokes a gratifying experience in the students.

Motivation, Gamification, Physics

Caracterización de la situación de la división de tecnologías de la información y comunicación de la universidad tecnológica de la selva

Characterization of tecnologías de la información y comunicación faculty of universidad tecnológica de la selva

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Abstract

Currently, national education policies of coverage, quality and relevance impose challenges to higher education institutions. To face them, universities must place the curricular update, student motivation and improvement of the teaching-learning processes as primary focus of attention. To effectively transform these axes, it is necessary to have relevant information that allows to assertively decision making. Thus, this project characterizes the Information and Communication Technologies Division of the "Universidad Tecnológica de la Selva", through the analysis of information obtained from students and population of the area of influence combined with the review of repositories indicators of official information. In that sense, this work provides an instrument to evaluate students' expectations and opinions regarding the teaching - learning process and incorporates an instrument aimed at the population of the area of influence to measure their level of knowledge of the University and the general opinion of it. This new aspect is relevant given that the population of the area of influence is the first promoter or detractor of the institution's work due to its coexistence with the university community and it is not usually considered in this type of studies.

Characterization, Expectations, It

¿Cómo promover la ciudadanía digital?

¿How to promote digital citizenship?

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Abstract

There are several attempts that have been made in Mexico in recent years and through the different six-year periods of Government, to insert Information and Communication Technologies (ICT) in the teaching and learning process at the levels of basic education. The foregoing was attempted through the creation of multiple Federal Government programs for that purpose. One of these programs establishes digital competencies and within these can be located the competence of Digital Citizenship. The present work shows a small outline of the competition of digital citizenship in new students of Educational Institutions of the State of Tabasco. Digital citizenship does not have a single focus, there are multiple edges that can be addressed.Finally, some proposals for various actions are exposed, through which the acquisition of this digital competence can be achieved. Teachers, as active agents in the teaching and learning process, can be important actors through the promotion of the proposed activities and practices.

Digital competences, Digital citizenship, Sexting

Diseño teórico metodológico de un modelo didáctico para potenciar los procesos de enseñanza y aprendizaje de las matemáticas en el instituto tecnológico superior de Poza Rica

Theoretical and methodological design of a didactic model to enhance the teaching and learning processes of mathematics at instituto tecnológico superior de Poza Rica

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Abstract

Higher Education Technological Centers through their Educational Model for the XXI century: training and development of professional skills, promote teachers to develop research projects in a way that allows them to improve the teaching process and thus contribute to training integral of the future professional with knowledge, skills, abilities, attitudes and values that allow him to continue learning throughout his life. To achieve such purposes, a group of professors, we elaborate a research project in the area of Mathematics, assuming essentially the conceptual framework provided by Vygotsky's Cultural Historical Approach and the work of other authors with similar reference. The objective of this work is to develop the conceptual and methodological bases of a Didactic Model, that allows to direct in a scientific way the teaching and learning processes of Mathematics according to the conditions of subjects such as Differential Calculus and Integral Calculus, as well as the environment which is presented in the institutions of the National Technological System, specifically in the Instituto Tecnológico Superior de Poza Rica, Veracruz state, Mexico.

Teaching model, Teaching, Mathematics

Enseñanza de la termodinámica en ingeniería con base en competencias

Teaching of thermodynamics in engineering based on competences

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Abstract

The present work shows an analysis of the activities carried out in the classroom on topics that involve thermodynamics. This proposal contemplates methodological aspects and competences of the subject on basic topics that involve the understanding of the phenomena that involve the first and second law of thermodynamics. The proposal aims for the student to develop a cognitive process that can be used as a tool to help the process of improvement in their learning. This process is characterized by a feedback between the implementation of the changes concerning the teaching-learning process and the evaluation process of the achieved learning. The analysis of the evaluation is made based on the phenomena that involve the fundamental concepts such as energy, work and heat, as well as the need to develop assessment instruments according to the competence that the student needs to develop. The results show a significant progress, in terms of the level of learning achieved, by making an annual comparison of school performance based on a competency scheme.

Teaching, Thermodynamics, Competency

Análisis de teorías de aprendizaje para la elaboración de una metodología para la inclusión en las universidades en México

Analysis of learning theories for the creation of a methodology for inclusion in universities in Mexico

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Abstract

In recent years, inclusion in Mexico has caused higher education to open its doors to people with disabilities who want to access an education program. Taking into account that the word include is bound to accept, it is important to have the appropriate knowledge, tools, spaces, and attitudes for the reception of these people in campuses, both private and public, to achieve a synergy among all involved In the binomial teaching-learning. All this with the objective of strengthening inherent competencies of people with disabilities and granting some others in order to let them compete in the chosen institution. In this document, different learning theories will be analyzed, in order to know the strengths and suggest a methodology that allows teacher and student to be aware of their inherent competences as well as know the ones needed to have a good performance in the class. Through a concept map that describes the key points of the aforementioned theories to reach the final result. It should be noted that until now there is little information regarding the study of a specific practice for the inclusion of people with disabilities in higher education in Mexico. For this reason, the mentioned analysis is relevant.

Inclusion, Disabilities, Methodology

La eficiencia terminal en los programas educativos de ciencias económico - administrativas del instituto tecnológico de Campeche

Terminal efficiency in educational programs of economic - administrative sciences of the technological institute of Campeche

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Abstract

The Higher Education System (SES) undoubtedly represents an opportunity for the generation of high performance learning communities, innovation and technological development; able to modify social structures through different areas of knowledge and respond to the challenges posed by the National Technological Institute of Mexico (TecNM) such as: coverage, quality and relevance for regional development and the advances of the new Model Educational. In the present study, the terminal efficiency of educational programs in the area of Economics - Administrative Sciences of the Technological Institute of Campeche (ITC) is analyzed, as an attempt to build indicators, to know the efficiency in the application of school resources in training of the graduates and to be able to affirm the strategic value of the knowledge, attending the demands of the same one and compete successfully in the professional market, when considering this one, the fundamental axis of the social, cultural, economic and political development of the nations.

Higher Technological Education, Terminal Efficiency, Plans and Educational Programs

Determinación de horarios de aberturas en una vivienda de construcción masiva para su corrección térmica interior

Determination of opening schedules in massive construction housing for interior thermal correction

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Abstract

Currently the choice of massive construction models is the alternative with greater recurrence to acquire a house in warm humid climate in Mexico, however, much of this is not adapted to its climatic environment and causes thermal discomfort in the user because of the internal environment generated as response of the characteristics of its architectural envelope. To correct in a short time the effect of thermal discomfort, the user usually employs mechanized climatizations solutions such as fans or air conditioners. It was proposed the use of schedule for opening hours in the architectural envelope in a warm humid climate, mainly in windows, as a strategy to correct the internal thermal environment, considering its advantages as the immediate application and easy implementation, in contrast to some architectural or physical modification of the envelope. Dry bulb temperature and relative humidity measurements were made in a massive construction model to determine its thermal performance in the hottest month of the year. Subsequently, simulations were made with EnergyPlus to determine suitable opening times to correct the thermal environment by prolonging the hours of interior comfort when compared with the original interior thermal performance of the envelope.

Thermal performance, Warm humid climate, Simulation

Gestión curricular de alto desempeño en el instituto tecnológico de Campeche

High performance curricular management at the technological institute of Campeche

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Abstract

The Institutions of Higher Education (IES), face challenges to fulfill their substantive function of educating and training people; Within this educational process, there are factors that affect the achievement of academic objectives embodied in the school curriculum of the various programs of the education system. An adequate curricular structure guarantees that the practices carried out in the classroom are intentional, systematic and ensure learning; this implies the design and implementation of an innovative curricular proposal from the planning of the teaching - learning process to the evaluation. The curricular management is one of the strategic processes of HEIs, which operationalizes the public education policies in force in the state, where the curriculum is key in the Quality of Higher Education, because it considers the needs, problems and social interests, through the development of professional skills of students, in order to train professionals that contribute to national development. The curriculum, as a process, operates according to the school context from the perception of the teacher and the direction, marking a clear link between: the curricular management and the classroom processes, the support networks with the dimensions of the TecNM model to be aligned and Orient yourself to high performance.

Curricular management, Curricular policies, Educational management

La importancia de las relaciones interpersonales en niños de nivel preescolar para favorecer el aprendizaje utilizando el robot NAO

The importance of interpersonal relationships in pre-school children to promote learning using the NAO robot

APAN-ARAUJO, Karla Cecilia, MARTÍNEZ-TÉLLEZ, Rubelia Isaura, SORIANO-PORRAS, Dulce Maria y HUESCA-LAZCANO, Erick Eduardo

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Abstract

The present investigation forms part of the multiple options that can be worked with preschool children to favor their learning in each one of them; taking as a reference the interpersonal relations and using the technology with the NAO Robot. In addition, it shows how to link teaching strategies, collaborative work, innovation and technology; for the improvement of learning. To promote interpersonal relationships, a work plan was designed divided into three modules with certain planned activities, which were supported both by the teacher in charge of the group and the robot, it should be mentioned that the robot's programming was carried out by engineering students in Software from the Universidad Politécnica de Amozoc, Puebla. The general objective is to make a plan of activities using technology to promote interpersonal relationships in children and thus improve their learning. Interpersonal relationships are marked by an atmosphere of friendship, respect, understanding, listening and affection; aspects that undoubtedly increase the learning, self-esteem and sense of belonging of children.

Learning, Interpersonal relationships, NAO Robot

Metodología de enseñanza para la adquisición de competencias en estudiantes de terapia física de la universidad politécnica de Amozoc

Teaching methodology for the acquisition of competences in students of physical therapy of the polytechnic university of Amozoc

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Abstract

This study addresses the design of an active teaching methodology for learning in sixth-semester students of the Physical Therapy degree at the Polytechnic University of Amozoc. The intervention by the teacher corresponds to the design of a regulatory methodology and guidance in the learning process with specific purposes, selection of spaces, resources, strategies, experiences and coherent activities within the context of the subject of clinical practice I that stimulates students and allows them to interact and integrate the three types of knowledge conceptual, procedural and Attitudinal linking theory and real practice, creating productive environments that allow adjusting to the phases of significant learning gradually within a collaborative work, so that a study of type: explanatory, interventional, longitudinal, prospective, prolective, unicentric through the application of a teaching methodology whose objective is to demonstrate its impact on the acquisition of general and disciplinary competences through an evaluation that supports the achievement of these

Competencies, Methodology, Physical Therapy

Análisis de la pertinencia de la dinamización educativa de primer año de primaria

Analysis of the relevance of the first year elementary school dynamization

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Abstract

The present research objective is to publicize the dynamization through ICT of the subject of knowledge of the environment for the first year of basic education, since it is currently handled through books and knowledge is not implemented where the student can interact, knowledge of the environment lies in precisely knowing the elements that surround the student so that he is involved and interacting with it and if we show him through videos, animations, audio as it is composed, his / her academic growth can be more significant and be inserted in better shape to its context. The methodology that was used was the experimental one with which the prototype shown in this article was built, which contributes to generate the tools that improve the educational quality, just missing the dissemination of the article to have an impact on the primary of the Valley from Mezquital and Mexico, projects like this are needed.

ICT, Environment, Continuous improvement

Acompañamiento terapéutico para la aceptación o rechazo de una prótesis: Caso de paciente infantil con amputación de miembro superior izquierdo

Therapeutic accompaniment for the acceptance or rejection of a prosthesis: Case of a child patient with amputation

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Abstract

The project named "Therapeutic Accompaniment for the Acceptance or Rejection of a Prosthesis: case of a child patient with amputation of the upper limb" is derived from the investigation called Adaptation and Physiotherapeutic Qualification of Handheld Myoelectric Prosthetic Prosthesis, which was a work multidisciplinary and multi-institutional, where construction, design adaptation and habilitation included the areas of manufacturing, electronics, programming and physical therapy. The psychological area was structured transversally to physiotherapeutic adaptation-habilitation in response to the need to identify the factors that were influencing the acceptance or rejection of the use of the prosthesis. The objective of the project was to identify the set of discursive representations that favor the rejection or acceptance of the prosthesis using the techniques of narrative therapy and game therapy through the semi-structured interview. The methodological design is case analysis, which is a type of qualitative and exploratory study. The results obtained from the identification of the representations allowed us to propose an intervention protocol to accompany patients of 4 to 12 years candidates to use a prosthesis.

Represetations, Therapeutic accompaniment, Amputation, Myoelectric prothesis, Decision making

Fortalecimiento del razonamiento lógico y matemático en estudiantes de nuevo ingreso de las carreras de ingeniería para disminuir los índices de reprobación y deserción

Strengthening logical and mathematical reasoning in new students of engineering careers to reduce the rates of failure and dropout

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Summary

The paper exposes the results of an experiment that was accomplished at the Universidad Tecnológica del Valle de Toluca, in the career of Information and Communication Technologies. It consists of strengthening or developing the logical and mathematical reasoning in new students to reduce the rates of reprobation and desertion. A sample of thirty students was selected, to whom the proposed strategy was applied, a course of exercises and activities to strengthen or develop logical and mathematical reasoning; This workshop was designed according to the cognitive functions and mental operations established by Reuven Feuerstein in his Theory of Cognitive Modifiability. Before and after the workshop, a test was proposed by the CENEVAL (Centro Nacional de Evaluación para la Educación Superior) in an interactive guide for applicants to take the entrance exam for the higher level, afterwards, the failure and dropout rates were calculated both the pilot group and the rest of the students who did not participate in the experiment. The hypothesis was not completely approved, since only one of the analyzed indexes was reduced, interesting results and some recommendations as future work are addressed.

Logical and mathematical reasoning, Desertion, Higher education

6 Ingeniería y Tecnología

Tarjeta de control electrónica para transmisión de grúa de carga móvil tipo KRUPP

Electronic control card for transmission of mobile load crane type KRUPP

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Abstract

The design, modification and control of machinery and industrial equipment plays a very important role in any company, where machinery and / or equipment is found which are out of operation due to the lack of an electrical / electronic control part which possibly By the model of the machinery and / or equipment is no longer manufactured or is difficult to achieve. This causes economic losses due to having the machinery out of operation. This article presents a proposal to replace the computer corresponding to the operation of the transmission of a mobile telescopic load crane, which consists of using an Arduino programming board for the control part and to obtain the necessary logical sequence of the different transmission speeds, power electronics (power transistors) were used for the power stage through which the necessary voltage and current levels are obtained to which the electrovalves corresponding to the different speeds of the transmission operate. As shown in the content of the work control is very accessible, so, it could be implemented in a sustainable way in other vehicles that have an automatic transmission with changes in speeds through electrovalves.

Control, Crane, Transist

Aplicación de la ley de enfriamiento de newton en línea de producción

Application of newton's law of cooling in production line

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Abstract

The objective of this study is to solve the problem of the packaging process when handling canned food. In the thermal process the sterilization of the food product is carried out in addition to the cooking, a thermal shock is created to eliminate 100% the microorganisms that can damage the product; in addition it must comply with the NOM-130-SSA1-1995, Goods and services. Food packed in hermetically sealed containers and subjected to heat treatment. The temperature of exit is of 75 ° C, not being pertinent for the handle of the finished product and in agreement with the internal specification of the company, the temperature for the handle and packaging must be of 40 ° C.The methodology used is Newton's Law of Cooling for heat transfer, which states that the rate of heat exchange between an object and its environment is proportional to the temperature difference between the object and the environment. The differential equation is solved and the results obtained are validated with tests in the production line. The main contribution is that science is applied to solve a problem in a production line.

Cooling law, Temperature, Thermal process

Desempeño térmico de un espacio habitable con ventilación modo mixto. Diferentes condiciones volumétricas y diferentes condiciones térmico ambientales en el Estado de Guanajuato. México

Thermal performance of a living space with mixed mode ventilation. Different volumetric conditions and different thermal-environmental conditions in the State of Guanajuato. Mexico

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Abstract

In the present work the thermal performance of a habitable space with mixed mode ventilation is shown. Space located in a dwelling representative of the housing register by type and surface, data from CONAVI (2017). Results of operating temperature for a base case and six virtual evaluation models (MEVi) are presented, varying the interior air volume, using Design Builder® calculation tool. The main objective was to determine the model with less use of active systems by varying the volume of indoor air with a certain comfort range, according to each thermal condition, when using mixed mode ventilation. Key results: A) Heating and cooling needs were determined in three thermal conditions, B) by increasing the volume of indoor air, there was a decrease in comfort hours per year, and a clear tendency to keep the window open for three thermal conditions, C) it is demonstrated that, in the thermal conditions: cold sub humid, warm sub humid and temperate sub humid, that occur in the state of Guanajuato Mexico, the volume of indoor air is directly proportional to the energy demand by year.

Mixed mode ventilation, Thermal performance, Climatic conditions

Medidor bidireccional trifásico interconectado a la red con monitoreo de la generación de energía eléctrica del conjunto panel-microinversor

Three-phase bidirectional meter interconnected to the network with monitoring of the electric power generation of the panel-microinverter set

HERNÁNDEZ-AGUIRRE, Fredy Alberto, TÁNORI-RUÍZ, Víctor Alfonso, ORRANTE-SAKANASSI, Jorge Alberto, VÁZQUEZ-PALMA, Martín Gustavo.

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Abstract

The main objective of this paper is to present the activities carried out and the results obtained during the design of a three-phase bidirectional meter for a photovoltaic system interconnected to the network. The tests for validation and start up of the bidirectional meter used for wireless measurement and monitoring of the main consumption parameters and electric power generation are described: voltage, current, active power (W), apparent power (VA), power factor and power consumption (kWh). This bidirectional meter was born as a proposal to solve the problem related to the measurement of electric power in photovoltaic systems interconnected to the network, since the bidirectional meters currently installed by the power company (CFE, Comisión Federal de Electricidad) have an inconvenience, they can only be distributed and installed by the same company. It is a low cost and easy installation bidirectional meter. The main advantage of this bidirectional meter is the facility offered to the user to read and understand the readings of the measurements made, displayed on a personal computer screen or a mobile application. Furthermore, the history of the power consumption (kWh) show in the meter database helps the user in making decisions regarding cost reduction.

Bidirectional meter, Microinverter, Photovoltaic

Implementación de hornos ladrilleros en Tlajomulco de Zúñiga, Jalisco, para reducir la huella ecológica

Implementation of brick furnaces in Tlajomulco of Zúñiga, Jalisco, to reduce the ecological footprint

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Abstract

The inefficient use of fuels for the burning of bricks generates importan emissions of pollutants into the atmosphere, among them carbon dioxide CO_2, nitrous dioxide NO_2 and Greenhouse Gases (GHG), so it is very important to quantify these emissions and establish with it a baseline of carbon dioxide emissions equivalent (CO_2eq). The goal of this project is the implementation of brick kilns in the municipality of Tlajomulco of Zúñiga with the aim to reduce the ecological footprint, based on the existing ecological furnaces called MK2, having as oven innovation the placement of a second wall, which will manage to contain the generated heat, thus achieving a closed system isolated in both ovens connected to each other, to take advantage of it an optimal pre-drying of the bricks. This reseach is based on not having heat losses due to it is hermeticity, since the ecological furnaces has a double sealing wall reducing the burning time beetween 7 and 12 days.

Greenhouse Gases, Ecological footprint, Brick kiln

Tecnicas de mantenimiento

Maintenance techniques

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Abstract

The focused improvements are activities in which they are developed with the intervention of the different areas in a productive process, it is a development in the process of continuous improvement similar to that existing in processes of Total Quality Control applying procedures and maintenance techniques. Maintenance is a set of activities that are carried out daily in the equipment, including inspection, lubrication, cleaning, minor interventions, change of tools and pieces studying possible improvements. Progressive maintenance is a pillar of the most important in the pursuit of benefits in an industrial organization. The maintenance of quality seeks to establish as a purpose that the team has the "zero defects". The PTEE or Total Effective Productivity of the Equipment is a measure of the real productivity of the equipment, it is a measure that indicates the amount of time used by the equipment, the overall effectiveness of the equipment evaluates the performance of the equipment while it is in operation, this allows to prioritize between several maintenance projects, those most significant in the improvement of the plant.

Planning, Maintenance, Productivity

Una comparación entre el método MOORA y CODAS bajo ambiente de conjunto pitagoreano difuso

A comparison between MOORA and CODAS methods under pythagorean fuzzy sets

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Abstract

Multi-criteria decision-making methods (MCDM) have accelerated in recent years. Many authors have made remarkable manipulation of the uncertainty involved in MCDM problems as a constant to make the most appropriate decision among the alternatives proposed. For this reason, fuzzy logic has been integrated into the MCDM, achieving new hybrid methodologies. These have managed to increase decision-making capacity, allowing us to manipulate nonfuzzy (quantitative) and fuzzy (qualitative) information. The main of this paper presents the comparative analysis of the Pythagorean Fuzzy CODAS method in order to examine the advantages and differences in comparison to MOORA Pythagorean Fuzzy Set method. The analysis, in this sense, aims to present a new scenario for the selection of the best decision-making problem, taking its advantages and thus achieve a greater benefit in real problems applications. An illustrative case will be presented with the MOORA-PFS methodology, to see the results obtained with Pythagorean Fuzzy CODAS. Besides, this comparative study to academics to choose more operative methods for solve MCDM problems.

CODAS, MOORA, Pythagorean Fuzzy Set

Elaboración de un sistema de la planeación de la producción en una empresa manufacturera de botanas

Elaboration of a production planning system for a snack manufacturing company

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Abstract

A Production Planning System was made for a snacks' production Company by the development of a MRP system in order to increase the present production and to meet the demand.The methodology used was Material Requirement Planning (MRP) that basically consists in a logic system able to manage and control material requirement planning based on a number of pieces, components and material needed for manufacturing, in other words, it is a production planning system.The outcome of the Project has been an application with MRP features, with complements such as line balance, purchasing Budget of raw materials, among other things. The application relies on protection of information and backup by the same.The executable application of MRP system has contributed to reduce 50% the production breach at the company, as well as reducing waste in a 40%, idle time in a 50% and raw material costs in a 25%, achieving the stated goal.

Material requirement planning (MRP), Supplies, Waste

Evaluación de la energía mareomotriz en el norte del Golfo de California con fines de generación de energía eléctrica

Tidal energy evaluation in the north of the Gulf of California for power generation purposes

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Abstract

The tidal currents constitute a clean and inexhaustible source of energy. The determination of its magnitude in the north of the Gulf of California with a view to its use, represented the central objective of this work. The methodology included an exhaustive search of measurements of tidal currents, the generation of a text file of ordered time-speed data (history of speeds as a tabulation) from the found graphs of speeds, and finally its processing, which consisted of the histories of the current power density and power generated by a standard turbine, as well as the corresponding graphs of frequency and equivalence with respect to a continuous generation plant.The results show that the energy available in the tidal currents of the northern region of the Gulf of California is lower than that of other areas of the world with radical tidal changes; however, it is considered that the installation of several farms instead of one, located in the places where the currents reach higher speeds, together with the use of other renewable sources available in the region, constitute altogether an important option that must be considered.

Tidal energy, Tidal power plant, Locations of largest tidal ranges

Arrancador progresivo para motores de inducción trifásicos mediante programación arduino

Progressive starter for three phase induction motors through arduino programming

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Abstract

The progressive start of the industrial induction motors of alternating current (AC) is indispensable in any industrial process, at the present time it is counted on very reliable equipment that realize the variation of speed in progressive form, but these equipments are of high cost . In this article an alternative is presented to put into operation three-phase induction motors in a progressive way until reaching its nominal speed, which consists in using an Arduino plate for the control part and to be able to vary the external resistances of the power circuit. which will vary us to the angle of operation of the alternating signal, the power circuit consists of using an RC circuit and thyristor power devices that through the control allow us to modify the resistance of the RC circuit and thus vary the firing angle of the thyristor. As shown in the content of the work control is very easy to operate and of an economic cost, so the principle could be implemented in a sustainable way in other applications, such as industrial speed variators.

Variation, Motor, Induction

Desarrollo de un sistema electrónico con desplazamiento bidimensional para obtener el flujo lumínico en distintas fuentes de iluminación para conseguir sus curvas características

Development of an electronic system with two-dimensional displacement to obtain the luminous flux in different lighting sources to achieve its characteristic curves

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Abstract

A control electronic system was developed with equidistant perpendicular displacements to obtain the light intensity of different lighting sources, with a data acquisition card to graph the characteristic curves in an obscure chamber. An aluminum structure was implemented, placing bands jagged on each axis and mounted on the gear of each of the with bipolar steps motors, which allow movement in two-dimensional form. A graphical interface was generated to control the resolution of the displacement and 3D supports were designed to place the light flow sensor, obtaining the characteristic curve of the different types of lighting sources as LED panel, Compact Fluorescent Lights, high power LED, and incandescent in the experimental arrangement. This type of system presents diverse benefits for applications in the characterization of lenses, lasers or optical sensors to apply them in the field of electronics, mechatronics and robotics. The system allows to obtain the curve of light intensity that can determine the behavior of the light source in accordance with the two-dimensional displacement of equidistant form shown in a graphical interface.

Two-dimensional displacement, Luminous flux, Characteristic curves

Diseño y monitoreo en tiempo real de un biodigestor, aplicado a las condiciones ambientales de Hermosillo

Design and monitoring in real time of a biodigester, applied to the environmental conditions of Hermosillo

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Abstract

The general objective of this research is to sense and monitor the main variables that affect biodigestion processes; temperature, hydrogen potential (pH), humidity, volume and pressure within the bioreactor, and correlate them with the production of biogas, through a real-time monitoring system. For the development of the system design, information was collected on the variables and factors that affect the biodigestion process. Subsequently, the instruments and integral elements of the monitoring and sensing system were selected, all these electronic devices for commercial use and mentioned below. An LM35 sensor for temperature measurement, an industrial analog type measuring electrode for pH measurement, an FC-28 for moisture measurement, an MQ2 electrochemical sensor for measurement of methane production, an HC-SR04 ultrasonic sensor for level measurement (related to the volume of the biodigester) and a piezoelectric sensor MPX2202DP case 344C-01 for pressure measurement. The values captured by the sensors will be displayed in real time in a Visual Studio application, and will be automatically saved in a database. The integration of the system was experimentally tested in a span of 12 days in the city of Hermosillo, Sonora, Mexico, where measurements were obtained for comparison with other authors.

Monitoring of variables in real time, Biodigester, Environmental conditions of Hermosillo

Aplicación web para la gestión de planes e informes de trabajo académico de profesores para instituciones de educación superior

Web application for the management of plans and reports of academic work of teachers for institutions of higher education

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Abstract

This article describes the process of analysis, design, development and implementation of a web application for the management of the plans and work reports of Full Time Teachers (FTT) of Higher Education Institutions (HEI), through collaboration of the Research Group (RG) UTJAL-CA-2 Social Responsibility, Sustainability and Integral Development for SMEs of the Universidad Tecnológica de Jalisco and the Research Group UDG-CA-991 Development of Professional Competencies in Computer Sciences of the Centro Universitario de Ciencias Exactas e Ingenierías of the Universidad de Guadalajara. This process was developed through the agile SCRUM methodology for the periodicity of the phases and their implementation. The objective of the application is to provide a computer solution for the management of the academic plans and reports that according to the recommendations of the Accreditation Experts are necessary as part of the processes that ensure the quality in the Educational Programs, thus allowing to systematize and automate its processes of storage, consultation and validation, facilitating the management of them.

Web application, Web development, Work plans

Modelado e implementación de un sistema distribuido para la simulación de reacciones químicas

Modeling and implementation of a distributed system for the simulation of chemical reactions

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Abstract

This article describes the process of analysis, design and implementation of a distributed system consisting of a suite of applications, in which there is a web, a desktop and a mobile and two servers that perform the processing for the optical recognition of patterns, 2D and 3D simulation, session management and also provide the information of the periodic table. This distributed scheme establishes the frame of reference for the modeling, representation and simulation of chemical reactions through compounds and elements of the periodic table, for the support of classroom activities in the chemistry laboratories of the Educational Institutions that offer these subjects . The development of the software required the implementation of the agile SCRUM methodology for the production of the suite, which will help users through simulations to understand and understand the interaction of the elements with each other, providing visual support fundamental for the understanding of topics such as valence electrons and chemical bonds, which allows the development of the skills described in the graduation competencies of these Institutions.

Distributed system, Simulator, Chemical reactions

Uso de energía cinética para la obtención de energía eléctrica para señalamientos viales tipo leds y alumbrado publico aplicado en la ciudad de la venta, Tabasco

Use of kinetic energy for the obtaining of electrical power for road signs type leds and public lighting applied in the city of la venta, Tabasco

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Abstract

This research deals with the generation of alternative energy, for the implementation of traffic lights, we all need the use and use of electric power as an instrument of transformation in the community of La Venta Tabasco. There is no awareness of the use of road signs, by the drivers of this City; that is why it is proposed to design and implement a technical infrastructure that allows to use and transform the kinetic energy of vehicular traffic in transit areas. The main objective is to obtain the greatest amount of energy from the use of a speed multiplier, the inertia of a disk and an electric generator. The potential energy of a vehicle due to its weight can be exploited through a mechanism that transforms it into kinetic energy and then into electrical energy and channel it for the use of supply for road signs type LEDS and for public lighting, Helping the social environment and to our planet so as not to contaminate it anymore.

Kinetic Energy, Leds, Transformation

Automatización de los procesos de registro y levantamiento de datos para el diagnóstico de responsabilidad social universitaria de la universidad tecnológica de Jalisco

Automation of registration and data collection processes for the diagnosis of university social responsibility of the universidad tecnológica de Jalisco

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Abstract

This article describes the process of analysis, design, development and implementation of the modules of registration, validation and data collection on the RESSUDI Web Site for the development of the initial diagnosis of University Social Responsibility at the Universidad Tecnológica de Jalisco. This technological development meets the need to implement actions and strategies in the integral formation of the University Community that transcend the Institution's interior and exterior, for which the Research Group (RG) UTJAL-CA-2 Social Responsibility, Sustainability and Integral Development for SMEs developed through its Innovative Lines of Applied Research and Technological Development (ILARTD) this implementation through the agile SCRUM methodology, derived from its periodicity characteristics and its high flexibility to changes. The data collection module includes different questionnaires for each of the actors that make up the University Community, such as academics, administrative staff and students, which will be later analyzed through the specialized statistical software SPSS for the development of an Intervention Program Institutional

Web application, Web development, University Social Responsibility

Simulación de osciladores caóticos de orden fraccional

Simulation of chaotic oscillators of fractional order

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Abstract

In 1695 the theory of fractional calculus was introduced, but it only developed as a pure mathematical branch. Currently several research groups have focused on the control, the implementation of filters, PID controllers, synchronization, the implementation of circuits of chaotic systems of fractional order, etc. Currently, the number of applications of fractional calculus is increasing rapidly, these mathematical phenomena have allowed us to describe and model a real object more accurately than the classical "integer" methods. Along with the development of the fractional calculation, it was shown that many fractional-order nonlinear dynamic systems behave in a chaotic manner. This is the type of non-linear systems that are addressed in this research topic with the focus on derivatives of arbitrary order, where numerical simulations of chaotic behavior are presented in non-linear, fractional-order autonomous models. The case studies are six chaotic oscillators of fractional order; The systems of Lorenz, Rössler, Financiero, Lui, Chen and Lü, whose attractors are obtained by applying the definitions of the Grünwald-Letnikov definitions and the predictive corrective method of Adams-Bashforth-Moulton.

Chaos, Fractional order systems, Oscillators

Generación de mapeo cerebral utilizando emotiv 3D brain activity map para aplicación futura en rehabilitación robótica

Brain mapping generation using emotiv 3D brain activity map for future application in robotic rehabilitation

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Abstract

The objective of this article is to present the results that can be obtained by performing brain mapping from the Emotiv EPOC + brain computer interface in conjunction with the Emotiv 3D Brain Activity Map tool.The methodology is composed of: materials used, application of tests and analysis of results. The application of tests includes the assembly and connection of the equipment, relaxation tests and physical movement tests to visualize the activation of the different areas of the brain. Likewise, the graphical interface of the program, the visualization tools and information analysis, which it provides, is presented.The results present the brain mappings obtained through the software and an analysis of the information obtained. The contribution of this applied research is to evaluate the tools that this type of commercial technology is able to provide for the incorporation of brain activity in engineering areas such as robotic rehabilitation instead of using specialized equipment that is not commonly operable by any researcher and that It can make research more expensive.

Brain mapping, Emotiv EPOC+, Emotiv 3D Brain Activity Map

Antecedentes, perspectivas y potencial de la energía solar fotovoltaica en la industria en Puebla, México

Background, prospects and potential of photovoltaic solar energy in the industry in Puebla, Mexico

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Abstract

This article describes the current context for energy generation worldwide is in transition towards renewable energies, becoming a priority in energy agendas, which are increasingly compete with fossil fuels predominating coal, natural gas and oil, which they are causing climate change consequences to representing economics, social and environmental challenges. Renewable energy such as solar photovoltaic deploys a great opportunity to promote energy security in Mexico, since it has the potential of solar radiation on its territory. However, it was not enough for the industry to invest in projects to meet energy needs. The objective of this research is to analyze and create a framework for the use of solar energy in the Mexican industry, the convenience, the benefits, potential zones, as well as some international efforts which include the social and environmental aspect, in the same way as so favorable is the geographical location of Puebla for this technology and the guidelines to be take into account to encourage investment aimed and the transition with regard to the use of this renewable energy and improve energy efficiency.

Renewables energies, Photovoltaic solar energy, Using solar PV industry

Influencia de las condiciones de secado solar en la coloración de plantas medicinales

Influence of solar drying conditions on the coloring of medicinal plants

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Abstract

For millennia, humans have used hundreds of medicinal plants to treat diseases. Currently, many species with important characteristics are known to alleviate a wide range of health problems, mainly in rural areas, where the use of these resources is very high, even replacing scientific medicine almost completely. This paper presents the dehydration of medicinal plants that are grown in the State of Campeche through direct and indirect solar technologies in order to evaluate the influence of air flow and temperature on the color of the final product through the L* a* scale. b*, analyzing the activity of water and humidity during the drying process. The experimental results showed that the direct solar dryer with forced convection presents a little significant color change in a drying time of 400 min on average, guaranteeing the null bacterial proliferation and reaching a final humidity between 9 % and 11 %.

Natural and forced convection, Colorimetry, Drying kinetics

Transformación de energía cinética a energía eléctrica a través de un sistema estático para recargar aparatos electrónicos

Transformation of kinetic energy to electrical energy through a static system to recharge electronic devices

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Abstract

This project aims to produce electricity using a static bicycle, which has been made some modifications to take advantage of both tires. Along with these have been placed two dynamos which, having friction with the tires, transform mechanical energy into electrical energy, enough to recharge a cell phone. Parallel to this, it stops consuming electricity from the supply network which represents an energy and economic savings, if it is taken to large numbers of cell phones. By using this type of alternative power generation, we are also not emitting greenhouse gases into the atmosphere, which is also helping our health and the environment. This research is able to provide electrical power to cell phones in a friendly way with the environment, entertaining and healthy to keep in shape when charging our electronic devices, being a center of attention for students, since the circuit system allows to deliver 5 V and 0.7 A in direct current in approximately 15 minutes, achieving the load of 15% of a cell battery.

Renewable energy, Electric generator, Kinetic energy

Aprovechamiento de frutas y hortalizas de temporada de la región de Tabasco, mediante la deshidratación del producto, utilizando una estufa solar

Use of seasonal fruits and vegetables from the Tabasco region, by dehydrating the product, using a solar stove

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Abstract

Drying has been the most widely used fruit preservation process for many years. Food dehydration is a process in which heat transfer and mass transfer take place. The main objective of this research is to share the results obtained in the process of dehydration of seasonal fruits and vegetables of the Tabasco region through a dynamic model using a solar stove, through a controllable indirect heating method, which stabilizes the temperature of dehydration, so that there are no alterations in color and flavor of the fruit. The results in the dehydration of seasonal fruits (mango and cambola) are presented in adequate and homogeneous proportions, distributing each piece in the solar stove, exposed to solar energy for three days. A description of the solar drying used, the instrumentation used and the experimental process that was carried out in each of the tests is briefly shown. Solar energy is used as a good source of heat supply for the dehydration of agricultural products and the use of the solar stove gives another alternative to the use of this renewable and sustainable energy, which is available in Tabasco for drying food products, with the purpose of preserving and giving added value to the fruits of this region.

Renewable energy, Dehydration, Solar stove

Simulación del comportamiento térmico en exteriores urbanos correlacionando las variables de calor antropogénico vehicular y orientación

Simulation of thermal behavior in urban exteriors correlating the variables of vehicular anthropogenic heat and orientation

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Abstract

The complexity of the urban environment and its undeniable connection with the energy balance equation opens the doors for researchers to understand phenomena such as the Urban Heat Island (UHI). The least studied factor of the UHI is vehicular anthropogenic heat. Using Computational Fluid Dynamics (CFD) software, the aim is to understand the thermal environment within an urban canyon, based on two variables, the heat produced by the vehicle combustion engine and the orientation of the street (North - South and East -West). The analysis of the correlation of these variables is based on the information obtained from the simulation in different height strata, considering constant values such as direct radiation, diffuse radiation, emissivity and absorptivity of materials and a fixed temperature for the bonnet or hood of the car, altering the number of automotive vehicles and the orientation to examine the different patterns of the thermal profiles. The research opens the way to understand this phenomenon and be considered in simulations for the energy efficiency of buildings, since it directly impacts the facades of buildings and the determination of passive and active cooling techniques.

Simulation, Vehicular anthropogenic heat, Urban canyon

AppPECS: Una aplicación móvil para niños con trastorno del espectro autista

AppPECS: Mobile application for children with autism spectrum disorder

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Abstract

The study of treatments for children with autism and interventions through educational games is growing because researchers have seen an acceptance by users with autism spectrum disorder in this type of applications. Allowing this type of users to acquire and develop new skills such as digital, the development of writing through the use of the keyboard, as a means of communication and a mechanism of reinforcement in sociable aspects. Taking into account the benefits of using games through mobile applications in the treatment of targeted therapies in children with autism spectrum disorder, a mobile application has been developed to obtain an experience that interactively stimulates children for the purpose of Reinforce areas of learning development, such as repetition of activities (socialization), concentration, reinforcement of short-term memory, order and development of kinesthetic skills through the use of digitization. This project was applied in the Unidad de Servicios de Apoyo a la Escuela Regular No. 21 (USAER) instance of Special Education, dependent on the Secretaría de Educación Pública de Hidalgo.

Digital skills, Autism, Mobiles application

Aplicación web para la gestión de la información en la red integral de bienestar social

Web application for information management in the integral social welfare network

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Abstract

Information has become a fundamental resource in companies and, being accompanied by Information and Communication Technologies, it has become more significant to use them, since great changes can be achieved in companies. Through its management through technological tools, decisions can be made more easily, since there are different ways of representing information, to make it more clear and objective, as well as to access it from any place in a reliable manner. This work shows the development of a website that was made to the association Integral Social Welfare Network (RIBS), which works with 20 other associations and needs to have a closer communication and feedback with them in terms of public information and private, as the case may be. The scrum methodology was used, for the development of the website and the programming language was PHP, using the Laravel framework and for the management of the information the MySQL manager was used.

Association, Technologies, Website

Optimización de la eficiencia de la celda fotovoltaica

Optimization of the efficiency of the photovoltaic cell

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Abstract

The electrical production efficiency of a solar cell is affected by its operating temperature: when it increases, efficiency decreases. The purpose of this paper is to demonstrate this effect and how the use of heat sinks help to improve the efficiency in photovoltaic cells at temperatures higher than those of design (NOCT 20 ° C). The experiment consisted in measuring environmental temperature, cell's surface temperature, wind speed, voltage, current and power production of the solar cell while an electronically controlled load was connected(or demanding .01A). These measures were taken from two solar cells, one of them with a heatsink and the other (or another) without it. The measurements allowed us to obtain the current-voltage curve of both cells, which reveals that the cell with heat sink is more efficient in the production of energy than the cell without heat sink in a range between 3.4% -5.4%. The study was developed in the city of Cancún, Quintana Roo, with an average surface temperature of the panel of 40.42 ° C, average solar irradiation of 675 W/m2 and an average wind speed of 1.88 m/s.

Palabras clave Photovoltaic cell, Power, Efficiency

Metodología para la determinación de patrones en señales electroencefalográficas

Methodology for pattern determination in electroencephalographic signals

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Abstract

A methodology for the selection and determination of electroencephalographic (EEG) signal patterns is presented at the case study level, which can later be used as on-off control signals in other applications. Electroencephalographic signals are acquired through the use of a brain-computer interface (BCI). These systems capture electrical signals from the cortex of the brain and transfer them to a computer so that they can be analyzed by algorithms and some action is taken. In this case, the EEG signals are acquired through the wireless 14-channel Epoc+ platform. The methodology used consists first in acquiring signals from the user sample in three scenarios: in relaxation, thinking about turning on and off. Subsequently, the wavelet transform of each of the channels is obtained for each of the cases and the most significant coefficients are taken into account. Then, through digital signal processing algorithms, descriptive parameters are obtained for the on and off cases, which are used as patterns to describe each of the actions. With this information, a comparison between the incoming signals and the previously stored patterns is made to execute one of the established commands.

Patterns, EEG, Case of study

Integración de actuadores hidráulicos para los sistemas secundarios de moldeo y liberación en moldes de inyección de plástico

Integration of hydraulic actuators to ejection secondary systems in plastic injection molds

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Abstract

The manufacture of plastic products in the current markets demands the use of technologies that allow the molding of components with highly complex geometries and every time the time to manufacture is reduced. The presence of subsystems for the molding and release of negative structures increases the complexity of the mould, as well as the time required for the manufacture and adjust of the mould, since it is traditionally used mechanisms with angular pins. In this work the design of an injection mould is made for a component with negatives, which uses a system with actuator for the secondary molding and release of the negative structure according to the mould partition line. The mold is also design for the same component with the use of a secondary system of moulding totally mechanical and of conventional use.The analysis of the design and operation between a secondary mechanical molding system and a system with actuator for molding and releasing negative structures in plastic injection molds, alternative for reducing costs and times of Manufacturing.

Injection mold, Angle lift, Secondary molding system

Red de sensores de humedad y temperatura de bajo costo

Low cost temperature and humidity sensor network

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Abstract

This article presents the development of a low cost network of wireless sensors that use an open source hardware platform, consisting of an ESP8266 and a digital temperature-humidity sensor to measure the parameters in an area determined by the range of the sensor. The general development of the system includes the use of open source software to receive information through the network. Tests of sensor effectiveness were performed at three different points in an air-conditioned area. The first sensor was placed outside the area, the second in the middle and the last one at the exit of the air conditioning. The results obtained allowed to know the behavior of temperature and humidity in the area and the effectiveness of the sensor network to measure the variables, the results of the measurements are presented in detail. Because the system is highly scalable, inexpensive and easy to build compared to other systems, it is a good choice for a wide variety of applications.

Sensor network, ESP8266, Measurement

Estacionamiento Inteligente

Smart Parking

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Abstract

In this work it present the development of a prototype for the control of spaces in a parking lot, which through a web page monitors and displays in real time the available places, for this project it is used: anArduino Uno card, proximity sensors Lm393, male / female, male / male cables, ESP8266 WIFI module and two LEDs; all these connected to each other by a communication link developed withArduino code, allowing to transmit and send data in the Arduino serial.An Arduino serial communication link is made with java language code, acting as an intermediary for the insertion of information in the database.The web application was developed with the programming language PHP and HTML and was connected to the database hosted on the MySQL server, using as a Sublime Text code editor. Thus achieving on the web page the monitoring in real time of the available parking places.The results shown by the prototype indicate that it is probably feasible to implement this technology to make the parking lots smart.

Smart parking, Arduino Serial, Arduino MySQL communication

Análisis energético de la biomasa en Michoacán: Con caso de estudio para generación eléctrica de 4MWh

Biomass energy analysis in Michoacán: With study case for 4MWh electric generation

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Abstract

The energy reform promotes the use of renewable energies to face the reduction of fossil energy consumption. Michoacán is a state where agriculture proliferates, counting on a diversity of climates that favors the cultivation of a significant variety of fruits, in addition that its harvest area is abundant. On many occasions the waste generated from the harvest represents a problem for the farmers, because the volume is too much and they do not know what to do, unfortunately they opt by the illegal burning. However, biomass can be used as fuel with high thermal outputs, with a lower cost than other fuels, which represents an alternative for many industries that require combustion in their processes. Michoacán stands out continuously at the first places in the production of diverse fruts at national level, but its residues are used only for cattle consumption, so this research work not only takes into account the net harvest, it also makes an estimate of effective waste that can be considered biomass available for use in thermal processes, indicating according to its calorific value the energy potential wasted until the moment.

Biomass, Energy Analysis, Electric Generation

Generación eléctrica a partir de la fotosíntesis natural; ¿Una realidad escalable?

Electric generation from natural photosynthesis; A scalable reality?

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Abstract

Worldwide there are 7.5 billion population, and 16% of this people does not have electricity service, therfore they use fossil fuels to heat and light their homes. The high energy consumption at world, causes a high pollution in general of the earth and atmosphere, with serious results for the ecosystems, the health of the people and the climate, due to the main sources of energy used are Non-Renewable. The solar energy is directly used by green plants and other photosynthetic organisms, capable of capturing solar energy, transforming it into chemical energy and storing it. This natural process is called photosynthesis and consists of converting solar energy, water and carbon dioxide into carbohydrates and oxygen that act as nutrients for plants. The photosynthesis process technology is based on a biological generator that obtains electricity from the decomposition of organic substances extracted naturally from plants. It do it by releasing electrons and H2O in the process, without causing damage to any living organism. This project allows to identify new ways to generate clean energies, as well as the investigation of sustainable alternative energies.

Electric Generation, Photosynthesis, Renewable Energies

Modelado molecular de un ánodo de carbón activado como soporte de platino por medio de cálculos DFT

Molecularly modeling an activated carbon anode as a platinum support by means of DFT calculations

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Abstract

In this paper we present the molecular modeling of an activated carbon anode as platinum support of a proton exchange membrane fuel cell (PEMFC), in which platinum (Pt) interacts as a catalyst supported in activated carbon (CA) with molecular hydrogen (H_2) in order to break it or ionize it. The adsorption between CA and Pt is analyzed as an atom or as a minimum FCC(face-centered cubic) surface structure, to observe if there is any difference between activated and non-activated carbon in the Pt-H_2 reaction. Using quantum calculations of the Density Functional Theory (DFT), the adsorption and the effect of activated carbon on platinum were investigated, using different carbon and platinum structures. Our results show that the activated carbons provide a stable support for the platinum catalysts, taking into account that the CA presents a well of lower potential energy to adsorb the platinum (physisorption), whereas an activated carbon has a potential energy well major (chemisorption).

DFT, Activated carbon, Platinum support

Inspección mecánico-visual de ampolletas farmacéuticas de vidrio mediante el uso de visión artificial y robótica

Mechanical-visual inspection of pharmaceutical glass ampoules through the use of artificial and robotic vision

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Abstract

One of the problems currently faced by the pharmaceutical industry in an automatic process, is to ensure that by means of a single traditional inspection system, the characteristics of the glass ampules are evaluated with respect to their appearance in the finish and the color. In addition to being free of defects such as cracks, roughness, excess material and burrs in the finished product. In the present work, a prototype of automatic artificial vision was developed, reliable and safe for the mechanical-visual inspection, ordering and packaging of ampoules in the pharmaceutical industry. The elements that make up the system are: a robot of the brand Mitsubishi RV-2FB-D, the controller CR-750D, a camera COGNEX model ISM 1100-C11, a conveyor belt, a direct current (DC) motor and a vacuum suction cups, the latter responsible for taking the ampule. The results obtained in the project allowed to validate the use of artificial vision to visually and visually verify amber-colored ampoules in an automated process, as well as to validate the ordering of ampoules in the same position inside their packaging.

Robot Mitsubishi RV-2FB-D, Artificial vision, Cognex Camera, Ampule

Diseño de una micro-red virtual fotovoltaica, aplicando monitoreo energético en tiempo real, y estrategias de cambio de conducta para el ahorro de energía

Design of a virtual photovoltaic microgrid, applying real-time energy monitoring, and behavior change theories for energy saving

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Abstract

The Mexican energy reform of 2013 enabled the development of new management models and energy infrastructure. However, there is growing and unattended evidence of the weight of human behavior analysis in energy consumption. Therefore, this research integrates, with an interdisciplinary approach, the design of a virtual microgrid and an energy market in the Tonalá Campus of the University of Guadalajara, with real-time energy monitoring and behavior change theories.Firstly, the design of a virtual microgrid of 5 buildings, each with a virtual generation plant, is proposed. Each one dimensioned based on its historical demand and the generation of a 499-kWp photovoltaic plant, installed at the Campus. Both consumption and generation have real-time monitoring installed since May 2018. It was from this data that the virtual power plant for each building was dimensioned.Parallelly, the Transtheoretical Model of the stages of change and the Diffusion of Innovation Theory, are applied to design an intervention to modify energy consumption habits in the Campus community and set the foundations of an energy market pilot program.

Microgrid, Energy monitoring, Behavior change

Análisis termodinámico de las condiciones de operación de los ciclos combinados turbina de gas-vapor con uno, dos y tres niveles de presión

Thermodynamics analysis of the operation conditions of gas-steam turbine combined cycles with one, two and three pressure levels

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Abstract

The technology of gas-steam turbine combined cycles is once of the most viable options for the generation of electric power with lower costs of production per kilowatt-hour and environmental, considering that the type of fuel should be gas natural. In the Mexican Republic, the projections of power generation to 2018 through the use of this technology, it establishes the possibility to install new power generation plants with pressures of 100 to 160 bar, and temperatures of 538 to 580°C. Another option it's the repowering of the thermoelectric plants and cogeneration gas-steam turbines projects. Therefore, in this paper present a thermodynamic analysis of the configurations of combined cycles of one, two and three pressure levels with the objective in order to establish a parametric analysis of the power generation capacity, as well the thermal efficiency and Heat Rate based on the characteristics of the gas and steam turbines, likewise the quality of the last expansion stage has considered as a restriction to delimit the pressure of the steam domes of each level.

Gas turbine, Combined cycle, Thermodynamic analysis

Implementación de las etapas definir y medir de la metodología dmamc en una línea de producción

Implementation of the stages define and measure the dmaic methodology in a production line

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Abstract

The present study was carried out in a metal packaging manufacturing company located in Ensenada Baja California. The DMAMC methodology was applied in the "Define and Measure" stages for the analysis and to be able to propose strategies that allow to increase the efficiency, maintain the controls in the client - supplier chain, meet the client 's requirements and cover the requirements of use, opportunity, agreed cost and duration. The production line of the most sold product was selected and the critical characteristics of the global process were determined with key suppliers, inputs, outputs and users.The product that was selected represents 60% of the company's sales and has a high rejection percentage, which is equivalent to monthly losses of $ 12,500,000.00 dollars. With this study, we identified, in a timely manner, the factors that affect the performance of the processes and proposed solutions that can be implemented to increase productivity, quality and improve customer satisfaction.

DMAIC, Process, Product

Sistema embebido de análisis y control por medio de visión artificial y mediciones ultrasónicas, basado en labview y hardware roborio

Embedded system of analysis and control through artificial vision and ultrasonic measurements, based on labview and roborio hardware

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Abstract

In maintenance is vital to know the physical state of a equipment or process in real time effectively, fast and reliable way, since it would avoid short, medium or long term failures, caused by the bad operation or wear of parts that make up the process or equipment. One of the tools in which he allows this is known as; "Predictive maintenance", where the use of new processing and analysis technologies is indispensable. The implementation of a monitoring system by artificial vision in maintenance will eliminate the need to diagnose in person parts of a team or process. For this reason, an embedded system of artificial vision and ultrasonic measurements was designed and implemented, using the LabVIEW platform and RoboRIO hardware, capable to; analyze, monitor, classify, record and process the visible electromagnetic spectrum of a number N of objects with dimensions (X, Y, Z) in a production process. Which achieves an effectiveness of 87% against an ideal system, in which there is no error. Being this is the first of 3 phases of a more complex artificial vision monitoring system for the diagnosis of maintenance equipment and processes.

Artificial vision, Monitoring, Embedded system

Desarrollo de una aplicación en el robot nao h25 para la enseñanza y comprobación de la operación multiplicación con el método maya

Development of an application on the nao h25 robot for the teaching and checking of the multiplication operation with mayan method

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Abstract

This research document shows the development of an application implemented in the humanoid robot NAO H25, using the methodology of Analysis, Design, Development, Implementation and Evaluation (ADDIE). Currently, in most public institutions of basic education, there is no robotic technology that the teacher uses for teaching a particular subject. The purpose of the application is that it works as a didactic resource, with which teachers and students of basic education can use as a form of support for the teaching of the multiplication operation. This application is capable of making the NAO H25 robot explain the multiplication operation in an arithmetic way and carry out its verification by means of the Mayan method. When the application is implemented in the NAO H25 robot, it acts as a trainer in the topic of multiplications, following a didactic sequence as a form of support for the development of the explanation. For the moment, tests were carried out on a group of 32 students of the computer engineering degree at this university centre. Where it was found that 94% were interested in the robot acting as a capacitor. 97% would like more applications of this type to be made for learning other subjects. The development of the application is with the motive of obtaining a significant learning in the students of third year of basic education, fomenting the interest by the technology.

Application, Mayan Method, Robot NAO H25, Significant learning

TIC, ¿Carrera para débiles visuales?

ITC, Is this a degree for blind people?

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Abstract

Goals: Analyze, the inclusion of disabled people in education or work, because some schools offer the opportunity of studying a degree, giving learning tools in the way they can develop the competences for working. The Technological University of Santa Catarina created a program called Disabled Attention Program (DAP) in 2004. At the beginning just deaf people were assisted, but little by little people with other disabilities were integrated in the program, like blind, handicapped and intellectual disability people. The educative programs offered by the university are: Industrial processes, Business development, Mechatronics, Information technology and communication and others. Methodology: We did a qualitative analysis focused on the career of Information and communication technologies, on blind students, although the number of students has been limited to a few, just 2 of them have finished their career and the others have quit for many reasons. In this case the tool is a survey made of open and closed questions. The principal contribution of this research is to guide the students in a better way, by demonstrating them the real context of the career, so they can make a good decision about what they want to study.

Inclusion, Handicap, Blindness

Comportamiento térmico de fachada ventilada opaca en clima cálido seco extremo

Thermal behavior of opaque ventilated facade in hot dry climate

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Abstract

Energy consumption attributed to buildings amounts to approximately 30% globally. This consumption is even greater in buildings that lack climate adaptation strategies. In warm climates, solar control devices protect from thermal gains by direct solar radiation as a strategy to avoid overheating in buildings. Ventilated facades increase the energy efficiency of said devices when harnessing the convective cooling produced by the temperature and pressure differential inside the ventilated facade. The present research shows the thermal behaviour of an opaque ventilated facade through numerical modelling in ANSYS Fluent® computational fluid dynamics software in an extreme hot dry climate. The objective of the study was to analyze the effect of a ventilated facade on the thermal performance of the wall immediately adjacent to the living space as a passive convective cooling system. The variables analyzed were thickness of the air cavity, ambient temperature and wind speed of the external environment, as well as its effect on the surface temperature of the wall adjacent to the living space. The results show a decrease in the surface temperature of the wall, which reduces the total cooling load of the building.

Opaque ventilated facade, Opaque double skin facade, Computational fluid dynamics, Natural ventilation

Desarrollo de una superficie de Fresnel tipo canal usando un LED de alta potencia para adaptarlo a un reactor fotoquímico

Development of a channel type Fresnel surface using a high-power LED to adapt it to a photochemical reactor

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Abstract

A channel-type Fresnel surface was designed using the polynomial interpolation adjustment method. The experimental arrangement was composed of a metal complex, a high power LED lighting source, a cooling system and a Fresnel concentrator. The tests were done in a dark chamber, placing the compound at an effective focal distance from the reflected rays of the concentrator, for a time. By exposing the sample to the LED irradiation, its changes were registered in a UV-Vis spectrophotometer, obtaining an absorbance graph vs wavelength, the changes observed in the transition bands in displacement and intensity of the blue region to the red of the spectrum, confirmed the efficiency and usefulness of the Fresnel-type concentrator in the development of the photochemical reactor. This photochemical reactor has an advantage over commercial reactors, because it uses samples of compounds in small solutions, is portable, it can be implemented in university and pharmaceutical laboratories. The results were favorable, a low energy consumption was obtained, and a reduction of time in the molecular reaction process of the analyzed compound.

Fresnel concentrator, Photochemical reactor, Low energy consumption

Aplicaciones y desarrollo de prototipos con internet de las cosas

Applications and development of prototypes with internet of things

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Abstract

In the Internet of Things paradigm (IoT) it is considered that the multiple interconnected objects in the network can interact and cooperate with each other to provide services and generate new applications. The construction of these intelligent environments provides opportunities for economic and social improvement in the countries that brings new challenges for the hardware and software development industries and for the academic area. In this context, providing the set of components that constitute the structure for the development of prototypes and their applications in the IoT area is the objective of this document. The methodology used is qualitative with a descriptive scope because it identifies, classify and present the basic characteristics for the definition of integral IoT projects. The presented schematization constitutes a frame of reference that contributes to the training of human capital specialized in the technological area by providing a formal method for the systematization of applications that can control objects connected through the Internet.

Construction of applications, Prototypes, Internet of Things

Análisis de usabilidad web a través de métricas estandarizadas y su aplicación práctica en la plataforma SAEFI

Web usability analysis through standardized metrics and its practical application on the SAEFI platform

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Abstract

In this project, it analyzes the performance of a school management web application, taking into account "the quality of the product and the quality in use", according to ISO 25010: 2011, in order to have the data to improve or optimize the system. A methodology for the evaluation of usability is proposed, applying two evaluation methods: the empirical method contemplates the design and application of a data collection instrument that evaluates indicators and metrics by users of the web application; and the heuristic method that discriminates and applies specific use software tools that automatically evaluates the web application. The usability evaluation in its first phase in the empirical method on the product quality model gives us a linear trend between 60% and 80%; in the second phase about the heuristic method on the quality of use with respect to accessibility, it obtained compliance values between 32% and 93%, and in speed from 71% to 99%.

Usabilidad, Accesibilidad, SAEFI

Efecto de parámetros de mínima cantidad de lubricación en reducción de desgaste de herramienta

Effect of minimum quantity lubrication parameters on tool wear reduction

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Abstract

The objective of this work is to determine the influence of Minimum Quantity Lubrication (MQL) parameters on flank wear during face milling. Furthermore, the values of each factor in which the MQL resulted to be effective were determined. A designed experiment with two level, three factor and two replicas was used to test tool wear on P45 grade inserts at relatively high cutting speed (~900 m/min) on steel AISI 1045. A commercial MQL system was used with vegetable base lubricant non soluble in water.Results show that amount of lubricant and vertical angle are key factors that affects the effectiveness of the process. A response surface equation was obtained in order to determine the zones in which the factors resulted in the lowest tool wear. A flank wear decrease of 7 times, respect to the maximum observed, was found by using low level of air flow, low level of vertical angle and high level of lubricant.

MQL, Tool wear, Minimize

Controlador de servomotores industriales mediante un microcontrolador utilizando MicroPython

Industrial servomotor controller by means of a microcontroller using MicroPython

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Abtract

Electrical motors are indispensable machines in the industry, thus it is necessary to ensure that engineering students can develop speed and torque controllers, in a fast and efficient manner. One of the most commonly used motor control strategies is Field Oriented Control; however it's implementation requieres highly-intensive math processing and a fast processor with robust hardware resources. Several related works have been published, but they are hard to replicate and use due to the aforementioned problems. In this article, the author presents a torque and speed controller for industrial servomotors by means of Direct Torque Control which is known for its speed and ease of implementation compared to Field Oriented Control. In addition, the MicroPython programming language is used on the new and novel ESP32 microcontroller, which allows greater design simplicity. Results were validated using simulations and a physical implementation, thus achieving adequate motor funcionality. This work will provide students and researchers interested in industrial motor control, a fast and effective implementation tool.

Industrial threephase electric motor control, Python computer language, ESP32 processor

Metodología para el dimensionamiento óptimo de sistemas híbridos para la electrificación de comunidades rurales situadas en el Occidente de México utilizando herramientas computacionales de optimización

Methodology for the optimal sizing of hybrid systems for the electrification of rural communities located in western Mexico using computational optimization tools

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Abstract

This paper shows the importance acquired by specialized software for the design of energy systems that operate under a scheme outside the electricity grid and incorporate Renewable Energy. The relevance of this work is based on the understanding that one of the objectives of current governments is to improve the quality of life of people and their marginality index, through access to electricity service. A methodology is proposed for the sizing of an isolated hybrid system using HOMER Pro, a software of optimization of power systems that facilitates the technical and economic evaluation of the system. It started with the elaboration of a demand profile for a rural community located in the municipality of Mezquitic in the North of the state of Jalisco based on an international review, which allows to improve its Human Development Index; and the selection of the different energy generation and storage components that make up the system. The result of the simulations allows us to build a table of results, which facilitates the selection of equipment because it allows to observe the different combinations of technical, economic and meteorological variables and economically viable.

Load profile, Optimal sizing, Rural electrification

Algoritmo para la navegación autónoma de un vehículo aéreo no tripulado en pasillos de adoquín gris

Algorithm for autonomous navigation of an unmanned aerial vehicle in gray cobblestone aisles

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Abstract

Several sensors and high processing capacity are required for allowing to an unmanned aerial vehicle (UAV) navigate with total autonomy. The UAVs with greater autonomy have sensors such as stereoscopic cameras, lasers, ultrasonic sensors, among others. In addition, it is necessary that the UAV has a microcontroller capable of processing each of the data received by the sensors. The disadvantage of having many sensors integrated into an UAV is that they increase its cost, make it heavier, consume more energy and reduce flight time. This article presents the design and implementation of an algorithm that allows an UAV to navigate in a straight line in an autonomous way over obstacle-free gray pavements, using only the integrated camera. The VANT was adapted to a smartphone which is responsible for the digital processing of images. To evaluate the proper functioning of the UAV, tests were carried out on corridors at the University.

Unmanned Aerial Vehicle, Autonomous Navigation, Digital Image Processing

Análisis de confort térmico de la vivienda en valle de San Pedro durante el periodo frío por medio de simulación

Thermal comfort Analysis for the Valley of San Pedro housing during the cold period by use of simulation

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Abtract

This research focuses on the analysis of the thermal comfort behavior for the social interest housing, caused by the lack of adaptations to the predominant Mediterranean climate (warm-dry) of San Pedro Valley, Tijuana B.C. located at latitude 32°29'47"N and longitude 116°58'26"W, these conditions occur in the cold period during December, January and February, when minimum temperatures are between 3.5°C and 4.4°C.The Design Builder simulation was carried out by validating results against continuous measured data of the dwelling during the aforementioned periods, analyzing the internal temperature of the dwelling. The simulated coating material was polystyrene, which due to its thermal conductivity characteristics, allows to reduce thermal discomfort in to the social interest housing, contributing to the comfort improvement of the living space, showing it by results of the simulation tool.In this way the polystyrene coating alternative for the housing envelope, is a solution that allows to increase the hours of comfort within the space by bringing the indoor temperature closer to the comfort zone established for the local conditions during the cold period.

Thermal comfort, Social interest housing, Design builder, Cold period

Construcción y pruebas preliminares de un prototipo experimental para evaluar la transferencia de calor en un tubo de sección transversal cuadrada en un intercambiador de calor

Construction and preliminary tests of an experimental prototype to evaluate heat transfer in a square cross-section tube in a heat exchanger

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Abstract

The contribution of this research is to determine the change in the heat flow by the axial torsion in a tube of square cross section. The tube studied is part of a prototype heat exchanger designed and built by the research group in "Engineering and simulation of energy processes" of the Universidad Veracruzana, Coatzacoalcos region, Veracruz. The experimental prototype was designed and constructed with PVC pipe and the test section with aluminum tubes. The heat transfer of equipment was from 5 to 60 kJ with volumetric flows from 3 to 20 l/min and water as a working fluid. The tube without axial torsion (0°) is compared with three other tubes with 180°, 360° and 540° torsion. The experimental results reported in this study show the preliminary experimental tests where four levels of water flow are configured, using flow and temperature measurement instruments. The preliminary experimental results reveal an increase in the heat transfer in the equipment as the degree of axial torsion in the square section tubes is increased.

Heat flux, Passive improvements, Prototype

Aplicación de Metodología SCRUM para el desarrollo de aplicación móvil

Application of SCRUM methodology for mobile application development

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Abstract

Currently, young people have a strong attraction for games and social networks developed for mobile devices, so much is the demand that in 2017 the count of mobile Internet users was made; This survey showed that there are more than 3.5 billion users spending an average of 69% of their time a day on their smartphone, that is equivalent to more than 16 hours a day on the Internet.The previous statistics guided us to develop a Mobile Application in Android, with a game-like interface, since it is sought to be the closest thing to what a user with access to a smartphone frequents in their day to day; The project aims to help all students of the public institution, generating skills among themselves on the knowledge acquired throughout their stay at the University.The development of the Mobile Application was carried out under the SCRUM Agile Methodology; It is standing out above the others thanks to its easy implementation and obtaining the expected results.This work shows the process of implementing the methodology and the favorable results that were obtained when using it.

Scrum, App, Quiz

Prótesis para rodilla basada en energía cinética

Knees prosthesis based on kinetic energy

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Abstract

The need for prosthesis development dates back many years, but only in the last few years has material, control and automation technology been available to obtain prostheses that imitate the function and performance of the real part that is replaced. The development of prosthesis, involves the need to merge knowledge of human physiology and biomechanics, machining of materials. Currently there are various types of prostheses that are adapted to the needs of people who require them. Recent advances in bionics have made possible the development of more efficient prostheses, but at a high cost. There are limitations and challenges to be overcome in order to be successful, in addition to being accessible, for people with low resources, who only want to be able to walk and be independent, for which purpose it is intended to design and manufacture a prosthesis that supports walking to a person, with a low cost and that the people of low resources can acquire i.

Prosthesis, Cost, Functional, Design

Desarrollo de aplicación móvil para generar competencias en los alumnos de la universidad tecnológica de San Juan del Río

Development of mobile application to generate competences in the students of the technological university of San Juan del Río

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Abstract

Statistics tell us that at the end of 2017 there is a record of approximately 8 million applications on Google Play, Android in 2016 showed a total of downloads of applications of 90 billion; therefore users use an average of 9 applications per day and 30 applications per month.
With the above statistics, the development of a Mobile Application on Android was carried out, which consists of randomly generating questions by selecting a grade with their respective response options, if correct, 5 points are awarded, otherwise 3 will be subtracted.
The methodology applied was SCRUM, the project was carried out in 5 phases which were: planning meeting, daily scrum, development work during the sprint, sprint review and sprint retrospective.
It was developed with programming languages JSON, JAVA, PHP and SQL database integration.
In the end we got an apk that can be used on any device with Android 7.0 and above.

Mobile Application, Quiz, Technology, Android, Scrum

Análisis termodinámico del intercambiador de calor de un sistema ORC para el aprovechamiento de calor residual en procesos industriales

Thermodynamic analysis of the heat exchanger of an ORC system for the use of residual heat in industrial processes

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Abstract

In this paper we present the implementation of a system based on organic Rankine cycle coupled to a heat discharge of an industrial process. Waste heat is used as an energy source input to the system, which uses this energy to evaporate an organic fluid and expand it in a turbine, where mechanical power is produced. The system consists of 4 processes and the heat exchanger is specially analyzed. According to the availability of heat energy, the heat exchanger was designed to achieve the maximum efficiency in the energy system. Likewise, the maximum thermal efficiency of the ORC system is calculated as a function of the available energy, the energy source temperature and the available mass flow rate. By these calculations, the working fluid and the suitable operating conditions were selected through a thermodynamic analysis.

Organic Rankine cycle, Heat exchanger, Energetic efficiency

Reducción de tiempos de espera en el cambio de modelo mediante la aplicación de la herramienta SMED, un caso de estudio

Reduction of waiting times at the change of model through the application of SMED tool, a case study

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Abstract

In the management of the production, SMED (acronym of Single-Minute Exchange of Die) derived from the Lean Manufacturing methodology can be interpreted as a philosophy of work born in Toyota, its application is based on the elimination of waste in a sustainable way over time, allowing improve the productivity. This research presents the application of the SMED methodology in a company specialized in the production of honeycomb type packaging, where the main problem is in the line of CHS, this produces the main component of the product, however, the delay time is up to 71 minutes per model change, adjustment of the machine and then the start, reflecting in 1500 pounds of delayed product, being affected in customer response times, generating overtime and not meeting the daily production goals. The objective of this research is to reduce the time of preparation and assembly of the tooling according to the requested changes, through the application of SMED a flexible production system will be obtained that allows responding to the constant changes in the market, reduction of delivery times and increase in production capacity.

Production, System, Reduction

Desarrollo de prototipo, bastón para la asistencia de personas débiles visuales

Development of prototype, walking stick for the assistance of the visually impaired

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Abstract

Information technologies have become necessary in the area of the health sector, with the new trends that are emerging, this work aims to develop a prototype of a smart cane to improve travel, allowing to avoid obstacles that obstruct the path of visually impaired people.The methodology used was traditional through the stages of analysis, planning, design, development, testing and implementation, for the development of this prototype the Arduino IDE software was used, using as controller an ARDUINO ONE, for the control of distances, it was used HC-04 ultrasonic sensors, transmitting signals through the vibrating motor and a buzzer that emits a different sound depending on the programming of the ultrasonic sensors. All these connections were linked to an experimental table called Protoboard, which are directed to the ARDUINO ONE board.The final product allowed to have a cane that was tested with, people with visual weakness, the functionality was measured with a questionnaire that evaluated the mobility function and the results were greater than 80% of acceptance

Arduino, Technology, Weak Visual, Staff, Vibrating Motor

Aplicación móvil para la optimización de procesos de consumo de energía en sector hotelero

Mobile application for the optimization of energy consumption processes in the hotel sector

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Abstract

Engineering is the set of technological knowledge that helps in innovation, invention, development and improvement of techniques and tools that meet the needs and solve problems of companies and society in general, creating projects that facilitate the solution to any problem raised, not It matters what nature it is, always visualizing the benefit attached to a sustainability in general. Nowadays the biggest problem we have is the excessive consumption of natural resources, we need to give sound solutions that little by little will minimize this situation. In this project, a mobile application called Applight was visualized, which will help to reduce energy consumption in hotels, through an indicator that will let us know if any household appliance or lamps and lights were activated, thus having the opportunity to turn off and deactivate all those components that were left on when leaving. In this way, it will help to reduce energy consumption, in a large amount thus contributing to the care of the environment and the expenditure of energy payments in hotel companies.

Sustainable, Application, Mobil

Mesa de Corte por plasma automatizada mediante LabVIEW

Automated plasma cutting table using LabVIEW

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Abstract

The plasma cutting technique best known for its simplicity and ability to cut virtually any metal. This technique is present in most industries, with the passage of time has undergone technological improvements that allow cutting with better quality and greater productivity, so the importance of an automated system to efficiently and safely perform this homework. This article shows how the automation of a plasma cutting table was carried out using the Motion development platform and the LabVIEW graphic programming language from National Instruments. The interface that was developed provides the necessary tools so that the user can automatically make cuts of different materials for the manufacture of mechanical parts. With this improvement, the risk of accidents involved in the process itself is reduced, guaranteeing good operation and safety measures during its operation. Additionally, visual signs were integrated that allow to know the operation and operation status of the table, as well as emergency stop buttons.

Automation, Cuts, Labview

Deshidratador solar/eléctrico de alimentos con comunicación a dispositivo móvil

Solar / electric food dehydrator with communication to mobile device

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Abstract

Dehydration is one of the oldest methods used by man to preserve food, since since time immemorial new techniques have been implemented to improve the process and obtain herbs, fruits, vegetables and dehydrated meats. The objective of this research is to develop a prototype solar / electric dehydrator monitored, which reports the drying times of food, to determine the moments of intervention of the user in the different stages of this process. The method used is practical research-action, it was decided to use this methodological alternative, due to the academic and local context in which it develops, we found the problem and it is expected to solve it through this technological development where the following technologies are involved information: mobile programming, internet of things, also renewable solar technology.

Mobile development, Internet of Things dehydration technology

Interface de apoyo didáctico de ciencia y tecnología

Interface for didactic support in science and technology

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Abstract

The classroom has not changed much since its inception as everyday places where knowledge is acquired at all school levels. Currently, our education has progressed moderately, although there is still much to be done in education and teaching aids. Students nowadays, regardless of their age, are growing in contact with a technological world which provides them with quick, easy and often low quality information. Due to this, and taking advantage of current technological resources, a didactic interface was designed through a web environment open access. This interface has pneumatics material for the moment and allows to provide support to technical subjects through videos.Six videos were created and upload them in the developed platforms, which allow generating a better academic performance, the number of accesses to the platform and the reproductions of the videos allows observing the acceptance of the proposal that potentially will grow in time and options. Was applied a quiz to students of the engineering in mechatronics career of the UTSJR, where more than 70% they thought that the videos help them with understanding of their subjects and the students preferred that they make the videos.

Didactic, Web site, Pneumatics

Sistema de extraccion y tratamiento de metano

Methane extraction and treatment system

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Abstract

Currently sanitary landfills are considered sources of atmospheric pollutants. Biogas, a product of the biological decomposition of organic waste, incorporates mostly methane (CH4) and carbon dioxide (CO2), which are greenhouse gases. A large number of municipal sanitary landfills do not have control over methane gas emissions to the surface. This project is based on the construction of a portable prototype system for the extraction and treatment of methane gas from landfills. The objective was to manufacture and build a portable prototype system for the extraction and treatment of methane gas from municipal sanitary landfills. That it implements the necessary sections and devices to treat the gas and in this way facilitate its later use as fuel in heating systems, domestic use and / or internal and external combustion thermal machines. Using for this purpose a system of gas extraction, separation of solids, de-humidification and desulphurisation process. In the system variables such as the percentage of methane, temperature and humidity are monitored, in order to give a stability to the gas treatment process.

Biogas, Methane, Utilization

Desarrollo de un sistema de información para evaluación de la confiabilidad de cuestionarios mediante el coeficiente de cronbach

Development of an information system for the evaluation of the reliability of questionnaires using the cronbach coefficient

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Abstract

In the study of different qualitative researches, evaluation questionnaires are used, these questionnaires have to be validated in their reliability, the present work presents the development of an information system that evaluates the reliability coefficient; using the Cronbach Coefficient formula, which allows estimating the reliability of a measurement instrument through a set of items, with Likert values from 1 to 5, where reliability is better the closer the value of alpha 1.0 is. . The methodology used for the development of the system is Scrum, it is an agile methodology where partial and regular deliveries of the final product are made, prioritized by the benefit that they contribute to the recipient of the project. Therefore, Scrum is especially suitable for projects in complex environments, where you need to get results soon, where requirements are changing or poorly defined, where innovation, competitiveness, flexibility and productivity are fundamental. The development of this evaluation system allowed evaluating 7 questionnaires applied to students of UTSJR, in the use of virtual platforms for software engineering subjects, it is worth mentioning that questionnaires or surveys can be evaluated to evaluate reliability in qualitative research projects

Scrum, Reliability, Coefficient

Controlador robusto para el seguimiento de trayectorias para un exoesqueleto de extremidades inferiores

Robust trajectory tracking controller for lower extremity exoskeleton

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Abstract

Currently, robotics has shown that it can increase the efficiency in the specific rehabilitation of some of the limbs of the human body, in this case assisting people who have suffered a stroke, by using devices such as exoskeletons, to provide continuous, smooth and controlled movements. Stroke is the result of a shortage of the brain that leads in just a few minutes to cell death, causing severe damage to the human body, even death of the patient. People who have suffered a stroke have difficulty rising from a chair. An exoskeleton is a mechanical structure designed to be used on the human body as a garment, it serves as a support and is used to assist movements or accentuate strength as a support in a person. Lower extremity exoskeleton can assist patients with hemiplegia to get up or sit on a chair, thus avoiding muscle atrophy and possible spasticity. This paper proposes the use of a robust Generalized Proportional Integral (GPI) controller for trajectory tracking for controlling a six degrees of freedom exoskeleton, to assist patients when getting up and sitting down from a chair. Simulation results obtained with the virtual prototype of the exoskeleton, under the environment of the MSC Adams software in co-simulation with Matlab are presented.

Lower extremity exoskeleton, Robust Control, GPI Control

Simulación y pruebas de laboratorio de un aspa de turbina de viento de 600W de acuerdo a la Norma IEC-61400-2

Simulation and laboratory testing of a 600W wind turbine assembly according to the standard IEC-61400-2

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Abstract

In the present work is shown the numerical simulation performed by means of finite element software (FEA) and the static mechanical tests using extensometric techniques for a wind turbine blade of 600W in accordance with the international standard IEC 61400-2. A NACA 4412 profile was used and the loads applied were selected according to the following load hypotheses described in the standard: normal operation, maximum thrust, immobilization with wind load and maximum exposure. A methodology was developed for both the simulation and for the laboratory tests, the data of the microdeformation measured by extensometry were also analyzed and compared with those obtained by the numerical simulation. Concluding that the analysis of finite elements is a key step prior to manufacturing that allows us to save resources and gives us parameters to perform both manufacturing and testing. Laboratory tests are necessary to ensure safe and reliable functioning of the blade during its useful life.

Blade, Measurement, Simulation

Diseño y manufactura de un aislante para un rotating disc electrode

Design and manufacture of an insulation for a rotating disc electrode

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Abstract

The development of new materials is driven by the search to improve and make more practical the life of man. One of the methods implemented is the electrochemical technique, in which having the ability to hermetically seal the working tools for testing new materials is very important. To evaluate the effectiveness of the seal it is necessary to carry out tests that evaluate the electrochemical flow, which allow to relate it to the behavior of the material to be analyzed. The objective of this project is to design and manufacture an Teflon insulating device (coupler or electrode holder), which can be placed on the test axis of the Rotating Disc Electrode machine, Princeton Applied Research; From the previous approaches, it is deduced the need to develop a prototype that helps to evaluate the electrical potential of the material in said equipment to be analyzed and that this assures various aspects such as functionality and ease of use.

Electrochemical, Teflon, Insulator

Análisis del consumo energético de la herramienta de un torno CNC a diferentes velocidades de corte usando la densidad del espectro de potencia

Analysis of the energy consumption of the tool of a CNC lathe machine at different cutting speeds using the power spectral density

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Abstract

In a company, income must exceed expenses for the business to be profitable. The choices a company makes about its energy sourcing and consumption can profoundly influence its cost of production. The purpose of this paper is to examine the energy consumption of the cutting tool of a lathe using a numerical tool CNC. This study was designed to examine the relationship between speed of cutting and the spectral modes of the power spectral density. This work shows the impact of the current for different cutting speeds, the results of this study indicate that the power spectral density of the current of cutting, may be more than enough to determinate the energy consumption of the manufacturing process. The main contribution of this paper is the experimental validation of the attenuation of higher order modes of the electrical current at metal cutting process. These results can be used in the design and tuning of the speed control of the cutting tool.

Cut, Spectrum, Frequency, Current

Desarrollo de plataforma experimental para evaluar el desempeño de controladores PID en un sistema térmico

Development of experimental platform to evaluate the performance of PID controllers in a thermal system

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Abstract

This article presents the development of the programming and the tuning of the control gains for a thermal system, the programming was carried out in the LabVIEW software where it is possible to visualize and manipulate the sensors, indicators and actuators, the data is represented in a graphical user interface.
The Digital Write block is used in the RGB LED to determine the temperature level with color identification, the Analog Read block was also used to read the data of the temperature sensor LM35, the data acquisition was obtained through the datalogger, where they are stored and save the data generated from the experiment in a notepad on the PC, the communication is done through MakerHub where the type of connection and the port to send LabVIEW data to the Arduino card is selected, to determine the tangential curve with the parameters of the experiment, with the objective of applying the first Ziegler-Nichols method, acquiring the K_p, T_i y T_d gains of the closed system, to evaluate the P, PI and PID controllers. To tune the gains of the Proportional-Integral-Derivative Controller (PID) the Excel software is used, where the formulas of the first Ziegler-Nichols method are applied, once the gains are adjusted, it is possible to do real-time experiments. With the files stored through the data acquisition system (DAQ), you can evaluate the performance of the controllers with different gains, that is, compare the input and output data.

PID controller, LabVIEW, Arduino

Sistema de rehabilitación física con 2 CH, basado en electroterapia con software de seguimiento y control de paciente

Physical rehabilitation system with 2 CH, based on electrotherapy with patient tracking and control software

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Abstract

The Physiotherapist uses special equipment for electrotherapy, based on the generation and management of interferential currents, voltage and frequencies (sine waves, sawtooth and square), applying energy from the electromagnetic spectrum to the human organism, generating on the tissues, desired biological responses and therapeutic. In the present article, a viable reengineering proposal was developed for teams dedicated to the application of electrotherapy as a means of physical rehabilitation, based on the analysis, emphasizing the improvements to be implemented, to give timely follow-up to the patient and fundamental support to the physiotherapist. The design was contemplated and integrated a system for physical rehabilitation (2 CH), based on electrotherapy and thermotherapy, with software for control and punctual patient follow-up, creating a folder of clinical history since the patient arrives, plotting the progress or setbacks for the generation of reports, allowing the software to suggest changes or continuation with the treatments always with the corresponding medical authorization. The existing professional teams for this area are very expensive, the most complete incorporate an interface in the instrument, but there is no software that relates the patient to the medical part, they do not provide patient follow-up, much less suggest a specific treatment based on the history.

System, Electrotherapy, Patient

Método aproximado para determinar la potencia óptica en una linterna fotónica

Approximate method to determine the output optical power in a photonic lantern

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Abstract

Astronomy has benefited significantly from the development of photonic technology. However, the use of single-mode optical fibers in this area is not entirely efficient, this is mainly since its core, of the order of 8 microns in diameter, does not allow the capture of large amounts of light. In addition, in certain astronomical studies, it is required to analyze the multimodal incoherent light coming from the stars, particularly in the spectral range of the near infrared. One solution to these demands is the use of photonic lanterns, which are devices that function as an interface between a set of single-mode fibers and a multimode fiber, and in whose transition very low optical losses are obtained. However, there is not as far as we know, a mathematical method for the analysis of the behavior of the output power in photonic lanterns. Therefore, in this work we propose a numerical approximation method to determine the optical output power of single mode optical fibers in a photonic lantern, using the solution of eigenvalue equations, as well as the spatial capture of a part of the distribution of optical power, through of the end of a monomode tapered optical fiber.

Photonic-lantern, Astronomy, Optical power

Sintesis y caracterización del aceite de las semillas de chayotillo (*sicyos deppei*) para la producción de biodiesel asi como para investigar la toxina que esta semilla contiene que produce un efecto paralizante en los animales que la consumen

Synthesis and characterization of the seed oil of the chayotillo plant (sicyos deppei) for the production of biodiesel and to investigate the toxin that this seed contains that produces a paralyzing effect in the animals that consume it

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Abstract

The present research project aims to synthesize the oil from the seeds of the Chayotillo plant (SICYOS DEPPEI) by a chemical method through the soxhlet equipment, which consists of hexane reflux for the extraction of the seed oil from the plant. Chayotillo plant for its possible application in the production of biodiesel, the characterization of the oil of the seed will be done by infrared spectroscopy, the calculation of the percentage of oil contained in the seed, the color of the oil and investigate if the oil is found the toxin that produces a crippling effect in the animals that consume it when this corn comes when it is harvested with a harvester machine and it could be that if this seed were stirred in the corn that is used to make tortillas it could cause this same effect on the human being, once obtained the results will be spread among the people of the rural areas of the region of Tula-Tepeji.

Characterization, Oil, Chayotillo

Planeación y desarrollo de proyectos como estrategia de consolidación

Planning and project development as a consolidation strategy

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Abstract

Companies dedicated to project development commonly seek to increase their recruitment based on experience and usually leave aside the importance that entails the strengthening of technology transfer. Added to this and having as an extra need the definition of strategies to optimize the progress of the projects, was created a Management System that helped to obtain better control in development and define criteria for timely monitoring. The theoretical framework was established taking the bases of Planning and Project Management that allowed to basing this system. The approach used to structure it allows optimizing development times and assigning more comprehensive evaluation period for the technological transfer of the final product. Standardization was achieved in the design, development and manufacturing of projects, which resulted in be able to carry out activities at the same time in different projects without any offset or dependency problems between those activities and therefore, the strategic influence for the development of each project was reflected in all phases of the process. Finally, a case study is presented, in which the management system was implemented.

Project, Technology transfer, Management system

Diseño y construcción de un acoplamiento electrónico para realizar conexiones de IoT en un PLC convencional

Design and construction of an electronic coupling to make IoT connections in a conventional PLC

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Abstract

The growth of the digital industrial technology (Industry 4.0) is a revolution that makes it possible to gather, control and analyze data about several technical procedures. The result of this manufacturing revolution is the higher-quality products being produced at a lower cost. It is becoming increasingly difficult to ignore the role that Internet of Things (IoT) has in the productive processes, however, this technology is expensive and requires an update of the Programmable Logic Controllers (PLCs). This paper will focus on the update of the design and construction of an electronic coupling device to make IoT connections in a conventional PLC. In this work a siemens S7-200 PLC is used, in the inputs and outputs of this device a nodemcu esp32 WIFI card is coupled to monitor and control the process. The electronic circuit and the flow diagram of the coupling between the PLC and WIFI card are included. The evidence from this study suggests that the upgrade of the industrial equipment towards the industry 4.0 is possible without the need to make significant changes.

Industry 4.0, Internet Of Things, Programmable Logic Controllers

Técnica de extracción de información de bases de datos para su manejo como datos con posición geográfica

Data extraction technique of databases for its management as data with geographical position

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Abstract

The use of geographic information systems (GIS) is wide in diverse and different disciplines; as one of its main attributes, GIS allow the management of geographically referenced information, that is, data with geographical position. This work presents a technique for extracting information from databases and their subsequent geolocation. The technique is illustrated with a case where demand data for transportation services of a higher education Institution in Mexico City are handled considering its geographical position. The technique start with establishing criteria of search, selection and grouping in a data base taking into account what data it is possible to geolocate. After it information is exported to a GIS that allows a differentiated management, in particular, a spatial view of the data.

GIS, Databases, Information Extraction Technique, Transportation Demand

Diseño de un prototipo auxiliar terapéutico para el tratamiento del dolor en enfermedades músculo-esqueléticas

Prototype design therapeutic for pain treatment in musculoskeletal diseases

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Abstract

Musculoskeletal disorders are health problems that degenerate bones, muscles, and tendons; they range from mild discomfort to irreversible and disabling injuries, they also have symptoms such as pain and decreased joint mobility. This article presents the design and implementation of a therapeutic auxiliary device that uses Transcutaneous Electrical Nerve Stimulation (TENS) as an auxiliary tool in the treatment of pain caused by skeletal muscle disorders. The electronic device is controlled by an Arduino Nano microcontroller that communicates wirelessly (Bluetooth) with a mobile device to set up the intensity of TENS therapy. For the development of the device, a block diagram, an electronic circuit schematic diagram, and a user interface for a mobile device were made. Moreover, a survey instrument was designed to assess the level of pain. As a result, the prototype functionality is demonstrated through the implementation and validation prototype in case studies of the rehabilitation module of the Municipal DIF of Tantoyuca, Veracruz, Mexico.

Arduino Nano, Electrostimulation, Electronic device

Manufactura y pruebas de una celda de carga para un banco de pruebas de aspas de turbinas eólicas de baja capacidad

Manufacturing and testing of a load cell for a bank of low capacity wind turbine test blocks

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Abstract

In the present work, it is shows the design, manufacture and mechanical tests of a load cell for application in a turbine test bench of low capacity wind turbines are shown. The test bench is designed to withstand loads up to 3000 Nw and vanes up to 2.5 m in length. The general methodology of the cell design consists of, first, determining the operating loads of the bank, the selection of the type of load cell, the manufacture of this, the selection of the strain gauges for the measurement, the placement of the strain gauges in the load cell and finally the mechanical tests of the cell in the test bench. The material of the cell is aluminum 6061 and the configuration is type "S". As conclusions, it is mentioned that extensometric techniques allow to characterize the load cell by means of laboratory tests fulfilling the desired specifications with the design.

Cell, Gauge, Load

Determinación de las propiedades térmicas de un mortero modificado con sargazo como material alternativo en construcción

Determination of the thermal properties of a modified mortar with sargassum as an alternative material in construction

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Abstract

In the present work we analyze the properties of a mortar with the addition of treated sargassum algae, replacing the stone aggregate in percentages of 5%, 10%, 15% and 20% in order to reduce the thermal conductivity of the coating and the thermal load of the interior of the buildings, thus reducing energy consumption and implementing sustainable materials to the construction industry. For the purposes of this investigation, a characterization of the components of the mortar was carried out, the stone aggregate and the sargassum treated for its use as an aggregate. Samples were prepared for each percentage and compression resistance tests were performed at 3, 7, 14 and 28 days to analyze the behavior of the mortar during the hardening process. Adhesion tests were performed to determine if the mixtures are efficient for use as a coating. Subsequently, the thermal transfer was evaluated by conduction and convection. The material showed hydrophilic characteristics, therefore, the analysis of the mechanical properties showed as bigger substitution of sargassum, low is the resistance, limiting the efficient percentages to 5 and 10% for its use.

Mortar, Thermal insulator, Sargassum

Diseño y modelado de un motor de cd con variación de resistencia de campo para regular la velocidad

Design and modeling of a cd motor with field resistance variation to regulate the speed

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Abstract

Energy saving and the new technologies implementation in many areas of the industry have developed the evolution of industrial processes. The objective of this work is to investigate the effects and differences of the direct current motor reduce model versus complete model using the field resistance for speed control. The proposed method obtains the state-space model of both systems by means of the differential equation solutions toolbox of Matlab (ODE). The numerical integration method is used to know the position of the rotor in the time and the phase plane to know about the stability of the motor before the variation of the field resistance, mainly in short periods corresponding to the start. The phase plane is applied to identify the stability of the motor affected for the field resistance variation; this study is mainly carried out in short periods of startup.

CD motor with field control, Variation of field resistance, Reduced dynamic model, Complete dynamic model, Phase plane

Uso de dispositivos móviles para la enseñanza y aprendizaje en estudiantes de ingeniería: Hacia el uso de tecnología 5g

Use of mobile devices for teaching and learning in engineering students: Towards the use of 5g technology

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Abstract

Education is inextricably linked to the different stages of the history of mankind. In this sense, today's education is strongly influenced, by the digital age, by the great advance of information and communication technologies, by the global village and the neoliberal economic model. This forces us to assume the challenge that the incorporation of technology imposes on the formative processes in the classroom. The present work has as objective, to determine the use of mobile devices of students of the engineering careers in the Technological of Superior Studies of Jilotepec in the processes of learning and to idendificar those processes that foment their use. The study is based on the application of a survey in which the different engineering careers were considered, number of participating students by gender, age, use of equipment, use of mobile devices to read or study, time of use of mobile to study or consult subjects related to the different subjects as well as the type of networks consulted on the Internet. Finally, it shows the technological trend with the generation 5G and its application in the teaching and learning process in the very near future.

Mobile, Digital, Village

Aplicación de nanopartículas de IrO_2-WO_3 como material anódico para la Reacción de evolución de oxígeno en un medio ácido

Nanoparticles of IrO_2-WO_3 application as anodic material to oxygen evolution reaction in acid media

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Abstract

The hydrogen is an attractive energy carrier and electrolysis of water is the most efficient to H2 production process. The OER in the anode is the limiting reaction being the case of study. In the present work materials based on IrO2 and WO3 were developed in different mechanical mixing 100, 70:30, 50:50, 30:70, respectively, by means of a mechanical mixture from two chemical reduction syntheses. The IrO2 was obtained by 6.25 mM of IrCl3 dissolved in isopropyl alcohol by adjusting the pH with 1M NaOH and a 0.5 mol NH4OH reductant was applied by adjusting a basic pH of 13. The obtained precursor was filtered and calcined at 400 ° C for 1hr. WO3 was obtained from 10mM WCl6 dissolved in isopropyl alcohol and polyethylene glycol, generating a precursor of W (OH)x followed by a calcination process at 500 ° C for 1hr. The material was characterized by electrochemical techniques of CV, LV and EIS. The IrO2-WO3 (50:50) material has lower activation energy of overpotential at room temperature, and a maximum current density close to 20 mA /cm2 at 1.8V vs Hg/Hg2SO4.

Electyrolyzer, Nanoparticles, Oxygen Evolution Reaction

Caracterización de fibra de carbono reforzada como: Generadora y fuente de almacenamiento de energía eléctrica para suplir baterías de ion-litio

Characterization of reinforced carbon fiber as: Generator and storage source of electric power to replace ion-lithium batteries.

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Abstract

Multifunctional composite materials are becoming an important part of the energy and transportation industry, which makes composites of carbon fibers an excellent choice. The carbon fiber reinforced (CF's) with a polymeric matrix produces a multifunctional composite material, which increases its physicochemical properties and keeps intrinsic one (strength, stiffness, low density, electrochemical and piezoelectric). This research aims to implement CF's as an alternative generation source and storage of electric power applied to sustainable transport means. The used methodology has an approach qualitative-quantitative in inductive and systematic processes based on the collection and interpretation of scientific texts with objective reality analysis. CF's from petroleum derivatives have better intrinsic characteristics than those from biodegradable polymers (lignin, wool fiber and chicken feathers). The CF's characterization analysis allowed to identify the application of these as a sustainable alternative electric source and storage mean, as well as their limitations and evaluation of the power rate delivered for the design of device power systems.

Structural batteries, Voltage generation with carbon fiber, Composite carbon fiber

Uso de correo electrónico para analizar la comunicación bilateral aplicando big data y regresión lineal simple

Use of email to analyze bilateral communication with big data and simple linear regression

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Abstract

Currently, the email is the most used network service as a means of communication for sending and receiving messages and files. The objective of this study is to perform an analysis of institutional emails by applying a strategic that ensures the existence of a bilateral communication between the employees. The research is of applied type, which will allow to predict assertive working groups with prosperous and productive labor relations. The study integrates the application of a Technological Big Data tool called Immersion and the analysis of a Simple Linear Regression (PLS) model using Microsoft Office Excel. The adapted methodology is composed of three phases: first, the "Data Collection" where a large volume of data is collected (personal data) from an institutional email account for the case study, then we have the "Analysis" where a simple linear regression model is constructed to analyze the relationship between the collected data and finally, the "Interpretation" where the obtained results are explained. Having important applications such as the integration of academic group, thematic networks, disciplinary committees or collaborative members in projects.

Big data, Email, Communication

Modelo de aprendizaje para arduino uno básico/ Learning model for arduino uno basic

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Abstract

It is increasingly common for engineering degrees to include the teaching of programming in their curricula. The present work focuses on the teaching of basic Arduino IDE programming and implementation of an Arduino Uno board. The teaching of Arduino IDE programming is basic and can be applied to related careers such as Information Technology and Mechatronics. It is an appropriate model so that the students of these careers are motivated to visualize in concrete form the results of the programs developed by them. An Arduino Uno board was introduced as the main element, based on hardware and software principles for the implementation of programming practices whose inputs and outputs are HC-04 ultrasonic sensors and other components such as Buzzer and Micromotor. This work is based on the planning of a smart cane prototype that helps visually impaired people. These learnings acquired on basic programming in Arduino IDE, can be implemented in different projects where Arduino Uno is used

Programming, Basic education, Arduino Uno

Desarrollo de prótesis electromecánica de miembro superior

Development of upper limb electromechanical prosthesis

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Abstract

A project of a prosthesis of superior member is presented, where the innovation that is tried to reach is the manufacture of a prosthesis based on the analysis of mobility, the ergonomics and the operation, it is established the dynamic analysis of the different components that will be those that allow the person to take objects according to the mission of the hand and each finger, giving the well-being that the person seeks for this type of prosthesis, analyzing the evolution that has led these teams, defining the form and generating a mechanism for the improvement of the quality of life of people who have lost a limb or were born without them, but all point to a single future, the implementation of electromechanical attachments for its operation, from servomotors, batteries and 3D printing. The project goes partly to these applications increasing the use of myoelectric signals for the control of the forearm and hand prosthesis, finally to develop it will apply the knowledge of bioengineering, mechanics, electronics, robotics and electromechanics. The research of the project establishes to improve components of the existing structures, without taking into account the advantages and disadvantages that our proposal can generate.

Signs, Prosthesis, Arm

Diseño e implementación de un sistema de control de materias para estudiantes universitarios

Design and implementation of a Subject control system for university students

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Abstract

In the past, the manual subject inscription process was carried out in a tedious and impractical way, by making the data management in data sheets and fulfilling the many inscription paper formats. Using of this type of methodology for this process was considered the most appropriated at that time. Due to the amount of documents and files that were generated during the window registration process, the time to accomplish the task became too slow and unsustainable, causing the student lines to lengthen, a lot of pressure to the coordinators who are in charge of performing the process that could take a around 3 to 4 days to attend the total number of students, and finally lots of paper wasted on the process. Therefore, this work presents automation of the window registration process, creating a material manager in order to meet the needs of the coordinators, allowing the registration process to be more efficient for four university education programs.

Automatization, Process, Manager

Estudio y diseño del sistema de tierra integral de la facultad de ingeniería de la universidad autónoma de Campeche

Study and design of the integral grounding system of the faculty of engineering of the Campeche´s autonomous university

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Abstract

Nowadays, low voltage electrical systems are more complex due to sensitive non-linear loads to voltage variations due to disturbances or poor quality of power in the electricity supply network, so it is necessary to protect equipment people who use these electrical installations every day. This paper presents a study to design the equipotential grounding system of the Faculty of Engineering of the Campeche´s Autonomous University in order to obtain an earth impedance value that complies with the standards NXM-J-549-ANCE-2005 and NOM-001-SEDE-2012 to provide safety conditions to people and equipment operating in the electrical installation in low voltage, quickly draining the fault, making the value of the voltage with respect to the earth reached in the part failure is equal to or less than the safety value and offer the corrective measures to improve the quality of the energy, which we receive from the supplier company. This study is the basis to implement a model of integral earth system for any type of buildings in our environment to achieve stable voltage levels at a constant frequency.

Low earth impedance, Equipotential, Stable voltage

Sistema de control de temperatura on-off implementado en el proceso de termoformado para elaboración de bloque a partir de envases multicapas

On-off temperature control system implemented in the thermoforming process for block production from multi-layer containers

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Abstract

In this work, a temperature control system (SCT) was designed and implemented in the thermoforming process for the manufacture of blocks for wall construction (BCM). The control process in the SCT consists in establishing the reference temperature for the thermoforming and send it to the Mega 2560 microcontroller. This component processes the input signal, obtaining six digital signals that control the surface temperature of each of the external faces of the BCM mold that has a rectangular prism geometry. These signals are sent to the electrical isolation stage where the actuators enable six electrical resistances (200 Watts to 120 Volts). The feedback of the temperature in the control system was made through type-k thermocouples, whose analog signals are compared with the reference signal to regulate the temperature.This project contributes to establish and control the temperature of the resistances, implemented for the thermoforming process, for the elaboration of blocks using multilayer containers.

Control, Temperature, Thermoforming

Diagnóstico de las variables que inciden en la implementación de un modelo hacia la Educación Superior 4.0

Diagnostic of the variables that affect the implementation of a model towards Higher Education 4.0

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Abstract

One of the main requirements of the so-called fourth industrial revolution or industry 4.0 (I4.0), is the human resource prepared, innovative and with an attitude of adaptation, for that reason the Higher Education Institutions (HEI) face the challenge to offer a new generation of professionals who participate and promote this transformation. It is very important to train competent human resources in the face of the challenges involved in the development and incorporation of different strategies for the migration process of industrial processes, now traditional, towards the guidelines set by the fourth industrial revolution. The present investigation is a diagnostic that allows to identify and evaluate the competences required by the I4.0 and the way in which the HEIs should adapt their educational work. In this context, five guiding axes were considered involved; the actors, the available infrastructure, the relationships, the management and the R + D + i (Research, Develpment and innovation), in a way that allows the curricular adaptation in that direction. The result will allow proposing an evaluation model for Higher Education 4.0.

Diagnostic, Higher Education, Industry 4.0

Control por modos deslizantes de la relación de exceso de oxígeno en una pemfc interconectada a un motor de cd mediante un convertidor boost

Sliding mode control of oxygen excess ratio on a pemfc interconnected to a dc motor using a boost converter

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Abstract

In this work, a proton exchange membrane fuel cell (PEMFC) is used to electric energy supply to a permanent magnet DC motor in a sustainable way and the inlet air flow in the cathode is manipulated to ensure the PEM fuel cells efficient operation. A boost-type DC/DC converter is connected to the PEMFC, it is used with a PI linear control loop to regulate the speed of the DC motor under some possible load disturbances. In addition, a nonlinear sliding mode control (SMC) is designed for regulated the excess oxygen ratio considering constant the temperature and humidity of membrane, to achieve the PEM full cell operate in the ohmic region of the polarization curve, to avoid the oxygen starvation at the cathode and to prevent damage to fuel cell components. The results are validated using the internal models of the PEMFC and the power electronics from SimPowerSystems library of Matlab/Simulink.

Fuel cell, Oxygen supply control, Sliding Mode Control

Modelo predictivo inteligente para la generación de energía eléctrica en un sistema fotovoltaico

Intelligent forecast model for electrical power generation in a photovoltaic system

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Abstract

Solar energy is currently the most resourceful renewable source worldwide in which its obtainment, unlike many others currently used, does not mean any harm to the environment. To manage satisfactorily the electricity demand of photovoltaic systems a careful planning is required, nonetheless, to set successfully the solar behavior and even more to predict the amount of incident solar radiation is a completely stochastic process due the influence of meteorological variables. To overcome this problem, this study monitors diverse atmospheric variables by using a meteorological station located in the University of Sonora in Hermosillo city, Mexico; and registers real-time measure values every 5 minutes for 6 months. From the data obtained a computational model applying an Adaptive Neuro Fuzzy Inference System (ANFIS) as intelligent technique is presented in order to forecast the electrical power from a photovoltaic system installed in the same site. It is vital to understand the influence of meteorological variables on energy consumption in which a better understanding of it can contribute to a more useful strategy in meeting energy efficiency goal for Mexico.

Photovoltaic system, Meteorological variables, Adaptive Neuro Fuzzy Inference System (ANFIS)

Sobre la síntesis óptima de mecanismos

On the optimal synthesis of mechanisms

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Abstract

In the engineering design process, it is of particular relevance the problem statement that has to be solved to guarantee an optimal design. There is no general rule for this, and in the particular case of the synthesis of flat mechanisms, the solution strongly depends on the problem statement for the design or mechanism synthesis. The object this paper is presenting one proposal at synthesis problem of a four-bar flat mechanism for cartesian trajectory tracking. The mechanism synthesis problem is stated as a nonlinear optimization problem with non linear constraints. Four different approaches are considered in order to demonstrate the impact of the considered statement of the optimization problem for its solution. The solution of the four optimization problems is obtained by means of numerical calculations using genetic algorithms. The numerical results of the four optimization problem statemens are compared under fair circumstances and they depict the great influence of the initial problem statement for its solution.

Mechanisms, Optimization, Problem statement

Recuperación de compuestos fenólicos a partir de vinazas tequileras mediante resinas de adsorción en dos configuraciones (lote y continuo)

Recovery of phenolic compounds from tequila vinasses using adsorption resins in two configurations (batch and continuous)

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Abstract

Tequila vinasses are a complex waste due to their high organic load and the phenolic compounds they contain. Both characteristics can modify the ecosystems where vinasses are discharged. Among the phenolic compounds that have been found in the vinasse, several have commercial potential. In order to recover such compounds from different efluents, adsorption resins have been used, like FPX 66. The objective of this work was to recover phenolic compounds from vinasses, and two adsorption methods were evaluated: continuous process using a column packed with resin, and batch process, using flasks. In batch configuration 77.77% of phenolic compounds were removed from vinasses, but only 54.88% of the initial phenolic compounds in vinasse were recovered; while in the continuous configuration, 92.42% of initial phenolic compounds were removed from vinasses, and 82.85% of the initial phenolic compounds in vinasses were recovered. Considering not only recovery percentages but also the time required for the complete process of recovery of phenolic compounds in both configurations, it is concluded that the continuous process, using a column, has the capacity not only to remove more phenolic compounds from the vinasses, but also presents a greater recovery.

Tequila vinasses, Phenolic compounds, Adsorption resins

Elaboración de un fotocatalizador flotante basado en un composito de TIO2/aglomerado para tratamiento de contaminantes orgánicos usando luz solar

Elaboration of a floating photocatalyst based on a of TIO2/agglomerate composite for treatment of organic pollutants using solar light

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Abstract

Floating photocatalysts have caused interest due to the benefits they provide. For example, the floating support has characteristic lightness and flexibility; while the photocatalyst has the advantage of being able to interact with sunlight without the need of stirring or oxygenation. In this paper, a floating photocatalyst based on a TiO_2/ agglomerate composite is evaluated. The agglomerate is made from post-consumer packaging of multilayer containers. The catalyst was prepared by synthesizing of titanium dioxide powders with phase mixture anatase/rutile. The photocatalyst powder was attached to substrate surface using a varnish obtained by dissolving post-consumer polystyrene containers in toluene. The photocatalyst has different phase A-R (Anatase-Rutile) ratios. The approximate size of the nanostructure is 13.29 ± 3.28 nm, calculated using UV-Vis spectroscopy, the bandgap has values ranging from 2.56 eV to 2.90 Ev. The agglomerates have a rupture modulus of 14.95 N/mm^2; they are hydrophobic materials and possess dimensional stability against changes in humidity (length) less than 10%, chemical resistance, are flame retardant. The TiO_2/agglomerate composite is used for the photocatalytic degradation of a model pollutant (methylene blue) using sunlight.

Floating catalyst, Multilayer containers, Photocatalyst degradation

Diseño ergonómico de un dispositivo Braille para la lecto-escritura e impresión

Design ergonomic of a device Braille for reading-writing and printing

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Abstract

In humanity there are several people with visual impairment, thus calling this condition to the total or partial loss of sight. In the research carried out, the ergonomic design of a device that is integrated by 4 writing, reading, traction and printing systems is presented. The design of the device was made through 3 phases, the first corresponds to the design process of the systems mentioned above, the second to the ergonomic design of the device and control and the last to the integration process of all the systems described above. With the development of this design is intended to benefit people who have visual impairment by helping them to the process of their learning and also develop in these people various communication skills, with this device is intended to facilitate reading and writing with the Braille system for people with this disability and in the same way provide them with a more ergonomic and easy to use design.

Ergonomics, Braille system

Enseñanza del diseño mecánico mediante un proyecto CAD documentado

Mechanical design teaching through documented CAD project

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Abstract

In mechanical project development, there are two kind of knowledge, theoretical, taught according on syllabus at universities, and in the other hand, practical, usually learned in the working environment. For graduated recently engineers, it means a disadvantage once they are trying to get a job. Seeking to achieve better results on student performance from a real design plane, learning strategy is presented to enhance both knowledges applying them to an educational project completed, learning topics that normally is not covered on syllabus and generating all information required about design and manufacturing project. This paper shows a case of study about a telescopic crane design, analyzing all information generated from conceptual to detail engineering. Finally, preliminary results about all information generated through the different project stages is presented, helping in this way the decision-making process of the students and the information management when developing project from the beginning to the end.

Theoretical knowledge, Practical knowledge, Project

Aprovechamiento de residuos orgánicos para la generación de biogás

Use of organic waste for the generation of biogas

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Abstract

In our country, information on renewable energy is widely dispersed and the level of contamination of stray animals; like dogs and cats, they pollute the air and cause diseases in the increase. This accumulation is generated by the disposition of the non-ideal places and the absence of handling of these residues. The problem grows in places where the number of canes increases such as streets, shelters and places of adoption, the rate of generation of canine hinas is much higher.A biodigester was built which produces biogas through anaerobic digestion from canine excrement with the aim of promoting alternative energies and thus reducing the high level of contamination and unhealthiness that crop feces by being exposed to outdoor. This biodigester allows small-scale tests with canine feces, since its operating conditions are contemplated in the geographical area.

Biodigester, Biogas, Dog excrement

Evaluación técnica para un sistema de calentamiento de agua a través de tubos evacuados en la producción de sal de grano en el municipio de Petatlán, GRO

Technical evaluation for a water heating system through evacuated tubes in the production of grain salt in the municipality of Petatlán, GRO

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Abstract

The present work focuses on the technical evaluation of a water heating system for the production of salt grain in the coastal region of the municipality of Petatlán, Guerrero, with the purpose of increasing efficiency in the production process of said same product that is obtained by evaporating the water, taking advantage of the abundant available solar resource. For which a solar collector system is designed that through vacuum glass tubes the fluid is circulated at a low speed, increasing its temperature and accelerating the production process. The system is built using low cost materials and with sustainable criteria which is used in exploratory and field research where statistical data on solar radiation, volumetric flow of available salt water, temperature of the environment, among others have been compiled for later be analyzed and together determine the efficiency of the grain salt production process that will benefit the productive sector of the Costa Grande de Guerrero.

Solar energy, Evaluation, Erain salt

Aplicación de sistemas de refrigeración solar en zonas marginadas, organizaciones de bajos recursos y poblaciones desprotegidas

Solar refrigeration application systems in marginalized zones, low-income organizations and unprotected populations

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Abstract

The refrigeration systems are of great importance in the daily life of the human being, due to the fact that it is necessary to have cold storage systems for different processes and perishable products preservation. The generated electric power as an alternative source has been used for refrigeration systems involved in sustainable development programs. The aims of this research were to characterize a cooling system powered by solar panels and that pretend to improve the quality of life. Refrigerating machines that use alternative sources of energy contribute to sustainable development, however, those that do not use it have a greater environmental impact. The solar refrigerator prototype has a quantitative-qualitative approach in deductive processes based on interpretation and data collection. This was carried out using own materials for the refrigerators construction that allow obtaining a compact configuration, presenting, pressure-volume operation curves and autonomy of the system with maintenance similar to conventional refrigeration systems. The refrigeration system is intended to be used in marginalized areas, low-income organizations and in support unprotected populations.

Solar refrigeration, Sustainable development, Refrigeration system

Algunos errores numéricos en la respuesta del estado estable de sistemas mecánicos vibratorios

Some numerical errors in the steady state response of vibratory mechanical systems

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Abstract

In this work numerical simulation results are shown for the steady state response of linear mechanical oscillating systems and the numerical errors that can be present when some numerical algorithms are used to perform the simulations. For some numerical parameters, the mechanical oscillating system with or without damping response, does not converge to the expected steady state response; this discrepancy is not easily detected when the performance of the system is on the range of high excitation frequencies, due that for of high excitation frequencies the amplitude in the steady state response reaches very small values. We perform the time response of the system using conventionally numerical methods included in the common programming platforms, and the result is that using the same algorithm in different platforms the error is the same; selecting other numeric algorithm the result in satisfactory. Non linear forced mechanical vibration systems; behave like linear systems for some frequency range, then is very useful to obtain the right or correct responses in the steady state response for the linear system, this is fundamental for forward studies, the right analysis is based on the selected numeric algorithm.

Steady state, Numerical Methods, High frequencies

Construcción y simulación de un sistema de almacenamiento de energía térmica usando material de cambio de fase

Construction and simulation of a thermal energy storage system using phase change material

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Abstract

A material with phase change has the property of storing or releasing large amounts of energy in the form of latent heat, up to 100 times more than using sensible heat. In this paper we report the results obtained in the construction of a thermal energy storage system using erythritol as phase change material. The prototype uses 31.4 kg of erythritol with a melting point of 188°C and a latent heat of 340 kJ / kg, is heated up to 135°C and stores 17.17 MJ of energy in 9.8 hours with an efficiency of 48.66%. The system stored the energy for 2 days only considering the losses by the natural convection coefficient. To simulate the extraction of energy from the system, a forced convection coefficient of 3000 W/m2 K is considered in the heat exchanger and the system is discharged in 1 day. We can use 10.51 MJ daily in a period of 9.5 hours at a temperature of 135-118°C and the next day load it in a time 6 hours. The prototype was simulated with an accuracy of 91% compared to the real results.

PCM, Energy, Storage

Máquina virtual de remachado textil

Virtual machine of riveted textile

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Abstract

One of the process in the textile industry is the eyelet assembly in the different products, for it is used a “Riveter”. This machine is used to place rivets on textile garments or footwear, for esthetic or reinforcement purposes. There are three types of riveters: "Manuals", "Semi-automatic" and "Automatic"; one of the problems that these presents are the manual calibration because human intervention is required. A virtual machine for an automatic textile riveter was developed using CAD software as SolidWorks where the design of the mechanical systems that integrate the virtual machine, together a visual programming software, LabVIEW, is used, in which a front panel is developed, capable of controlling the entire production process as long as there is a link between these two interfaces through "LabVIEW Soft Motion " The communication between this two software achieve to characterize a "Virtual Machine of Riveted Textile" where it is improved in the riveting of eyelets in less than two seconds, the ability to rivet 4 different sizes of eyelets and automatic calibration using a mechanical system called "LongWorth-Chuck", this contributes to an optimization of conventional riveting machines.

Virtual Machinery, Eyelet Riveting Process, LongWorth-Chuck

Reactor de microondas de flujo continuo automatizado para la producción de biodiesel

Continuous flow microwave reactor automated for biodiesel production

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Abstract

Microwaves for organic synthesis are widely used due to the fact that reaction times are reduced with product conversion and selectivity improved. In this work, transesterification was carried out continuously to obtain biodiesel. A control system adapted to a home microwave oven was developed, by automating the process for continuous flow and with the less operator intervention. An embedded system and virtual instrumentation created in LabVIEW platform, for activation/deactivation orders and monitoring data supported by a PIC 18F4550 microcontroller was developed. The operative part is a power interface of transistors and activators formed by relays. The temperature sensor and power stage of the operative part of the process were linked through a PC interface by using an algorithm for data acquisition. Communication and control of the system was made through the LabVIEW platform in order to monitor, in real time, the parameters required to obtain the product. Results of automation and performance are presented.

Microwaves, Transesterification, Automation

Pico satélite educativo CanSat desarrollado en las plataformas ARM-CortexM4 y FPGA

Educational pico-satellite CanSat developed on an ARM-CortexM4 and FPGA platforms

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Abstract

This paper presents the design and implementation of a CanSat pico-satellite developed on the ARM-CortexM4 and FPGA Spartan6 platforms. The CanSat structure consists of four modules distributed in four levels of construction. The first level is the sensor module, consisting of: the IC BME280 (barometer, humidity and temperature), the L70 GPS system and an inertial sensors system MPU6050 and AK8975. The second level is the mission control module and incorporates an ARM-STM32F407 microcontroller integrated with the OS-Micropython that allows programming in Python language. This module has the capacity of data storage using an EEPROM-M24C32 memory and a micro-SD. The third level is the LoRa technology wireless communications module with a 10Km range. The fourth level is the vision module, consisting of an OV7670 camera interconnected with the FPGA XC6SLX16, which functions as a photo and video capture system. The design of the modules was made with SMD technology in PCB of up to four layers. The design of the CanSat protective case in PLA material, manufactured by 3D printing of FDM technology, is presented. Finally, the results of preliminary performance tests are presented.

Pico-satellite, ARM, FPGA

Diseño e implementación de un sistema seguidor solar inteligente a dos ejes para optimizar la produccion de energía fotovoltaica con una lente de fresnel y un sistema de limpieza robotizado a bajo costo

Design and implementation of an intelligent solar follower system of two axes to optimize the production of photovoltaic energy with a fresnel lens and a robotized low cost cleaning system

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Abstract

Photovoltaic systems with Fresnel lenses are expensive, as well as technologically complex, due to their optical, mechanical and control components. In addition, all these systems are sensitive to operation and maintenance costs. This article proposes the use of commercial Fresnel lenses to improve the efficiency of photovoltaic modules, in conjunction with a fuzzy intelligent controlled solar tracking system with two-axis and a novel low-cost robotic cleaning system. The basic idea is that this system optimizes the production of electricity in an economically and technologically simple way. The technology of Arduino microcontrollers and fuzzy logic for control, as well as the geometry of Fresnel lenses, will be used to concentrate solar energy in a small area, not to mention that these optical devices have a low weight. The accumulated effect of energy production will be improved by a novel low cost robotic cleaning system. The alignment and perpendicularity of the impact of solar energy on photovoltaic cells must be maintained as much as possible and the performance of this system must be compared with other more expensive and technologically more complex commercial systems.

Photovoltaic, Fresnel lens, Fuzzy control

Desarrollo didáctico complementario de las expresiones analíticas de las acciones de sacudimiento en las máquinas de combustión interna

Complementary didactic development of analytical expressions of shaking actions in internal combustion machines

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Abstract

The study of the forces and the pairs of shaking that appear in mechanisms, are of main interest in the study of the dynamics of the internal combustion engines. An internal combustion engine is modeled from a particular arrangement of a set of mechanisms of the connecting-rod-crank type. During the performance of the internal combustion engine, the repetitive movement of the slide or piston induces accelerations and forces that are transmitted and distributed between the connecting rod and the crank or crankshaft. When the crankshaft is subjected to the components of the forces induced by the piston, the shaking torques are generated in turn. The purpose of the analysis of the pairs of shaking is to determine the dynamic values of the counterweights that must be added to each mechanism, with the aim of reducing the set of shaking actions. In the traditional bibliography in which the dynamic equations are presented, the complete analytical developments are not always presented; there are references that present partial results, in this work the algebraic developments are presented that allow to validate the correspondence between the expressions of different bibliographic sources in the teaching of these subjects.

Didactics, Shaking actions, Internal combustion engine

Pedaleando por un ahorro

Make savings by pedaling

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Abstract

This project presents the design of an electrical power generation system, which takes advantage of a person's movement when exercising on a static bicycle. This system is implemented in a gym located in Suchiapa, Chiapas. The analysis is carried out of three categories of people: high performance athlete, occasional athlete and sedentary person, to evaluate the calories consumed per day and exercise time on static bicycle. This information provides an estimate of the energy generated in one day, to compare the receipt of power consumption of CFE before and after the system. The static bicycle is mechanically attached to a generator by means of a support, followed by a diode allowing the passage of the electric current with characteristics similar to a switch, which is connected to a voltage regulator that maintains a constant voltage level. The regulator is coupled to the electric accumulator and an inverter. The latter is in charge of converting the direct current input voltage and alternating current output.By implementing the mechanism with nine static electric bicycles, an energy saving of 17.57 % is obtained.

kinetic energy, Calories, Energy saving

Emisiones de GEI en KG-CO_2 /M2 generados por una vivienda tipo INFONAVIT

GHG emissions in KG-CO_2 / M2 generated by a house type INFONAVIT

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Abstract

Climate change is one of the main current problems, it concerns the entire human population since its effects are worldwide, especially now we have seen its consequences, according to Menghi (2007), the average global temperatures grew by more than 0.5 ° C in the last century, and the glaciers are disappearing from the earth. The greenhouse effect generated mainly by the gases of the same name (GHG), is the fundamental factor of climate change. Construction is one of the ways in which the human being contaminates in a constant way this due to urban growth and the demand for infrastructure that this generates. This research has the purpose of determining the KG-CO_2 / M2 generated by a 44 m2 house of interest type INFONAVIT using the Life Cycle methodology (ACV) of the products or materials, established in ISO 14040, employee an inventory of KG-CO_2 emissions from building materials, obtained from various bibliographic sources and databases and using the work volumes required to build the house. The results obtained of 161.57 Kg-CO_2 / M2.

House, GHG, KG-CO_2/M2

La inteligencia artificial al rescate de las pequeñas y medianas empresas

Artificial intelligence to the rescue of small and medium enterprises

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Abstract

The present work seeks to show the use of artificial intelligence as an option within electronic commerce, this in order to contribute to the growth and promotion of sales of small and medium enterprises. The application of artificial intelligence in the economic sector is very broad, so this time is intervened with a proposal aimed at this sector.Through the present development, a mobile application was designed, where it is proposed to apply the use of Machine Learning or automatic learning through patterns, to implement an application capable of recognizing images and text provided by users to link them directly with small and medium companies, which will offer their services and products through it, allowing them to compete on a par with large companies that have the economic solvency to develop their own applications individually.The process for the development of the application was the Scrum methodology, since derived from the nature of the project, it was required to make constant changes in the development of the product, by the Sprint

Artificial Intelligence, Mobile Application, Deep Learning

Big Data para ayudar a generar alertas tempranas en salud pública. Diseño de una arquitectura de software para sistemas Big Data

Propuesta de diseño de una arquitectura de software para sistemas Big Data para ayudar a generar alertas tempranas en salud pública

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Abstract

The massive production of data in different formats and sources, governmental, social, and legal has created the possibility that government institutions in México can have a clear vision of what society thinks about specific issues. In public health, these data are the base for generating alert indicators on outbreaks of diseases in various regions or communities, based on epidemiological intelligence concepts. The problem that institutions face is the lack of an architecture of software systems suitable for collect, catalog and analyze for to take better decisions and action routes to the health authorities of our country. The objective is to design a Big Data system covering the four main requirements of large-scale data processing. 1 Support large writing workloads from various sources. 2 An elastic architecture, capable of withstanding the peak load times of work and adding or releasing resources as needed. 3 Support intensive analysis, to be able to admit large and diverse reading requests. 3 High availability to support errors in hardware and software.

Big Data, Software Engineering, Public Health, Epidemiological Intelligence

Sistema de identificación y seguridad para estudiantes mediante RFID

Identification and security system for students through RFID

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Abstract

Radio frequency identification (RFID) is one of the most promising new technologies belonging to the systems of data acquisition and automatic identification (AIDC). It consists of three basic elements: an electronic tag, a tag reader and a database. Which makes it a versatile system with multiple applications for the industry, home and building automation.This document presents the implementation of an identification and security system for students through RFID. The system uses passive tags, an RFID reader with Arduino card and has connectivity to a database created in MySQL with C ++ visual programming. The main objective is to store student access and location data, this way you can make reports of class attendance, use and / or access to laboratories in addition to having real time monitoring of the students' location. Compared to some other similar technologies, RFID does not require visual contact with the reader, is affordable and easy to implement.

RFID, Arduino, Visual Studio, MySQL

Diseño de polinizador mediante vibración forzada en invernaderos tipo túnel

Pollinator design through forced vibration in tunnel type green houses

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Abstract

Given the problem of the declining population of bees globally, it is necessary to implement measures that contribute both to the protection of these pollinating insects and the development of assisted pollination systems (Roubik, 1989). An alternative to the cultivation of certain species is through the use of greenhouses that allow a better environment for the species in question. But at present the greenhouses for creeper plants in which the present research work is focused, do not have a pollination that allows a high efficiency in their process. For which the use of artificial methods is proposed to achieve assisted pollination based on the use of forced vibration and convection that allows production to be optimized. The design consists of elements that produce vibratory oscillations, so that the pollen is dispersed among the plants, thus achieving a more optimal production. The fundamentals of frequency range to be developed by the vibration device and the system model are presented. As well as the parameters and physical variables involved in the process, thus seeking to provide an alternative that allows for effective pollination in the face of the imminent decline in the population of pollinator species.

Pollination, Greenhouse, Vibration

Una nueva topología de bajo costo para microinversores

A new low cost typology for microinverters

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Abstract

In recent years, the implementation of solar energy facilities has grown, as it is considered an environmentally friendly way to produce electricity. Solar energy can be exploited under different configurations or connection schemes. The most useful connection schemes are the string connection, the power optimizers and the microinverters. Microinverters have a wide advantage compared to the other schemes due to their ability to take advantage of solar energy under different environmental conditions, such as partial shading, temperature and irradiation. The implementation of microinverters has been slowed down because of its high cost and reduced lifetime. In general, the design of microinverters commonly includes elements such as transistors, electrolytic capacitors, sensors and a microcontroller. Electrolytic capacitors are commonly used as decoupling stages, even though they present a lower lifetime due to high frequencies of operation and current rises. In this paper, a new microinverter topology is presented, it uses a low-cost array of multilayer capacitors to filter high frequencies and get a low-cost topology.

Microinverters, Solar energy, Capacitors

Estudio de la eficiencia instantánea térmica de un campo de colectores cilíndrico parabólico

Study of the instantaneous thermal efficiency of a parabolic cylindrical collector field

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Abstrac

The aim of this article is to present the results of the study of the instantaneous thermal efficiency of a field of parabolic cylindrical collectors, which will feed saturated steam to a micro turbine of 5 kw of power, taking into account that the average radiation in the Nezahualcoyotl state of Mexico is 650 w / m2, the set has four concentrators, each parabolic cylindrical concentrator (CCP) is 2 m long and 1.50 m wide, with an opening angle of 90° and a concentration ratio of 5 , super polished aluminum with a reflectance factor of 0.87 was used to build a simple Rankine cycle.In addition, an electronic system has been designed and built that has the ability to follow autonomously, the tracking system works without the use of photosensitive sensors to avoid conflicts with the surrounding context and that is of an accessible cost.According to the results of the tests applied, the overall efficiency of the solar collector field was around 70%, and the concentrators group generated thermal energy, close to 7 kW thermal saturated steam, required by the steam micro turbine.

Solar, Parabolic concentrator, Solar traker

Convergencia de la trayectoria lingüística en el espacio de estados de un controlador difuso aplicado a un sistema no lineal

Convergence of the linguistic trajectory in the state space of a fuzzy controller applied to a non-linear system

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Abstract

This article presents the design of a fuzzy controller to stability analysis base on the convergence of the linguistic trajectory in the state of space, for an inverted car-pendulum system, the fuzzy controller is of the Mamdani type and, it consists of 25 rules, 3 input variables and each one is composed of five memberships functions. The inverted car-pendulum system is represented by a non-linear model, which is obtained from a linearized equivalent model under the consideration of small oscillations. Results are validated against a PID control base on the trajectory on the phase plane to evaluate the efficiency and effectiveness of the fuzzy controller. The dynamic behavior of the system of both controllers is obtained with a unit impulse input, the simulation of the control system is developed on the MATLAB / SIMULINK software using the FUZZY LOGIC TOOLBOX, which allows to perform test and simulations, and also it shows results of graphic form.

Control, Fuzzy, Stability

Estudio de las condiciones de iluminación dentro de las instalaciones de la facultad de ingeniería mecánica y eléctrica región Poza Rica – Tuxpan

Study of lighting conditions within the facilities of the faculty of mechanical and electrical engineering, Poza Rica – Tuxpan region

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Abstract

Lighting is a fundamental part in the ergonomic conditioning of workstations; Although, the human being has the ability to adapt to different light conditions, the deficiency in it causes visual fatigue, which can be one of the causes for which workers make mistakes in their activities or even to cause accidents. The present work focuses on an analysis of the lighting conditions in the classrooms, laboratories and cubicles of the faculty of Mechanical and Electrical Engineering, and identify yes, the areas where the visual tasks associated with the workstations have poor lighting or excessive that causes glare, to determine what preventive or corrective measures to take, in order to achieve a safe and healthy environment for the university community. With the help of a luxometer measurements are made to calculate the average illumination (EP) and compare it with the Official Mexican Standard "NOM-025-STPS-2008, Conditions of lighting in the workplace" that establishes the maximum permissible limits (500 luxes). The results obtained reflect that not all the mentioned areas comply with NOM-025-STPS-2008.

Lighting, Luxmeter, Security

Técnicas de aprendizaje automático en el diagnóstico de aerogeneradores

Machine learning techniques in the diagnosis of wind turbines

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Abstract

The Mexican Center for Innovation in Wind Energy (CEMIE-Eólico) designed a wind turbine diagnostic system based on turbine behavior models using the signals of the Supervisory Control and Data Acquisition system (SCADA). The system provides a pattern of variables that exhibit abnormal behavior in the presence of a fault. The patterns are formed with the detection of the abnormal behavior of the variables during a time window in which the failure manifests itself. This paper presents the application of machine learning techniques for the identification of faults in wind turbines after the diagnostic system. The training and validation data were obtained from the simulation of six different faults in the wind turbine using the Mexican Wind Machine (MEM) designed at the National Institute of Electricity and Clean Energy (INEEL). The diagnostic system was applied, profiles of abnormal behavior were generated and experiments were carried out for the multiclass classification of fault patterns using the "Random Forest" algorithm. Finally, the algorithm performance was evaluated using accuracy and precision metrics achieving 91% in the classification of patterns to identify the root failure.

Wind turbine diagnosis, Random Forest, machine learning

Desarrollo de un sistema de información para la eficiente gestión de sustancias químicas con base en la norma oficial Mexicana NOM-018-STPS-2015

Development of an information system for an efficient management of chemical substances based on the official Mexican norm NOM-018-STPS-2015

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Abstract

The technologies of the information nowadays are essential in the development of our daily life. They have been reflected in various activities and serve the purpose of integrating various branches of science. Having this in mind, the development team achieved to identify that in the division of chemistry at the technological university of San Juan del Rio, there was the necessity to have a web platform to consult the substances that are in storage. And also provide a tool for the implementation of the official Mexican norm NOM-018-STPS-2015 which has the purpose of identifying the dangers and risks of dangerous chemical substances through the use of pictograms. The software development stages were implemented using XP (Xtreme Programming) being that it's an agile methodology and it allows to prioritize tasks according to the client's requirements, using the programming languages PHP 7, MySQL and HTML 5. The acquired result was a web system with the modules of queries, substances information, which was used by students of chemistry engineering who evaluated the platform via a survey, and accomplished a 75% of satisfaction.

Web Platform. NOM-018-STPS-2015.Pictograms

Libro interactivo para la enseñanza de la lengua Mazateca de Huautla de Jiménez, Oaxaca

Interactive book for teaching the Mazatec language of Huautla de Jiménez, Oaxaca

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Abstract

Native languages are part of the cultural heritage of humanity, for this reason it is important to rescue and conserve them. This paper presents the design and implementation of an interactive book using augmented reality, which contains text in Spanish and in the Mazatec language variant of Huautla de Jiménez, Oaxaca; This material isused by teachers of the bilingual elementary school Ing. Jorge L. Tamayo, who provided feedback to developit, the topics that are included makere ference to the family and their activities in the community, food and animals. The development of this resource was made with Vuforia and Unity 3D and the UCD methodology, for its operation the user puts the camera of his mobile device on the images of the book, the application detects and identifies the marker and displays 3D objects and reproduces the audio of the pronunciation in Mazatec of the text related to the image. For the tests, two usability evaluations were conducted. The tests reported a 100% effectiveness, a 9.5 acceptance, there was an average of 5 seconds ahead of the estimated time for the completion of tasks.

Augmented reality, Usability, Native language

Clasificador de atención de la inmediatez en el área de servicios de urgencias Médicas

Classifier of immediate attention in the area of medical emergency services

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Abstract

In Mexico and Latin America it has become necessary to train emergency personnel to carry out the first stage of triage in order to optimize the human resources available in hospitals. Therefore, this research develops a mobile application that allows the patient's symptoms to be recorded when they go to the emergency services area and can be classified by a Bayesian network in a supervised learning environment that allows the hospital's medical staff to determine the procedure which must apply to the patient. The data collected from the mobile application is stored in a web system, therefore the symptoms are used as attributes to be classified and to make a prognosis of the possible disease, which determines the priority of the medical care using the colors of the practical guides of the health clinics, therefore the message is displayed indicating the color, the response time and a possible diagnosis of the disease.

Triage, System, Classifier

Hidrógeno como combustible complementario para motores de ciclo diésel

Hydrogen as a complementary fuel for diesel cycle engines

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Abstract

The use of hydrogen as a complementary fuel to internal combustion systems search to obtain automotive machines with individual parameters for sustainable development, providing the hydrogen amount required to be used in diesel cycle engines. The aims of this investigation are to use a dry hydrogen cell prototype to quantify the amount released that is optimal for energetic supply to the diesel cycle in standard operating conditions. This research was conducted under a mixed approach, using an experimental, systematic, descriptive, explanatory, correlational, empirical and in a field context, the variables considered for the development of the research are the amounts of hydrogen, diesel, oxygen, time and concentration of the mixture for the experiments. The prototype presented controlled operating conditions depending on the delivered hydrogen flow to obtain the operating curves of the diesel engine (pressure-volume, temperature-entropy), setting the necessary concentration of the mixture for optimum performance for the internal combustion cycle. The combustion systems evolution with hydrogen will tend to optimize performance when characterizing the supply in a controlled manner, depending on the torque in diesel engines under real operating conditions.

Diesel cycle, Hydrogen, Electrolysis

Desarrollo de una aplicación móvil para la eficiente gestión de sustancias químicas con base en la norma oficial Mexicana NOM-018-STPS-2015

Development of a mobile application for an efficient the management of chemical substances based on the official Mexican norm NOM-018-STPS-2015

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Abstract

Nowadays the use of mobile applications has contributed in different areas of engineering, the following project presents the development of a mobile application for the chemistry area, which allowed the effective management of substances following the Official Mexican Norm NOM-018-STPS-2015.The utilized method for the development of the application is scrum; which is an agile framework that allows collaboration, self-organization, early delivery, transparency beyond others; the workgroup was formed by students and teachers of the divisions of technologies of the information and communication and pharmaceutical and industrial chemistry. The initiative of implementing a mobile application for devices with an android operating system, with an API greater or equal to 4.4 allowed a highly effective, optimizing the management of the control of chemical substances used by students and teachers, Streamlining the process of returning the laboratory supplies and guaranteeing the fulfillment of the learning process in the laboratories of the technological university of San Juan Del Rio, it was implemented with students of Industrial and pharmaceutical chemistry engineering, where 86% of the users affirmed to be satisfied with the mobile application.

Scrum.NOM-018-STPS-2 015.Software

Prototipo de sistema informático para la enseñanza y apoyo en lecto-escritura de niños con discapacidades motoras, auditivas y visuales en el estado de Aguascalientes

Prototype computer system for teaching and reading-writing support for children with motor, hearing and visual disabilities in the state of Aguascalientes

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Abstract

The present research aims to identify predictive relationships of an IT success model with levels of statistical significance, between a set of organizational, technological, individual and environmental variables, and variables of the individual and organizational impacts perceived by the Educators specializing in sign language of some institutions like DIF (state and municipal), Threshold of Educational Technology of the State of Aguascalientes and the Association of Deaf of the State of Aguascalientes. The study consisted in evaluating, through reliability, validity and sensitivity, a prototype of a web development created by students of stay for the Threshold of Technology of the State of Aguascalientes. The pilot study was applicated with the application of the measurement instrument to 20 people between educators, directors, language experts and advanced users of the Deaf Association of Aguascalientes.

Software, Hearing disability, Sign language, Web

Sistema integral para la gestión del programa de tutorías en el instituto tecnológico de Tehuacán

Integral system for the management of the tutorials program at the technological institute of Tehuacán

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Abstract

The tutoring in the Technological Institutes has been implemented as a support strategy for the integral formation of the student, where the teacher becomes his companion in his professional training process, developing activities that have the purpose of stimulating the integral human development of the student. The present work presents the design of a web system, to support the management of the tutorial program, and the tutorial task, involves each of the different actors (Institutional coordinator, coordinator of area tutorials, department head, tutors and tutors). This web system was the result of the investigation Analysis of the tutorials at the Technological Institute of Tehuacán whose purpose was to learn from the experience of the actors the program to propose a strategy that would favor tutoring. The research was developed using a qualitative methodology, where information is obtained using instruments such as observation, interviews and surveys. This system seeks to favor the mentoring program in the achievement of its objectives and consequently in the achievement of the institutional goals of the Technological Institute of Tehuacán.

Tutoring, Tutoring Program, Tutorial action

Simulación del modelo matemático de la cinemática diferencial de robots seriales planos configuración RRR y RPR

Simulation of the mathematical model of the differential kinematics of serial robots for the RRR and RPR configuration

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Abstract

This article presents the model and simulation of the serial robot configurations of the types RRR and RPR, applying the theories of differential kinematics, to obtain the representation of its mathematical model (Jacobian matrix) and its simulation. The differential kinematics in robotics is the relationship between vector spaces, so it is possible to make the velocity map in the joint space in the end effector workspace. We present the differential kinematic model that is obtained from the position kinematics by differentiation techniques and with the help of the asymmetric matrix we obtain the information that is part of the Jacobian matrix, which allows us to know the velocities of the joint variables as a function of linear and angular velocity in the end effector and vice versa. The simulation of the manipulators is carried out validating the mathematical differential model; through the validation of the differential kinematics of serial chains it is possible to apply the procedure to complicated manipulator robots. The method presented here is the basis of a useful tool for solving complex robots, as in the case of redundant, parallel and hybrid serial manipulator robots.

Differential kinematics, Robotics, Jacobian matrix

Conversión digital de texto entre sistemas Braille y letra en tinta

Digital text conversion between Braille and letter in Ink systems

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Abstract

Writing is a communication way available to preserve information, ideas and knowledge, to be transmitted between different social groups and through the step of time of a generation towards its successors. To use the system of Letter in ink, it is required that the person can use the sight to recognize the lines and strokes that form the letters and can obtain knowledge; for blind people, they need to use another sense, in this case touch, to carry out the reading of information through the Braille system. Nowadays, there is a large amount of information in digital format, managed by informatics systems, where sight in needed to read that information. The development of this conversion system will allow blind people to be integrated into the world of digital information, so that they can access text files, represent them in Braille system and have the ability to read them without any problem; in addition, it will allow these people to express their own ideas, emotions and knowledge by writing them in the system they already know end be converted to the Letter in Ink system so that later, it can be placed on the Internet and used by anyone worldwide

Digital text, Braille, Conversion

Secuenciador dinámico para el control de movimiento de robot hexápodo en una arquitectura FPGA

Dynamic sequencer for hexapod robot motion control in an FPGA architecture

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Abstract

A hexapod robot control system hardware architecture is presented. The control system is integrated in an FPGA XC6SLX16-Spartan6. The design is developed using hardware description language, VHDL. A robust architecture, divided into three logical state machine blocks, is implemented in the FPGA. Block one consists of a serial communication system for the information interchange between the user and the FPGA. The second block corresponds to the sequential circuit and data manager in charge of controlling the functions of the entire architecture. The third block is an 18-channel PWM pulse generator with a progressive duty cycle change control to perform robot movements. The system is designed to allow the user to download a complex movements sequence by combining different positions and waiting times. The architecture allows to save up to 10 movements different sequences in the internal memory block. Additionally, it allows modifying any sequence in real time, without affecting the robot operation. The architecture controls 18 servomotors allowing 18 degrees of freedom to the robot. The performing and movement test of the robot are presented.

Pico-satellite, ARM, FPGA

Análisis de la generación de las irreversibilidades a partir del coeficiente de operación en un sistema de refrigeración por compresión mecánica de vapor con R-134a

Analysis of the generation of irreversibilities from the coefficient of operation in a refrigeration system by mechanical vapor compression with R-134a

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Abstract

This paper presents the development of individual contributions, in the generation of irreversibilities, of a refrigeration system based on the Coefficient of Operation (COP). The generation of irreversibilities has been widely analyzed using the principles of the first and second laws of thermodynamics. This analysis uses the parameters of enthalpy, entropy as well as the temperature and heat generated in each component. The method proposed in this work improves the accuracy of the calculations due to the use of the COP in the mathematical process, which includes the processes of heat transfer and pressure drops developed in the evaporator, suction line, compressor, discharge line, condenser, liquid line and expansion valve of the mechanical vapor compression refrigeration system. The mathematical analyzes and the experimental results are shown, with these it is concluded that the exposed procedure is closer to the real conditions than those traditional procedures found in the text books.

COP, IRREVERSIBILITIES, R134a

Diseño de un sistema de inventario computarizado para la rastreabilidad de partes reutilizables

Design of a computed inventory system for the traceability of reusable parts

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Abstract

This article presents the design of a computerized system for the traceability and reuse of pieces, where it impacts on the reduction of manufacturing costs, contributing to the decrease in the consumption of natural resources. The components to be reused are recovered from a complete used equipment, starting from a list of all its parts. The system facilitates the traceability of the components that need to be recovered, reducing the time of location and supplying parts to the production areas. In addition, it avoids the saturation in the warehouse area of parts that are not required. This system will have data in real time and concise on the inputs and outputs of raw material, speeding up the reception of equipment, making the capture of input inventory. As a result, it will lead to better production planning, increasing the recovery rates of the required components, making the most of the storage area, decreasing equipment unloading times. In addition, it will allow a better costing of inputs and outputs of the company. On the other hand, the software development cost was minimal, and could have a considerable impact on the profits of the industry, ecology and the economy where it is implemented.

Inventory, Recycle, Planning

Optimización del tiempo de barrenado en perfiles de aluminio

Optimization of the drilling time in aluminum profiles

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Abstract

The manufacturing branch of aluminum windows national line is an area that nowadays the conventional processes are deficient and with errors at the time of execution causing the manufacturer to lose time, so the need arises to improve the process of drilling in the profiles of aluminum national line for the assembly of windows. The objective of this work is to build a die to optimize times and maximize productivity in the drilling of aluminum profiles national line by means of a study of times, the design was made using the methodology of Bruno Munari. With the construction of the die for aluminum profiles national line was achieved the reduction of the time of drilling on average from 1.7 minutes to 0.07 minutes that represents the optimization of time in 95.88% while to assemble a window the time of 3.5 minutes was reduced to 0.14 minutes what represents the maximization of the production in 96%.

Optimization, Productivity, Study of times

Diseño e Implementación de un sistema de medición de respuesta de sensores de gas

Design and implementation of a measurement system for gas sensor response

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Abstract

Gas sensors are widely used in devices known as electronic Noses. Which are used for the detection of gas leaks, environmental quality and food, etc. However, it is necessary to perform a quantitative and qualitative analysis of these sensors based on the measurement of their response to obtain their characterization. In the present work is shown the design and implementation of a measurement system for gas sensors response. Therefore, a sealed stainless-steel chamber that internally contains the sensors is designed. On the other hand, a temperature controller is implemented using a PID controller governed by an interface developed using virtual instrumentation software. Particularly, this system has the ability to measure the response of gas sensors, such as: metal-oxide and quartz crystal microbalance. The development of this project, presents an alternative to measure the response of sensors to commercial, contemplating a lower cost and same functionality. Measurements were performed at different temperatures, applying samples of ethanol, obtaining typical results in the response of this type of gas sensors. Therefore, it can be said that the system operates satisfactorily.

Electronic Nose, Gas Sensors, PID Control

Propuesta de producción de biodiésel mediante aceite vegetal usado

Proposal to produce biodiesel using waste vegetable oil

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Abstract

Today, the use of renewable energies is constantly increasing, for that reason, Universities must constantly provide update to their students with innovative techniques that allow a compression of the concepts of biofuel production, in our case, will start with the production of biodiesel. The current document shows the production of biodiesel using the transesterification technique. All this with the help of equipment and materials available to the University, as a chemical reactor. This equipments will be reactivating and repairing for the good future functioning. In order to establish production condition chords to the chemical reactor, facilities and equipment of the university, has been tested with new vegetable oil to later scale the conditions to the use waste vegetable oil. The importance of producing biodiesel are in contribution of emission reduction from combustion and making use of the waste of vegetable oil.

Biodiesel, Transesterification, Waste vegetable oil

Caracterización térmica y eléctrica de un sistema fotovoltaico de alta concentración de disco parabólico

Electrical and thermal characterization of a high concentration fotovoltaic system using a parabolic dish

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Abstract

This paper presents the experimental study that consist of the thermal and electrical performance analysis of a HCPV system compound by two parabolic dishes with their respective power conversion units (PCUs), configured in a special optic known as XRX-Köhler. This system uses multi-junction cells, that despite it high efficiency, the cells do not use between 60 to 70% of the solar radiation received, so this energy must be removed with a cooling system to maintain its temperature within an interval that ensures its integrity and the best performance of it. Unlike simple junction cells, MJs can operate at higher temperatures with acceptable electrical production efficiencies. This characteristic of operating in a wide range of temperatures (~ 90 °C), can make thermal systems of solar applications work with residual heat and thus improve the overall performance of the system. A series of experimental test campaigns has been developed for the evaluation of the IV curves instantaneously, as well as the electrical and thermal instant efficiency obtaining overall values of ~24% and ~53%, respectively.

Solar concentrator system, Parabolic dish, Multi-junction cells

Estrategias de la mezcla de mercadotecnia de la industria del calzado en San Mateo atenco plaza azul

Strategies oh the marketing of the footwear industry in San Mateo atenco plaza azul

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Abstract

The manufacture of Mexican footwear is a very prestigious and well-known commercial activity, since it has a history of more than 400 years. The state of Mexico represents 5% of the national value of production. The most representative municipality of this state is San Mateo Atenco. At present, its sales fell between 50 and 60%, according to the producers; this represents a serious situation since ca. 70% of the inhabitants are devoted to this activity. So, this work is focused to identify some elements of marketing used by the footwear industry of San Mateo Atenco and to propose new strategies to positively impact its sales. The research is of an exploratory type, the footwear producers of the Plaza Azul were considered, and a random probabilistic sampling was applied. Some of variables considered were: innovation, quality, guarantee, own brand, credit plan, exhibition, advertising. It was found that: physical location of the Plaza Azul, product quality, accessible and competitive price were some of the strengths. On the other hand, some of the recommendations for this sector are: innovation in design, online sales, diversification of payment methods and to generate customer service standards.

Footwear, Marketing, Strategies

Propuesta de creación de un centro de transferencia de tecnología en la Universidad Politécnica de Gómez Palacio

Proposal for the creation of a technology transfer center in UPGOP

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Abstract

Currently, most of the students of the different Institutions of Higher Education have a social commitment, which is to develop new technologies that contribute improvements in the daily life of the people. The main objective of this proposal is to create an interface that measures the needs of the company and translates them into areas of opportunity and development for universities and to implement projects in the classroom aimed at industries and thereby bring innovations to processes, products, among others. Currently, at the Polytechnic University of Gómez Palacio, students from five different specialties are being worked on, which innovate in the creation of new products, which can be patented or implemented in the industry. Another important feature to highlight is the fact that currently there is no way to protect the authorship of students, in addition to the fact that when delivering completed projects completely, the use that will be given to these products is unknown. It is for this reason that the creation of a technology transfer center is proposed; with it, it would be promoting the innovation of projects and active participation of companies, with the support of the institution.

Innovation, Technology, Linkage

Control de brazo robótico clasificador mediante hmi y servidor web

Control of robotic arm classifier using hmi and web server

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Abstract

The use of automated machines and its manipulation using artificial intelligence is increasingly common to perform routine tasks within the industrial field. The present work aims to show the automation of a robotic arm, its monitoring and control using a web server and a Human Machine Interface (HMI) screen. For this work a robotic arm MITSUBISHI was programmed for the classification of pieces based on their color. Subsequently, this system is monitored and controlled employing the programming of a web page and the design of an HMI created using the TIA-Portal software. As a result of this methodology, a complete system of industry 4.0 will be obtained, which can be implemented to control and monitor a robotic arm using a HMI screen and Web Server in the current industryThe systems used to carry out the control were a PLC S300 (cpu313C 2 DP) with ASI CP 343 2 DP network card, with 5 slaves, Keypad (Slave 1) Module 2DI (Slave 2), Optoreflexive Sensor (Slave 3) Set of valves FESTO (Slave 4)Modules2DI 2DO (Slave 5) 2DO an S1200 PLC (CPU 1214 C DC / DC / DC) an HMI screen (KTP600 Basic Mono DP) as color sort

Robotic arm, Web Server, HMI

Herramienta para la enseñanza de la lengua Mazateca basada en realidad aumentada

Tool for the teaching of the Mazatec language based on augmented reality

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Abstract

This paper presents a tool for teaching the Mazatec language based on Augmented Reality (RA) technology, aimed at teachers at the Naxhó Café indigenous preschool education center, located in the town of Huautla de Jiménez, Oaxaca.The project was developed using the methodology of User Center Desing (DCU), this methodology allowed to carry out two teaching activities with students of first, second and third year of preschool with which they could obtain considerable results in efficiency, efficiency and satisfaction of said tool.

Mazatec, UCD, Augmented Reality

Combustibles alternativos para motores de combustión interna obtenidos a partir de residuos plásticos

Alternative fuels for internal combustion engines obtained from plastic waste

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Abstract

Of the different methods for recycling plastic, pyrolysis offers the possibility to overcome the limitations of mechanical recycling, which requires large amounts of clean, separate and homogeneous plastic waste to ensure the quality of the final product. Pyrolysis is the chemical decomposition of plastic materials by thermal degradation in the absence of oxygen. The plastic waste is introduced into a chamber, where it is subjected to high temperatures, and the gases generated are condensed in order to obtain a distillate hydrocarbon. This paper presents the results obtained from the pyrolysis of plastic waste mixtures of polypropylene, high density polyethylene, and low density polyethylene. In a first stage, the plastic waste is subjected to a rapid pyrolysis process at temperatures of 440-450 °C, obtaining a mixture of heavy hydrocarbons. Subsequently, these hydrocarbons are subjected to a distillation process, first at a temperature of 180 °C, where a hydrocarbon with properties similar to those of gasoline is obtained, and then at a temperature of 360 °C, yielding a hydrocarbon with properties similar to those of diesel.

Pyrolysis, Plastic Waste, Hydrocarbons

Estimación de la ubicación relativa de una cámara utilizando un sistema de visión monocular

Estimation of relative location of a camera using a monocular vision system

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Abstract

ObjectiveEstimate the location of a camera with respect to objects in the real world, using monocular vision.MethodologyIn this paper we introduce a method to calculate the relative location of the camera with respect to a group of points located in the three-dimensional space. The method requires only three fixed reference points of which the real distance between each pair of points must be known. With this information it is possible to estimate the relative location of the camera when it is moved, using successive images that contain the same points.ContributionIn recent years, processing power of computers has grown considerably and, with this, the interest of the scientific community in visual odometry has also increased. For this purpose, in many cases, it is convenient to use a single camera (monocular system). Unfortunately, a monocular system allows to estimate the location of the camera with respect to some object in the real world only up to a scale factor. The main contribution of this work is the estimation of the location of the camera in real world coordinates with respect to a reference object.

Artificial vision, Visual odometry, Monocular system

Caracterización de un músculo artificial de nylon y su implementación en una articulación de un robot manipulador serial

Testing of a nylon artificial muscle and its implementation in a joint of a serial manipulator robot

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Abstract

In this paper we present the study and description of a nylon muscle, to validate its performance and define its properties, applying loads on it and subjecting it to thermal stimuli. The results of the implementation of the nylon muscle are reported in a joint of a rigid mechanism, of a serial manipulator, however, the difficult thermal control that the muscle possesses makes the thermal shock (the ambient temperature and the applied one) wear at a certain point to the muscle, exhausting its properties or a very slow response from it. Testing that the material can only be used in the suspension of the load in the application of rigid systems. It is observed that an important feature of nylon muscles is their incredible capacity to contract loads that are higher than the same weight of the muscle and that by means of a thermal stimulus can be contracted thanks to its anisotropic property, just as the material is extremely attractive for the application of soft robotics and intelligent materials

Soft Robotics, Soft Actuators, Nylon Artificial Muscle

AMATL: Galería colaborativa para la conservación y difusión de fotografías digitales de Teotitlán de Flores Magón, Oaxaca

AMATL: Collaborative gallery for conservation and diffusion of photographs of Teotitlán de Flores Magón, Oaxaca

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Abstract

Photography is a document that reflects a visual testimony of political, scientific, social and cultural events of humanity, plays an important role in the conservation, transmission and visualization of such events. This work presents the design and implementation of a gallery to generate photographic collection of Teotitlán de Flores Magón through the collaboration of the population. The objective of this application is to remember and show the past to the new generations through a collective memory based on photography. The development of the software was done using the PHP language, the MySQL database manager and the view-controller model that allows a better organization of the application code, which facilitates the maintenance and updating of the application by the developers. The evolutionary process methodology was used in this project, all its stages were carried out to obtain a better software. The evaluation of usability with several users showed beneficial results with respect to satisfaction, efficiency and effectiveness metrics.

View-controller model, Web application, Usability

Implementación del modelo de gestión estratégico para la mejora de la calidad en la cadena de suministros

Implementation of the strategic management model for the improvement of quality in the supply chain

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Abstract

The aim of this paper is to show the results about the design and implementation of a strategic management model based on the Balanced Scorecard (BSC) methodology applied to a company in the automotive activity which allows it to have greater competitiveness. The developed methodology allowed a review of the vision, mission and objectives of the company in order to align the objectives of the supplier quality department, in such a way that the indicators obtained directly impact the KPI of the company and this generates a strategic map for the development of suppliers. These indicators allow measuring the performance of companies, establishing metrics with greater impact, which is of great importance in worldwide. The BSC is linked to the Toyota Production Systems (TPS), where one of its pillars is the Just in Time and therefore the importance of having an OTD metric (Delivery Compliance). The implementation of this methodology, we obtained the following indicator to evaluate the suppliers: Defective Material, OTD, Process of Approval of Production Parts and Defects per Million. These results allowed improving the efficiency in the company and that of the suppliers because they directly impacted the KPI, OTD and CONC metrics.

Quality, Balanced Scorecard, Supplier Development

Propiedades ópticas y estructurales de las películas de óxido de silicio rico en silicio obtenidas por la técnica HFCVD

Optical and structural properties of silicon rich oxide films obtained by HFCVD technique

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Abstract

In this work we present the results of the analysis obtained from the deposit and characterization of thin films of silicon rich oxide (SRO). The films were obtained by hot filament chemical vapor deposition (HFCVD) technique, such films were deposited on silicon substrates p-type. The deposit of thin films was realized considering different distances from source to substrate (DFS) which were 3, 4, 5 and 6 mm. The quantity of precursors (SiO_2) was controlled by the distance from the filament to the source, which was 6 mm for this work, the filament was held at 2000°C. A constant 3-minute deposit time was maintained, and the hydrogen flow level was 10 sccm. The films thickness was obtained by using the profilometry technique, the thickness range was from 200 to 600 nm. The vibrational molecular modes of the SRO films were obtained by Fourier Transform Infrared Spectroscopy (FTIR). The films of 3 mm DFS exhibit an optical transmittance of 90%. The optical energy band gap of the thin films varies from 2.2 to 3.3 eV. When an annealing process at 1000°C was carried out for one hour, the SRO films increase their photoluminescence by an order of magnitude approximately.

SRO, HFCVD, UV-Vis

Modelado y simulación del péndulo de base móvil

Modeling and simulation of mobile base pendulum

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Abstract

This article describes the simulation and control of a mobile base pendulum (PBM), which consists of a mechanism with two wheels and a vertical cylindrical rod, which can rotate freely on its own axis, then the mobile must move to compensate for the angular displacement of the pendulum. The objective is to develop a mathematical model to simulate the dynamic behavior of the mechanism and thereby develop a Proportional, Integral and Derivative (PID) controller, optimal that manages to maintain this pendulum at a vertical degree in a time ts ≤ 1 second, with an entry angle of ± 10 degrees. The Newton-Euler (NE) methodology was used to determine the dynamic equations of motion, by analyzing the free body diagram and using the physical laws that allow defining the forces acting on the system to achieve the state of equilibrium. These simulations were carried out with the SolidWorks (SimMechanics Link) and Matlab (Simulink) tools, in addition a closed loop system was used to analyze the output signal Y (s) with respect to the input signal U (s). The contributions of this development consist of designing high-precision controllers with the purpose of improving industrial automation processes from the implementation of a control system, in areas such as robotics, marine vehicles, aerospace, to name a few examples.

PID, Pendulum, Control

Estudio de superficies de magnesio modificadas con fosfatos y películas poliméricas para aplicaciones médicas

Study of magnesium surfaces modified with phosphates and polymeric films for medical applications

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Abstract

Magnesium and its alloys have been of scientific interest in bone regeneration due to its resorbable, biocompatible and mechanical characteristics. However, its electrochemical activity is a challenge; surface modification treatments are sought through biopolymers or conversion treatments to reduce its corrosion rate. The objective of this research was to evaluate the corrosive behavior of magnesium in simulated physiological solution through electrochemical techniques through a phosphating interface and a chitosan-grenetine film. The phosphating treatment was carried out by chemical conversion pH 10, 11 and 12 and a film was prepared by polymer solution and convective drying. The surfaces were characterized by DRX, RAMAN, SEM-EDS. Combined phases of phosphates with rugose and porous morphology with non-conductive properties were obtained to relate to the electrochemical response of the phosphate interface with different areas of pure magnesium, estimating the actual phosphated area. The biopolymeric film induces the corrosion process at a rate of approximately a quarter of magnesium phosphate during 4 weeks of exposure in the physiological medium. Improving the adhesion properties of the biopolymer film and the porosity could contribute to bone regeneration during this corrosive process.

Magnesium, Corrosion, Polymers

Diseño de un sistema fotovoltaico autónomo para el uso en áreas recreativas en la zona costera

Design of an autonomous photovoltaic system for use in recreational areas in the coastal zone

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Abstract

Photovoltaic station created on a frame of metal and wood taking advantage of the conventional umbrella geometry, made of mesh-shadow of those used on beaches or terraces, projecting its shadow in order to avoid sunstroke to users. A multifunctional element was developed; combining ecology and technology, which uses photovoltaic technology to provide charge to gadgets and integrated LED luminaires.The 2 photovoltaic modules located on the structure not only serve to generate electricity but also to provide protection from solar radiation. For the development of this project, electrical, electronics, energy engineers and various experts in the field have collaborated.This station includes 50 Wp and 1 lithium-ion battery that makes possible the production and storage of electrical energy coming from the solar resource. Thanks to this system, the supply of electricity is guaranteed even when there is a low level of solar radiation. The recharge capacity of this installation is up to 12000 mAh at the same time an availability 24 hours a day.

Photovoltaics, Radiation, Gadget

Aplicación de internet de las cosas en el monitoreo de la producción de lombricomposta

Application of the internet of things in the monitoring of the production of vermicompost

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Abstract

In this article we show the results of the application of an architecture based on Internet of things for the production of vermicompost through an interface that allows to monitor and collect temperature, humidity, and pH data through intelligent sensors that use the cloud computing service. The methodology used for the construction of the architecture was based on a search of the state of the art in open databases. For the implementation of the same, a pure experiment with a dependent variable and two independent ones was built. The results obtained by the measurements made during a period of four months, allowed to create grapHs where the constant temperature changes are observed in a range of 19 to 27 ° C, humidity in the range of 41% to 85% and the pH of 5 to 8.4 in the acid of the substrate. This information obtained in a ubiquitous way, helped the user to generate a weekly plan for irrigation, aeration, and mixing of the vermicompost, in order to reduce time, costs and human effort. It also helped maintain optimal environmental conditions for the reproduction of earthworms.

Internet of things, Vermicompost, Cloud computing

Implementación de un sistema de riego con recuperación de agua proveniente de la climatizacion en el sector industrial

Implementation of an irrigation system with water recovery from climate control in the industrial sector

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Abstract

This paper presents the study and analysis of the use of water generated by air conditioning units in a company that manufactures electronic products for the medical, industrial and automotive industry. The company knows its environmental responsibility and is aware that water is necessary for life, therefore, it must be used and taken care of, to avoid that this resource is not renewable. We propose to use the water generated by the condensation of air conditioners in the company's areas. The project, which will recover and reuse the 2,104,400 liters of water generated in said refrigeration equipment through the design and implementation of functional irrigation systems with a coverage of 820m2 of grass. The use of water for this irrigation system is based on other elements, in the maintenance of the air conditioners, which avoids the generation of surplus chemical contaminants in the condensed water that is discharged.

Industrial Maintenance, Water Reuse, Environmental Responsibility

Estudio del comportamiento de sensores de gas basados en resonadores de cristal de cuarzo para altas frecuencias

Study of the behavior of gas sensors based on quartz crystal resonators for high frequencies

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Abstract

Quartz crystal microbalance (QCM) sensors have been frequently used as micro-weighing devices, since they have demonstrated to be highly sensitive due to the frequency shifts ought to mass- increments stuck on the sensing film surface of the sensor. This kind of devices are normally used as arrays of sensors in systems known as Electronic Noses, for the detection and analysis of gases, fluids, and biological compounds among others. The sensitivity of the QCM sensors is directly proportional to the resonance frequency of the crystal. Therefore, increasing sensitivity implies using high frequency crystals above 20 MHz. Quartz crystals have been manufactured in two modalities: fundamental and overtone, the latter being used for frequencies between 30 MHz and 200 MHz. In this work, we present theoretical arguments as well as experimental results that describe the characteristics and differences in the performance of 30 MHz sensors in both modalities, in addition to other considerations in the behavior of these devices that cannot be observed from the analytical point of view, but from the point of experimental view.

High-Frequency QCM Sensors, Overtone, Electronic Nose

Efecto de la distribución del tiempo de servicio de los usuarios primarios en las estadísticas de los espacios en blanco de un sistema de radio cognoscitivo

Effect of the service time distribution of the primary users in the statistics of a cognitive radio system white spaces

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Abstract

Cognitive radio technology was developed for spectral efficiency improvement in mobile communication networks. This is achieved by allowing secondary users to opportunistically and transparently use the white spaces of the primary network. In this paper, the effect of the service time distribution of the primary users in the statistics of the white spaces is analyzed. In particular, the first two standardized moments of both, white space time and white space interarrival time are found, considering the following distributions for the primary service time: log-normal, Weibull, and Pareto. One of the most relevant results is that, for low (moderate or high) traffic load, the exponential (hiper-exponential) distribution is an excellent option for modelling the white space duration. Characterizing these variables allow us to use the on-off paradigm to capture the primary channel activity and, in this way, evaluate the performance of cognitive radio networks. Results were obtained by using discrete event simulation techniques.

White space statistics

Metodología para el modelado y simulación de pruebas de fatiga en álabes de aerogeneradores de baja potencia

Modeling and simulation of fatigue tests on blades of low-powered wind turbines

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Abstract

This article presents the design, simulation and fatigue analysis of various aerodynamic profiles used in low power wind turbines. For this purpose, the model of a blade of a horizontal axis wind turbine with a nominal power of 5 kW is developed. The analysis of the lift, drag and power coefficients of the aerodynamic profiles was carried out with the XFLR5 software. The methodology used for the blade design is based on the interactions and convergence method called BEM. Also, to simulate the structural and aerodynamic part of the element, the QBlade program was used. With the main objective of ensuring that the fatigue safety factors mentioned in the IEC 61400 standard are achieved, the Simplified Load Model was applied. The maximum fatigue value of 21,421.66 N and the maximum flapwise moment value of 698.41 Nm were obtained.

Fatigue, Blade, QBlade simulation

Sistema de monitoreo remoto para manejo integrado de plagas en cultivos de chile habanero

Remote monitoring system for integrated pest management on habanero crops

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Abstract

At least 50% of Habanero crop losses are caused by pests, diseases and climatological changes. The crop requires development and implementation of a tool called Remote Predictive Monitoring System for pest on Habanero crops, this consists of installing a structure that is able to integrate sensors that measure temperature, rain, humidity,etc. The system is powered by solar energy at experimental crop centres. The data is sent by radio frequency and GSM to the monitoring centre, where a predictive software generates a percentage of common pest attacks that affect the plants included in the crop field sensed. Finally the system provides specific recommendations for biological and chemical control. With the validation of the experiment by two Farm Research Centres and a Farmers Association, the system was installed on three experimental crop fields, reducing crop losses from 40% to 68%. With an investment of 1.4% (equivalent to the money lost per crop), implementing the system and following the recommendations it was achieved that there would be extra profits between $136,000 and $165,000 per crop cycle of 4 hectares. This project is being considered for patent registry as a prototype to replicate for other crops.

Telemonitoring, Fuzzy logic, Agroindustry

Diseño de un sistema fotovoltaico para la reducción de usuarios de tarifa DAC

Design of a photovoltaic system for reducing “DAC” rate users

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Abstract

The increase in costs for electricity consumption has gone up, significantly affecting the economy of users, within the tariffs of residential users is the “DAC” rate (that means high consumption domestic rate). An economic analysis of electricity consumption rates indicates that, as of January 1st, 2019, the cost per kWh used in the “DAC” tariff corresponds to $ 5.121 MXN, which means that a “DAC” user pays more than 200% than a user 1C rate for each kWh consumed. For this purpose, a photovoltaic system has been designed for interconnection to the network, this system allows users to change from “DAC” rate to tariff 1C, and consequently will allow the reduction of these costs about the electric power service, this system can be installed in any yard, besides generating electricity, the photovoltaic products will be 2: a swing and a gazebo, with an installed capacity of 1.1 kWh, which will provide a rest and relaxation service.

Tarifa DAC, Tarifa 1C, kWh

Efecto de los procesos de combustión sobre la eficiencia total de una central térmica de vapor

Effect of combustion processes on the total efficiency of a steam thermal power plant

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Abstract

In the present investigation, a simulation model of the thermal calculation of the steam generator's steam generator 350 MW, operating under a Rankine cycle with superheat and regeneration, was developed. An analysis was carried out, modifying some parameters of the combustion (air and fuel flow) and the temperatures reached by the products of the combustion at the exit of the steam generator's home were determined, using the method of successive substitutions, applied to the thermal calculation methodology, with a stopping criterion of the approximate relative error of ε_ra <1 x10-8.
It was found that the temperatures reached by the combustion gases at the steam generator's outlet for the 100%, 75%, 50% and 25% regimes are: 1492.4 ° C, 1379.3 ° C, 1238.0 ° C and 980.0 ° C, respectively. Regarding the effect of air dosing on the thermal efficiency of the cycle, it is observed that it increases slightly with the increase of the dosage. Being the maximum thermal efficiency of the cycle of 35.8%

Rankine cycle, Combustion, Efficiency, Heat transfer

Diseño experimental de aerogenerador tipo savonius

Experimental design of savonius wind turbine

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Abstract

This project applies renewable energy technology, the calculation and design of an experimental Savonius vertical axis wind turbine is described. The objective is to acquire the necessary information for the construction and modeling of an experimental wind turbine. This prototype was constructed to use the movement of the air to generate electricity in a clean and non-contaminant way. The parts were assembled to make as much energy as its possible, those designs were calculated using the formulas of wind resource harnessing. Following this clean and non contaminant ideas, we recycled most of the materials used for the construction of this prototype. We calculated the rotative speed of the device according to the wind, we also calculated the electric energy that the device could generate with the wind. We studied the environment data such as wind speed, temperature for three weeks, where installed the experimental device it is going to be.

Renewable Energies, Wind Turbine, Savonious

Diseño e implementación de un plan de mantenimiento, basado en la metodología tpm, en planta productora de alimento balanceado para ganado bovino

Design and implementation of a maintenance plan, based on the tpm methodology, in a balanced food production plant for bovine cattle

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Abstract

The case study presented in this investigation, addresses the analysis of the current management of the maintenance of the machinery and equipment used in the balanced feed mixing plant for cattle of a private company in the northern region of Sinaloa, with the purpose of design and implement an efficient methodology to improve unscheduled stoppages due to recurring failures. Within the applied activities, a routing of the machinery and equipment was carried out to diagnose the state in which they were, the 5's methodology was applied in the warehouse and cellar area to be able to maintain the order, cleaning and classification of tools, materials and spare parts. The formats and logs were designed as an integral maintenance plan, validating it to carry out the controls for several weeks to compare the initial diagnosis with the final results. An increase in productivity was obtained as corrective maintenance decreased, reducing downtime and developing a commitment with the staff, keeping the areas tidy, classified and clean.

Total Productive Maintenance, Preventive Maintenance Plan, Corrective Maintenance

Diseño de un control difuso tipo mamdani para regular la temperatura de una acuario tipo tropical

Designing a mamdani type fuzzy control to regulate the temperature of a tropical aquarium

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Abstract

In the present research work, an automatic control technique based on fuzzy logic is shown to regulate the temperature conditions in a tropical aquarium with a capacity of 100 liters. To analyze the effectiveness of the technique, the design and implementation of a fuzzy logic controller type Mamdani was carried out. Subsequently, the diffuse controller was integrated into an electrical system using a 100-watt resistor. The regulation is carried out from the acquisition of the water temperature, thus varying the current of the resistance, a temperature sensor, and a heater as actuators were used. The functionality of the system is verified through the Artix-7 FPGA platform, using the VHDL hardware description language. The controller design was developed using the fuzzy logic tool in Matlab in order to compare experimental results of the FPGA, obtaining an error of 2.94% accuracy between both designs.

Fuzzy logic, Vhdl, Temperature

Sistema aerodinámico para un sistema eólico de baja potencia

Aerodynamic system for a low power wind system

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Abstract

One of the main needs of the society is to have electric power in their homes, which is why an orientation mechanism of the aerodynamic system for a Low Power Wind System is developed, developing the mechanical and electronic elements for orientation according to the gusts of wind, but its development is directed to moderate winds, up to 12 km / s, considering its application for supply or if they already have electricity for self-supply, considering the simulation, control, design and implementation of the aerodynamic system , its form of mechanical and electronic orientation, as well as determining how the incidence of wind affects each of the aerodynamic components of the wind turbine and how each of the climatic changes to which it is subjected affects them, such as humidity and wind speed, how the system behaves within certain wind intervals in areas in which can be implemented, so that tests in a wind tunnel of aerodynamic behavior will be developed and the elements of the guidance system of the blades and dynamic behavior tests that designate the material for the manufacture of the system will be established.

Wind Turbine, Aerodynamics, Low Power

Análisis del tostado del grano de café

Analysis of coffee grain roasting

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Abstract

Analyzing coffee grain roasting operations - Veracruz Region will contribute to the distribution of equipment and machinery in the Industrial Engineering workshop of the Educational Program. It aims to obtain improvements in the roasting process through the study of the work (January–June 2019), to lay the foundation for the proposals of Systems of Quality Management, Safety and Environmental Care in the following phases of the project (2019-2020) with effects on continuous improvement.In the coffee industry in Mexico has in the medium and long term, opportunities to grow and consolidate.As with most agricultural products from smallholders, such as coffee, the prices paid for the input ("cherry coffee") They are far from what the processed coffee comes to obtain in presentations of soluble and ground powder for coffee makers, and the process of improvement, quality, efficiency in roasting activities is necessary. The method analyzed the case studies of the operations of companies, producers and research related to the coffee and coffee industry and the interpretation of the statistical results.

Coffee bean, Roasted, Analysis

Estudio experimental del rendimiento térmico de un colector solar de tubos evacuados para calentar aire de secado

Experimental study of the thermal performance of a solar collector of evacuated tubes for heating drying air

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Abstract

A solar collector with evacuated tubes was developed to heat air from room temperature until it has the capacity to be used in drying processes. The instantaneous and global thermal efficiency of the equipment was studied, as well as the behavior of the outlet temperature at different air flows. Measurements of inlet and outlet air temperatures, irradiance were taken, and mass flow were determined. The amount of heat absorbed by the air was calculated and, in relation to the irradiance, instantaneous efficiency was obtained to later determine the overall efficiency. The device consists of a polypropylene tube where 5 evacuated tubes were placed. Air was flowed into each of them with an arrangement of a stainless-steel conduit with thin-walled tubing. For various air flows, thermal behavior curves were obtained, where increases in air temperature between 30°C and 50°C were observed, reaching outlet temperatures of up to 90°C. Efficiencies were calculated from 40% to 60%, for high and low operating temperatures, respectively. The increase in temperature resulted in a linear trend, facilitating the design of instrumented dryers and their control.

Solar Drying, Evacuated Tubes, Thermal Efficiency

Sistema de reconocimiento de patrones de turismo regional aplicando algoritmos de minería de datos

Pattern recognition system in regional tourism using data mining

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Abstract

Secretaría de Turismo in Mexico does not have enough information about regional tourism in the country, in comparation with data of international tourism, in which, a tourist profile is obtained to know purpose of the travel, stay, transportation used and another data to allow the identification of mechanisms to improve the tourist offer and, in this way, potentiate the arrival of tourist to the country. On the other hand, to national and regional tourism the profile is omitted, making it difficult to identify patterns of behavior, and is an area of opportunity to obtain them using cell phone networks. The purpose of the presented work is to identify patterns of behavior of national and regional tourism using data mining algorithms to analyze the data of connection of cell phones. The analysis of the information is achieved with KDD methodology in combination with K-means algorithm, first determining the place of residence of a person and next, detecting the connections outside this place. With the executed tests using several patterns of behavior, it was possible to determine if a person carried out national and regional tourism using measures of time and distance between their connections to cell network.

Data mining, Cell network, national and regional tourism

Sistema de monitoreo y control automatizado de nivel para contenedores de líquidos no corrosivos, de uso doméstico y comercial

Automated level monitoring and control system for containers of non-corrosive liquids, for domestic and commercial use

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Abstract

The automation of processes today is one of the present needs in society as a result of the inefficiency that results from carrying out certain tasks without mechanisms that optimize them, whether due to time, efficiency, and in general All the technological progress that we already have, these mechanisms have become obsolete. This document shows a response to this situation, specifically focused on liquid management processes, the implementation of a Level Automated Monitoring and Control System for non-corrosive containers for domestic and commercial use.The adequate selection of the components that make up this system will allow its easy accessibility, with respect to the cost that this implies, its structure will be designed in such a way that it minimizes the execution time, that integrates more than one control, and that its interface Be as friendly as possible with the operator. This allows it to be an easy-to-use system, greatly improving the response time in its realization, as well as it will allow to have a greater control in the capacity of the level of the containers reducing in this way the expenditure of liquids that can be arouse by some carelessness.

Monitoring, Containers, Liquids

La certificación de competencias laborales en el programa de estudio de la carrera de Energías Renovables de la Universidad Tecnológica de Tijuana

The work competencies certification in an educative program of Renewables Energies career of the Universidad Tecnológica de Tijuana

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Abstract

For the last four years, Tijuana´s Technological University (UTT) has planned a workforce competence certification program with students from the renewables energies study program. The main goal is to validate their abilities on photovoltaic (pv) systems connected to the electrical grid and to consolidated their technician formation. The purpose of this study is to analyse impact of the implementation of the workforce competence standard "EC0586.01 Instalación de sistemas fotovoltaicos en residencia, comercio e industria" (Photovoltaic systems's installation in residence, commerce and industry) in educative program (EP) of the renewables energies career of the university. Methodology. The project was carried in four stages: 1) alignment of school subjects of EP; 2) certification process; 3) Results of the evaluation process and exchanges on the subject; 4) Analysis of the results reveals. Contribution. This investigation project was an opportunity to learn the relevance of the implementation of work competencies standard in the EP of UTT as in the case of work field of renewable energy career.

Workforce competence certification, photovoltaic systems connected to the electrical grid, Educative program

Circuito de arranque suave para un motor monofásico de corriente alterna conectado a un sistema fotovoltaico

Soft start circuit for a single phase alternating current motor connected to a photovoltaic system

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Abstract

This work presents the study of a circuit used as a Soft Starter for a single-phase AC motor connected to a photovoltaic system. The direct start of a motor connected to an inverter activates its protection because it is not able to withstand the current that the motor demands in its start, that is why a technique is proposed that minimizes and eliminates the high peaks of current that generate Currently there are soft starters or frequency variations and other soft start techniques that are used for three-phase motors, what is required for this case is a soft starter for single phase motors. The circuit used as a test for Soft Starter allows performing the phase control by varying the firing angle. The photovoltaic system with which the soft starter tests were carried out has an inverter of 1,500 W to which a single-phase motor of a quarter of Hp was connected. Measurements were made with a digital multimeter, a hook Wattmeter, a digital oscilloscope and a washing machine motor. The main bases for the development of Soft Starters are left connected to a photovoltaic inverter for the start of single-phase motors.

Starter, Soft, Mono-phase

Análisis de sustentabilidad del empleo de BCS para calor de proceso

Sustainability analysis of aplication solid biofuels in industrial processes

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Abstract

The use of solid biofuels in for industrial heat has gained interest in several countries of the world, due to the economic advantages offered by its use since it is considered a neutral renewable energy source of greenhouse gas emissions greenhouse. Even with the high availability of biomass in Mexico, with appropriate characteristics for incineration, its development has lagged behind other countries. It is important to carry out economic and environmental feasibility studies of the biomass systems already installed in order to identify opportunities for its optimization.This article presents 2 environmental and economic feasibility studies of the use of BCS for process heat; using agave bagasse and pine woodchip among other biofuels. An emission analysis, an ACV analysis as well as an economic feasibility analysis are carried out and the results are compared with the use of fossil fuels to determine their feasibility in the medium term**.**

Solid Biofuels, Sustainability

Análisis de una red colaborativa basado en el uso de un sistema informático que permite compartir auto en un ámbito universitario

Analysis of a collaborative network based on the use of a computer system that allows auto sharing in a university context

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Abstract

A technological model that has had great growth is the linking of people through virtual groups created in digital media, also called social networks. This article presents an analysis of a collaborative social network whose design is based on the organizational structure of a university. By means of implementing a computer system that promotes a service of car sharing, and thus improve the transport conditions of its community, it is possible to find symmetrical and asymmetric relationships that they come of common user association rules in the university. Based on this study, the behavior of the network can be predicted thanks to the observed behavior patterns of users. These predictions are of great help in the planning of future activities where the network is expected to have certain collaborative behavior among its individuals when it comes to performing actions with a common benefit and achieve goals planned in the future.

Analysis, Social Network, Collaborative

Desarrollo experimental de un domo solar

Experimental development of a solar dome

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Abstract

The project presented in the following scientific article shows the results obtained in an experimental work that was carried out by students of the renewable energy career, which aims to develop a solar dome, which uses the heat energy of the great star of the solar system, in addition to reducing pollution and reduce CO2 emissions to the Earth's atmosphere. The idea is simple, make a solar dome, with which you can heat and / or cook food, in an easier and cheaper way and without using conventional methods such as gas burning, and in rural areas, the use of firewood or other organic pollutants.

Dome, Energy, Pollutants, Sustainable, Environment, Saving

Escenario sobre la aplicación de aprendizaje ubicuo en un entorno activo

Stage about the application of ubiquitous-learning in an active environment

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Abstract

Ubiquitous-Learning and its context sensitive applications (context-aware) has the potential to provide personalized and active learning, in addition to allowing the student to develop attitudes and aptitudes based on problem solving, progress monitoring, information, exchange of information, knowledge and collaboration process. Our contribution consists of the creation of a ubiquitous learning environment, which from a series of multimodal interfaces developed for an Environment Intelligence Environment and context sensitive applications, aims to influence teaching-learning activities through a laboratory of practices collaborative. The objective of the proposal is to implement the concept of Ubiquitous Learning (Ubiquitous Learning), providing the student with a space conducive, to generating knowledge and encouraging the development of cognitive skills. In this article, a description about the stage of the available technology in an Active Environment applied to the improvement of the academic performance of some subjects, where the student's evaluation is relate to their practical skills, that is, "The know-how".

Ubiquitous, Learning, Environment

Reconocimiento y segmentación de la mano con una cámara infrarroja

Recognition and segmentation of the hand with an infrared camera

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Abstract

In this article we present how, through an infrared camera, images are obtained under different light conditions that allow us to segment, classify and recognize gestures made with one hand. The infrared camera used was built by making small physical modifications to a conventional webcam and adding an infrared filter. Additionally, infrared LED structures were designed for the lighting of the scene, making it possible to be used in different light conditions.

Recognition, Segmentation, Infrared

Control robusto adaptable para sistema no inercial: Acrobot sobre un carro

Robust adaptive control for system non-inertial: Acrobot on a cart

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Abstract

This work shows the mathematical modeling of the non-linear system of an Acrobot on a car, which consist in a planar rotational mechanism with two joints of revolute, with an actuator in the elbow, but without actuator in the shoulder through the classical Euler-Lagrange method. In addition, a robust control strategies is proposed to achieve the attitude stabilization of the inverted position of Acrobot on a car in a non-inertial physical framework, these include reactions forces and relative motions which can potentially alter the performance of the system. The algorithm proposed is the Adaptive Sliding Modes Control (ASMC), which alters the dynamic of a non-linear system applying a discontinuous control signal that forces the system to "slide" until reaching the desired stability point, whose the main advantage is reject modeling uncertainties and non-linear effects , which result from the accelerated framework of reference to which Acrobot on a car. Implementing a scheme by numerical simulations in the platform Simulink.

Non-inertial Systems, Acrobot, Sliding Mode

Deshidratación de plátano (*Musa paradisiaca)* por medio de radiación solar en un secador directo

Dehydration of banana (*Musa paradisiaca*) by means of solar radiation in a direct dryer

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Abstract

The objective is to dehydrate banana (*Musa paradisiaca*) using two direct solar dryers. The purpose of dehydrating the banana, is to give an added value. The fruit is remove the peel, and cut into slices of 1.75 cm radius with a thickness of 0.525 cm. It is placed in two polymer mesh trays with dimensions of 24 cm by 34.2 cm. The initial moisture is determined, and weighed. Later they are introduced to solar dryers. For both dryers the humidity and the temperature of the medium are determined every 15 min, and the color is determined every hour. Finally, the moisture content of the final product is determined. Each test is done in triplicate. The percentage of humidity decreases from 57.23% to 20.87% in natural convection and 20.80% in forced convection. The drying time is 8 hours and the average operating temperature is 38.7 ° C for natural convection and 34.68 ° C for forced convection. In dehydration the percentage of humidity decreases 36.36% on average in the two forms of operation. In forced convection the product darkens less.

Dehydrated, Banana, Dried

Tratamiento fotocatalítico de una disolución acuosa de azocolorante negro ácido 52 utilizando como catalizador diferentes mezclas de óxidos semiconductores

Photocatalytic treatment of an aqueous solution of azo dye acid black 52 using as a catalyst different mixtures of semiconductor oxides

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Abstract

In this study, the photocatalytic degradation of azo dye Acid Black 52 using different mixtures of semiconductor oxides as a catalyst is reported. The experimental system consisted of a Batch reactor in which the azo dye, the semiconductor oxides and the hydrogen peroxide were mixed, whose concentrations were 0.1 mM, 100 mg/L and 65.2 mM, respectively. The mixture was homogenized by a magnetic stirrer and the pH was adjusted to 3.0. The initial volume was 500 mL. A white light lamp (127 V, 60 Hz, 362 mA, 60 W, 60 lm/W) was placed coaxial to the reactor and turned on to activate the catalyst. Samples were taken every 30 minutes to measure the absorbance, for this purpose a HACH DR3900 spectrophotometer was used. After 180 minutes of treatment, the best result, 60% degradation of the azo dye, was obtained with the mixture manganese oxides-iron oxides. The purpose of this work was to completely transform the pollutant into carbon dioxide, to avoid its adverse effects on the environment and human health, using catalysts excited with visible radiation.

Photocatalytic treatment, Acid Black 52, Semiconductor oxides

Deshidratador solar híbrido para el secado de plátano

Banana drying hybrid dehydrator

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Abstract

In this work the design of a solar dryer for the dehydration of fruits is presented. Banana is used as raw material for analysis and evaluation purposes. The system is supplied with solar energy in the form of (photovoltaic) PV and (photothermic) PT. The PV part of the dehydrator consists of a solar panel, whose energy supplies electrical resistances to increase the temperature, also feeding a forced air convection system which is carried out with a pair of fans that are at the entrance and exit of the dehydrator, also a control and measurement system. In the other side the PT part consist in a passive storage system of heat direct and indirect catchment of radiation. For the development of the solar dryer it is necessary to take into account certain parameters such as: weather conditions (solar radiation, ambient temperature and wind speed), thermal conductivity, temperature and properties of the components.

Hybrid, Thermal Conductivity, Humidity, Convection

Cómputo en la niebla aplicado a la manufactura inteligente bajo el contexto de la industria 4.0: Desafíos y oportunidades

Fog computing applied to intelligent manufacturing in the Industry 4.0 context: Challenges and opportunities

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Abstract

Cloud computing offers high server-level data processing capacity, while fog computing works using nodes at the edge of the network, enabling real-time data processing with low latency and improved ubiquity, so it can contribute on Industrial Internet of Things (IIoT) applications. This article discusses the technical challenges that have arisen in implementing the IIoT, and how the fog computing paradigm is helping to solve some of them. For this, a review of scientific articles in the Google Scholar and Web of Science databases has been carried out using keywords. The results show that there are various challenges related to interoperability, mixed criticality, latency, fault tolerance, scalability, horizontal and vertical integration, functional safety, legacy industrial systems, and energy efficiency. The main trends to face these challenges are reported. This article proposes a series of opportunity areas for research and development of possible solutions.

Industrial Internet of things, Fog computing, Industry 4.0

Fabricación de un concentrador solar parabólico compuesto (cpc) para desinfección de agua de consumo en comunidades rurales

Manufacture of a compound parabolic solar concentrator (cpc) for the disinfection of consumer water in rural communities

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Abstract

This paper presents the selection of supply materials and describes the manufacturing process of a solar compound parabolic solar concentrator (CPC) to disinfect drinking water for consumption by rural communities. The volume of water to be treated is 100 liters/day, average amount of water for services of a family of 6 people, including washing of kitchen utensils and food preparation. The selection of supply materials for the CPE manufacture was made considering the lifetime, low cost and availability in the Mexican industrial market. The main components of the CPC are: 1. the profile of the involute, made of galvanized steel sheet gauge 20 (0.9 mm) with bright chrome finish to achieve a reflective surface, 2. Hydraulic system, integrated by coupling elements between 6 lines of borosilicate glass tubes of 44 mm outside diameter and 1.6 mm thickness with PVC accessories and 3. Mechanical support structure of the CPC, which was designed with a variable angle, to adjust according to the latitude of the operation site, this was manufactured with industrial processes of pailería and reinforced tubular profile (PTR) of 14 gauge steel (1.9 mm thickness) was used.

Manufacturing process, Solar composite parabolic concentrator, Disinfecting drinking water

Deshidratación de guayaba (Psidium guajava) en forma de rodaja mediante radiación solar en un secador directo

Dehydration of guava (Psidium guajava) in slice form by solar radiation in a direct dryer

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Abstract

The objective of this work is to reduce the moisture content of the guava (Psidium guajava) cut in slices, through the solar radiation characteristic in the area of the capital of the state of Zacatecas. Natural convection and forced convection were used to achieve the objective of this study. The selected guava comes from the municipality of Jalpa, Zacatecas. Moisture was evaluated with an OHAUS MB45 thermogravimetric scale, then the guava slices were placed in polymer mesh trays with dimensions of 34.2 cm long and 24 cm wide. They were introduced inside a transparent dryer with dimensions of 74 cm x 80 cm of base and a frontal height of 13 cm and posterior of 40 cm. A Checktemp 1 thermometer was placed inside the dryers to evaluate the temperature in the drying process. The initial humidity of the guava was 50.51%, the final moisture obtained in the natural convection was 8.08%, while in the forced convection it was 8.32%, after 8 hours of drying.

Dehydrated, Guava, Dried

Estudio teórico-experimental de la transferencia de calor en el tubo receptor de un colector solar de canal parabólico

Theoretical-experimental study of the heat transfer in the receiver tube of a Parabolic-trough solar collector

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Abstract

The capture of solar energy through parabolic trough collectors is a technological application for the use of clean energy, this allows reducing the use of fossil fuels and reducing the generation of greenhouse gases (GHG). Therefore, this article presents a theoretical-experimental study of the heat transfer in the receiver tube of a parabolic channel collector through which the working fluid flows.The receiver tube is made of copper with a nominal diameter of 1 "and is covered by a borosilicate glass tube with an outer diameter of 2 1/2" x 2.5 m long, to reduce convective losses. The theoretical study is carried out in two-dimensional (2D) Cartesian coordinates and axi-symmetric boundary condition to model and simulate fluid dynamics and analyze the behavior of convective heat transfer between the air of the annular space and the working fluid. The simulated fluid temperatures were from 80 to 180 ° C, this range includes various industrial applications where process heat is required. The simulated direct radiation values were from 600 to 1100 W / m2. The difference between the theoretical and experimental results was less than 8%.

Parabolic trough collectors, Convective heat transfer, Fluid dynamics

Evaluación de los niveles de ruido en áreas y departamentos del instituto tecnológico superior de Guasave

Evaluation of noise levels in areas and departments of the upper technological institute of guasave

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Abstracts

The present experimentation is the evaluation of noise levels in laboratories, classrooms and departments of a Higher Education Institution. Its objective is to identify and evaluate the working conditions to which workers and students are exposed when performing tasks. The study was conducted based on the official Mexican Standard NOM 011-STPS-2001 "Conditions of safety and hygiene in workplaces where noise is generated". Using a TES 1353S sound level meter for 4 weeks, evaluating 16 zones, in 2 periods. As a result, it was obtained that 6 of the 16 zones evaluated exceed the maximum permissible exposure limits. And recording discomfort and lack of concentration in the activities to be carried out on workers and students. As a recommendation, the implementation of periodic medical examinations and personal protective equipment for the personnel, in addition to the evaluation of noise levels in the preventive maintenance of the institution.to make the activities more comprehensive.

Noise, Environmental conditions, Preventive maintenance

Gestión del mantenimiento mediante Six Sigma para la optimización de la productividad de la maquinaria y equipos diversos para una pyme

Management of the maintenance through Six Sigma for the optimization of the productivity of the machinery and diverse equipment for an SME

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Abstract

The application of Six Sigma to Maintenance Management, to optimize the productivity of machinery and equipment for an SME, using the Six Sigma methodology, which is made up of its 5 DMAIC phases. This research develops and applies a combined strategy of TPM and Six Sigma in an SME to eradicate a major CTQ problem. In this sense, the approach used, the tools and techniques used are highlighted, evidencing the savings that were achieved through the structured application of a combined TPM / DMAIC procedure. Through the correct application of the TPM and Six Sigma methods, the present research identifies optimal parameter adjustments and maintenance activities, which allowed the company to eradicate CTQ problems and achieve significant improvements in product quality, the cost and delivery of a modest financial outlay. The application of the strategy and the resulting conclusions regarding its effectiveness for the industry is the real value of this work, for which, it will be valuable for quality professionals, and specialists in manufacturing in a wide range of industries

Quality, Six Sigma, TPM, SMEs

Análisis teórico de una chimenea solar con tres canales de flujo de aire

Theoretical analysis of a solar chimney with three air flow channels

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Abstract

A solar chimney configuration consisting of three air flow channels divided by two metallic plate, placed in the center of the chimney between two acrylic covers, leading to symmetric air flow, is proposed as an alternative for the design of natural ventilation systems for buildings in tropical and subtropical climatic zones The solar chimney dimensions are 2.0 m height, 1.0 m width, and gap between channels of 0.30 m. These dimensions are appropriate for the design of ventilation systems for residential buildings in central México. A Numerical simulation using the global mass and energy balances in steady state was utilized to evaluate the efficacy of the proposed configuration. The temperature profiles, calculated for a typical hot day in a tropical region, reveal that the configuration is more efficient than the single channel chimney, achieving thermal efficiency values near 75%. This solar chimney configuration can be used with better results than the traditional design as an alternative for natural ventilation systems in residential buildings without a significant increase in the cost of the residence investment.

Solar chimney, Natural ventilation, Solar energy

Detección y representación de eventos ambientales basada en agentes

Detection and representation of environment events based in intelligent agents

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Abstract

An Intelligent environment can respond to the necessities of the users according to the context, this is so that the individuals can have the ideal climatic conditions in order to go about their activities, these conditions are related through a series of special norms. The events that we describe in this paper are in relation to the events of the environment (temperature, humidity, brightness, and presence), also involved are different variables like time, space, or person, such are important in order to be able to model what is occurring in a determined place. In this project, we propose a personalized ontological design for the academic dominion. The ontological model is utilized for the identification of environmental events according to the data acquired from the environment through the simulation of intellectual agents. Also, our ontological model is used to rationalize with the information obtained from the identified events. The model of ontologies based on events considers four contextual questions like a perspective modular: person, seasonality (weather), spatiality (location), network (resources in order to acquire environmental data) and event (academic events). And the detector is based on rules obtained from the standards of optimum climatic conditions of a physical space.

Ontology, Agents, Events

El impacto que ha tenido la gestión de la calidad, en la competitividad de las organizaciones

The impact that has had the quality management, on the competitiveness of organizations

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Abstract

Overview of quality management systems are essential for the competitiveness of the organizations, since they allow to promote a culture of continuous improvement in the same, higher education institutions are not exempt and is for this reason that they have implemented these systems as in the Nacional Tecnológico de Mexico, which currently has a comprehensive system (System of management of quality (ISO 9001:2015), environmental management (ISO 14001:2015) system, equity of gender (MEG), system model Energy management, health and safety at work management system, recognition of Social responsibility and in some cases the institutional environmental programme (PAI), for it is important to know how they have impacted the community. Some findings about the management system in the Instituto Tecnológico de Toluca, is that, if there is knowledge of the processes, care of environment due to institutional environmental program.

Organizations, Quality, Competitiveness

Criptografía basada en curvas elípticas

Cryptography based on elliptic curves

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Abstract

Cryptography incorporates the techniques with which it seeks to guarantee protection of information, in front of unauthorized persons. This way of protecting information has existed since ancient times, where there were elements that only certain people were able to understand and interpret. In the beginning, cryptography was used for the purposes of war and power, but thanks to the great technological advances developed at the end of the last century, we have seen the need to safeguard the information that everyone manages and shares through the internet. That is why cryptography takes on greater importance. Current cryptography is based on two types of protocols, one of symmetric cryptography and the other corresponding to asymmetric cryptography. In this paper, an asymmetric type protocol based on elliptic curves on the finite field GF(p) was analyzed, proposing a library developed in PHP that allows to encrypt and decrypt information, which aims to provide security services, authentication, integrity and confidentiality of the information.

Cryptography, Protocol, Elliptic curves

La cognición en la web a través de un chatbot como elemento disruptivo

The cognition on the web through a chatbot as a disruptive element

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Abstract

Today, the companies try to basic needs of their clients, the use of technology would help solve and have efficient communication in real time with them. Therefore, the objective of this project is to perform a disruptive technological tool, a chatbot, and make an analysis of your employment in uses a social network (Facebook), to break paradigms of behavior in a massive number of users and that maximizes the social The main subject is the commercial impact, complete credibility and satisfaction this tool in the user (around the company that apply chatbot). Nowadays, companies seek to satisfy most of their client's needs; that tool assistance to reduce the troubles between them and the company. Moreover it is well known that today's generations do not live without social networks interactions and even more so that they are buying products through the internet. Finally, there are companies that make use of this technology: Aero México, National Geographic, Starbucks, Next_u, etc.

Cognitive, Chatbot, Disruptive

Diseño y construcción de un colector solar de tipo concentrador parabólico compuesto (CPC) para pruebas de calentamiento de aire

Design and construction of a compound parabolic concentrator (CPC) solar collector for air heating testing

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Abstract

This paper presents a design proposal and the theoretical and experimental evaluation of a solar collector of parabolic concentrator type (CPC) with tubular absorber for air heating tests with ideal thermal performances for applications such as drying and conditioning systems. air. The collector consists of four concentrators formed of galvanized sheet that make the function of reflecting the sunlight towards the absorber tubes, with a concentration ratio of 2.5 and an acceptance half-angle of 23.5º, with the objective of not requiring a system of solar tracking The absorber is a copper tube where the air circulates. With this proposal from the collector, a theoretical efficiency of 25% was obtained, which represents a third part of energy gain compared to a commercial CPC. This efficiency was obtained according to the materials and dimensions implemented. The system is technically feasible to be used for low temperature processes, with average quality of 60 ºC, which can produce significant energy savings and reducing the amount of CO2 emissions, favoring the environment.

Solar collector, CCP, Air heating

Reciclado de desechos plásticos en laboratorio de manufactura

Recycling plastic waste in manufacturing laboratory

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Abstract

Mexico is ranned first place among countries with plastic waste production; recycling mainly polyethylene terephthalate (PET), the recycling of other plastics is almost nil. Laboratory equipment are didactic elements in Manufacturing Engineering; It allows to develop professional competences required in this major, by integrating theoretical and experimental contents through laboratory practices. The problem of continuous use of 3D printers in lab practices is that, for each kilogram of polylactic acid (PLA) and acrylonitrile butadiene styrene (ABS), between 10% and 30% results in waste material. The university can hardly afford these supplies to the Manufacturing Laboratory because of the high cost of plasctic materials. That is why this project seeks to offer a technological proposal to give plastic waste a second life, as an outcome from laboratory 3D printers. This may decrease the environmental impact generated by the university. These wastes can be recycled, through a mechanical method, and used as material in the realization of laboratory practices that develop academic and professional skills of new manufacturing technologies.

Plastics, Recycling, Manufacturing

Evaluación del funcionamiento de un prototipo de electrofloculación para el tratamiento de agua residual proveniente de procesos de biodigestión y biocompostaje

Evaluation of the operation of an electroflocculation prototype for the treatment of residual water from biodigestion and biocomposting processes

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Summary

Introduction. In recent years, the Government of Baja California has promoted not to discharge wastewater with high content of fats and oils. A company in the region dedicated to the collection of sludge, installed a horizontal centrifugation system for the extraction of oil, generating a sludge with 5% fat and oil. The result of this process is sent to a process of biodigestion and vermicompost for the generation of solid and liquid humus, which generates wastewater with high organic load that require a treatment before disposal. Objective. Develop an experimental prototype of electroflocculation to wastewater treatment with a high content of organic matter. Methodology was divided into 4 stages: 1) Physicochemical and biological characterization of the wastewater; 2) Assembly of the electroflocculation prototype; 3) Experimental assessment 4) Verification of system operation. Contribution. Through the elaboration of the prototype, the effectiveness of the electroflocculation process was confirmed for the wastewater treatment (WT) with a high content of organic matter (OM) and pathogenic bacteria, since a greater than 50% decrease of the biochemical oxygen demand (BOD5), chemical demand of oxygen (COD), fecal coliforms and Salmonella.

Electroflocculation, Characterization, Prototype

Modelado matemático de un controlador pid de ganancia variable dependiente del punto de consigna en la salida de un pid convencional

Mathematical modeling of a variable gain pid controller, dependent of the set point in the output of a conventional pid

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Abstract

A PID control structure was modified proposed by K. Ogata. It is proposed a structure Nonlinear PID control, implemented using analogical electronics. A mathematical model was obtained using conventional methods. It was proved the validity of the model obtained comparing against the response of the model proposed by K. Ogata. It was concluded that the proposed structure is stable.

Modeling, Nonlinear control systems, PID

Medición del potencial de explotación de energía fotovoltaica y eólica en tamaulipas, region Altamira

Measurement of the potential of the exploitation of photovoltaic and wind energy in tamaulipas, region Altamira

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Abstract

Now a day, Mexico is looking the way to generate electricity by using renewable, clean and ecofriendly sources according the actual legal framework. This project is a meteorological portable station which will record either direction and speed of wind, light irradiation and environment air temperature in a data logger unit conformed by a microprocessor and a memory. The data recorded in the device will be mathematically analyzed and processed in a delimited period of time and plotted on different type of graphs or documents for to support feasibilities studies which could identify the power potential of photovoltaic energy and wind energy in the city of Altamira Tamaulipas.The main goal of this project is contribute with actual studies which will determine the feasibility of energy generation by using clean energy sources in the south part of our state promoting the development of energy power industry, mainly in the city of Altamira.ObjectivesTo build a portable meteorological station and to carry out a study of the measurement of the photovoltaic and wind energy exploitation potential in Tamaulipas, Altamira region, based on the data of the environmental variables measured and collected during a certain time, to determine the viability of generation electricity through wind and solar resource in this region.MethodologyIn order to carry out the evaluation of the photovoltaic and wind energy potential measurement in Tamaulipas, Altamira region, a customized portable weather station module will be manufactured, to perform measurements of wind speed, wind direction measurements, temperature measurements, and irradiation measurements, at the site of interest.In addition, a system will be installed to register all the variables described in a micro SD memory and a communication system through a bluetooth module. This portable weather station will be installed, at the top of the library building of The Polytechnic University of Altamira. The exact geographical location is shown by means of GoogleMaps with a Latitude 22.462239 and longitude: -97.970186 (Google, 2018).Contribution Provide information on the meteorological variables of our environment, adding a solar panel that demonstrates its viability. Implement an interface that allows constant monitoring and the different measurements made at the meteorological station, using sensors and microntrollers.

Energy, Photovoltaic, Wind power

Mecanismo diseñado y simulado virtualmente

Mechanism designed and simulated virtually

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Abstract

Objectives: To show a process to synthesize and analyze a crank mechanism oscillator function generator. Simulate it in a virtual reality environment, without losing its physical characteristic. Evaluate deviations between analytically desired and virtually obtained.Methodology: Using the analytical method described by Hartenberg and Denavit, a graphic package and an electronic spreadsheet; knowing the angle of rotation of the crank, the angular reference position of the crank, the displacement of the oscillator, the extreme values of the independent variable and the function; precision positions, link lengths, eccentricity and oscillator reference position were determined. The links were generated, the mechanism was assembled, analyzing fifteen of its positions. Of the infinite number of existing solutions, five were synthesized. For each solution that justify it, the deviation of the generated function was evaluated with respect to the desired one.Contribution: The friendly, fast, safe, accurate and parametric process was demonstrated; modifying the inputs and checking the update of the outputs, therefore it is a contribution to the scientific progress of the area.

Simulation, Mechanisms, Design

Implementación de motor stirling para generación de energía eléctrica limpia empleando una lente de fresnel

Implementation of stirling engine for clean electric power generation using a fresnel lens

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Abstract

In search of expanding the generation of electric power and reduce the burning of fossil fuels. It is proposed to use the tools that already have and the necessary information to make a prototype of Alfa type Stirling engine, which is a thermal machine with low levels of noise and toxic emissions, that its relative design is of low manufacturing cost for the generation of clean electrical energy, for the heating we will use a Fresnel lens with the purpose of satisfying the thermal energy demand of the same, in the sense of achieving the best angle of capture of solar rays, at the same time achieving the highest concentration of heat possible for the heating angle of the motor. The validation of the proposed model is based on experimental results, using the information obtained from the production of electrical energy, with this the validation of the prototype will be performed, similar to the solar parabolic dish concentrator.

Stirling, Fresnel, Energy

Prototipo web para el procesamiento de registros de pacientes potencialmente infectados con tuberculosis en la Huasteca Hidalguense

Web prototype for the processing of records of patients potentially infected with tuberculosis in the Huasteca Hidalguense

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Abstract

The development of a web prototype for the registration of samples of patients potentially infected with tuberculosis is of great importance because the information generated from the laboratory results must be transmitted in a rapid, truthful and complete manner to the medical units that request them with the purpose of providing a specific treatment according to the diagnosis obtained in the previously analyzed samples.Building a web platform through the Web Engineering methodology allows optimizing the sending of test results so that they can be consulted from any entity authorized by the Secretary of Health of the State of Hidalgo in real time, immediately and without intermediaries to reduce bureaucratic procedures that are delayed, in addition to unreliable.This project was born as a solution to the problems that arise during patient care services, since at this stage is the most difficult to deliver results immediately, an action that contributes to the diagnosis of the disease is carried out late and causing new infections of this disease.

Prototype, Web, Tuberculosis

Implementación de sistema de control automático de temperatura en proceso de parafinado mediante LabVIEW

Implementation of automatic temperature control system in the process of paraffining by LabVIEW

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Abstract

This paper details the design the automation processes for the control of temperature and length variables due to the need to control some of the main physical variables that are part of the production process |, thereby obtaining the physical signals and interpreting them for processing and assignment of a measurable baseline assessment, which allows controlling the values to determine the behavior of the processes. These automation processes were developed using computer-assisted control, LabVIEW graphic programming software and an NI 6000 USB data acquisition card. The processes to be implemented are based on: the control and monitoring of temperature in the area of pabileras, control and monitoring of proportion in the mixing of matches, as well as the control of size and temperature in the production of the wick. These automation processes for the control of quality variables allow the manipulation and monitoring of physical variables such as temperature and length, since they greatly influence the production of matches. Allowing the user to adjust the desired values in the production area and keep them as stable with reference to quality standards. The implementation of an automatic temperature control system for the paraffin process through LabVIEW is shown, an analysis will be carried out in the area of pábilo and paraffin production of the company Cerillera la Central S.A. de C.V. in which the temperature of 174 ° F to 188.6° F must be controlled, by means of solenoid valves activated by relays at 127 VAC, a resistive sensor (PT-100) coupled to a Wheatstone bridge will be used which will deliver analog data; which will be processed by the NI USB-6000 data acquisition card, a PC and NI-LabVIEW software in order to turn on or off the solenoid valves that activate the steam supply for paraffin heating

NI 6000 USB data acquisition card, Pabileras, Mixing

Estudio de la degradación en paneles solares sometidos a prueba de humedad-congelación

Study of the degradation in solar panels subjected to humidity-freezing test

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Abstract

All materials in greater or lesser proportion interact with the environment, which causes them changes. In some cases the change is only in the appearance, in others, the change is in the properties. In the case of solar panels, degradation can cause a reduction in electrical parameters; for example: reduction of the maximum power supplied by the solar panel. To be able to certify the fulfillment of a function during a certain time, it is necessary to test the materials to verify the useful life of the same. The objective of this study was to determine the capacity of the module to withstand the effects of high temperature and humidity, followed by freezing temperature. The test was carried out in a Weiss climate chamber, according to IEC 61325. The results obtained in 4 of the 5 samples tested met the specification of power change of less than 5%, of the initial value, only One piece denoted a change of 6%. It is concluded that the number of pieces under test must be increased in order to reduce the measurement uncertainty. This study contributes to the quality assurance of solar panels.

Degradation, Solar Panel, Freezing

Estudio cinemático de la mano para movimiento de oposición del dedo pulgar y movimientos de flexión y extensión de los dedos índice, medio, anular y meñique

Hand kinematic study for the thumb opposition movements and the flexion-extension movements of the index, medium, annular and little fingers

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Abstract

Present work studies hand articular kinematics for opposition movements of the thumb and flexion-extension movements of the fingers. We gathered data by means of Motion capture (MOCAP) photogrammetry and passive markers on the participant hand located in anatomical points recommended by International Society of Biomechanics (ISB). We collected data from nine participants who did not have any neuronal, rheumatologic or traumatological problems. Cycles were demarcated for the study's ranges of movement and analyzed with the rotation of three-dimensional joints method. Subsequently, obtained data was fed in a virtual model in 3D through the software "OpenSim" to simulate the obtained ranges of movement and compared with similar studies. We found that with the proposed methodology, ranges of movement for each hand joint in the performed exercises are acceptable between subjects and according to similar studies. This will allow a later study of greater scope focused in the comparison of people suffering from hand disorders compared to a population standard.

Joints, Kinematic, Photogrammetric

Transporte masa: Simulación de fluidos incomprensibles en una capa difusora de gas utilizando openfoam

Mass transport: Simulation of incomprehensible fluids in a gas diffuser layer using openfoam

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Abstract

The Gas Diffusion Layer (GDL) provides a transport route for the reactant species from the flow channels to the catalytic layer in a fuel cell. The components design requires that the species present a uniform diffusion towards the electrodes and that the formed products are shifted as faster as possible, to avoid the increase of the ohmic resistance due to the blocking of the active sites, or it constitutes a bottleneck that the performance decrease fast. This work presents a solution proposal for the continuity equation in incomprenssible fluids in a 3D model of a gas diffuser layer with titanium wired mesh characteristics of a fuel cell using "OpenFOAM" open source software. The aim of the study is to show that under different scales or size of the gas diffusion layer there are significant changes in the velocities of propagation of the reactant species towards the active area of the fuel cell.

Fuel Cell, GDL, OpenFoam

Diseño e implementación de una interfaz de control para la integración de una celda de manufactura flexible

Design and implementation of a control interface for the integration of a flexible manufacturing cell

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Abstract

In modern industry, flexible manufacturing systems (FMS) are indispensable to increase productivity and product quality. The cells that constitute them have several work stations connected to each other through a communication protocol, therefore, with which they are able to identify and distinguish between the different parts or products processed in the system. Furthermore, they have the ability of adaptation to the demand of processing different products and quantities. In the FMS communication protocols are used such as Device Net, Ethernet, among others. However, there are cases in which there are no communication modules; however, it is necessary to develop alternative devices to communicate the work stations with each other to integrate a flexible manufacturing cell with the necessary characteristics. This paper presents the results obtained from the study of infrastructure for the development of a communication interface to integrate a flexible manufacturing cell using a microcontroller, with the capability of communicating two work stations. In this particular case, a FANUC M6iB robot with a HAAS VF2 machining center.

Flexible Manufacturing System, Industrial Robot, CNC

Organización del almacén de garantías de una empresa distribuidora automotriz de Ciudad Obregón

Organization of the warehouse of guarantees of an automotive distribution company of Obregon City

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Abstract

This project was carried out in the warehouse of guarantees of an automotive distribution company in Obregon City, which presented the disorganization of parts, unnecessary files, clogged floors and lack of cleanliness, causing the time to search for parts and files to be extended. Therefore, the objective of improving the conditions of organization and cleanliness of the warehouse was established through the 5'S philosophy. The procedure consisted of: describing the area under study; evaluate the initial situation of the warehouse; train the staff; elaboration of inventory of warehouse objects; separation of necessary and unnecessary objects; subsequently a place was assigned to each object, then the area and objects of the store were cleaned; standards were developed for the activities carried out in the warehouse; the level of compliance with the 5'S philosophy was measured and finally the final warehouse situation was evaluated. Initially, the situation of the warehouse as criteria of 5'S had a 16.47% compliance and once implemented the philosophy 5'S, the rating was increased to 92.94%, therefore, the objective of this project was achieved that was to improve the conditions of organization and cleaning of the warehouse.

Improvement, Organization, 5s

Modificación a un proceso de elaboración de brochetas en una empresa productora de derivados de la carne

Modification to a process of making skewers in a company that produces meat products

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Abstract

This research analyzes a skewer production line of a meat processing company due to the fact that it presents bottlenecks and leisure time, with the objective of proposing improvements in the method through the analysis of operations. The procedure was to know the specifications of the product and the process, study the activities and determine standard times by the Maytag Company method. The results show that the critical operations are those of portioning and assembling the product for which three improvement proposals were designed whose evaluation determined that the mold method is the most suitable for the production of skewers. The chosen method is considered more efficient, since when compared to the current method, it presents a decrease in the operating time of 11.68s per product, as well as 7.88s in leisure time, resulting in an increase in production of 321.95 kg per shift, this represents an increase of 124.83% in the efficiency of the production line, making evident the relevance of these techniques for the continuous improvement of the processes.

Actions, Improvement, Efficiency

Dispositivo automatizado para control de micro corrosión generada en convertidor de ozono instalado en área de producción de industria aeroespacial de Mexicali

Automated device for micro-corrosion control generated in ozone converter installed in Mexicali's aerospace industry production

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Abstract

Due to failures in ozone converters used in the aerospace industry and manufactured in a company located in the city of Mexicali, and that generated a health problem in commercial aircraft interiors due to the malfunction of ozone converters, the internal environment was evaluated of the company mentioned and located in the desert area of the northwest of the Mexican Republic. The analysis was carried out with specialized equipment and a device for detecting and controlling chemical substances derived from sulfur and deposited on metallic surfaces of electrical connections of ozone converters installed in a section of aircraft cabins. With the monitoring equipment, the corrosive environment in the interiors of the company was quickly detected and with the development of an electrical fault detection device in the ozone converters, the failures were reduced by 70%. Microanalysis was performed using the Electronic Scanning Microscopy (MBE) technique, to identify the contaminating substances deposited on the metallic surfaces of the electrical connections of the ozone converters, as well as the concentration levels of said substances. The automated device for micro corrosion control was designed, manufactured and tested, to detect periods of deposition of sulfur-derived chemicals. In addition, specialized filters were installed to reduce the entrance to the interiors of the company in Mexicali, and thus have a regulated environment and thus avoid the generation of micro corrosion. The study was conducted from 2017 to 2018.

Industrial processes, Micro corrosion, Corrosive industrial environment

Generador de agua mediante el uso de celdas peltier y energía solar

Water generator through peltier cells and solar energy

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Abstract

At present, the drought periods are longer due to global warming, which has generated scarcity and water rationing, these conditions become the main problem in remote villages to urban areas and with little infrastructure. Mexico, with 653 aquifers throughout its territory, 106 are overexploited due to agricultural, mining, industrial and urban activities, which projects to the country a possible depletion and contamination of its vital liquid. For this reason, in order to contribute to a solution to the problem of water scarcity, by applying a control system to the technology used by the Peltier cells, a moderate flow of water is generated, since it condenses the particles of water suspended in the air. In this way, an array of Peltier cells will be implemented to obtain as much water as possible under environmental factors, such as humidity and temperature. In addition, when dealing with areas where the climate is arid, it is intended to use alternative sources of energy, of autonomous photovoltaic type, to take advantage of solar radiation and feed the control system in a self-sustaining manner.

Renewable Energies, Water Condensation, Peltier Cells

Estudio de corrientes y velocidades de aire, para la implementacion de generadores eolicos

Study of currents and air velocities, for the implemantation of win generators

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Abstract

Demand for electrical energy and rising production costs, coupled with the need to favor renewable energies, mean that alternative solutions must be proposed which, in addition to reducing consumption costs, are sustainable solutions with very low environmental impact. Although a solution has been given with the use of solar cells, these can still be expensive or require additional maintenance in the fixation and support systems when they are in zones of high nitrate concentrations. As a rule these coastal areas have the advantage of receiving wind of different speeds during prolonged periods of time during the day, which can facilitate the placement of electric generators by windmills. In the Faculty of Engineering, a zoned study was carried out on wind speeds and directions over a long period of time, in order to establish the conditions and feasibility of the placement of these generators, considering the topography and typology of the place measured speeds and directions on one of the complex buildings. Thus, a register was obtained that allows calculating the energy production and the convenience of exploiting this clean and sustainable energy solution.

Generation of energy, Sustainability, Ecology

Construccion de un prototipo anaerobio para el tratamiento de aguas residuales

Construction of an anaerobic prototype for the treatment of wastewater

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Abstract

It has been proposed systems that adapt economically and technically to the conditions of most places that have a considerable water consumption. The work consisted of an anaerobic biological reactor in which the treatment of domestic wastewater was carried out. Sedimentation characteristics of the activated sludge were achieved after the second stabilization period. Throughout the treatment three samples were characterized (key, effluent and influent) in three times of hydraulic retention, of which were analyzed: pH, temperature, conductivity, turbidity, SST and COD. Additionally, the samples were analyzed in the laboratory to determine COD, BOD5, fats and oils, and fecal coliforms. With the designed system removal percentages higher than 45% (key sample) and 34% (effluent sample) were obtained for COD and greater than 71% (key sample) and 57% (effluent sample) for SST. The parameters analyzed met the maximum permissible limits established in NOM-003-SEMARNAT-1997 and in PROY-NOM-001-Semarnat-2017. A filtration system was installed that increased the percentages of removal in the treated samples reaching a better water quality. Chlorine was also added to ensure the elimination of fecal coliforms.

Treatment, Anaerobic, Sludge

Análisis de la transferencia de calor de un sistema de refrigeración a partir de nanofluidos

Heat transfer analysis of cooler system from nanofluids

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Abstract

In the last decade one of the main opportunity areas of the cooler systems is increase their efficiency; for this, it has been innovating in materials and working fluids mainly. In the last decade one of the main areas of opportunity in refrigeration systems is the reference to increase their efficiency. For this, it has been innovating in materials and fluids of work mainly. In this work, the analysis of the transfer of calories in liquid cooling systems is analyzed by adding nanoparticles. These systems have different industrial and refrigeration applications in electronic systems. In the present work a configuration of the refrigeration system to be used is proposed. The analysis consists of the mathematical mode from the design of the geometry and the trajectory of the flow in the pipeline, in addition to a simulation in Computational Fluid Dynamics (CFD) of the system. The conditions are presented in the results.

Nanofluids, Cooler , CFD simulation

Análisis energético de un sistema termoeléctrico para el aprovechamiento del calor residual en un motor turbofan mediante dinámica de fluidos computacional

Energy analysis of a thermoelectric system for the use of residual heat in a turbofan engine through computational fluid dynamics

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Abstract

This paper shows the energy analysis of a thermoelectric system coupled to a turbofan engine, which is based on the mathematical modeling of the heat transfer of the system during the cogeneration process using fluid dynamics (CFD). The use of waste heat from a turbofan engine would allow us to increase its efficiency which has both economic (due to fuel savings) and environmental (reduction of polluting gases). The proposed section for the installation of the thermoelectric system is the one that covers the turbine and the nozzle section of the turbofan engine, since they are sections in which there are better operating temperatures, in the order of 600 to 200oC. As results of the CFD simulation you get the distribution of temperatures through the thermoelectric and the difference of electrical potential generated. These results determine the overall efficiency of the system and the electrical energy generated by the waste heat. The energy generated by the thermoelectric system can be used in secondary aircraft systems, such as the lighting system, entertainment, etc. The importance of the analysis lies in increasing the overall efficiency of the engine combustion process, to reduce fuel consumption and the costs associated with it.

Thermoelectric Generator, residual heat, CFD Simulation

Diseño y análisis energético de un sistema de refrigeración autónomo para el traslado de vacunas

Design and energy analysis of an autonomous cooling system for the transportation of vaccines

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Abstract

Vaccination is one of the most important methods of promoting health in the world, to preserve the effectiveness of these pharmacological products the operation temperature range in between 2°C and 8°C. Thermoelectric coolers are solid state devices that convert electrical energy into thermal energy, although they are destined to small capacities of cooling which are of the order of 2 to 250 watts, they are optimal for the cooling of portable systems. This paper describes the design and energy analysis of a portable system for the transfer of vaccines in rural areas, which will be powered by solar energy. The design integrates the choice of thermal insulation, geometry and operation of the system. Energy analysis allows to obtain the necessary energy to maintain the vaccines at temperatures between 4 ° C and 6 ° C, from the estimation of the thermal loads, and thus the election of the photovoltaic system best suited to ensure the necessary autonomy time.

Portable cooling system, Transfer of vaccines, Energy autonomy

Modelado y simulación CFD de un sistema de refrigeración para el almacenamiento de vacunas contra la influenza estacional

Modeling and CFD simulation of a cooling system for the storage of vaccines against seasonal flu

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Abstract

It is very important to carry out vaccination campaigns in the marginalized areas of our country, because they are more vulnerable to contracting diseases, but to do the appropriate containers are needed so that they arrive with their properties and to protect each person. The Seasonal Influenza vaccine is transported in portable refrigerators at a temperature of 2 and 8 ° C, and the storage time is within 3 and 7 days for the first and 12 to 36 hours for the second. This paper presents the modeling and simulation by Computational Fluid Dynamics (CFD) of a refrigerated system, from thermoelectric cells, for the storage of influenza vaccines. The results show the temperature distribution within the refrigerated system and the transfer of heat in each container element, as well as the most appropriate arrangement to keep each vaccine to the optimal storage temperature. Being able to count on portable systems that allow the optimal transfer of vaccines keeping refrigerated in a constant way would have a positive impact on the health of people who live in marginalized areas.

Thermoelectric cooling system, Simulation CFD, Vaccines against seasonal flu

Prototipo de sistema fotovoltaico conectado a red eléctrica: Diseño, caracterización e implementación

Prototype of photovoltaic system connected to electrical network: Design, characterization and implementation

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Abstract

We present the design of a prototype solar photovoltaic system interconnected to the electrical network based the Standard CONOCER Mexico EC 0586.01 with which students from Polytechnic Universities and other education institutes technological of renewable energy acquire the theoretical-practical knowledge of photovoltaic technology, for so that students professionals more competitive. The prototype is designed using SolidWorks® software, is design for small space by the dimensions that have and is easy transportation because it does not weigh. The implementation consist in connections between components and the corresponding connections to the electrical grid and determine the acceptance by users through questionnaires applied. The characterization consist in acquired real-time physical and electrics parameters by computational tool designed, the graphs of characteristic curves of solar panels as function of solar irradiance and graphics of energy production of the photovoltaic system. Finally the use of the electricity network to supply an electric demand not covered by the prototype of grid interconnected photovoltaic system.

Photovoltaic system, Prototype, Certification

Simulación numérica de la cámara de combustión para un nuevo calorímetro de referencia/ Numerical simulation of the combustion chamber for a new reference combustion calorimeter

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Abstract

The Centro Nacional de Metrología is developing a reference calorimeter to measure the superior calorific value of natural gas in collaboration with the Instituto Tecnológico de Celaya. We present the study of the combustion chamber for two formulations a steady state (already published) against the transient state. The study of the combustion chamber is performed employing computational fluid dynamics (CFD) through FLUENT®. For this work, specific parameters were set to define and simulate the combustion process involving the exchange of energy, momentum and mass transfer. In this work, we present simulations performed in steady and transient state, for which was used the Eddy Dissipation Model (EDM). Is shown the simulation of two geometries for the combustion chamber; one cylindrical body a hemispherical lid and the other elliptical, which was proposed to increase the area to heat transfer to the surrounding medium, water in our case. The criterion for selection is the chamber that achieves the lowest temperature for waste combustion gases at the exit. Achieved by the cylindrical chamber with a hemispherical lid in the first 4 seconds with a difference of 0.4 °C lower than the elliptical chamber.

Superior calorific value, Reference calorimeter, Computational Fluid Dynamics

Métodos de remediación para la remoción de pesticidas en aguas residuales

Remediation methods for the removal of pesticides in wastewater

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Abstract

This work is part of one of the priorities of sustainable development that is the conservation of soil and the care of aquifers. Water is a vital liquid for human and all kind of living beings, the presence of pesticides in drinking water is a health problem that requires solution. In this paper, a review of the different methods used for the removal of pesticides in wastewater is made, such as biological remediation methods, using plants and microorganisms, remediation by physical methods by adsorption of contaminants with activated carbon, zeolites, polymers and clays and finally chemical remediation, through advanced oxidation with the production of hydroxyl radicals. A review of the most commonly used pesticides in the different agricultural areas is carried out, as well as their impact on the health of the inhabitants in these regions. Finally, a comparison of the advantages and disadvantages of these methods is made both for its effectiveness as well as for their cost.

Remediation methods, Removal of pesticides, Wastewater

Estudio de adsorción, retención y difusión de pesticidas piretroides como la permetrina en suelo agrícola y su capacidad para actuar como filtro

Study of adsorption, retention and diffusion of pyrethroid pesticides such as permethrin in agricultural land and its ability to act as a filter

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Abstract

This work is part of one of the priorities of sustainable development that is the conservation of soil and the care of aquifers. It is known that soil acts as a natural filter for contaminants in groundwater, so one of the most important objectives is to understand the interaction between soil and pesticides, especially pyrethroids, which are some of the most widely used today. as well as the process of retention and diffusion of these substances through the soil. A systematic study was carried out to determine the transfer, diffusion and retention of pyrethroid pesticides through agricultural soil samples. The kind of soils to be used in this study were identified, the quantity of functional groups was determined qualitatively using Infrared Spectroscopy by the Fourier Transform (FTIR) with Attenuated Total Reflection (ATR). Permethrin was taken as the pyrethroid model molecule, the qualitative concentration of permethrin absorbed in a soil bed was monitored using the absorbance of a suspension of permethrin in water. The pesticide retention capacity of two types of wet soil is shown and the mass flow through the soil bed was determined too. The magnitude of the mass flow was inversely related to the amount of functional groups in the soil.

Diffusion, Flux, Pesticides, Pyrethroid, Soil

Análisis de un sistema eléctrico industrial o comercial

Analysis of an electrical system, industrial or commercial

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Abstract

Every electrical system, either with small or big demand, needs to be diagnosed in order to determine its efficiency and quality degree as far as electric energy is concerned. Wherefore several variables and conditions are required about the equipment in order to verify its performance. The present work has the objective to evaluate an industrial electrical system in order to determine improvement areas in such system addressing part of these variables. The methodology used to measure such variables, is with the use of an electrical network analyzer, monitoring the consumption profile of such installation during a period of 24 hours, thereafter, making an analysis of the measured data in order to diagnose such a system. It is important to mention that there exist also other equipment such as the thermo-graphic camera in order to detect hot spots in the electrical installation that may lead to predict a possible failure in the future, but in this particular case, it will be focused on the electrical network analyzer equipment only. In this way, it is planned to contribute in the maintenance of the electrical devices and to the improvement of the energetic efficiency, having this way economic savings and helping to reduce the carbon footprint as well.

Electrical system, Monitoring, Maintenance

Control operacional para reducción de consumo de energía eléctrica en el instituto tecnológico de Chihuahua II

Operational control to reduce electricity energy consumption at the Chihuahua II technological institute

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Abstract

Operational control to reduce electricity consumption in the Technological Institute of Chihuahua II, is a subject of great interest for the technological community, as it is an institution committed to caring for the environment and the efficient use of energy. It is currently certified by the ISO 14001 standard in its Environmental Management System (SGA) and the ISO 50001 standard in its Energy Management System (SGEn).There is information on electricity consumption since 2011, and it is from 2012 that a monitoring program and visual aids for the operational control of consumption and its reduction were implemented. The objective of the investigation is to determine if the actions taken are resulting in a reduction of consumption and efficient use of electrical energy.According to the considered data, a downward indicator is observed, with a slight increase in 2018, determining if this reduction is statistically significant, a series of statistical analyzes is performed, such as ANOVA, regression, correlation and paired tests

Control, Electric power, Reduction, Efficiency

Prototipo electrónico simple y de bajo costo para rastreo de vehículos basado en GPS

Simple and low-cost electronic prototype for GPS-based vehicle tracking

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Abstract

This article presents an electronic prototype for vehicle tracking based on GPS (Global Positioning System) location as a proposed solution to the problem of vehicle theft that affects the Oaxaca de Juarez municipality and its surrounding municipalities, according to statistics from the Office of the Prosecutor Specialized in High Impact Crimes, vehicle thefts have increased rapidly in recent years.The "V" diagram was used to make the prototype, which proposes a solution within reach of the owners of vehicles, since similar products require the device and the payment of a membership to follow up in real time. The prototype consists of an Arduino board, a GPS module, a communication module for sending SMS (ShortMessage Service) messages, an accelerometer to detect vehicle movements and other components that are required for the operation of the complete circuit. The program has been developed in C language for Arduino and a free application of GoogleMaps is being used to send the location of the vehicle when detecting any vehicle movement

Anti-theft device, Arduino, GPS

Sistemas de bombeo solar en Pachuca Hidalgo

Solar pumping systems in Pachuca Hidalgo

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Abstract

The extraction of water from wells for supply in rural populations is one of the most profitable and novel applications of photovoltaic solar energy. The use of a specific type of submersible pumps for applications with photovoltaic energy, that work with direct / direct current (DC / DC) generated directly from the photovoltaic modules, allows an independent installation of the electrical network with very scarce maintenance needs, in This project was carried out the sizing, installation and commissioning of an autonomous pumping system with a submersible pump powered by a photovoltaic solar installation in the municipality of Actopan Hidalgo in the state of Pachuca. To implement the project, a climate study was first carried out. the area to support the efficiency of the solar pumping system, in this project we used 18 panels of 150 W, a SubDrive Solar controller, a Franklin Electric pump of 3 HP and a frequency inverter for the optimization of said pump.

Solar energy, Solar pump, Solar panel

Diseño y desarrollo de un prototipo Checking – Fixture para componentes de la industria automotriz con un enfoque hacia la industria 4.0

Design and development of a prototype Checking - Fixture for components of the automotive industry with a focus on Industry 4.0

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Abstract

The present work shows the design and the integration of several complements in a device at prototype level that carries out the tracking of the physical and dimensional characteristics for components of the automotive industry based on the new technological trends, as it is the industry 4.0. For this purpose, CAD design software such as Solidworks 2017 is used, the use of CAM systems with EdgeCam 2019 software as a manufacturing element, the vision system is used using the Matlab software and the Minitab 2017 statistical tool as an interface a device that helps to know the behavior of the parameters that are defined as critical in the production of automotive components and be able to carry out the necessary adjustments in the production parameters to reduce the variability in the process. Looking to have information in real time and make timely decisions. Generating the corresponding statistical control charts, with the aim of avoiding possible reworking or in the case of scrap generation.

Checking – Fixture, Industry 4.0, Automotive Industry

Diseño de una aplicación móvil para diagnosticar plagas en cultivos de maíz

Design of a mobile application to diagnose plagues in corn crops

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Abstract

The agricultural activity in the Mezquital Valley is highlighted by the production of corn, which makes it one of the main economic activities of the region, however the production of this crop is affected by different pests, mainly: blind hen (Coleoptera), Worm Cogollero (Spodoptera frugiperda) and Worm Trozador (Agrotis ípsilon), these propagate in certain stages of corn growth and are usually very harmful to their development and may even cause the total loss of production, which is why The purpose of this work is to present the design of a mobile application, which will allow to choose some characteristics to determine which pest is attacking the crop and with it to reduce in time the damage that they can cause and to diminish or to avoid big losses in the production. For the development of this project, the cascade methodology is implemented, consisting of 5 stages, requirements, design, implementation, verification and maintenance.

Mobile application, Plagues, Corn

Detección de fallas en máquinas rotatorias utilizando parámetros no lineales

Fault detection in rotatory machinery using nonlinear parameters

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Abstract

With the development of modern electronics and the increase in processing power it is now possible to install many and diverse sensors in a single type of machinery. Temperature, vibration, pressure, voltage, etc. they are variables that are commonly monitored in rotating machinery. These variables together contain all the information related to the condition of the machine. In case of a malfunction, this will be reflected in one or more of the monitored variables. These changes can be so subtle that they can not be noticed directly in the time series. Therefore, it is necessary to transform this information into a new and more useful representation. In the present work an alternative methodology is exposed for the analysis and diagnosis of malfunctions present in components of rotating machinery. This methodology is based on the processing of time series obtained from the sensors installed in the machinery, without considering the model of this. The extraction of nonlinear parameters is presented as an alternative, among which the maximum exponent of Lyapunov stands out, as an indicator of the state of the machine. In conjunction with traditional parameters it makes it possible to detect faults masked due to non-linear behavior of dynamic systems.

Fault detection, Dynamical systems, Lyapunov exponent

Diseño, desarrollo e implementación de una celda de manufactura didáctica para ingeniería mecatrónica en la UPTx

Design, development and implementation of a didactic manufacturing cell for mechatronic engineering at UPTx

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Abstract

The present work presents the fundamentals, the main activities developed and the results so far obtained by teachers of the academic program of mechatronic engineering with the design project, and implementation of a didactic manufacturing cell for the academic program of mechatronic engineering in the laboratory of machine tools-CNC of the lt2 in the UPTx. This cell is a sample of the reinforcement and potentialization that higher education institutions can carry out to potentiate the technological transfer with the business sector of the region.The integration of the didactic manufacturing cell was carried out as an academic project in which the existing equipment in the different laboratories of the educational mechatronic engineering program was used and integrated with the design and elaboration of the missing ones for the complete development. The main benefits obtained are the strengthening of the skills and competences that students can achieve during the period of their professional training at the University, as well as familiarizing the student with industrial environments, in a second stage it is intended to use said cell as Continuous education resource with the companies of the region, as well as with the graduated students

Didactic manufacturing cell, Mechatronic engineering, Implementation

Diseño y construcción de un pico-satélite educativo CanSat tipo rover denominado EagleSat V2.1

Design and construction of an educational CanSat pico-satélite rover type called EagleSat V2.1

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Abstract

It is described how a CanSat pico-satellite type rover was designed and built to compete in the Fourth CanSat National Educational Satellites Competition. Students of Engineering in Information Technologies and Communications with the support of teachers of that career designed and built the pico-satellite called EagleSat V2.0. Using the methodology of the "V" model, the mission was conceptualized which was the sending of data of: internal and external temperature, pressure, relative humidity, altitude, longitude, latitude, battery level, vibration and acceleration through telemetry to an earth station; take video and return to the starting point using a rover type vehicle; the requirements and architecture of all stages of the EagleSatV2.1 were specified. Starting from the architecture, the printed circuits were designed and built, the components and the different sensors were welded to measure the data. In addition, a mechanical structure and tires were designed and printed on a 3D printer which would make up the Rover type vehicle. Thanks to the excellent work done, the first place was obtained in the Fourth CanSat National Satellites Educational Contest in the comeback category.

CanSat, method in V, rover vehicle

Control Robusto $\mathcal{H}_\infty$ en forma global para robot manipulador

Global Robust Control $\mathcal{H}_\infty$ for robot manipulator

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Abstract

In this paper is proposed a solution to the tracking problem with robust H_∞ global control, applied to robot manipulator completely actuated with rotational joint in presence of external disturbances. The Hamilton-Jacobi-Isaacs inequality is verified by a strict function of Lyapunov and enough conditions will be found under which the equilibrium point of the closed-loop system is asymptotically stable globally while the disturbed system has a gain L_2 less than or equal to a predetermined constant. Currently, one of the disadvantages of the H_∞ control, with respect to other control techniques, is the linearization of the system around a point of equilibrium, which converts the Hamilton-Jacobi-Isaacs inequality into algebraic of Riccati equations, which facilitate the solution to the motion control problem H_∞, however, the controller becomes local. Now, through a strict function of Lyapunov it was possible to verify that the Hamilton-Jacobi-Isaacs inequality is satisfied globally. The theory is validated in a robot manipulator with l degree of freedom.

Robust control, Nonlinear systems, Manipulator robots

Manufactura de un prototipo automatizado para la cocción de tortilla de maiz

Manufacture of an automated prototype for the cooking of the tortilla

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Abstract

In the present work of the manufacture of an automated prototype for cooking for corn tortillas, which is a food base mainly for Mexican cuisine, where the elaboration process is done manually by hand by people who press the dough to form the tortilla put on the griddle and during the cooking process they are turned manually and using an average of 3 times. Therefore, the objective was to make a prototype of three rotating comals for the cooking of handmade tortillas to automate the process of turning and cooking the tortilla for the transformation of the raw material (dough). with which the temperature can be programmed in a range of 240 ° C-260 ° C with LP gas, without people having to turn the tortilla and thus use less time and obtain more production and only one person operates the burners, but you also have great savings in gas consumption. To carry out manufacturing and automation, three important disciplines of the mechatronics career were used, which are: mechanical, electronic and computer science. Helping in its process.

Automátion, Manufacture, System

Rediseño de un triciclo de carga pesada, libre de contaminación

Redesign of a tricycle to heavy load, pollution-free

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Abstract

The tricycle is a widely used tool nowadays due to its versatility, since it allows effectively transporting all types of loads such as: construction materials, fruits and vegetables, traveling businesses, and even human passengers. Currently consists of three wheels two front and one back forming a triangle, its components are: tires, wheels, seat, lift truck, frame, transmission chain, multiplication, back gear, the counterpedal mass, among others. The article describes the redesign of a heavy load tricycle capable of loading 700 kg without deforming its structure. For this purpose, it follows the design process proposed by Budynas and Nisbett in his book "Design in Mechanical Engineering of Shigley". Likewise, the design and simulation has been worked in a trial version of the Siemens NX 10 software, which is a CAD software. The plans of all the designed components are presented, as well as a graph of their assembly.

Tricycle, Redesign, Heavy load

Revisión del estado del arte de la extracción de características de señales electroencefalográficas

A review of the state of the art of feature extraction of electroencephalographic signals

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Abstract

We present a review of the state of the art of the techniques and algorithms most used in the selection and detection of characteristics of electroencephalographic signals of people when consciously performing activities. These features are numeric parameters that describe the behavior of the signal and are the basis of patterns. In addition, previous experiences in the acquisition of electroencephalographic signals using the Epoc brain-computer interface manufactured by Emotiv are presented. First, some techniques used to eliminate artifacts (disturbances) present in the signal generated by blinking, strong breathing or other movements that contaminate the signal are presented. Later, the algorithms most frequently used in the processing of electroencephalographic signals are shown for the extraction of characteristics that describe the behavior of these patterns and that can be used to detect and recognize patterns in other signals. Finally, we present the lessons that we have acquired as a work team in the recording of electroencephalographic signals in order to be helpful for beginners.

Feature extraction, Electroencephalographic signals, BCI

Sitio web y aplicación móvil para el control de datos climatológicos a tráves de sensores en un prototipo de estación agrometeorológica

Web site and mobile application for the control of climatological data through sensors in a prototype of agrometeorological station

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Abstract

The National Institute of Forestry, Agriculture and Livestock Research, Iguala Experimental Field and the Technological University of the North Region of Guerrero, are joining their knowledge in the scientific and technological field with the purpose of developing collaborative projects. In the State of Guerrero, there is a lack of accurate and timely agroclimatic information that serves as a determining factor in decision-making in productive processes. The purpose of this study is to develop a website and a mobile application, where the information issued by the prototype of agrometeorological station can be accessed. The data will be entered into a database on the website and will be stored every 10, 15 or 30 minutes of the climate variables, such as: temperature, relative humidity, precipitation, solar radiation, leaf moisture, speed and direction of the wind. The mobile application will allow to consult historical and real-time weather data. This will result in better control of environmental information so that producers in the cultivation of corn, fruit and vegetables can prevent and avoid pests and diseases of their crops.

Website, Mobile Application, Climatological Data

Prototipo de estación agrometeorológica de monitoreo de datos climatológicos

Prototype of agrometeorological station of monitoring of climatological data

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Abstract

One of the limitations in agricultural production in the State of Guerrero is the various events of meteorological disasters, with the case of recurrent drought, hurricane winds, high rainfall that cause floods and very high daytime temperatures that directly affect annual crops (corn, beans and sorghum) and perennials (mango, lemon, avocados). In the entity there is little accurate and timely agroclimatic information that serves as a determining factor in the decision-making process of production processes. The present study has the purpose of developing a prototype of low-cost agrometeorological station. The data can be monitored via the Internet 24 hours a day, from the climate variables, such as: environmental temperature, relative humidity, rainfall, solar and ultraviolet radiation, wind speed and direction. With the storage of these climatological data, information will be obtained that contributes to the prevention of diseases and pests in the cultivation of corn, fruit trees and vegetables of economic importance. Reason for which the National Institute of Forestry, Agriculture and Livestock Research and the Technological University of the North Region of Guerrero, are joining forces in the development of a prototype of agrometeorological station.

Prototype, Agrometeorological Station, Climatological Variables

Obtención de metano por medio de la combinación de excretas de vacas y conejos

Obtaining methane through the combination excreta of cows and rabbits

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Abstract

The work shows the methane production that was obtained by combining different substrates of cow and rabbit excreta. Five biodigesters of the Batch type were used for the study, in which they were filled with different proportions of cow, rabbit and water excreta, in order to quantify which combination produced the greatest amount of methane. In order to know the amount of moisture free material and the fraction that has to produce biogas, the dry mass and volatile mass of cow and rabbit excreta were determined. During the test, readings of pH, pressure, temperature and composition of the biogas were taken. In the end it was obtained that the substrate formed by 10% of cow excreta, 40% of rabbit excreta and 50% water, presented the highest amount of methane of all the combinations.

Biodigester, Biogás, Methane

Software para administrar recetas de comida típica de la región

Software to manage recipes of typical food of the region

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Abstract

Development of software that facilitates the administration of typical food recipes from the region, which can be shared with other users, in addition to being able to follow up the information posted on the web quickly and easily.It is sought that with the use of software of this type, users who have access to the platform can share and in the same way take, typical recipes from the region and from other regions, to preserve traditions and have a variety of information with which they would have a diversity of possibilities when preparing meals.On the other hand, a functional prototype of the software was also obtained, which was achieved following a spiral development methodology.

Software, Information management, Spiral development methodology, Recipes

Propuesta de tratamiento terciario de aguas residuales no convencional para la mejora de la calidad del efluente

Proposal for the treatment of unconventional tertiary waste for improving the quality of effluents.

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Abstract

As a study of the proposal of a tertiary system for the improvement of the effluent quality of the wastewater treatment plant of the municipality of Jilotepec, the implementation of strategies has been sought, in order to achieve a qualitative research method, focusing on design and mathematical calculations, of wastewater use. To this end, the objectives are to carry out a research methodology proposed to analyze the arrangement of the aerators within the position of the Imhoff-type aerobic reactor, thereby achieving an acceptable sedimentation process, and subsequently to change the position of the aerators within of the aerobic reactor achieving a more complete cleaning to allocate the effluent for irrigation under the parameters of NOM-001-SEMARNAT-1996, looking for a better quality of effluent, with destination of urban use and as a calculation strategy it was proposed to implement a process of phytoremediation to avoid possible damage to the effluent.

Proposal, Research, Water

Comparaciones ópticas y estructurales de las películas de óxido de silicio rico en silicio (sro) depositadas por las técnicas lpcvd y hfcvd

Optical and structural comparisons of the silicon rich oxide (sro) films deposited by lpcvd and hfcvd techniques

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Abstract

In this work, we conducted a comparative study of the optical and structural properties of Silicon Rich Oxide (SRO) films deposited by two chemical vapor deposition techniques: at Low Pressure (LPCVD) and activated by Hot Filament (HFCVD). SRO-LPCVD films were deposited at a silane and nitrous oxide pressures (R_0=P_(N_2 O)/P_(〖SiH〗_4)) rate of R0=10 y R0=25. SRO-HFCVD films were deposited at a hydrogen pressure of 25 and 100 sccm, at a distance between source and substrate of 8 mm. To improve the optical properties, we have subjected the films obtained by both techniques to thermal treatments at high temperatures. The optical and structural characterizations that we used for comparison of the films were: Null Spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR) and Photoluminescence (FL), Scanning Electron Microscopy (SEM) and High-Resolution Transmission Electron Microscopy (HRTEM). The SEM microscopy corroborates the thicknesses of the SRO films obtained by Null Spectroscopy, likewise, the HRTEM microscopy corroborates the diameter size of the silicon nanocrystals (ncs-Si), which also were calculated theoretically with the band gap energy (Eg) obtained in the FL spectra. These characterizations show that either of the two techniques are excellent alternatives for obtaining SRO films with photoluminescent emission, which can be used for photodetector and electroluminescent devices.

SRO, LPCVD, HFCVD, FTIR, SEM, HRTEM, Photoluminescence

Análisis de reducción de ruido eléctrico en MOSFETS tipo SI y SiC mediante disparadores ópticos

Electric noise reduction analysis in MOSFET Si and SiC by optic drivers

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Abstract

The current demands in the development of applications in power electronics, centered on intelligent electrical networks, power converters and charging systems for electric cars, to mention some of them, generate demands and requirements for the manufacture of devices and for the semiconductor material used. The already known silicon technology is not able to withstand this type of conditions, since they can not operate at high temperatures. That is why similar materials, such as silicon carbide (SiC), generate a great interest for the electrical properties that it presents in relation to other semiconductors. However, the losses due to their rapid switching mean that SiC devices can not operate at high frequency, which is a requirement for implementations in high power converters. In the present work, the differences in the operation of the SiC and Si MOSFETs are analyzed, as well as the efficiency obtained when proposing a switching through optical controllers.

MOSFET, Analysis, Opto-drivers

Aplicación de algoritmo de filtrado colaborativo para realizar recomendaciones de productos turísticos en el estado de Oaxaca

Appliance of collaborative filtering algorithm to make recommendations in the state of Oaxaca for touristic products

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Abstract

The state of Oaxaca,México, is visited by millions of tourists every year. According to data from the Ministry of Tourism in 2018, there was a hotel occupancy of 5,038,769 visitors, both locals and foreigners. The number of sites that can be visited, routes that can be toured or activities that can be done are varied so the making of decision process could become complicated. There are several promotional web sites that can guide tourists about their trip, however, what is nice for one, may not be for another, because the profiles of tourists vary depending on the purpose of their visit, their age, the amount of money they have destined for the trip, among other things. Being able to predict tourists products to improve their travel experience is very important for the government, service providers and of course, for tourists, therefore the importance of applying a collaborative filtering algorithm to make recommendations to the tourists about places, hotels and restaurants that could improve economy in the whole state. Besides, the algorithm could help to point the routes in a map for quick reference and location.

Collaborative filtering, Algorithm, Tourism

Análisis de los factores de productividad, desperdicio y confiabilidad de los equipos, al implementar TPM en una empresa del sector automotriz

Analysis of the factors of productivity, waste and reliability of the equipment, when implementing TPM in a company of the automotive sector

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Abstract

Total productive maintenance (TPM), is one of the practices most used by automotive companies, to increase their productivity, which is why this research is carried out in an automotive company validating this assumption, with the implementation of the TPM in a productive line and determining by means of an experiment design, if the TPM does not significantly affect the indicators of efficiency, waste, reliability of the equipment, because these indicators are important for the productivity of the company. With this analysis it was possible to demonstrate, for this particular case, that the MPR tool does help improve two of the indicators, although this conclusion only applies to this company and the line in which said analysis was applied, under the conditions in which was evaluated the tool, so that this conclusion is more general, it has to be evaluated in other companies and to be able to make the comparison of the behavior in each of them.

KeyWords: TPM, Improvement, Experiment design

Nivel tecnológico de la industria aeroespacial de ensenada, B.C. en sus procesos de manufactura

Technological level of the aerospace industry of ensenada, B.C. in its manufacturing processes

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Abstract

The present project was carried out with the purpose of characterizing the technological level of the aerospace industry of Ensenada, B.C. Mexico., In its manufacturing processes to establish areas of opportunity and determine its impact on competitiveness. A quantitative, descriptive research was carried out to establish the level of automation, which was applied in direct surveys in industrial visits (Ovalle, et al., 2013). Seven companies were interviewed where it was determined that they have different strategies for the purchase of new technologies, including automation. It was identified that companies acquire the new technology through previously selected suppliers and in some cases quoting new suppliers. Technological surveillance is preferably carried out in catalogs or with the visit of suppliers; also by customer recommendations, or visiting fairs or technology missions. It was recorded that some companies have the advice of research centers and that they select the new technology through the criteria of standardization and adaptability to the process, followed by price and brand. The highest levels of automation were recorded in the communication, production process and the stages of supply of materials.

Aerospace, Automation, Competitiveness

Evaluación de tecnologías de sistemas de gestión de contenidos (CMS) para el desarrollo de modelos de negocio electrónicos e-bussines

Evaluation of content management systems (CMS) technologies for the development of electronic business models e-bussines

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Abstract

A content management system (CMS) in its acronym in English is a software that allows designing an online store, meeting the needs of the micro company to implement web platforms for online sales, the technical evaluation is presented at the descriptive and qualitative level of the best practices of the most used CMS: Magento, PrestaShop, WooCommerce, Wordpress and Joomla, in this sense it is proposed that the more functionality and simplicity offered by the CMS, it is possible to adapt to the real needs of micro businesses , the methodology used was oriented in two main phases, a documentary research comparing the characteristics of each product and another performing installation tests observing functionality and integrity of the information, observing through a case of application the behavior of the sale process, obtained a concentration of technical characteristics, advantages and disadvantages of each pro duct identifying the most suitable product for a type of electronic business model. It has been concluded that Prestashop and Wordpress are ideal products for the development of electronic businesses adapted to micro businesses, in relation to the functionality, stability, integrity and simplicity that they offer in their application.

Content Management System, Bussines intelligence, Indicators

Aula interactiva 3D como recurso para la enseñanza en el Tecnológico Nacional de México campus Oaxaca

Interactive classroom 3d as a resource for teaching at the Tecnológico Nacional de México campus Oaxaca

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Abstract

This article builds a prototype of an immersive virtual classroom implemented in the I.T.Oaxaca that serves as support to the learning process of the students of Computer Systems Engineering. Without discarding in the future, this advisory platform will be incorporated into other engineering services offered at the institution. The experimental proposal uses the metaverse of Second Life, simulating physical spaces in three dimensions and allowing users (avatars) to interact with each other in order to exchange information and experiences. Despite being in the beta phase of the implementation, interesting indicators and learning expectations have been obtained in the students by associating the knowledge mediated by the interaction between their avatars and the 3D scenography; which immerses the student in a new study adventure with high levels of interactivity, leading it in an informal way to a new learning style.

Avatar, Metaverse, Virtual worlds

La tecnología en la aeronáutica en pro de las energias renovables y de la bio-sustentabilidad

Aeronautics technology in favor of renewable energiesand sustainable bio

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Abstract

Basic sciences, technology and human sciences in aeronautics are integrated in favor of renewable energies for sustainable development.Thus, the objective of this project is to create a rainwater and condensed water storage system with automated irrigation, powered by solar energy that provides crop moisture and contributes to the reduction of CO2 in the semi-desert region of Querétaro. The methodology used is action research, which consists of observing and detecting a real problem to immediately analyze and assess the possibilities of intervention. In this case it was the waste of natural resources in the university (water and solar energy). An action strategy was designed afterwards which consisted in: 1. Integration of a team of specialist teachers and students. 2. General planning of the project. 3. Theoretical and field research. 4. Systems design: hydraulic, structures, automated irrigation with solar energy. 5.Application of device tests and the study of the process of crop growing and composting. Our contribution in this project is above all social and ecological and not to science; university social responsibility is encouraged emphasizing the importance that the application of technology offer alternatives for the care and use of natural resources and greater use of renewable energy. As an added value, the project contributes to applied research with an interdisciplinary approach of professors and students of different aeronautical careers in favor of sustainable development. It is clarified that during this initial stage there is still no scientific contribution made as we plan ,in a subsequent stage, to test and show levels of radiation and humidity in the region.

Technology, Renewable energy, Sustainable Bio

Diseño experimental de aerogenerador tipo savonius

Experimental design of savonius wind turbine

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Abstract

This project applies renewable energy technology, the calculation and design of an experimental Savonius vertical axis wind turbine is described. The objective is to acquire the necessary information for the construction and modeling of an experimental wind turbine. This prototype was constructed to use the movement of the air to generate electricity in a clean and non-contaminant way. The parts were assembled to make as much energy as its possible, those designs were calculated using the formulas of wind resource harnessing. Following this clean and non contaminant ideas, we recycled most of the materials used for the construction of this prototype. We calculated the rotative speed of the device according to the wind, we also calculated the electric energy that the device could generate with the wind. We studied the environment data such as wind speed, temperature for three weeks, where installed the experimental device it is going to be.

Renewable Energies, Wind Turbine, Savonious

Sistema de encuestas georreferenciadas utilizando Java Spring Framework con el modelo de vista del controlador

Implementation of a georeferenced survey System with Java Spring Framework using controller view model

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Abstract

Information systems support many purposes in organizations of any kind. Sometimes the information systems are used to know the tendency of the population on diverse subjects; surveys have become a public issue of relevance to people. In this project a web information system of georeferenced surveys has been developed and implemented to know the vote intention of the population of the Central Region of Coahuila. Using the Netbeans Integrated Development Environment with the Controller View Model pattern and MySQL for the database management. As a result, the application has been designed to identify geographic coordinates of the areas of interest for the application of the survey through waypoints and tracks; which record exact data of the location of the interviewer; the spring web framework modules was used for the complete development of the application. Approximately 2800 surveys were applied in a 3-month span and it allows recording of the audio session for each one of the pollsters, according to the selected area and the corresponding sectional; obtaining precise and exact data on the opinions of the respondents for subsequent analysis and graphing.

Georeferenced system, MVC Pattern, Spring framework, Java, MySql

MatLab y sus toolboxes como herramientas IoT para facilitar el desarrollo y diseño de sistemas mecatrónicos: Migrando hacia la I 4.0

MatLab and its toolboxes as IoT tools to facilitate the development and design of mechatronic systems: Migrating towards I 4.0

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Abstract

This chapter deals with the tool tables that are used in MatLab, used as tools that facilitate the calculation, simulation, development and design of applications that are highly compatible. engineering, mainly by students, since they are not easy to manage, licenses are usually not available in the same place as research centers have unlimited use of them, the opportunity to be little known, consequently little handled. What is more important is a work platform, through the development, use and applications of the tool boxes, it has become versatile and complete, because it is not necessary to learn large programming codes, since a low work environment is known which builds confidence in the development of designs and simulations. Tools to show that it is easier and more complete, reduce the analysis time and ensure that the result is as close as possible to reality. All the tools were improved 4.0, in the middle of the fourth industrial revolution, and in a single software which allows to generate multiple applications.

MatLab, I4.0, Fourth Industrial Revolution, Toolboxes

Diseño de software educativo para elevar el aprendizaje significativo de los estudiantes de nivel básico: Un caso de estudio

Educational software design to increase the meaningful learning of students on elementary level: A case of study

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Abstract

In the document "Rethinking education, towards a global common good" published in 2015 (UNESCO, 2015) established that a quality basic education is the necessary foundation for learning throughout life in a complex and rapidly changing world, so this article presents an educational software which is a mobile application that helps students to identify their learning style. This application implements the learning style into lesson plans and study techniques to help each student achieve their full potential. The application helps students to become competent and confident ICT (Information and Communication Technologies) users who can use basic knowledge and skills acquired to assist them in their daily lives, facilitates good communication between students, thus promoting better social understanding and is a potential tool that modifies the paradigm of education in the 21st century.

Learning, Mobile applications, Education, Knowledge, Learning style

Desarrollo de sistema web como herramienta de aprendizaje para Náhuatl en la variante orizabense

Development of the web system as a learning tool for Náhuatl in the Orizabense variant

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Abstract

The development of a web system is proposed, which allows teaching-learning of Nahuatl in its Orizabanese variant with the help of visual and auditory elements, so that the user can acquire basic knowledge about speech processing, fostered in society and mainly in young people the preservation of this macro-language, customs and traditions through the inclusion of technology. For the development of the website PHP, HTML, CSS and MySQL were used as basic tools for its programming. As a result, the implementation of the website as a learning support was achieved, which allows to visualize and listen in real time to the pronunciation, writing and meaning of basic words and sentences, which are commonly used in conversations for everyday life. In addition to different modules that seeks interaction with the user. This platform aims to promote the preservation and dissemination of dialects and traditions among the Spanish-speaking population, through inclusion in technology through websites.

Nahuatl, Learning, Web

Universidad e Industria 4.0: El desarrollo de proyectos tecnológicos desde la perspectiva de género

University and Industry 4.0: The development of technological projects from a gender perspective

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Abstract

The conceptualization of Industry 4.0 emerged in Germany in 2010 as a high-tech strategy has had a global impact on the development of technology-based projects, supported on pillars such as the Internet of Things or the simulation of manufacturing processes. In this sense, and derived from the procedures called industry stays carried out by the areas linking universities with companies, all the actors has assumed the commitment of forming specialized human capital that solves technological problems and support the business and social sector. Because knowledge is the foundation of technology, its development requires experience to generate and structure ideas using the intelligence and ingenuity, so in these models of synergy and linkage, the mechanism that guarantees the convergence between academia and industry is the teacher advisor, as a central figure that amalgamates the actors involved: the advisors (as) industrialists, the students and, in many cases, the chambers, groups or the different governmental instances.This support structure is essential because with the overwhelming insertion of new technologies in such a short historical period, in addition to the digital divide, they have revealed different forms of subjectivity fostered by the Internet and new exclusions related to gender, such as the scarce presence of women in the patent registration, the industrial design or intellectual property, making it a priority to establish what is the participation of academics in Industry 4.0 and what are the possible areas of opportunity to reverse this trend of segregation.Therefore, to describe the contribution of women in the development projects carried out through the university business linkage scheme that are based on the pillars of Industry 4.0 is the objective of this research; the method used during the process has a quantitative approach and the scope of the identified variables is presented with descriptive statistics and bi-varied analysis by Spearman correlation.This study includes a documentary analysis of 1406 projects at the Higher Technical University level and Engineering of technological education programs, in which the participation of the students in the development of projects and the academic advisors is determined. Among the significant findings found, in some educational programs, the projects, in which women are appointed as academic advisors, are of low impact or may have little relation with the pillars of Industry 4.0, therefore in those programs prevails the disparity from a gender perspective.

University and Industry 4.0, Technological projects, Gender Perspective

GUÍAME: Prototipo de herramienta para la asistencia en el desplazamiento de personas con discapacidad visual

GUÍAME: Prototype tool for assistance in the displacement of people with visual disabilities

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Abstract

Technological innovation plays a very important role in the development of society because with it, many of the social problems that currently afflict humanity are being solved. According to the INEGI in 2017 in the State of Oaxaca there are 3,967,889 people, of whom 2.3% suffer from visual disability, in the capital of the State of Oaxaca there are 1,368 people with this disability. Unfortunately, as in most of the country, there is no vision, nor the resources to plan "INCLUSIVE" infrastructure for the disabled as set out in the General Law for the Inclusion of People with Disabilities, installing specialized equipment that integrates and promotes the indiscriminate coexistence and without limits (few possibilities to move) affecting mainly their development as an individual by dependence on a person, cane or guide. There are no records of minors leaving without company on the street and in adults is only 20% (INEGI, 2017) to perform some diligence, this for fear of being disoriented. Therefore, an inclusive support tool for people with visual impairment called "Guíame" has been developed; with the intention of helping to improve the conditions of well-being (quality of life) on a physical (health), psychological and social level. This device detects and recognizes objects in front of the user by means of artificial vision and prevents in an auditory way so that the user decides to stop and / or avoid it. And with an Internet connection, you will be able to guide you from one place to another freely through the streets of the City of Oaxaca with an interactive map. Currently in Mexico there is no system capable of helping people with this disability, as "Guíame" does.

Disability, Artificial intelligence, Inclusive tool

Aplicación móvil para la preservación de las lenguas originarias de México aplicando Inteligencia Artificial

Mobile application for the preservation of the original languages of Mexico applying Artificial Intelligence

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Abstract

Nowadays, Information and Communication technology is widespread; to such a degree that they are applied in all areas of daily life, for example, learning, sharing information or simply to be able to communicate. That is why the project called “Mobile Application for the preservation of the Originating Languages of Mexico applying Artificial Intelligence" was developed. It generates an opportunity to the society, the native people and the individuals for the preservation of the languages, since they allow the communication, preservation and diffusion that gives as result the integration of culture in our society.Currently, the original languages in our country are being lost more and more, due to the migration that their speakers tend to make in search of better life opportunities.They face discrimination because of the language, and, it can result in psychological violence tendency. The way those people encourage discrimination is stop speak their native languages. The consequence could be the lost of native language.Mexico is one of the countries with the greatest cultural and linguistic wealth in the world, having 68 native languages and 364 linguistic variants of which approximately 70% are at risk of disappearing, a situation that is unacceptable. In Mexico, 14 of the indigenous languages are about to disappear, so it is considered very important to look for strategies for their conservation, because these languages are part of the diversity of languages that exists in the world.

Native languages, Mixteco, mobile application, artificial intelligence, Mobile methodology

La adecuación de las pruebas de usabilidad para identificar errores en el diseño de textos digitales interactivos

Suitability of usability tests to identify errors in the design of interactive digital texts

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Abstract

The subject of this research is to probe that usability tests used in computer science can contribute to improve interactive digital texts (TDI) one product of editorial design. For this, an experiment was designed based on the Spiral Methodology of Barry Bohem (1988) proving TDI are evaluable by data and that production errors are easily identifiable through usability tests. This research contributes to the profession of the graphic designer by allowing them to appropriate usability tests and adapt them to their products, using new skills - beyond the excellent composition and semantic load of their elements - to support their proposals with empirical data, corrections and redesigns; and with this it is demystified that the designer is guided only by the taste for the composition by verifying that the "taste" is for the good function.

Usability, EPUB, e-book

Análisis de la sustentabilidad energética del proceso de reciclado de PVC de alfombra modular

Energy sustainability analysis of the recycled PVC from carpet

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Abstract

Due to the great growth of the world population and the increase in the standard of living in general, the use of textile fibers has increased significantly in recent decades. In this context, this article allows to show an analysis of the sustainability of the carpet production process and the perspectives that have the process of recycling it in Mexico, focusing mainly on PVC recycling. This paper is one of the results of one CONACYT-PEI Project, in which it objective is the design of a carpet recycling process in Mexico. In order to show the potential and savings generated by the recycling of some compounds such as PVC, Nylon, polyester and synthetic fibers, an analysis of the background on the process of recycling of carpets and textiles worldwide and in the United States is performed. Likewise, an analysis is carried out on the energy and water consumption of carpet production with virgin materials and the recycling process. In order to present a context and show the viability of the process. This document is focused particularly in the recycling process of the carpet backing. Finally, some criteria are taken to obtain conclusions regarding the sustainability of the process.

Carpet recycling, Energetic sustainability, PVC

Aplicación de las tecnologías móviles al servicio de transporte público para personas con discapacidad en la ciudad de Oaxaca

Mobile technologies application to the public transport service for people with disabilities at Oaxaca City

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Abstract

The present paper has the purpose of disclosing the works carried out by a group of research professors of the Tecnológico Nacional de Mexico / Instituto Tecnológico de Oaxaca with the students helping. It addresses the solution to a real problem, which occurs in a vulnerable society group, as it is, people with disabilities. This people is attended by the DIF of the state of Oaxaca; In this case, a mobile and web application for control and monitoring of the "DIF takes you" program is developed, these applications allow the control of adapted transport units for people with disabilities and their use within the limits of the city of Oaxaca and Oaxaca conurbations. The applications functionality allow the registration of users who through a subsidized monthly fee can use the specialized public transport service, the monitoring of the service, as well as the drivers of the units, and, the service units themselves. Likewise, a very important feature is that the route of the units can be visualized in a Google map, being able at all times to follow the route of the units in real time. On the other hand, the web application was developed for service administrators, in order to obtain binnacles of the use of transport units, fuel loads and mileage traveled; administrator can also control the assignments of drivers to the units, among other functions. For the development of the software, the Scrum methodology and a series of programming tools are used for both mobile devices and web systems.

Disabilities, Mobil application, Web application, Scrum

Desarrollo de sistema de control de reactivos con base en la inspección de la superficie de la espuma y su relación con el monitoreo del flujo de ganga en una columna de flotación

Development of reagent control system based on the inspection on the surface of the froth and its relationship with the monitoring of the tail flow in a flotation column

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Abstract

This paper presents the proposal of two monitoring systems that make use of artificial vision systems to detect if the coal flotation process is operating efficiently. These systems inspect the froth surface and the tail flow. A graphical interface for monitoring was created, as well as a reagent addition control system. So when a fault is detected in the operation, which can be reflected in froth velocity or in the tonality of the tail flow, an alarm is activated to the control system so that the operator can add typical reagents in flotation, such as frother or collector, these They are very important variables in the process and are the most commonly used to improve recoveries of valuable ore. To achieve this an interface was programmed in Matlab that was linked to the vision system; the image analysis techniques and the reagent control system were programmed. For this, a dosing control system with an Arduino Uno card, a trigger circuit and two peristaltic pumps was built. Using a fully instrumented laboratory flotation column and with two vision systems installed, one in the tail flow and the other at the top of the column to acquire images of the froth surface, it was possible to relate the solids recovery with the froth velocity and with the tonality in the tail flow. To obtain different mineral recoveries, the froth height bed was varied, detecting that when there are high mineral recoveries the froth is fluid presenting an average pixel intensity of 30 in the tail flow, where 0 is black and 250 white. On the contrary, when there are low recoveries, there is a static and viscous froth, and a tonality of 10 very close to black is present, which indicates that valuable mineral is lost in that flow.

Artificial vision, Monitoring, Control, Flotation column

Diseño de un control híbrido neurodifuso para una unidad turbogás

Design of a hybrid neuro-fuzzy system for a gas turbine

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Abstract

Several needs and opportunities have been detected during the development of Distributed Control Systems for Combined Cycle Power Plants at the National Institute of Electricity and Clean Energies. Among the most important is the improvement of the speed, power and temperature control strategies for turbogas units, currently based on conventional PI algorithms, to achieve safer and more profitable operation. To a great extent, this is because turbogas units pose a larger number of tighter requirements to the control system since these units operate at relatively higher temperature, speed and pressure than other power units. An attractive alternative to improve the control strategies at turbogas units consists on the deployment of control techniques based on fuzzy logic, which may supersede some of the disadvantages of modern control approaches and satisfy more sophisticated requirements than with conventional control. Nevertheless, deployment of fuzzy control is usually accompanied with a performance reduction and undesired upsets on the process response during the parameter tuning stage, which is unacceptable for high-risk turbogas units. This thesis research deals with the latest problem through the design and development of a PI like controller that merges fuzzy logic and neural network techniques into a hybrid system for speed control of a turbogas unit. The proposed controller may be applied without negatively impacting the process performance and response; later it could be used to improve them. The proposed neurofuzzy PI controller emulates a conventional PI controller; it is designed through supervised neural learning from a set of input-output patterns defined by the conventional controller. The neurofuzzy PI development is carried out in two stages. In the initial stage, the set of training patterns is generated through the static mapping defined by the structure and parameters of the conventional PI controller. Performance of this neurofuzzy PI controller was verified through simulation experiments with a first order with time-delay process model. Results show the equality of both the neurofuzzy controller and the conventional controller, thus they may be used interchangeably in the same application. In the former design approach, it is necessary to precisely know the controller structure and its parameters; nevertheless, these requirements may prevent application in a real world situation. Therefore, in a second development stage, it was decided to generate the input-output training patterns through direct measurement during the turbogas unit start-up. Performance of the resultant neurofuzzy controller was verified through start-up simulation experiments with the mathematical model of a 25 MW GE-5001 turbogas unit. Results show the equivalence of both controllers. With these results, it is concluded that the neurofuzzy controller can directly substitute the conventional controller without causing any undesirable upsets on the plant response. In addition, it is not necessary to know the structure and parameters of the conventional controller to be substituted, thus easing its application for speed control of a turbogas unit. The results of this research, in the form of solutions to the design of neurofuzzy controllers with a guarantee on their performance, constitute a worthy contribution towards achieving safer and more profitable operation of a turbogas unit in the short term.

Neuro-fuzzy control, Gas turbine, Neural network, PI controller

Familias normales, Teorema Grande de Picard y algunas de sus consecuencias para funciones analíticas

Normal families, Picard Great Theorem and some of their consequences for analytic functions

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Abstract

The present expository work sought to familiarize the reader with a well-known theory of the convergence of families of analytic functions, the study of normal families, theory that appears in most of the classical texts in Complex Analysis. The objective of this compendium is to present a chapter with basic knowledge on Topology and Complex Analysis, as tools, in order to explore some important results related to Montel´s Theory and Picard´s Great Theorem. The work contains some of their consequences for analytic functions and several examples of their applications, which contributes to strengthen in the readers the background to study Holomorphic Dynamics.

Picard's Great Theorem, Montel's theory, Analytic Functions

Propuesta actual de la Industria 4.0 en el clúster automotriz del Estado de San Luis Potosí

Current situation of the companies of the automotive cluster of the State of San Luis Potosí in Industry 4.0

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Abstract

The future development of Industry 4.0 and its effect on the automotive industry requires the involvement of all parts of the supply chain to increase reliability and offer massive benefits. In the State of San Luis Potosí Mexico. since 2015 an Automotive Cluster has been formed that integrates the business, government and educational sectors; The latter is the importance of developing the suppliers of human capital, which is why it has been integrated into the Higher Education Institutions (IES) so that training strategies can be generated in students and graduates to effectively comply with the current needs of the regional industry, as are the technological trends Industry 4.0 to achieve a sustainable growth of automotive companies. In this work, the current situation of the Automotive Cluster of S.L.P. that coordinates the System of Science, Technology and Innovation (SICITI, by its initials in Spanish) belonging to the Potosino Council of Science, Technology and Innovation (COPOCYT, by its initials in Spanish) with respect to the use of the tools of Industry 4.0, trying to clearly define the areas of opportunity and the proposal of strategic projects that improve the use of current digital technologies. Statistical tools were used to quantify the participation of the entities that currently participate in the Automotive Cluster in the State of S.L.P. to make known the need for greater involvement of both the Government, the Academy and the industry to define public policies on the development and use of 4.0 technologies and those that come to revolutionize the automotive sector in the future.

Industry 4.0, Automotive cluster, Automotive sector, Institutions of Higher Education

Sistema Biomimético para la navegación autónoma en entornos desconocidos

Biomimetic system for navigation in unknown environments

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Resumen

En este artículo se presenta el diseño e implementación de un sistema biomimético para el control de la navegación de un vehículo terrestre no tripulado que mapea y localiza obstáculos cambiantes en entornos desconocidos mediante un autómata celular que utiliza una estructura de hardware basada en células hexagonales organizadas de forma similar a la estructura de un panal de abejas. El autómata está diseñado como una adaptación del algoritmo bioinspirado en la danza que las abejas emplean para localizar la mejor fuente de alimento. En este sistema biomimético las abejas están representadas por seis sensores láser ToF por tiempo de vuelo montados sobre células hexagonales para cubrir 360° de visión. El autómata se programa en el software Python y se implementa el sistema embebido en una tarjeta Raspberry Pi 3B. Para validar los resultados, se efectúa el prototipo robótico de un vehículo terrestre de cuatro ruedas, no tripulado, que es controlado por el sistema embebido. Los resultados muestran que el uso de algoritmos bioinspirados permite que el robot se adapte y en tiempo real resuelva el problema de la localización de obstáculos cambiantes, sin necesidad de usar cámaras; facilitando su navegación autónoma cuando está inmerso en un ambiente de navegación desconocido.

Biomimético, Algoritmos bioinspirados, Colonia artificial de abejas, Robot autónomo

Sistema de control Mioeléctrico para silla de ruedas

Myoelectric control system for wheelchairs

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Abstract

Wheelchairs must allow people with a temporary or permanent disability to be included in society. In the development of this work, a mechanical and electronic adaptation of a myoelectric control system is carried out in a simple, economical and personalized way, enabling the user to easy-handle the wheelchair, looking for friendly technologies. The development of this work is designed in four stages: electromyographic sensing, power, control and mechanical coupling. With the development of these four stages it is sought to simplify in a modular coupling way the myoelectric system to any type of manual wheelchair, looking for a more comfortable and independent use of it, permitting adaptations oriented to any user's needs.

Myoelectric, Control, Wheelchair, Arduino

Sistema de visión integrado en FPGA para el cálculo de la orientación de objetos usando momentos de inercia de segundo orden

Vision system FPGA-integrated for object orientation calculation using second order moments of inertia

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Abstract

This chapter presents a vision system capable of calculating the objets rotation angle captured by a video-camera. An algorithm based on the principles of inertia second order moments is proposed. The main idea is to incorporate this algorithm into an FPGA-vision system that will correct the orientation of electronic integrated circuits, which are manipulated by a pick & place machine, during the printed circuit boards manufacturing process. The vision system performs on a FPGA Spartan-6 and controls an OV7670 camera, a TFT display screen, RS-232 communication with a PC and an SDRAM memory. The algorithm for rotation calculating, using Matlab, is executed on the PC. The preliminary results show in average a precision of 99.998% in the rotation angle calculation.

Vision, FPGA, Angle rotation, Second order moments

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