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 V

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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Colegio de Ingenieros en Energías Renovables de Querétaro A.C. Octubre 21-23, 2020.

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 2020, se complacen en invitarlos a la 4ta., edición de este congreso, que se llevará a cabo del 21, 22 y 23 de octubre de 2020, 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 V-2020 contiene 178 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

San Juan del Río, Qro.
Octubre 21-23, 2020.

María Ramos Escamilla
Ángel Marroquín de Jesús

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Alimentación Solar Fotovoltaica para un Prototipo de Electrocoagulación de Aguas Residuales

Photovoltaic Solar Power for a Wastewater Electrocoagulation Prototype

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Abstract

A photovoltaic solar power supply is presented; it supplies energy to the electrodes of a wastewater treatment prototype by electrocoagulation. The source will be able to supply three voltages levels 10, 20, and 30 volts, with a current of 1000 mA. The system consists of an array of solar panels and Nickel Metal batteries. The amount of energy to be supplied by the solar panels is estimated, the level of storage in batteries is calculated and fed to the electrocoagulation system. The results of an experiment that operates independently of the power supply line and that works in rural areas are presented.

Wastewater, Electrocoagulation, Photovoltaic Solar Energy

Estudio del desempeño de focos de iluminación domestica

Study of the performance of domestic lighting bulbs

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Abstract

Artificial light greatly affects our performance in the environment, being long under it, it is important to make a choice of which is most convenient for us, based on qualities that we seek in them. Incandescent luminaires were the ones that dominated the market for a long time, but they turn out to be the least effective and even uncomfortable in environments. Fluorescent luminaires, on the other hand, are much more comfortable and have better qualities that allow them to function naturally in spaces, but they have a clear disadvantage in containing mercury inside. LED luminaires are essential if you want to choose effective and versatile sources, that can satisfy the different needs of consumers and fulfill the qualities that they require. Despite this, it is important to know the performance of the luminaires. In this work presents the comparison between these three types of luminaires, comparing their efficiency, photometric, colorimetric and electrical characteristics. We compare an incandescent bulb, two fluorescent lamps (savers) and seven LED luminaires, all equivalent to 60W. The purpose of this study is to evaluate the clear advantages and disadvantages with special emphasis on the LED luminaires that currently dominate the market.

Artificial lighting sources, Efficiency, Colorimetry

Análisis en retrospectiva del uso de plataformas de aprendizaje virtual como estrategia para evitar la deserción de los estudiantes de nuevo ingreso en Facultades de Ingeniería

Retrospective analysis of the use of virtual learning platforms as a strategy to avoid the desertion of new students entering Engineering Faculties

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Abstract

Mostly of the engineering schools in the world coincide in having high dropout rates during the first year of their new students, mainly caused by low performance in basic science subjects. Some of these academic institutions counteract this problem with the so-called "zero semester", with face-to-face preparatory courses or, with some type of tutoring or accompaniment program for the new student; But what happens when these options are not possible to implement in the academic institution?
In the Faculty of Engineering of the Autonomous University of Campeche, a leveling strategy was designed, through the implementation of a virtual propedeutic course using the academic content of the online learning platform Khan Academy. This strategy has been applied in the last two school years (2018-2019 and 2019-2020)
This project consists of a retrospective analysis of these two generations and a comparison is made with the 2017-2018 school year, in which this strategy had not been implemented.

Virtual learning platforms, Educational innovation, Mathematics & Basic Sciences

Películas de SRO-HFCVD como dieléctrico en estructuras MIS y sus propiedades eléctricas

SRO-HFCVD films as dielectric in MIS structures and their electrical properties

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Abstract

This paper presents the results obtained by the electro-optical characterization of a MIS structure built by depositing a film of an *Indium Tin Oxide* (ITO) on a Silicon Rich Oxide (SRO) film using the Chemical Vapor Deposition Hot Filament (HFCVD) system. The SRO-HFCVD films were deposited considering two hydrogen fluxes levels at 25 and 100 sccm, under these conditions we grow single and double films, both being heat treated at 1100 ° C to improve their optical and structural characteristics. Through of the techniques of Null Spectroscopy, XPS and Photoluminescence, it was possible to determine the thickness of the SRO films, quantify the silicon excess present in them and analyze their spectra. These films are used as the active layer in Metal-Insulating-Semiconductor (MIS) structures, such structures were electrically characterized through the I-V curves. From the result of these characterizations a comparison is made between the MIS structures with films virgin (V) and with ones heat-treated (T-T). Characterizations indicate that SRO-HFCVD films with T-T significantly modify the optical and electrical properties of MIS structures, which is promising for the design of integrated optical sensors.

Photoluminescence, XPS, MIS structures, I-V Curves

Fabricación y caracterización de películas transparentes y conductoras utilizadas como contactos en estructuras MIM con películas SRO-LPCVD y SRO-HFCVD sobre sustrato de cuarzo

Manufacture and characterization of transparent and conductive films used as contacts in MIM structures with SRO-LPCVD and SRO-HFCVD films on quartz substrate

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Abstract

This work presents the manufacturing and characterization process of two types of transparent conductive oxide (TCO) films, as contacts. Aluminum doped zinc oxide (AZO) deposited with the Sputtering technique and tin doped indium oxide (ITO) using the pyrolysis spray technique, these transparent and conductive films were deposited as contacts on a film of silicon-rich oxide (SRO) which was deposited by two systems of chemical vapor deposition by low-pressure (LPCVD) and by hot-filament (HFCVD) on quartz substrates with polysilicon film as metal contact, with the object of building two Metal-Insulating-Metal (MIM) structures, one with SRO-LPCVD film and another SRO-HFCVD thus highlighting the electrical characteristics of these structures. The precursors used for the LPCVD system are silane (SiH_4) and nitrous oxide (N_2O) and for the HFCVD system the gaseous precursors are obtained from a solid quartz source stripped with atomic hydrogen. First, we present results of the optical characterizations of the TCO´s and SRO films, the band gap obtained by Tauc to calculate the size of the nanocrystal in SRO-films, causing light spots. And I-V curves of MIM structures with interesting results.

AZO, ITO, SRO, TCO

2 Biologia, Quimica y Ciencias de la Vida

Food intake and biomedical serum indicators in mice adults exposed high fat diet for a short term

Ingesta e indicadores bioquímicos sericos en ratones adultos expuestos a una dieta alta en grasa por un periodo corto

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Abstract

Little is known about the changes that occur in serum biochemical indicators associated with the intake of a high fat isocaloric diet (HFD) and its relationship with eating behavior for a short term. The objective of this study was to evaluate food intake and serum markers: triglycerides, glucose and cholesterol, in adult mice exposed to HFD for a short term. Experimental and longitudinal study, with 30 mice (10 per group: Standard Diet (DE), HFD Low Fat Diet (LFD), they were exposed for 5 weeks to corresponding diet. Furthermore, the liver was evaluated to determine the percentage of microvesicles and macrovesicles of fat by histological technique (hematoxylin and eosin). The results were: In HFD group, decreased 37% and 48% in caloric and food intake, respectively; 13% increased, body weight; in addition, a 34% decrease glucose and increased tryacylglyceride in serum and a 65% increase fat microvesicles in liver compared with control group. In conclusion, its importance considering the content and quality of macronutrients in diet Although the diets consumed by the mice in this research were isocaloric, exposure to HFD in short term evidenced a reduction in food intake and glucose triacylglicerides levels in serum, increase in body weight and hepatic steatosis. It is suggested this model could be used to evaluate the effect of an isocaloric HFD on changes in biomarker in serum, and development of hepatic steatosis in a short term. Assessing HFD intake could provide a better understanding of the metabolic mechanisms related to the development of chronic deseases.

High fat diet, Food intake, Adult, Mice, Serum indicators, Fat microvesicles

La Conservación Voluntaria en núcleos agrarios de Oaxaca, México: Participación, costos y beneficios

Voluntary conservation in agrarian nuclei of Oaxaca, Mexico: Participation, costs and benefits

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Abstract

Conservation with a community-based approach (CBC) points out that its application, in addition to preserving biological resources in natural areas, also contributes to improving the quality of life of those who participate in it. This work analyzes the participation, benefits and costs that the certification of Voluntary Areas Destined for Conservation ([VADC] referred to as a modality of protected natural areas [PNA] and guidance from CBA) has brought to the residents of the farming settlement located in the Isthmus, Valles Centrales and Mixteca regions of the state of Oaxaca. To do this, interviews were conducted with local authorities and *ejidatarios (*property owners*),* in addition to applying random questionnaires to their inhabitants. The results show that the participation of the local population in the certification and management of the VADC is low and passive. The prior organization of the Assembly and the forms of State intervention negatively affect its participation. Also, the benefits are limited and directed to the application of government programs related to ecotourism. The residents of the different farming settlement do not indicate costs for certification, however, they express concern due to the exclusion of a large number of them generated for access to economic support related to the ecotourism project in the VADC. Communities and government institutions maintain a relationship of tension regarding decision-making concerning the management of resources designed to the VADC.

Protected areas, Ecotourism, Development, Community conservation, Local government

Capacidad de carga turística en el parque nacional Islas Marietas, Nayarit, México

Carrying capacity in marietas Islands National Park, Nayarit, México

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Abstract

Sightseeing tours in ANP's planning is essential to mitigate the environmental impacts that these actions produce in visited ecosystem. México has natural areas that deserve special attention for their protection by tourist visitation, among which is the Parque Nacional Islas.Marietas (PNIM), for that reason was conducted a study on load carrying capacity tourism during the period 2014-2015, in order to assess the effect of the influx of tourists on the conservation of this protected natural area, as well as the perception of the tourist with respect to overcrowding. For this purpose, were carried out field visits and surveys to tourists. The used methodology is based on the evaluation of physical carrying capacity, effective carrying capacity and real carrying capacity, focusing the study area of Punta de Mita, Nayarit, Mexico. The results shed a carrying capacity effective on the top level of visitation, which represents an influx of abundant during holiday season, affecting seriously the place visited, however the perception and satisfaction of tourists, does not change. It is concluded that the tourist carrying capacity is exceeded, a review and planning by government agencies involved in the tourism management of the protected area, should be to regulate the economic benefits, environmental impacts and the proper handling of the tours.

Tourist satisfaction, Visitation, Ecosystem

Efectividad para el control de arvenses en palma de aceite (*Elaeis guineensis* Jacq.) mediante la implementación de tapetes agroecológicos

Effectiveness of weeds control in oil palm (*Elaeis guineensis* Jacq.) through the implementation agro-ecological carpets

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Abstract

In oil palm production, one of the most critical stages is the first year after the transplant, due to the interference between the weeds and the crop that reduces the growth of the latter. Therefore, to evaluate the viability of control of weeds in oil palm (*Elaeis guineensis* Jacq.) By implementing agroecological carpets two treatments were established (with carpet and without carpet) with 6 repetitions each treatment, in the ranch "Agua" Bendita "located in Palenque, Chiapas. At the beginning of the experiment and after 120 days after the placement of the carpets, the following variables were evaluated: number of leaves, area of the crown, average length of the spine, height of the plant, stem circumference; as well as the initial inventory of weeds. All the agronomic variables were evaluated from the beginning of the experiment. The most abundant weeds identified at the end of the study were: *Cynodon nlemfluensis* Vanderyst., *Panicum maximum* Jacq., *Rottboellia cochinchinensis* (Lour.) Clayton, *Amaranthus spinosus* L., *Ipomoea purpurea* (L.) Roth., *Portulaca oleracea* L. and *Priva spp*. . L. When evaluating the effectiveness of the control of weeds generated by the agroecological carpets, an ANOVA analysis showed that the treatment with carpets obtained highly significant differences with respect to the treatment without carpets, with a control of weeds at 100% when leaving the carpets in the plantation. When the means of the agronomic variables were compared, 2 homogeneous groups were formed, the best group consisted of 100% weed control with carpets. For the variables height, crown area and percentage of control of weeds, there were highly significant differences, while for the stem circumference, the length of the spine and the number of leaves there were no significant differences. The coefficients of variation are less than 25%, which indicates that the design used was adequate and the variables of medium to high relationship are correlated. Therefore, it is concluded that carpets are a feasible methodology for weed control. It is recommended to continue with the evaluations until the palms are in production, in order to determine their correlations with the productivity of the palms; besides verifying the effects of the carpets in the development of the oil palm in the long term.

Control de arvenses, Neumáticos de desecho, Tapete agroecológico

Agua y salud en México: Patógenos y legislación

Water and health in Mexico: Pathogens and legislation

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Abstract

In this chapter we resume the panorama about infectious or no infectious waterborne diseases in Mexico, its etiology and symptomatology. Furthermore, an analysis about mexican legislation in this topic is presented. Finally, we explain other new topics little treated but of primary importance such as emerging waterborne diseases, antibiotics in drain water and the effect of climate change on human health.

Emerging diseases, Bacteria, Viruses

Caracterización de metabolitos secundarios de *pouteria campechiana* (H.B.K. 1942)

Characterization of secondary metabolites of *pouteria campechiana* (H.B.K. 1942)

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Abstract

This tree is presumed to be native to Mexico, some references place it in southeastern Mexico, through Central America to Panama and in South America, Colombia, Peru and Brazil, since it grows in humid forests. Pouteria, Latinized form of a native name and Campechiana, alludes to the City of Campeche. The purpose of this investigation was to evaluate the secondary metabolites of the Kanisté leaf. A descriptive study of the secondary metabolites contained in the leaf was carried out, this was collected in the town of Hool, Champotón, Campeche. The techniques for carrying out phytochemical screening were developed based on the work carried out by the Ministry of Public Health, MINSAP. The following positive metabolites were obtained from the leaf in aqueous extract at room temperature: tannins, flavoniodes, essential oils, amino acids and anthocyanidins. In hot aqueous extract the positive metabolites were: tannins, flavonoids, lactones, essential oils and anthocyanidins. In ethanolic extract at room temperature the positive metabolites were: flavonoids, lactones and essential oils. In hot ethanolic extract the positive metabolites were: flavonoids, lactones, alkaloids and essential oils. The metabolites present in the four extracts predominantly were: flavonoids and essential oils. The positive metabolites in the different extracts were: tannins, flavoniodes, lactones, alkaloids, essential oils, amino acids, and anthocyanidins. The diversity of metabolites found in this research indicates that the leaf can have effective pharmacological effects such as: astringent, anti-inflammatory, antioxidant, antibiotic, among others. It is recommended that precautions should be taken when they are used therapeutically as an herbal remedy, as well as increasing studies that support the safety and efficacy of the pharmacological mechanisms of action of Kanisté leaf.

Screening, Secondary Metabolites, Kanisté

Tendencias en el estudio taxonómico de copépodos de agua dulce de México

Trends in the taxonomic study of freshwater copepods from Mexico

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Abstract

In this study we present a review of taxonomic studies and conceptual frameworks on which the classification of freshwater and free-living copepods has been addressed in Mexico. This synthesis contributes towards the taxonomic certainty of these little-known organisms. This kind of studies are based on the use of technical tools such as the analysis of multiple morphological and / or molecular characters, which are currently considered as a source of information to describe and define species.

Copepoda, Crustacea, Freshwater, Free living, Zooplankton

Biodiversidad y vulnerabilidad de playa del carmen ante el incremento del nivel medio del mar

Biodiversity and vulnerability of playa del carmen due to the rise of the mean sea level

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Abstract

Sea level rise is a matter of concern because an estimated 600 million people live in coastal areas less than 10 m above sea level. Mexico is a coastal country that has a very important terrestrial and aquatic biodiversity, which is rich in endemic species, if we add to that its exposure to hurricanes and the increase in the mean sea level, it is logical to work in a multidisciplinary way about of their vulnerability to climate change. For this reason, the city of Playa del Carmen, known as the heart of the Riviera Maya in the Mexican Caribbean, was chosen to learn about its vulnerability to rising sea levels, combined with the aquatic biodiversity of the cenotes that surround it. The results show an area of 19,281 m2 that would be affected in a 1 m flood scenario, which is equivalent to a loss of USD $ 77 million; coupled with the existence of 27 species of crustaceans and fish that inhabit the cenotes, of which 13 are endemic. It is concluded that the development of management plans to adapt and mitigate the impact of the sea level rise in Playa del Carmen will require the inclusion of engineering solutions to protect the infrastructure in urban and tourist areas; establishing as a priority the conservation and restoration of the natural habitats, as well as the urgent creation of an ANP that includes the conservation of the cenotes as aquifer bodies, anticipating their salinization, and therefore their endemic species, which further elevate the country's biodiversity.

Adaptation, Aquifer, Climate change, Ecology, Mexican Caribbean

Biopolímeros: De principio a fin

Biopolymers: From beginning to end

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Resumen

Los polímeros naturales o biopolímeros, se han posicionado como la mejor opción para reducir los problemas de contaminación originados por el uso de polímeros sintéticos. En este capítulo se muestra que existe una extraordinaria variedad de biopolímeros, que pueden ser obtenidos de diferentes fuentes naturales y que son clasificados de acuerdo con su origen, funcionalidad, carga, y estructura. En cuanto a los métodos de obtención, se ha encontrado que los biopolímeros producidos por microorganismos presentan ventajas a los obtenidos por plantas. Para su producción biotecnológica, existen una serie de variables que deben ser ajustadas de acuerdo al tipo de microorganismo productor y a las propiedades físicas del polímero a obtener, las cuales definirán sus diversas aplicaciones, estas variables son: pH, temperatura, composición del medio de cultivo, fuente de carbono, agitación, aireación, entre otras. Para entender la etapa final de los biopolímeros, los cuales deberían cumplir con los requisitos relacionados con la biodegradabilidad y el compostaje para poder ser considerados materiales de bajo o nulo impacto ecológico. Se revisa también la tendencia que estos materiales tendrán en torno a sus aplicaciones y el mercado.

Biopolymers, Bioplastics, Producing microorganisms, Biodegradability

Uso del mezquite (*Prosopis spp.*) como recurso alimenticio

Use of mesquite (*Prosopis spp.*) as a food resource

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Abstract

In recent years, changes have emerged in eating habits, including interest in foods with a certain added value, such as rich in dietary fibre, fatty acids, probiotics, prebiotics, reduced calories, low-fat foods, and foods with natural additives wich extende their shelf life. Consequently, the research has focused on explore different alternatives to meet these demands. However, the development of new food products is a constant challenge, which includes the optimization of the used ingredients as a fundamental step to develop the best formulation. In addition, there is a great world's interest to investigate the under-exploited crops, not only due to the agronomic interest, but for their nutritional value. One of these crops is the mesquite, since its traditional and ancient uses includes the utilization of pods or fruits as human food. Therefore, this chapter review the interest to rescue the use of the mesquite pod as a raw material in food products such as bakery products in order to increase the fiber, minerals, and protein content, without modify their technological and sensory properties.

Mesquite pods, Added value products, Bakery products

3 Medicina y Ciencias de la Salud

Factores de riesgo para accidente cerebrovascular en adultos jóvenes

Risk factors for stroke in young adults

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Abstract

Objective. Determine risk factors for stroke in young people under 45 years of age in the Toluca Valley. Methodology. Cross-sectional and correlational study. A questionnaire was applied to determine the risk factors for the cerebrovascular event in young adults. Two age groups of 18 to 32 and 33 to 45 years were compared, using a Mann Whitney U. Subsequently, a Pearson correlation was made and, the Odds ratio and relative risk ($p < 0.05$) were calculated.Contribution: 2593 surveys were analyzed, 62% belong to the group of 18 to 32 years. 68.9% present some low-medium risk factors for stroke. 20% exercise more than 2:30 a.m., and only 3.4% have an adequate diet.The presence of risk factors is related to the age group, in those aged 33 to 45 years, comorbidities (overweight / obesity, hypertension, and diabetes). While lifestyle (smoking, alcoholism, and drug use) in those under 32 years of age. Those indicate that awareness and training programs should be conducted differently, according to the age group.

Stroke, Risk factors, Young adult

Posicionador automático para lámpara de fototerapia

Automatic positioner for phototherapy lamp

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Abstract

Phototherapy is a technique that uses the visible spectrum of electromagnetic radiation, with the aim of treating various skin diseases, having an anti-inflammatory action. This technique is commonly used in hospitals or offices that have this technique; nevertheless, the elements or equipment destined to this work lack mobility, partially applying the treatment to the whole body of the patient. This can be an inconvenience when it is necessary to apply phototherapy in specific parts of the body.This article presents the design of a phototherapy lamp positioner, capable of moving along the “X” and “Y” axes, in order to improve the technique, focusing the lamp on specific points of the body to be treated. Derived from this, a platform is used to generate virtual interfaces for Man-Machine communication and in turn allow us to see the behavior of the system as is the case of LabView®.It is intended to have a high impact in the field of phototherapy-oriented medicine since there will be greater freedom in the movements of this device automatically, in addition to being able to time the lamp's positioning times during the application of this technique , making the device easy to use for the personnel who use it.

Phototherapy, Interface, Communication

Uso de plantas medicinales en la prevención de enfermedades en Jalpa, Zacatecas

Use of medicinal plants in disease prevention in Jalpa, Zacatecas

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Abstract

The importance in the use of medicinal plants is demonstrated when quantifying medicinal and dietary food supplements, used in traditional practice and empirically among the population. Barthelson et al. (2006) (Acosta, 1993). It is estimated that 80% of the world population depends on traditional herbal remedies and that at least 35,000 plant species have potential for medicinal use. Annan and Houghton, (2007). Methodology and methods: It is a transversal, observational and descriptive investigation. A questionnaire was applied to 60 inhabitants of the Municipality of Jalpa, Zacatecas, which allowed understanding and reflection on the use of medicinal plants as prevention of diseases. The information was processed through the statistical program SPSS V. 24 and Excel. Results: The interviewees confirmed the knowledge of natural plants, for medicinal use were: mullein tea, temachaca, caper flower, chance. The most used are: Azar, Gordolobo, Temachaca, Flor de Caper. **Conclusions**: The use of medicinal plants continues to be an alternative medicine, for a considerable number of the population. **Contribution**: Respondents confirmed knowledge of the use of plants as natural medicine.

Temachaca and caper flower, Medicinal use

Reflexión sobre la incidencia de Síndromes Dolorosos en alumnos de V cuatrimestre de Terapia Física de la Universidad Politécnica de Amozoc

Reflection on the incidence of Pain Syndromes in students of the V semester of Physical Therapy of the Polytechnic University of Amozoc

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Abstract

University of Amozoc of the Bachelor of Physical Therapy during their first and second cycle of training take theoretical subjects, so they stay in the classroom for approximately 6-10 hours for 5 days. of the week, at this time they adopt prolonged and incorrect positions, in addition to this, presenting postural alterations in different anatomical areas, in addition to a BMI that in 48% of the sample indicates overweight and obesity, on the other hand despite having knowledge of the norms of postural hygiene due to the discipline of study these are not applied applications so the objective of this research is to test the relationship between the factors of poor body hygiene, with the appearance of Painful Syndromes, through the evaluation of posture , application of the Nordic musculoskeletal instrument and postural habits to students for the early detection of es t is possible to alter actions that in the future cannot impact in the context of their activities due to the presence of musculoskeletal injuries, for this reason the importance of developing preventive programs implemented at school aimed at postural education is retaken.

Postures, Pain syndromes, Postural education

4 Humanidades y Ciencias de la Conducta

Liderazgo complejo como elemento para mejorar el índice de aprobación

Complex leadership as element to improve the approval rate

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Abstract

We currently live in a globalized world, which requires having certain knowledge and skills in order to carry out daily work activities, such as knowledge of some programming language, databases, among others.Many of the companies currently request universities that graduates not only have the necessary knowledge to carry out activities, but rather that graduates have the skills of being, to display their knowledge as it is, teamwork, leadership, the development of work schedules, among others.For all of the above, a way was sought to impart not only the essential knowledge of a subject in the classroom, but also a way to exploit the abilities of each student within the classroom, which is why complex leadership was implemented. at the “Universidad Politécnica of Gómez Palacio”, specifically in the 6th quarter grade of the Information Technology degree, implemented in the database subject, with this, a strategy was sought to improve the approval rate, since this specific subject is a difficult subject for the students of the degree to understand.

Complex leadership, Approval rate, Learning strategies

Paradigmas del proceso enseñanza-aprendizaje a distancia

Paradigms of the distance learning-teaching process

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Abstract

Online teaching and learning are an alternative paradigm to face-to-face education. It promotes the generation of knowledge through theoretical and methodological processes derived from the development of science and technology in the field of communication and information. With distance education, the teacher undertakes innovative strategies that promote meaningful learning. In this paradigm, the teacher as an educational subject is not excluded, on the contrary, it assumes a new role that transits towards the new culture of distance education based on the diversity of resources that the Web has. The most relevant challenges of this new paradigm are accessibility, personalized system, flexibility in study, and interactivity with better learning materials and resources.

Teaching, Online Learning, Personalized System

Efecto de la temperatura de bulbo seco y humedad relativa en la sensación térmica percibida en espacios exteriores en clima cálido seco

Effect of dry bulb temperature and relative humidity on the thermal sensation perceived in outdoors spaces in hot dry climate

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Abstract

Conditions of the thermal environment in outdoor spaces determine not only its quality, but also the risk of morbidity from remaining in it. The objective of this research was to estimate the effect of dry bulb temperature and relative humidity on the perceived thermal sensation in outdoor spaces in hot dry climate. The thermal comfort adaptation approach was used with the thermal sensation interval means method, the analysis considered three activity levels for the warm period (with 823 observations) and cold period (with 863 observations), and the adaptation level of subjects based on their thermal sensation. The results indicate that even when the critical effect is due to the dry bulb temperature, the relative humidity has an important effect on the perceived sensation.

Perceived thermal sensation, Outdoor spaces, Hot dry climate

Estrategias bioclimáticas para el diseño de edificios vinícolas

Bioclimatic strategies for wineries design

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Abstract

Greater amount of energy consumed in wineries is used for cooling and humidifying of the interior, for this reason the correct design of energy efficient wineries has become an important issue for winemaking countries. The purpose of the design of buildings that require less or no energy to achieve controlled conditions of the indoor hygrothermal environment for production and aging of wine, allowed to formulate the objective of this work, which was to evaluate six models of wineries with bioclimatic design located in El Valle de Guadalupe, Baja California from data on thermal performance (indoor temperature and relative humidity) and energy consumption (kWh and degrees-hour), obtained by dynamic thermal simulation. The zone of the study was characterized, based on the review of previous studies optimum temperature ranges were defined for aging and wine production. A basic model of a wine-making building was designed to which bioclimatic strategies were applied. The results obtained allowed to suggest the best bioclimatic design options for this type of buildings.

Wine cellars, Bioclimatic design, Energy efficiency

Eficiencia energética en vivienda de construcción en serie y en modelos demostrativos bioclimáticos en zona de clima cálido seco

Energy efficiency in mass-built housing and demonstrative bioclimatic models in a hot-dry climate zone

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Abstract

The residential sector is one of the biggest consumers of electric energy, especially in zones with extreme dry-hot climates such as Mexicali. The implementation of NOM-020-ENER-2011 energy efficiency standards for the envelope of the dwelling is essential to provide thermal comfort with a lower energy consumption. The goal of this article is to evaluate the application of energy efficiency standards in three housing models: The first one was a prototype of mass-built housing (commercial model) and the remaining were demonstrative dwelling prototypes built with bioclimatic criteria. The analysis was made with the digital calculation tools provided by the Secretary of Energy and the National Commission for the Efficient Use of Energy. The results showed that for the commercial dwelling to reach the energy efficiency standards, it is required to diminish the overall heat transfer coefficient. Therefore, it was achievable to improve the energetic efficiency by including the bioclimatic housing criteria. Although important efforts have been made to optimize the housing design, they have not been effective enough to improve the energy efficiency of the mass-built housing.

Energy efficiency standards, Mass-built housing, Hot- dry climate

La violencia en el noviazgo en estudiantes universitarios

Violence on dating relationships among university students

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Abstract

The present research work diagnoses the existence of violence on dating relationships among the students of the Unidad Académica Multidisciplinaria de Ciencias, Educación y Humanidades, of the Universidad Autónoma de Tamaulipas.

Violence, Dating relationships, Students

El COVID-19 y la escuela en casa

COVID-19 and the school at home

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Abstract

The human being faces a global threat, COVID 19, for which, until today, there is no vaccine, which has forced people who work in non-essential activities to seclude themselves in a confinement at their home. School authorities implemented The School at Home Program, which brought unprecedented situations and problems to solve.

COVID 19, School at home, Problems

La psicomotricidad como una herramienta del juego terapéutico implementada en un Centro de Estimulación Multisensorial

Psychomotricity as a therapeutic game tool implemented in a Multisensory Stimulation Center

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Abstract

The present investigation shows the way to work the psychomotricity as a tool of the therapeutic game implemented in a Multisensory Stimulation Center (CEMS) which is located in the Polytechnic University of Amozoc, Puebla, México. The objectives are: a) Determine the level of psychomotor development in preschoolers, b) Develop a plan of playful strategies that contribute to psychomotor development, c) Evaluate the psychomotor development of children once the activities have been implemented. For this, educational activities were designed with third year preschool children, where previously a group of children was assessed using a specific test to determine their level of psychomotricity according to their development, which were reported by their teachers. Subsequently, the population to work was selected and a series of activities supported by means of therapeutic play were established, in such a way that they potentiated their psychomotor development. Finally, the contribution of this research is to demonstrate the impact that is obtained in psychomotor development through therapeutic play in preschool children.

Psychomotor development, Therapeutic play, Multisensory stimulation center

5 Ciencias Sociales

Satisfacción laboral de los trabajadores de una organización florícola: Estudio de caso en la empresa “La flor de Catemaco”

Job satisfaction of workers in a flower organization: A case study at the company "La flor de Catemaco"

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Abstract

Job satisfaction in flower organizations has been poorly addressed, although it is of great relevance for productivity management. The purpose of this research is to estimate the determinants of job satisfaction of the employees of the company "La Flor de Catemaco", a flower company, specialized in the production and marketing of natural flowers and ornamental foliage, located in Villa Guerrero, State of Mexico. The empirical evidence from the parameters obtained in this study suggests that the determining variables of job satisfaction are: Seniority in the position, motivation regarding the work being performed, recognition of the tasks performed and satisfaction with respect to the job. salary received. The study is temporarily circumscribed in 2018, using information from a survey applied to 20 workers, which is processed by methodological requirements using a logistic econometric model.

Job satisfaction, Logit model, Flower organization

Investigación de mercado en Metepec, Estado de México para determinar la aceptación de un jabón artesanal elaborado con base de maíz

Market research in Metepec, State of Mexico to determine the acceptance of a artisan soap made from corn

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Abstract

Currently there are some skin diseases that have increased their appearance in people, mainly due to environmental pollution. According to some research, it is known that at 18 years of age, people have accumulated 70% of the chronic actinic damage that will manifest itself with some skin condition in adulthood. Certain scientific studies demonstrate the beneficial properties of the corn plant in relation to skin conditions, so the development of an artisan soap based on this plant was proposed. The objective of this work was to apply a study that allowed determining the acceptance of this soap in Metepec, México. The type of research was quantitative and descriptive in scope. The market study process was carried out by Zikmund (2009) considering the following stages: Definition of the objective, Planning of the design and the sample, Collection, processing and analysis of the data and Formulation of the report. The results were: 90% acceptance of the product, elaboration in pastel colors, with relaxing aromas, stick, oval in shape and a size of 160 grams. Respondents aware of the environmental problems that exist, prefer biodegradable packaging.

Soap, Corn, Skin

Perfil del consumidor y preferencia de compra de Farmacias G I en San Mateo Atenco, Estado de México

Consumer profile and purchase preference of Farmacias G I in San Mateo Atenco, Estado de México

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Abstract

The pharmaceutical industry is currently one of the most viable businesses nationally and internationally. There is a growth in investment for the creation and expansion of pharmacies, as well as in research and development of treatments; The expansion of large patent medicine pharmacies, similar pharmacies, and interchangeable generic pharmacies has led Mexico to occupy second place in Latin America in this sector. This research studies the business model of GI pharmacies, a growing concept, which has made it position itself in the market in any region of the country. The research is descriptive, and the objective is to know the profile of the consumer, which helps to understand the purchasing behavior, to increase the degree of satisfaction and thus achieve a better position in this widely competitive market. The variables considered for this study are: demographic, geographic, psychographic and behavioral. All of them make up the consumer profile, where a description of the selected client is established as an objective that will help us determine the purchase preference.

Profile, Preferences, G.I. Pharmacies

Instrument to measurement the effect of Entrepreneurial Orientation and Innovation Capability on MyPYMES

Instrumento para medir el efecto de la orientación empresarial y la capacidad de innovación en My PYMES

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Abstract

The purpose of this work is to identify, based on the literature, some of the dimensions and/or factors of the existing process in entrepreneurial ecosystems, considering the interior, financial structure, strategic alliances and decision making by senior management y the Universities through the literature review to propose a measurement instrument conductive to an entrepreneurial orientation (OE), developing its operationalization at a conceptual level to enhance innovation and improve business performance. The paper is a review of the literature published in various sources, including Journal of business Research, Human Resource Development Review, Journal of Management Studies, journal of Marketing Communications, Academy of Management Journal, International Journal of Technology Management & Sustainable Development, among others. The results of the literary review of 137 articles allow us to recognize that: OE is defined by many scholars on the subject, according to different thematic approaches; the proposal by Lumpkin and Dess (1996) includes five dimensions: 1) autonomy 2) competitiveness 3) innovation 4) proactivity 5) risk taking; influenced by communication networks within strategic alliances, baked by senior management teams, their cultural profile and social responsibility, for a transdisciplinary and multidisciplinary effect that generates innovation. The results of the review allowed the construction of an instrument with a hundred questions to improve the process of measuring the impact of OE an CI on SMEs.

Entrepreneurial Orientation, Innovation, Innovation capabilities

Reflection on Consumers in e-Commerce

Reflexión de los Consumidores en el Comercio Electrónico

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Abstract

This paper presents a reflection on the ideal requirements that a provider should offer to the consumer. Traditionally, studies are made to improve products and/or services, but the consumer's point of view is disesteemed. This work approaches the commerce scenario from an approach where the consumer is the protagonist. The context of analysis is *electronic commerce* (e-commerce), however, the approaches can be extended to traditional commerce. It should be noted that commerce can be classified as traditional or electronic. In the specific area of *e-commerce*, it is known that the relevant defining characteristic is the use of *information and communication technologies* (ICT). Due to the above, the consumer has some particularities that are considered to present the approach. It is about identifying the elements for *e-commerce* improvement. Improving the *sale-purchase cycle* that includes improving marketing, improving consumer service, improving the product and/or service offered, and the improvement of the WEB portal.

E-Commerce, ICT, Consumer

Identificación del perfil del consumidor para la industrialización de queso tipo Chihuahua

Identification of the consumer profile for the industrialization of Chihuahua type cheese

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Abstract

It is of great importance that family businesses when deciding to launch a new brand in the dairy market know the characteristics of the consumer, so that they can identify the tastes, needs and preferences of potential customers, who can later become regular customers That is why the objective of this article is to present the results of a market research focused on identifying the consumer profile for the industrialization of Chihuahua-type cheese. In such a way that market niches can be established where quality products are offered according to the needs and possibilities of customers. While it is true today, there are different brands of dairy products on the market, it is also true that day by day consumers have greater demands regarding this type of product. On the other hand, in the state of Zacatecas, properly in the municipality of Río Grande there are small companies that are dedicated to the production of bovine milk, which have the possibility of giving added value to their product, industrializing it to transform it into cheese Chihuahua type.

Marketing, Market research, Consumer profile

Intervención: Cuidado del medio ambiente en la formación clúster de turismo alternativo, para el desarrollo regional

Intervention: Care of the environment in the alternative tourism cluster training, for regional development

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Abstract

Strategies for the development of an Environmental Intervention Plan in the formation of the alternative tourism cluster for regional development applied in El Triunfo, Baja California Sur are addressed to allow poverty reduction through the generation of self-employment in the region, increasing the quality of life and without compromising the natural environment. The objective is to identify strategic activities and processes that are integrated into the start-up of companies that conglomerate together and form an alternative tourism cluster. To carry out the same, the Planned Change Model Intervention methodology is used, where information is collected, data is processed, the intervention plan is analyzed and designed. For the purpose of this investigation they have been designed; a questionnaire to identify the knowledge and application of the regulations of the Law of Ecological Balance and Protection of the Environment, applied to the companies that conglomerates make up the cluster and an observation matrix to collect the information, for the processing comparative matrices have been designed with in order to identify opportunities for improvement and include them in the intervention process.

Regional development, Care of the environment, Strategies

Análisis de los hábitos de estudio en estudiantes de nivel superior, un caso de estudio

Analysis of study habits in higher level students, a case study

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Abstract

It is the responsibility of Higher Education Institutions to offer quality education to their students in such a way as to make them more competitive in the specific area where they have decided to train, for this purpose it is important that teachers and academic tutors have knowledge about the study habits that their students have, as well as knowledge of the existence of generic electronic learning objects that help to improve their experiences or study habits if necessary, this in order to generate strategies within the classroom that encourage and motivate students to decide to commit to their study and obtain acceptable academic performance. Since, the techniques or forms of study they possess are directly related to their performance. Avoiding in this way the failure in the subjects that semester with semester are taking and even the decrease in school dropout. The objective of this research is to carry out an analysis of study habits in 17 Computer Systems Engineering students to identify areas of opportunity and in this way to implement suitable customs and strategies in them to reduce bad practices in their study.

Study habits, Academic performance, Electronic learning objects

La orientación emprendedora femenina en la industria textil y de la confección, en Moroleón, Guanajuato, México

Women's entrepreneurial orientation in the textile and clothing industry, in Moroleón, Guanajuato, Mexico

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Abstract

The research objective is to analyze how the role of women in management in Smes in the textile and clothing sector (TCS), in the southern region of the state of Guanajuato, manifests itself in the five dimensions of Entrepreneurial Orientation (EO). Methodologically this work is quantitative and explanatory, based on a model of structural equations, based on information from the application of a validated questionnaire to 103 women managers of the above-mentioned region, contributing to theoretically and empirically increase the studies on the OE and promote it for a greater boost of business with female leaders who pay for the socio-economic development of the region. In conclusion, the women managers of the STC develop the five dimensions of the OE: innovation, by generating new models of garments and being at the forefront. Watering, by investing in raw materials or machinery. Proactivity because they are always looking for new ways to do the activities, they perform for the benefit of the business they lead and retain autonomy by making decisions that improve the performance of their business. Aggressive competitiveness by implementing new ways to conquer customers to excel compared to their competitors.

Entrepreneurial orientation, Female manager, Textile and clothing sector

Proyecto interdisciplinario en la enseñanza de la Ingeniería para el fortalecimiento de las Ciencias Básicas

Interdisciplinary project in Engineering teaching for the strengthening of Basic Sciences

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Abstract

This article proposes a methodology to develop an interdisciplinary learning project, where the student of first Semester of General Education of Engineering Sciences selects a productive process according to the professional profile of the engineering of his interest from which he will identify the main competences and knowledge that he demands and relate them to the theoretical and practical knowledge developed in the courses of basic sciences. The objective is to build new knowledge structures through the integration of the different disciplines that make up the first semester of engineering to provide solutions to a common problem, in this case, the productive process. In accordance with educational trends and the information society, higher education institutions are increasingly using learning in an interdisciplinary way, since a change in the way of teaching and learning is evident in the academic environment. Another benefit of this proposal is to fight the apathy and discouragement that is perceived in students since they do not immediately visualize the purposes of the learning units because they perceive them as independent.

Interdisciplinary project, Basic sciences, Engineering education

Desarrollo de competencias profesionales en alumnos TSU en Energías Renovables Área Solar, durante el Proyecto de Instalación Fotovoltaica de la Universidad Tecnológica de Aguascalientes

Development of professional skills in TSU students in Renewable Energies Solar Area, during the Photovoltaic Installation Project of the Technological University of Aguascalientes

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Abstract

Based on the focus of competency-based education and attending the interest of professional training of the student of Renewable Energies Solar Area of the Technological University of Aguascalientes, this article describes a didactic experience that contributes to the development of professional competence, to Through the participation of students of the fifth semester, in the first Photovoltaic Installation (IFV) of 118 photovoltaic modules in the Institution. This experience is supported by project learning strategies, situated learning and meaningful learning, focused on promoting the development of skills, knowledge and attitudes that integrate the professional competence required in the graduation profile of Energy students. The methodology used includes learning activities aimed at developing knowledge, knowing how to do and knowing how to be, which, when integrated, contribute to developing the professional competence of the Energy graduate; it also implies the development of four learning products indicated in the Results, which describe developed skills, acquired technical knowledge and attitudinal aspects modified or strengthened by students. Finally, it should be noted, with the opinion of the students, that this strategy stimulates and motivates student performance to complete their training

EBC, Professional competence, Skills

Plan estratégico para disminuir los altos índices de rotación de personal

Strategic plan to decrease high staff turnover rates

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Abstract

A strategic plan is presented, appropriate to the needs of the Sam's Club company to contribute effectively) in reducing the turnover of personnel in the operational area mainly in the departments of groceries, boxes and protection. Documentary and field research was used in the development of this project to obtain internal and external information from the company. Internally, historical information on casualties and exit surveys was analyzed, as well as working climate questionnaires were applied to employees and interviews department heads. As for the external environment, it was studied through interviews with workers from the main competitors of Sam's Club. Both the general and the specific objectives were fully fulfilled resulting in the design of strategies to address the problem that is presented by the company today, it is emphasized that the implementation and development of the strategies is a decision

Strategic planning, Staff turnover, Diagnosis, Improvement plan, Intervention

Análisis de rentabilidad e impacto económico del uso de clembuterol de productores de bovino en Morelos, México

Analysis of rentability and economic impact of the use of clenbuterol from bovine producers in Morelos, Mexico

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Abstract

In the present investigation, the evaluation carried out with different methods served to determine the level of production and the economic competitiveness of livestock projects.The evaluation of the project aims to identify the advantages and disadvantages associated with the investment, so the implemented analysis method is useful for making rational decisions regarding different alternatives, especially when a development program is involved in the project, such as This is the case of the "Reliable Supplier" Program in livestock farming.Methods used that served to provide more accurate information on the generation of income and the level of competitiveness of companies, is the financial analysis and evaluation. Only the monetary aspect of the project is considered, with the objective of determining its profitability in terms of money flow.The research starts from the study of the “Reliable Supplier” Program, which focuses on the eradication of the use of Clenbuterol in animal feed, making meat producers aware of the importance of developing procedures that reduce the potential of contaminants in food, that can damage the final product, and that generate a health problem for consumers.

Profitability, Financial evaluation, Clenbuterol

Análisis de indicadores de ventajas comparativas reveladas: Competitividad de las exportaciones de fresa (*fragaria spp*.) mexicana

Analysis of indicators of revealed comparative advantages: Competitiveness of Mexican strawberry (*fragaria spp*.) exports

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Abstract

China and the main United States of America producing strawberry countries in 2016, contributed as a whole more than forty per cent of the entire volume of strawberry produced in the world. Spain, the United States of America, Mexico and Netherlands are the main exporting countries, while the main importer countries were the United States of America, Germany, Canada, France and the United Kingdom; the same year, Mexico occupied the third place like producing and third place between the exporting countries. In the previous context, this one investigation raises the analysis of the competitiveness of the strawberry produced in Mexico as regards Spain and the United States of America those who are the biggest exporters of the product on a global scale; by means of the calculation of the index of revealed comparative advantage of Vollrath (IVCR) for the period 1994-2016, the analysis of the indicator recounts that the competitiveness was increasing and that Mexico is provided with a comparative advantage revealed in the strawberry exportation.

Comparative Advantage, Strawberry, Competitiveness

Análisis sobre la presencia de depresión, estrés o ansiedad y su relación con el desempeño académico en estudiantes de licenciatura

Analysis of the presence of depression, stress or anxiety and its relationship with academic performance in undergraduate students

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Abstract

To implement corrective and supportive measures, this educational research is carried out to identify the presence of risky levels of depression, anxiety and / or stress and to evaluate its possible influence on the high rates of failure and drop out of the students of Systems Engineering Computational and Biochemical Engineering. One of the objectives of National Technological Institute of Mexico (TecNM) is to apply teaching strategies that allow a high degree of learning, less dropout and a higher degree of graduation from competent professionals. Applying a systematic stratified random sampling, 262 students were chosen who participated by answering previously assessed surveys (Cronbach's alpha between 0.78 and 0.914). Both programs usually show high rates of failure and low terminal efficiency. Preliminary results show high stress rates and average anxiety in the first grades, this is previously unknown for most of the students; Anxiety and depression presented slight differences between freshman students and the ones of last semesters, without considering that these factors could be determining in their academic performance, the students agree that these problems affect their academic performance, in terms of failure and turn out to be a factor to cause dropout.Objective: to correlate the results obtained in the applied surveys referred to know the degree of depression, anxiety and / or stress among the students of 2 different degrees with their level of academic performance.Methodology.- A stratified random sampling was applied to students of Biochemical Engineering and Computer Systems Engineering. 4 surveys were applied to determine anxiety, stress, depression and influence on their academic performance, the data were analyzed using predetermined scales and the Chi square test to find out the correlation between the mentioned variables.Contribution.- Levels of anxiety, stress and depression were detected in Engineering students and their correlation regarding the affectation in their academic performance, factors to be taken into consideration to avoid failure and desertion.

Anxiety, Stress, Dropout

Jóvenes mujeres en programas educativos STEM de la Universidad de Guadalajara-CULagos

Young women in STEM educational programs at the University of Guadalajara – CULagos

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Abstract

STEM careers are aimed at training professionals with disciplinary skills such as solutions to different types of problems in social, industrial and academic environments. The participation of young women in STEM careers, considered exclusionary with regard to gender, has been increasing but is not enough to reach a level of equity. This document presents the characteristics of the educational programs offered at the University Center of los Lagos, part of the University of Guadalajara and the opinion of the female students on what is attractive, motivating and difficult if it is the case, which results in their training as engineers.

STEM careers, Professional skills, Gender, Female engineer, Higher education

Percepción de violencia de género en estudiantes universitarios

Perception of gender violence in university' students

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Abstract

This investigation focuses on a research analysis on violence to which both genders are exposed, the objective is to know which is the gender that receives the most abuse, limiting it to engineering students, and what is the type of violence suffered, if it is verbal, physical or bullying. The methodology used for this work was of a cross-sectional quantitative approach, the first phase of the investigation was exploratory, conducting a bibliographic review in journals and documents that were related to gender, abuse, school looking for them to be recent, and in the second phase an online survey, which was structured with multiple choice items, applying it through the Google Forms platform, to demonstrate the hypothesis that students of both genders are subject to some type of abuse. The survey was applied to 229 engineering students ages 17 and 28 years old, with an average age of 19.8, from the sixth to eighth semesters in their careers at a public university in the northeast of the country, which participated anonymously. And as it's been demonstrated in previous analysis statements such as those that indicate that the female gender is more susceptible to being abused than the male. The results of the research show that, although the male sex is not exempt from suffering abuse, is still the female gender the most vulnerable to receiving some type of violence.

Violence, Higher education students, Gender

Electricidad para marginados, una visión desde la reforma energética mexicana

Electricity for the marginalized, a vision from the Mexican energy reform

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Abstract

Starting with the 2013 constitutional energy reform, the updating of the legal framework to regulate the sector participants in new circumstances began in Mexico. Between that legislative whirlwind in which the normative texts of the industry were created, modified or abrogated, the model changed to bring electricity to the population with marked poverty. In this paradigm shift, the Universal Electric Service Fund was created to bring the fluid to the most unprotected sectors, such as rural communities, marginalized urban areas and end users in conditions of marginalization. The objective of this chapter is to describe the legal nature of this instrument and to review whether it is effectively complying with its legal mandate, through a descriptive and documentary-type investigation.

Supporting components, Electricity, Trust, Energy reform, Marginalized population

Empoderamiento y Toma de Decisiones en una muestra de mujeres docentes universitarias

Empowerment and decision-making process in a sample of university female teachers

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Abstract

In the current chapter, results of an exploratory research of a correlational type, are presented, the objective was "to identify the relationship between the decision making process and the empowerment in full time female teachers in the UAEM", through a non probabilistic intentional sampling that was composed by 47 women which are full time researcher – teachers from the UAEM, the following variables were considered: a) Empowerment, b) Decision making process, two instruments were administered, the IMEM which is a questionnaire that was designed to assess the empowerment level in Mexican women and the Operative Decisions Making Scale (ETDO) in order to measure the dominant decision making style. The results indicate that women from the sample have a medium empowerment level which indicates that empowerment is a process, in consequence, women teachers are reaching a position in the paid work field, as well as in the leading working positions. Decision making is perceived with enough resources to understand the situations and to make right decisions. With regard to the relationship between the variables, results indicate there is a moderate correlation between female empowerment and decision making.

Empowerment, Decisions, Women

Participación de las mujeres estudiantes de Ingeniería en Gestión Empresarial del Tecnológico Nacional de México/ Poza Rica, Ver., en propuestas estratégicas de microempresas

Participation of women Engineering students in Business Management of the National Technological of Mexico/ Poza Rica, Ver. In strategic proposals of micro enterprises

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Abstract

This document presents the results obtained, using descriptive statistics, on a target population of students in the eighth semester of the Business Management Engineering (BMI) degree program at the Poza Rica Higher Technological Institute, in the years 2017, 2018 and 2019. The study consisted of analyzing the participation of female eighth semester students of the Business Management Engineering program at the Poza Rica Higher Technological Institute in the development of integrative projects to solve problems in the different microenterprises in the area in 2017, 2018 and 2019. Integrating projects are those that cover different disciplines with the specific objective of solving one or several problems. In order to carry out these projects, the professional competencies of the students participating in the integration projects were used, that is to say, the abilities and work skills developed by the students through the years of study and learning at the Poza Rica Higher Technological Institute. Likewise, each work was oriented through several subjects selected from the study program of the Business Management Engineering (BMI) career in the years 2017, 2018 and 2019. It should be noted that the subjects were different in each of these years. The objective of this work is to determine the level of feminine influence in the elaboration of strategic plan proposals for the surrounding microenterprises. Finally, the conclusions and the importance of training women in the business field since the years of study are presented, not only as strategic managers but also as entrepreneurs.

Strategic Planning, Microenterprises, Women's Participation

Implementación de herramientas tecnológicas en apoyo a comunidades aisladas

Implementation of technological tools in support of isolated communities

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Abstract

Isolated communities and / or rural areas require mechanisms that allow inclusive growth and reduction of inequalities. Strategies that promote possible solutions to local problems that have emerged from the same community. Internet access is a tool for the integral development of society, by allowing the exchange of information and ideas at low cost. Interaction between the communities can be promoted through the establishment of communication mechanisms that allow them to express problems and possible solutions for the benefit of community development. The research that frames this article proposes the development of a research methodology using technological tools, allowing a flow of information that can be compiled, analyzed and structured as a basis for the decision maker, allowing to raise proposals and / or solve problems through the approach of thematic axes, the integration of a network of experts and the implementation and evaluation of the results of Virtual Forums. The contribution of virtual forums in the community also induces an education process and establishes an influence group for the benefit of community development. The projects that emerge from citizen interest promote co-responsibility, monitoring, a sense of belonging and identity. Therefore, the integration and growth of any community should be promoted, facilitating permanent spaces for social interaction, promoting local social development in the search to improve the quality of life and promoting local culture.

Technological tools, Virtual forums, Isolated communities

Desafíos de las Mujeres: Trabajos, cuidados, uso del tiempo y salud emocional durante el COVID-19

Women's challenges: Jobs, care, time use and emotional health during COVID-19

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Abstract

The objective of the work presented was to analyze the main activities that women carry out during the quarantine of COVID-19, associated with work, care of others, use of time and emotional health. The challenges that people face in the face of a pandemic are characterized by feeling out of control of everything that prevents them from having a "normal" life. Confinement has multiplied the tasks of daily life, and with it the efforts to maintain a sanity to face the uncertainty that a pandemic brings. Men and women are living the pandemic; however, recognizing the scenario of violence and inequality towards women, it is pertinent to recognize how they are living.Derived from the decision to keep the family safe during quarantine, women regain a unique role in this particular situation. They are the ones who have historically had the responsibility of maintaining a home free of risks and with the responsibility of caring for children, the sick and the elderly. Feeding, cleaning the house, attending to school tasks are examples of activities that are added to women, in addition to the work role that they now perform from home with the so-called home office and homeschooling. Thus, this reality that is assumed and experienced by women is the object of research that has been accentuated by a situation never before experienced: the pandemic and voluntary confinement by COVID-19.This research is relevant again, because there are expressions that manifest themselves about the mental and physical state of those who have attended to the government's (federal and state) recommendations to stay at home, with this, women who have work roles become unthinkable, not having time to publish articles, or generate collaborative synergies to influence science, technology and innovation, because there is no time that is enough to attend to other relevant roles in family life.The added value of this publication is the possibility of giving a voice to those who have not been fortunate enough to be heard, to express their emotions, to make a reflective process of their environment and their current situation. To be able to be the means to make tangible the need to share tasks, to show society that it is not to minimize a reality faced by Mexican women, particularly in the State of Querétaro.

Housework, COVID, Women, Online work

El Índice de Habitabilidad y Cohesión Social (IHaCoS) un instrumento para la medición del hábitat en México

The Habitability and Social Cohesion Index (IHaCoS) an instrument for the measuring habitat in Mexico

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Abstract

The production of series housing , in the last two decades, has focused on reducing the houses deficit, due to the fact that the supply was insufficient and the real demand of the country was not met, from previous years (eighty and ninety). In general, the houses that are being built at the national level have the same construction characteristics for arid areas, the forest, the jungle, or the beach (shape, space, material, etc.). This condition reflects the lack of solutions that satisfy the comfort needs of its inhabitants, considering environmental and urban habitability, as well as social cohesion. The National Housing Commission (CONAVI), through the National Council of Science and Technology (CONACYT), has promoted the development of an index that makes it possible to measure habitat conditions in Mexico. The authors present the proposal of the Index of Habitability and Social Cohesion (IHaCos) as an evaluation alternative and reflection on the importance of proposing changes in these houses. One example is that the monitored dwelling presents less than 50 percent of the habitability conditions considered optimal for the IHaCos index.

Habitability, Social cohesion and environmental monitoring

La capacitación, clave para mejorar la calidad del servicio restaurantero

Training, key to improving the quality of restaurant service

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Abstract

The objective of the study was to determine the influence of staff training on the improvement in expectations and perceptions of service quality using a quantitative methodology with a structural equations model. The DINESERV instrument, adapted from the SERVQUAL instrument, was used with the scales: tangible, reliability, response time, guarantee, empathy and satisfaction in the quality of restaurant service. It was applied to a sample of 114 clients from a restaurant in Michoacán. The research results show that there is a difference between expectations and perceptions. In addition, it has made it possible to identify the service components that require attention and thus to develop a training plan for the restaurant's service personnel. As a limitation of the study is that it refers to a single case, but contributes to the identification of areas of opportunity in the quality of service contributing to improve the competitiveness of the company with adequate training. Within future lines of research, the sample would be extended to other types of restaurants and companies in the tourism sector.

Quality, Service, Expectation, Perception, Training

Creatividad en la evaluación de competencias profesionales en la formación docente inicial

Creativity in the evaluation of professional competences in the initial teacher training

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Abstract

Educational evaluation, Training, Teachers, Creativity, Skills

Medición del nivel de impacto correlacional del Autoestima en el Rendimiento Escolar, mediante intervenciones Psicopedagógicas

Measurement of the level of correlational impact of self-esteem on school performance, through psycho-pedagogical interventions

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Abstract

The objective of this research is the quantitative and qualitative analysis of the correlational relationship around two variables: Self-esteem and School Performance, through the application of an inductive-deductive methodology that incorporates statistical lines of exploration in the study process, supported under the different learning theories to quantify the level of Self-esteem of 2nd year high school students, allowing the development of a psychopedagogical intervention proposal (workshop to strengthen self-esteem) which solves the need to implement immediate actions and measures to improving the emotional state of the student population.Self-esteem has gained great importance in recent decades, its effects are reflected in the behavior that students present inside and outside the school classroom. It is determined that a high self-esteem management allows students to undertake productive activities, although it is true that this develops from childhood and that it is what drives our life, it is also true that not having the means or being able to train their activities efficiently, leaves the person at a disadvantage in the context in which they live and function. The accumulation of frequent failures and the little interest in improving the school environment trigger risk situations in the adolescent that, to a great extent, if they are not addressed, cause students to feel helpless and lost without knowing what to do and much less how to continue the course road.

Correlation, Self-esteem, School Performance, Statistics

La acreditación elemento clave en el fortalecimiento académico del instituto tecnológico superior de huauchinango (ITSH)

Accreditation key element in the academic strengthening of the higher technological institute of huauchinango (ITSH)

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Abstract

In the last decades it has been necessary to implement the accreditation processes in the academic programs of the Institutions of Higher Education (IES), improving the functions and processes that are developed within them, as well as, to guarantee the quality of their educational programs, heading towards continuous improvement. Accreditation of academic programs in Mexico emerged as part of government strategies aimed at improving the quality of the higher education system (Rubio, 2007). Accreditation in academic programs of Higher Education is a fundamental tool that ensures the improvement of the quality of the services offered, that is, it is the process that involves comparing academic programs with parameters established within the framework of an accrediting body to check if they meet quality standards. For this reason, the purpose of this research is to analyze the importance of accreditation in an academic program, the impact it has when carrying out an accreditation and re-accreditation process that allows quality assurance, identify more effective procedures for the collection of efficient information and that include a series of strategic steps so that they help us obtain the available and timely information at the required time, which can achieve the accreditation of the academic programs of the Higher Technological Institute of Huauchinango, ensuring the educational quality and promoting the improvement and compliance with the established standards of the educational programs that face accreditation processes.

Accreditation, Educational quality, Academic programs

Tipologías de consumidores universitarios dentro de la práctica del e-commerce

Typologies of university consumers within the practice of e-commerce

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Abstract

Despite the fact that 8 out of 10 mexican internet users have purchased online, knowledge of attitudes in the consumer's purchase decision towards digital channels remains scarce. The objective of this study is to know the existence of consumer profiles in university students from San Luis Potosí due to attitudes towards electronic commerce. To carry out the purpose, it was necessary to collect information from 354 consumers, carry out a factor analysis and, subsequently, a cluster analysis. As a result, 3 groups of consumers with similarities in demographic profiles and consumption habits were distinguished but with different attitudes to online purchases.

Perceived benefit, Fear of being scammed, Conglomerate analysis, Consumer typologies

Innovación en el proceso de recolección de datos a partir de solicitudes de baja definitiva para analizar la deserción escolar

Innovation in the process of collecting data from permant withdrawal requests to attend school dropouts

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Abstract

Each educational institution must diagnose and analyze its own causes, since despite the common ones, there are their own that make the dropout phenomenon different. The present work was carried out at the Polytechnic University of Puebla, in its Industrial Engineering program, it had an innovative objective through the use of Information and Communication Technologies (ICT) in the data collection process based on a permanent withdrawal request, to speed up generation of information on desertion. This research has a quantitative approach; The technique of critical incidents was used to establish 15 different causes that represent the 224 reasons exposed in the records of the request for definitive cancellations, from the periods of September 2014 to April 2019. The main causes detected were: personal problems, change of university, the student did not like the career, loss of quality, family problems and change of residence. It was established that desertion has a seasonal behavior for the months of May-August. Through innovation in the collection process and the use of ICTs, it will be possible to decrease the workload in the department in charge of processing the data of the losses, thus, with this proposal, the information is updated, generated and shared in real time among all the interested departments; the process innovation increases accessibility to data that will support decision makers.

School dropout, Causes, Dropouts, Technological innovation, ICTs

Riesgo suicida en adolescentes de secundaria: Su relación con cohesión y adaptación familiar en Tlaxcala

Suicide risk in secondary school adolescents: Its relation to cohesion and family adaptation in Tlaxcala

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Abstract

The objective of this research is to analyze the relationship of suicide risk, cohesion and family adaptation in secondary school adolescents in Tlaxcala. The participants were 50 adolescents from 12 to 14 years old; 28 women and 22 men. The instruments used were: the *Suicide Risk Inventory* for *Adolescents* (IRISA) online by Hernández and Lucio (2011); consisting of 50 items and three subscales: suicidal ideation and intent; depression and hopelessness; absence of protective circumstances; as well as the index of psychological distress associated with suicide risk. The Family Cohesion and Adaptability Assessment Scale (FACES III), trusted and validated in Mexico by Ponce, Gómez, Terán, Irigoyen and Landgrave (1999-2002), with a Cronbach's Alpha of .70. The results showed that suicide risk was negatively and significantly related to cohesion (r = -.599 ** p <.001), but not with adaptation (r = -.262 p <.058). It is concluded that the family is a protection factor to avoid suicide risk.

Suicide risk, Adaptation, Cohesion, Adolescent

Dificultades que se presentan en estudiantes al cambiar inesperadamente su ambiente de aprendizaje de presencial a virtual

Difficulties that occur in students when changing unexpectedly their learning environment from face-to-face to virtual

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Abstract

This chapter shows data about the difficulties which are externalized by students of the 2020A calendar, who in order to conclude their academic programs in a timely manner established by the Secretary of Public Education, they had to migrate from face-to-face learning modality to virtual modality due to the health contingency caused by the COVID19 outbreak. To achieve the objective of showing such difficulties, first the skills needed to dabble in virtual learning were selected and conceptualized. Subsequently, a random sample was selected from different academic levels to which a survey was applied, to carry out this research only ten items from this survey were used. We present the results and related analysis to keep record of this research. Finally, we conclude this chapter with a brief reflection about the most relevant skills required by the students that allow them a successful virtual academic performance thus achieving the objectives established in their academic program.

Skills, E-learning, Classroom learning

Factores de riesgo cardiometabólico en una población de estudiantes universitarios

Cardiometabolic risk factor in young university students

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Abstract

Background. Metabolic syndrome has been associated with diabetes mellitus and cardiometabolic disease in adults. Among another group of alteration are considered as risk factors for cardiometabolic disease such as obesity, dyslipidemia, hyperglycemia, insulin resistance and arterial hypertension.Methodology. Cross sectional analytical study. We determined HDL and triglycerides in a dry chemistry equip named Fujifilm drichem n500i and using the Friedwald formula, we stimated VLDL and LDL. For the diagnosis of Metabolic syndrome, we use the ATP-III criteria Results. We recruit 519 students who comply the selection criteria, 63.4% females and 36.6% males. We found a prevalence of elevated LDL of 51.64% and metabolic syndrome of 3.6%. We also did the association of each metabolic syndrome parameter with this disease and found OR of 100.5 (P<0.00001 IC: 13.20 – 763.8) with abdominal obesity. Conclusion Most prevalent risk factor in young student are the HDL deficit and the elevation of LDL, afterwards, abdominal obesity. The prevalence of metabolic syndrome is low 3.6%, but the presence of 1 to 2 parameters increase up to 50%. Prevention is necessary in all groups but act timely could make the difference.

Efecto de la tutoría grupal en estudiantes de ingeniería del Instituto Tecnológico de San Luis Potosí

Effect of group tutoring on engineering students of the Instituto Tecnológico de San Luis Potosí

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Abstract

Tutoring, in all of its modalities, is a didactic strategy to decrease the failure and desertion rates, and increasing graduation efficiency. This project involved 61 engineering students from the Instituto Tecnológico de San Luis Potosí, to establish group mentoring as a fundamental basis for achieving the integral development of a group of students while improving their academic performance during the first four semesters of the program. The type of study was mixed-type, with a descriptive scope and longitudinal design. The Tutorial Action Plan, which was made per semester, included activities aimed at health care, transversal and professional skills development, cultural learning, and academic monitoring. Among the results achieved, oral health was one of the situations attended by campus doctors and dentists. Museum visits and walking through a traditional town worked out to enhance their general culture while achieving better group integration, the reading and career/life planning workshops served to motivate them. Besides, it evaluated English skills, finding out that most of the students meet the basic-level. Throughout the academic monitoring, it found that math subjects were the ones with the most failure rate. Therefore, it was designed specific actions to help the students to succeed. Those actions improved the average grades of the group, compared to those who did not take the group tutoring. It was measured high academic performance with the School Performance Additive Index; the students who achieved high-performance grades were 93% in the second semester, 82% in the third, and 88% in the fourth. It concludes that group tutoring can help the students to overcome their academic difficulties and at the same time to improve full personal development, acquiring transversal and professional skills, as well as expanding their cultural knowledge. Finally, there was also a positive impact on the retention of students, as desertion was 1.6%, far below the institutional average.

Integral development, University tutoring, Failure, Desertion, Transversal competences, Academic performance

Propiedades psicométricas del instrumento pensamiento crítico en la intervención educativa

Psychometric properties of the critical thinking instrument in educational intervention

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Abstract

This research work was carried out in order to determine the reliability of an instrument to measure critical thinking skills in the educational intervention process carried out by students in the Chihuahua Unit of the National Pedagogical University of the State of Chihuahua (UPNECH); It is worth mentioning that the psychometric property of content validity of this instrument was carried out by means of the expert judging method. The study sample was intentional and consisted of 72 students who were in the 5th, 6th and 7th semesters of the Bachelor's Degree in Educational Intervention. The instrument was made up of 14 polytomous reagents and they were assessed through a Likert scale of four levels of "educational intervention", among them "fair", "good", "very good" and "excellent". Considering the type of questionnaire, the reliability of the instrument was determined with the application of the internal consistency method, by calculating the coefficient of Cronbach's alpha, obtaining $\alpha = 0.703$; According to experts in the field, this value shows that the instrument is reliable to measure the construct for which it was designed. Contributing to the reliability of the instrument, the existence of a high degree of homogeneity in its items was also registered, a result that was obtained through the "elimination of the element" test offered by the SPSS statistical program, the latter used in its version 22.

Educational intervention, Psychometrics, Reliability

Las trayectorias escolares, un análisis por cohorte generacional

School trajectories, an analysis by generational cohort

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Abstract

The study and monitoring of school careers in Higher Education Institutions constitute a source of information that, systematized, is capable of strengthening educational planning, seeking to improve the quality and relevance of educational services, as well as contributing to the achievement of a more inclusive higher education.The result of a study of generational school trajectories in the area of Economic and Administrative Sciences of the National Technological Institute of Mexico / Campeche Campus is presented; A quantitative, descriptive scope approach was used from the existing records in the Comprehensive Information System (SII).Taking into account the complexity of the object of study, the students were characterized in terms of graduation, definitive dropout, desertion, transfer, enrolled, lag, assets and degree, among other aspects, allowing the identification of the behavior of school performance in the attached study programs: Engineering in Business Management and Engineering in Administration of the 2010-2018 cycle.

Higher Technological Education, School Pathways, Academic Performance

Organizational Culture in the human resource of a Mexican Hotel Organization

La Cultura organizacional en el recurso humano de una organización hotelera mexicana

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Abstract

This document describes the organizational culture factor of the human resource that works in a Mexican hotel organization. The theoretical path was made from the inputs of Barney, Hill, Pérez Mayo, Gordon, Thévenet, Golden, Stoner, Serna, Koontz y Cooke y Lafferty; as a explanatory framework which distinguishes the importance of identifying through an inventory of organizational culture, as it builds and defines such organization, it´s relations and it´s processes. The methodology is empirical, descriptive and quantitative. The instrument used for the collection of data was the questionary generated by Cooke and Lafferty, called Inventory of Organizational Culture. This instrument allowed to identify the Organizational Culture starting from the methodological categorical criteria proposed by themselves, meaning, they measured the dimensions: realization, auto-update, humanistic-encouraging, affiliate, conventional, approval, dependent, of evasion, antagonistic, power, competitive and perfectionist; defined by the instrument.

Culture, Organizational culture, Hotel

Estrategias para incrementar el uso de la banca electrónica entre los usuarios de los servicios financieros

Strategies to increase the use of electronic banking among users of financial services

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Abstract

The bodies related to the financial system and banking, have the objective of increasing the number of people who make use of financial services, in order to have better control over the income received in the country.One of the strategies that financial institutions have implemented has been the use of electronic banking, however, they haven't got the desired participation. It seeks to propose strategies that support the increased use of electronic banking. Through the data obtained in the field of investigation, strategic management matrices were designed to know the situation of the use of electronic banking.Besides, some strategies are generated that contribute its use, through the descriptive methodological design. Being a cross-sectional study, it is limited in a single moment in time, so it is not possible to differentiate certain factors that could modify the result.Even so, the information obtained and the proposed strategies can be used by the entire financial system, contributing positively to the fulfillment of the objectives of the National Policy for financial inclusion and the National Strategy for Financial Education, joining efforts to the program of "Acceso Financiero Universal para 2020" promoted by the World Bank group.

Electronic banking, Financial services, Strategy

Análisis del Servicio del Laboratorio de Computación de la Facultad de Ingeniería Mecánica y Eléctrica en la Universidad Veracruzana en Poza Rica Veracruz, México

Service analysis of the computer lab of the Faculty of Mechanical and Electrical Engineering at the Universidad Veracruzana in Poza Rica Veracruz, México

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Abstract

Talking about quality and educational excellence within any higher level institution represents continually improving in each of its areas, which is why the constant analysis and self-evaluation of the services provided within it are increasingly important, these are carried carried out in order to locate areas in which it is necessary to implement strategies that help achieve the desired quality levels. This research work is an analysis study carried out on the services provided by the Computer Laboratory 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 100 people (students and academics) which allows to identify the indices of each of the services that are provided in it, the results obtained provide relevant data that will later serve to design an improvement plan that allows generating actions that favor to continue being a quality educational institution.

Quality and excellence, Analysis, Continuous improvement

6 Ciencias Agropecuarias y Biotecnología

Coeficiente de cultivo de granado en la Comarca Lagunera

Crop Coefficient of Pomegranate in the Comarca Lagunera

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Abstract

For agricultural development, water is the most important thing, so today farmers are looking for crops that have some degree of resistance to drought and high economic value such as pomegranate, however, there is poor literature on its production. The Crop Coefficient (Kc) helps us determine the water requirement during plant development, which is critical for reducing production costs and saving water. The objective of this study was to know the Kc during the phenological development of the pomegranate, in an orchard located in the municipality of Gómez Palacio, Durango, Mexico, using 8 Landsat satellite images and geographic information systems. The estimation of Kc based on the Normalized Difference Vegetation Index (NDVI), was performed as proposed by Calera (2016).The KC values obtained range from 0.33 to 0.65. Its evolution with satellite images is consistent according to the development stages of the crop.The relationship between the NDVI and KC may be a promising tool for farmers to estimate water use of pomegranate trees on a regional scale based on satellite imagery.

Crop coefficient, NDVI, Pomegranate

Evapotranspiración del cultivo de granado por balance de energía

Evapotranspiration of pomegranate crop by energy balance

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Abstract

Evapotranspiration is a key element in calculating the surface energy balance, wáter balance and crop water stress and crop yield determination. However, it´s direct measurement or estimation is frequently complicated, since the diversity and complexity of the factors acting in this physical process. (morphological, physiological and soil factors).SEBAL (Surface Energy Balance Algorithm for Land) estimates ET based on satellite images, using the principles of surface energy balance producing excellent results as reported in several studies of different scientist authors; minimizing the cost and time for the ET determination for large vegetation zones. The objective of this research work was to estimate the potential evapotranspiration for the pomegranate crop in a commercial farm, located in Gomez Palacio, Durango, Mexico, by SEBAL using Landsat 8 satellite images during the crop cycle 2016. The results were validated with estimates of ET by the FAO 56 method, obtaining a Willmott concordance index of 0.96, which means good estimation precisión.

Evapotranspiration, SEBAL, Pomegranate

Determinación de los parámetros cinéticos de la pirolisis de la biomasa lignocelulosica

Determination of the kinetic parameters of pyrolysis of the lignocellulosic biomass

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Abstract

Over the past decades, interest in renewable energy and the environment has grown considerably, with a significant effort being made in the field of energy efficiency, the creation of sustainable technologies and the reduction of the carbon footprint. Therefore, the use of biomass in an economical and efficient way is of interest, and its study and analysis becomes necessary. In this work, kinetic parameters such as activation energy (Ea) and pre-exponential factor (A) were determined for apple residues using the non-isothermal thermogravimetric method and treating the data obtained under the models mathematicians of the differential method and the maximum speed method, and additionally performing the activation energy distribution.The calculation of the activation energy helped to see the way in which thermal decomposition takes place (if there are one or more processes and in what range of conversions they occur), through the characteristic kinetic constants provided by the kinetic models, allowed to identify the gaseous species emitted by the material, and thus study the processes through which such decomposition occurs

Kinetic parameters, Biomass, Pyrolysis

Aplicación de ethephon en una población de mezquite (*PROSOPIS SPP)* para la extracción de goma en Naica, Chihuahua, México

Application of ethephon in a mesquite population (*prosopis spp*) for gum extraction in Naica, Chihuahua, Mexico

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Abstract

The objective of the research was to extract gum from the mesquite plant, for this, a plant hormone in concentration of 10%, 10.85, 15%, 20%, 25% was used. It was applied to cuts of trunk and secondary branches of trees. The results indicated that 100% of the treated plants produced gum. The duration of the hormone's effect on gum production was nine weeks. Harvests were made every three weeks. No plant showed signs of damage or deterioration. It was observed that as the tree has a greater perimeter of the stem, it produces a greater amount of gum. It was also observed that the plant hormone apparently did not cause biological damage to the leaves and pods according to visual observation compared to other trees without treatment. The proximal chemical analysis that both mesquite and huizache gums have similarity and even improve the parameters required by the Food and Drug Administration for the use of gum arabic in the food industry. The production and harvest periods are from February to June and from September to December. There is an estimated average production of around 180 gr per tree production season

Emulsifier, Food industry, Resins, Non-timber native species

PM_1 in outdoor air: Sources, ion species content and alkaline properties in the Guadalajara Metropolitan Area, Jalisco-Mexico

PM_1 en el aire exterior: Fuentes, contenido de especies iónicas y propiedades alcalinas en el Área Metropolitana de Guadalajara, Jalisco-México

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Resumen

Las partículas finas (<1 micrómetro o PM_1) pueden tener efectos adversos sobre la salud humana debido a su tamaño y composición. Se colectaron muestras de PM_1 en dos sitios (Centro y Tlaquepaque) del AMG durante la temporada de secas cálidas, se analizaron para determinar concentraciones de aniones y cationes mediante cromatografía de iones. Los niveles de PM_1, ∑Aniones, $HCOO^-$, Cl^-, NO_3^-, SO_4^{2-}, $C_2O_4^{2-}$, ∑Cationes, Na^+, NH_4^+, K^+, Ca^{2+}, y Mg^{2+} sugieren concentraciones homogéneas en los dos sitios. Las especies más abundantes en cada sitio son SO_4^{2-}, NH_4^+, NO_3^-, Na^+, y K^+. Las fuentes secundarias de SO_4^{2-}, NH_4^+, y NO_3^- sugieren que los gases precursores (SO_2, NO_x, y NH_3) contribuyen significativamente a las concentraciones de iones en PM_1. El oxalato muestra una fuerte correlación con K^+, a partir de la quema de biomasa, y los principales iones secundarios (∑SO_4^{2-}, NH_4^+, NO_3^-), por procesos de formación secundarios. La correlación negativa entre Na^+ y Ca^{2+} indica una fuente antropogénica. El balance de iones, la alta cantidad del total de cationes en el área de estudio, la comparación entre NH_4^+ observado y calculado, y la relación de amonio total/sulfato total (pendiente >5.99) son evidencia de condiciones ricas en amoníaco (ambiente alcalino). Los resultados de este estudio son las primeras caracterizaciones químicas de PM_1, incluido su contenido de aniones y cationes, de la segunda área urbana más grande de México.

Partículas finas, PM_1, Iones, Alcalino, Fuentes

Caracterización de la biomasa lignocelulósica para la producción de biocombustibles

Characterization of lignocellulosic biomass for biofuel production

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Abstract

Transforming lignocellulosic biomass into valuable energy compounds is a field of research that is considered of great importance today due to the problems of the energy crisis and environmental pollution, biofuels produced from various lignocellulosic materials such as wood, agricultural or forest residues, agro-industrial residues, etc. They have the potential to be a valuable substitute for liquid or gaseous fuels for both the transportation sector and power generation.Agro-industrial waste represents a renewable energy source, obtained in large quantities as a result of the industrial processing of fruits and vegetables, becoming a cheap raw material for conversion to biofuels, these in addition to reducing the concentrations of pollutant gases and greenhouse gases emitted to the atmosphere as well as reducing major waste disposal problems.The agro-industrial residues are organic (lignocellulosic biomass) whose object of study was the residue from the processing of the apple in the extraction of juice from Cuauhtémoc, Chihuahua. Specifically, this research aims to determine the appropriate standardized techniques to characterize lignocellulosic biomass of apple processing residues.The results obtained from this study demonstrate that the low ash content and the high content of volatile matter make lignocellulosic biomass (residue from apple processing in juice extraction) a candidate with a high potential for biofuel production. .

Lignocellulosic biomass, Characterization, Biofuels

Dinámica de fluidos computacional y aplicación de flujo multifásico para el análisis de gradientes termohalinos en energías marinas renovables

Computational Fluid Dynamics and multiphase flow for the analysis of thermohaline gradients in marine renewable energies

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Abstract

La investigación y desarrollo tecnológico dirigido hacia la optimización y aprovechamiento de fuentes de energía renovables ha tomado amplia relevancia dentro del contexto ambiental, económico y geopolítico. Las energías oceánicas, como el caso de la energía por gradiente termohalino se basan en la generación de energía en función de la diferencia de temperatura y salinidad entre las capas de agua del océano para operar sistemas hidrocráticos o membranas. La dinámica de fluidos computacional (CFD) proporciona un enfoque para el análisis de detalle de la interacción de masas de agua con diferentes propiedades termohalinas. Además, soporta el análisis de la dilución de fluidos y su trayectoria dentro de las complejas condiciones de los ecosistemas costeros. No obstante, no existe un modelo CFD capaz de simular la dinámica de fluidos multifásicos para aplicaciones costeras considerando: i) generación, propagación y absorción de olas y corrientes; ii) modelado trifásico con una mezcla de 2 fases y superficie libre, iii) equilibrio térmico y iv) modelado de turbulencia. Por lo tanto, este capítulo muestra el desarrollo y la implementación de las ecuaciones de gobierno para simular estos procesos dentro del marco de trabajo CFD de OpenFoam® dando pie a la generación del nuevo modelo numérico *interMixingTemperatureWaveFoam*. Los resultados muestran la aplicabilidad del modelo al considerar el caso de una laguna arrecifal con un aporte de agua subterránea (SGD).

CFD, Modelación numérica, Flujo multifásico, Gradiente termohalino, Energía renovable

Obtención y caracterización de hidrolizados proteicos de quinoa y amaranto por digestión *in vitro*

Obtaining and characterizing of protein hydrolyzates of quinoa and amaranth by in vitro digestion

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Abstract

Currently, the consumption of food that can replace the consumption of meat has increased. This is due to the environmental impact caused by its production, as well as the health damage that has been reported in recent studies. Recently, pseudocereals have emerged as an alternative to supplement that consumption, specifically quinoa *(Chenopodium quinoa Willd)* and amaranth *(Amaranthus spp)*. These psuedocereals are characterized by providing large amounts of macronutrients, helping the body to function properly, promoting growth and regulating metabolic processes. Despite this recent consumption trend, gastric and duodenal digestibility in vitro has not yet been evaluated to determine how much of the protein ingested can be absorbed to be used by the body. Therefore, the objective of this work was to evaluate the above, by means of the preparation of defatted quinoa and amaranth flours, to which protein isolates were made at pH 2, 4 and 6. Subsequently, the isolates were hydrolyzed by gastric simulation at pH 4 because it was the highest yielding pH. SDS-PAGE electrophoresis was run. Simulated duodenal digestion was carried out with the papain and bromelain enzymes. The yield of the protein hydrolyzates, as well as their concentration was higher for quinoa at the different pHs tested, unlike amaranth. In the gastric simulation it was determined that the main proteins in both pseudocereals were globulins and albumins. In the duodenal phase, no protein was observed. According to the obtained values, it was concluded that the proteins present in quinoa and amaranth have excellent digestibility and therefore can be absorbed through the duodenum.

Quinoa, Amaranth, Proteins, Electrophoresis

Pruebas de factibilidad y desempeño de un control híbrido neurodifuso para una unidad turbogás

Feasibility and Performance of a hybrid neuro-fuzzy system for a gas turbine

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Abstract

Durante el desarrollo e implantación de Sistemas de Control Distribuido para Centrales de Ciclo Combinado Gómez Palacio (SCD-GP) de la Comisión Federal de Electricidad [1, 2] se han detectado varias necesidades y oportunidades de desarrollo tecnológico. Una de las más importantes y apremiantes es la del mejoramiento de las estrategias de control de potencia, velocidad y temperatura de las unidades turbogás. En gran parte esto se debe a que las unidades turbogás se caracterizan por operar a temperaturas, presiones y velocidades relativamente más altas que las de cualquier otro tipo de unidades, lo cual se traduce en mayores y más estrictos requerimientos para el sistema de control a fin de obtener una operación segura y rentable [3]Actualmente, los sistemas de control de unidades turbogás están basados en algoritmos de control convencionales del tipo PI (Proporcional e Integral) La idoneidad de este tipo de controladores para tareas de regulación ha sido ampliamente probada. Sin embargo su uso para el control de velocidad durante el arranque, o para el control de potencia en todo el rango de generación de una unidad turbogás, plantea serios cuestionamientos, ya que el desempeño de la unidad puede ser afectado adversamente debido a la no linealidad de la dinámica del proceso, la cual cambia conforme al punto de operación. A pesar de ello el uso de los controladores se ha prolongado por mucho tiempo debido a su sencillez y a que estrictamente, no se requiere de un modelo matemático del proceso para su diseño y ajuste. La importancia de este último hecho no puede menospreciarse, ya que la dificultad de contar con modelos matemáticos precisos del proceso es una de las causas fundamentales para que no se haya generalizado la aplicación de estrategias de control moderno.Una alternativa atractiva para mejorar el desempeño de las unidades turbogás es el empleo de técnicas de Inteligencia Artificial para el control de procesos, las cuales podrían superar algunas de las desventajas del control moderno y permitirían satisfacer requerimientos más sofisticados que con el control convencional. Específicamente resulta de interés investigar la aplicabilidad del control basado en lógica difusa, para el cual se han reportado múltiples aplicaciones exitosas en otras áreas industriales.En el Instituto de Investigaciones Eléctricas, el desarrollo de controladores difusos para unidades turbogás [4], en donde sé rediseñó la programación del sistema de control para la unidad turbogás W501 y se incorporó un controlador difuso de velocidad en tiempo real para el arranque de la turbina de gas [5,6]Posteriormente este trabajo fue continuado y extendido al control de la potencia generada [7,8] En ambos casos los resultados obtenidos fueron exitosos y constituyen una base sólida para el uso de controladores difusos en una unidad turbogás real.Sin embargo, desde un principio fue patente la dificultad para obtener la base de reglas y los parámetros de los diversos elementos del sistema de inferencia difuso embebido en el controlador. Para solucionar esta problemática y automatizar lo más posible el diseño del sistema de sintonización basado en redes neuronales, el cual primeramente se aplicó a controladores PI convencionales [9], y en una segunda etapa a la sintonización de un controlador difuso [10] El enfoque de este último trabajo consistió en desarrollar un sistema que proporcionara los parámetros que definen las variables lingüísticas del controlador usando un algoritmo de aprendizaje de redes neuronales.

Neural_fuzzy control, Gas turbine, Neural network, PI controller

Biosíntesis de Nano Partículas Metálicas

Biosynthesis of Nano Metallic Particles

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Abstract

In recent decades, research has increased on new methods of synthesis of metallic nanoparticles, which are capable of meeting current energy, economic and environmental demands. The synthesis of nanoparticles of manganese oxides (MnO), which are favorable for use in "electrical capacitors", given their optical, physical and chemical characteristics, as well as their great capacity to store large amounts of energy, hence the name of "Capacitors".In this work, a green synthesis method of nanoparticles of zinc oxides (ZnO) and manganese oxides (MnO) present in the residues of zinc-carbon cells was used, by means using the biomass of the Water Lily (Eichhoirnia Crassipies) as a bioreducing agent , the lily was selected for the characteristics that this plant presents in the accumulation of metals and its use to eliminate heavy metals in water treatment plants, the obtained nanometals were analyzed by means of X-ray diffraction, DRX, and X-ray energy dispersive spectroscopic (EDX) microscope techniques. Transmission System (TEM) to identify its structure and size was also used.

Synthesis Nano particles, Manganese oxides, Zinc oxide, Zinc-carbon batteries, Water lily

Perfil lipídico en una cepa de la microalga *Dunaliella tertiolecta* y su potencial para producción de biodiesel

Lipid profile in a strain of the *Dunaliella tertiolecta* microalgae and its potential for biodiesel production

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Abstract

The atmospheric problem due to the use of fossils has motivated in the scientific community the generation of projects that fundamentally contribute to economic viability to the country and environmental and social benefits, therefore renewable energy sources are playing an important role. In the area of pure biofuels, it has been difficult to reach the goal, not because of the availability of biomass but because of the production that is achieved after its conversion, the energy balance still being non-competitive. Many species of microalgae are being the new inputs with expectations for a possible solution to produce fuels such as biodiesel. In this research, the cell growth of a strain of the microalgae *Dunaliella tertiolecta* was studied in two culture media to determine the profile of fatty acids containing the lipids of the microalgae and to be able to evaluate the potential of the microalgae for the production of biodiesel. The most effective culture medium for growth was Guillard's, in which a microalgae concentration of 2.1 x 106 cells / mL was reached in 21 days of culture. The extraction of the lipids produced in the cell wall of the microalgae was obtained in 20 minutes using sonication and the modified Bligh & Dyer method after recovering the biomass by sedimentation-flocculation with sodium hydroxide as the best agent (98%). The lipid profile was composed of 46% saturated fatty acids and 54% unsaturated fatty acids, suitable to produce biodiesel. However, linolenic acid is present which could affect the oxidative stability of diesel.

***Dunaliella tertiolecta*, Fatty acids, Lipids, Biodiesel, Flocculation**

El comportamiento del consumidor ante la oferta de productos ecológicos en bebidas embotelladas en el sur de Tamaulipas

Consumer behavior when faced with the offer of organic products in bottled beverages in southern Tamaulipas

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Abstract

This research work allows us to offer information regarding the current market conditioned on the supply of sustainable goods in the market. This research encourages directing attention to new consumer behaviors in an optimal way to improve the social and business environment. Green consumers as they are known to this type of market provide new behavioral patterns for the implementation of new commercial strategies, while in society this sector manages to be an ideal to be followed by other consumers, even if they do not belong to this same segment, given that this market represents a great opportunity to modify the behavior models of this target segment and of society in general. In such research, the psychographic characteristics that consumers possess are exposed, which manage to influence purchasing decisions at the time of purchasing a product. The behavior of a specific market represents the basis of the movement of trade, which is why it is suggested to each of the readers of this information to constantly remember that the main resource in the commercial chain is the consumer and as such is of most important always be in function of what the market demands.

Comportamiento, Consumidor, Productos ecológicos

Codigestión anaerobia como alternativa para el tratamiento de aguas residuales lácteas y la generación de biogás y biosólidos

Anaerobic codigestion as an alternative for the treatment of dairy wastewater and the generation of biogas and biosolids

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Abstract

Anaerobic digestion of dairy wastewater is an economical and viable option for its treatment, however this type of substrate can be a problem for the optimal development of a digester. Anaerobic co-digestion is the treatment of a set of organic residues of different origins and composition, where the balance of nutrients and the physicochemical characteristics of the substrate are improved, helping to better stabilize the system and increase the production of biogas. This would favor the cogeneration of electrical energy and, consequently, would reduce the use of fossil fuels by the use of clean, renewable and low-cost energy. The objective of this work was to develop an anaerobic co-digestion bioprocess, in order to treat the wastewater from the dairy industry and residual sludge, as well as to evaluate the production of biogas and the obtaining of biosolids. This process is visualized with a feasible treatment. Regarding the generated sludge, it was found that it does not have toxic characteristics, concluding that the co-digestion used is an alternative for the recovery and reuse of wastewater, as well as the generation of biogas and biosolids.

Codigestion, Anaerobic, Biogas, Biosolids, Dairy wastewater

Agricultura sostenible: Herramienta para la soberanía alimentaria

Sustainable agriculture: A tool for food sovereignty

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Abstract

Agriculture has been one of the most important economic activities for the humanity, due to this is directly related to the food production. Throughout history, the hunger problems have been solved in order to supply the entire population, which led to the development of the green revolution, thereby achieving a significant increase in agricultural productivity, however, the excessive use of agrochemicals, such as, fertilizers and pesticides has had a negative effect on the environment, causing soil degradation and threatening the socioeconomic environment, in where a lot of proportion of the population is immersed. Conservation agriculture arises as an alternative to this problem, its aims to make efficient use of available natural resources in an environmentally friendly way, and thus achieve sustainable agricultural production that guarantees the food sovereignty of the most vulnerable population.

Agricultural crop, Conservation tillage, Green revolution

7 Ingeniería

Estudio del Contenido en gel del Material Encapsulante EVA, como una Medida de Calidad del Proceso de Laminación de Módulos Fotovoltaicos

Study of the Gel Content of the EVA Encapsulant Material, as a Measure of the Quality of the Lamination Process of Photovoltaic Modules

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Abstract

The gel content is a test that tests the resistance of the material of the module encapsulation layer, ensuring that the current conduction pathways of the cells are hermetically isolated from the inclement weather.In order to guarantee a good lamination of a photovoltaic module and therefore, a long service life of the same it is necessary that the degree of curing of the encapsulant befind between 65% - 90%. The objective of this work was to study the gel content of the EVA, after rolling. The gel content was determined using the EVASA supplier test method, taking EVA samples, after the lamination process of the photovoltaic modules. The results obtained were 73 to 96%. It is concluded that the gel content is a parameter that serves to guarantee the lamination process, since in the curing process chemical bonds are formed transversely between the long molecules of the EVA, which are weakly bound together before the reaction . The percentages of gel content, mean the percentage of EVA in which said reaction took place.

EVA, Lamination, Gel content, Fotovoltaic module

Determinación de profundidad optima para intercambiadores de calor tierra-aire en Saltillo, Coahuila

Determination of optimal depth for earth to air heat exchangers in Saltillo, Coahuila

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Abstract

Saltillo Coahuila, due to the lack of an adequate architectural design, some homes do not meet the thermal environment conditions required during the winter period, it is estimated that 471,725 habitants are affected by temperatures until -3.4°C, which causes morbidity problems, so that the need for the use of electromechanical air conditioning systems with electrical energy consumption of high economic and environmental cost arises. The objective of the work was to study the feasibility of applying a geothermal heat exchanger for home heating. Periodic variation of soil temperature at different depths was studied to determine the optimum by experimentally validated equations. An ideal depth of 3 m was determined due to a variation of 25 y 30% and lower excavation cost compared to depths of 6, 9 and 12 m.

Geothermal heating, Low enthalpy, Passive systems

Aplicación De Metodología Dmaic en el proceso productivo de fabricación de ladrillo artesanal

Application of Dmaic Methodology in the production process of artisan brick making

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Abstract

The history of the brick is the history of civilization, the architecture began when 2 bricks were joined. Brick is an older man-made building material. (W. P. Campbell, 2004 and Sánchez, 2013) The objective of this work is to identify the brick manufacturing production process in the city of Ciudad Juarez through the application of the DMAIC methodology. The research work is based on an exploratory sampling with visits to the most important production areas, specifically at km 20 in Ciudad Juárez Chih. Observing the manufacturing process from the mixing of the clays to the firing of the units in the oven. Currently it has been found that the wooden mold only allows to obtain 3 bricks and the mold could be improved to double the production, in addition a table could be adapted that makes it easier for the worker to place the mold without having to bend down. It has been found that there is variability in the dimensions of the bricks between one production and another, verifying the dimensions of the 1st burning in January. Analyzing the production of 500 raw bricks in a 6-hour day, taking 5 products every hour.

Bricks, Productive process, DMAIC, Variability

Diseño de un sistema de refrigeración por absorción solar amoniaco-agua de simple efecto para la conservación de alimentos

Design of a single-acting ammonia-water solar absorption cooling system for food preservation

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Abstract

The increase in the use of non-renewable energy sources and the strong dependence of the energy sector on these sources, encourage the study of applications that use renewable energy sources. In this scenario, there has been an increase in the number of jobs related to refrigeration systems that use other sources of energy in addition to electricity, such as absorption cooling systems, which can produce a cooling effect using mainly heat. residual or other sources such as solar thermal energy. This article presents the design of a cooling system that will operate with solar energy, using the principle of absorption with the ammonia-water working torque in continuous function, to contribute to a cold production alternative in food preservation.

Absorption cooling, Ammonia-water, Thermal load

Desarrollo de un algoritmo de programación SIG para estimar la Evapotranspiración en los cultivos mediante sensores remotos

Development of a GIS programming algorith to estimate evapotranspiration in crops by remote sensoring

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Abstract

A study was conducted to evaluate the feasibility of GIS programming as a potential tool in the automation of image processing obtained by the LANDSAT 8 satellite to estimate evapotranspiration (ET) in crops. The objective was to develop an algorithm in python language implementing the SEBAL model. 35 complex equations were developed, which were automated for the processing of 13 scenes, thus covering the entire vegetative cycle of corn cultivation on the "Rancho Las Mercedes" property. For the validation of the results, the data measured by the INIFAP weather station network was consulted on the dates corresponding to the images. The results obtained show an RMSE ranging from 0.001 for the month of June to 0.013 for the month of April. The instantaneous ET values are between the ranges of 0.01 mm / hr and 0.80 mm / hr. Maps of their spatial distribution were generated, where it can be seen that the lowest ET values, those close to zero, correspond to human settlements and bare soils, while the highest values correspond to sites of vigorous vegetation and bodies of water.

Evapotranspiration, SEBAL, Python

Optimización del proceso de barrenado del área del estabilizador vertical para disminuir defectos en una empresa del sector aeroespacial mediante la implementación de la metodología DMAIC

Optimization of the drilling process in the vertical stabilizer area to reduce defects in a company in the aerospace sector by implementing the DMAIC methodology

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Abstract

Currently for organizations it is very important to comply with the satisfaction of both external and internal customers, in the same way it must comply with the established quality protocols, because the products that can be obtained can come to undermine the consumer's well-being final. The present work deals with this subject, however, it is necessary to specify that the company where the project was carried out will be determined as "Company A", due to a confidentiality contract. In which there is a process where holes are made in the skin of the vertical stabilizer with a semi-automated machine. At the end it is inspected, and it is noted that the countersink has marks which are visible or can be felt when the nail is passed over it. This problem causes operators to have to carry out this process again, but by hand so as not to exceed the established countersink measurement and leave it with a mirror polished aesthetic. The objective of this project is to minimize these defects that appear in the skin of the vertical stabilizer in the drilling process of "Company A", which have been generating rework in the production line. In this context, the importance of complying with quality problems would continue to contend in an increasingly strict market, seeking continuous improvement, standardization and control of processes, and customer satisfaction.The present identification work reduces and controls the sources of variation that are affecting the outputs of the vertical stabilizer barrier process, through the application of the DMAIC methodology (Define, Measure, Analyze, Improve, and Control. generated were favorable to the process and that in addition to the reduction of defects, other areas of improvement were found so that the affected process became standardized and controlled.Taking this into account, it is recommended that the methods and production department continue to work together, so that these defects do not continue to appear. Additional research can be done to identify other factors that indirectly affect the drilling process and this could be a great opportunity for the station.

Quality, Defects, Aerospace sector, Drilling, DMAIC methodology

Impacto de la realidad aumentada en el rendimiento académico de los estudiantes de educación primaria en la enseñanza de las ciencias naturales

The impact of augmented reality on elementary school students' academic performance in teaching natural sciences

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Abstract

Augmented reality is a technology that allows combining real-world life with digital information, through other technologies such as computers, tablets or smartphones. Currently, it is used in diverse areas such as advertising, medicine, arts and education, among others. This research was carried out in the city of Ocosingo, Chiapas, Mexico, in a context where it is difficult to access technology and, above all, connectivity. It focused on using augmented reality in a didactic sequence for the teaching and learning process of the circulatory, respiratory and digestive systems in the Natural Sciences subject, in order to demonstrate whether the use of this technology as a didactic tool allows 4th grade students to improve their academic performance. The study was carried out under a quantitative, quasi-experimental and descriptive approach, using data collection tools such as tests designed with dichotomous responses (pre-test and post-test) and surveys with closed-ended questions under the Likert scale. The results show that using augmented reality in the teaching and learning process, within the classroom, significantly increases the academic performance of students compared to the traditional way of teaching these topics in the aforementioned subject.

Augmented reality, Didactic sequence, Academic performance, Elementary school, Natural sciences

Desarrollo del algoritmo genético heurístico para la coordinación de protecciones

Development of the heuristic genetic algorithm for the coordination of protections

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Abstract

The coordination of overcurrent relays is an easy task when dealing with a radial distribution line. However, when directional units are in place to protect meshed networks, the problem becomes very complex. This is because the protection device must offer primary and backup operation for the same or multiple lines using the same protection setting. Moreover, considering two parameters namely the time dial setting and the current pickup setting make the coordination problem even more complex to be achieved manually. Therefore, in this article, the protection coordination study is formulated as an optimization problem to be solved using a heuristic Genetic Algorithm. This not only saves time for the protection engineer; it also transfers the burden to a computer using artificial intelligence and guarantee that the results are close to optimal.

Genetic Algorithm, Heuristic Optimization, Directional Overcurrent Relay Coordination

Manufactura artesanal de papel

Artesanal paper manufacturing

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Abstract

The work addresses the feasibility of a proposal to recycle handmade paper at the Faculty of Mechanical Engineering and Naval Sciences of the University of Veracruz, Region Veracruz; creating handmade paper with leaf residues that were already used in administrative and academic procedures, creating a sustainable impact in its three dimensions (social, economic and environmental) in its operational activities.Qualitative research was carried out reviewing projects developed in other institutions, observing the environment to know the needs and difficulties of operation, which involves the plan and proposal of technical and financial analysis.The financial analysis concludes that the implementation of this project requires an initial investment that involves equipment and tools impacting on linking activities, social service and the Dual Institutional Training Program.The manufacture of a handmade paper recycler is feasible with short-term academic and social impact benefits, based on project indicators and research on academic practices in plant distribution, ergonomics, quality control, operations research, safety, administration and marketing.

Recycle, Manufacture, Paper

A review of open-source ventilators for COVID-19

Una revisión de los ventiladores de código abierto para el COVID-19

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Abstract

In this paper, we present a review of the open-source mechanical ventilators developed worldwide during the beginning of the COVID 19 pandemic. There are many ventilators projects, some Ambu-based, below based and ones that use the air and oxygen lines of the hospital, by controlling the flow and pressure. First, we present the basics of mechanical ventilation concepts. Next, we present an overview of the principal open-source initiatives world, a description of the ventilator, and its working principles. Also, the webpages of each of the projects developed are shown. This paper intends to give the reader a start point of the mechanical ventilators proposed. Finally, we present a compilation developed by the international community where they present the main ventilator projects developed worldwide, where to get their information and the developers' experience. It is important to notice that most of them have not been approved yet by the medical authorities of their respective countries.

Ventilator, Open-Source, COVID 19

Caracterización en línea de la dinámica temporal de señales para el monitoreo del Sistema Eléctrico de Potencia

On-line characterization of temporal dynamic of signals for monitoring the Electrical Power System

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Abstract

The characterization of dynamic phenomena is essential for monitoring the Electrical Power System subject to disturbances. This article proposes an On-line time systematic approach to analyze and characterize the temporal evolution of transient and nonlinear oscillations in these systems. Two methods are used; the first method is based on a local decomposition of the signal under study into orthogonal basis functions to obtain the dynamics of transient oscillations. Next, a second method is applied to those orthogonal basis functions to obtain analytical signals and characterize the instantaneous amplitude, phase and frequency attributes of the oscillations and determine a physical interpretation of the system's behavior. The proposed methodology is a time-frequency-energy analysis which can be applied to the time-synchronized Phasor Measurement Units measurements. The results demonstrate that the proposed methodology provide an accurate characterization of transient phenomena with non-stationary effects.

Oscillation, FIR filter, Kaiser window

Huella de carbono de una pavimentación con la metodología del ACV y SIMAPRO

Carbon footprint of a paving with the ACV and SIMAPRO methodology

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Abstract

The activities carried out by human beings are responsible for the greenhouse gas emissions that heat the planet and generate climate change. The best known gas is CO_2, causing 63% of warming, which is generating consequences in the essential processes of our nature, as in the case of ecosystems, such as wetlands, are at risk of disappearing, the increase in temperature Average and decreasing rainfall, rising sea levels, decreased Arctic ice. The construction industry is one of the ways in which human beings pollute and one of them is due to urban growth and the demand for urban infrastructure, such as urban subdivision roads. The purpose of this study is to determine the KG-CO_2 / M2 and the environmental impacts that are generated in the construction of an asphalt pavement in urban Development in Ciudad Obregón Sonora using the Life Cycle (ACV) methodology and the Simapro software. 9.0, using the required construction volumes. The results obtained of 13.6280 Kg-CO_2 / M2.

Asphalt binder, Pavement, GHG, KG-CO2 / M2

El sistema ANDON, como herramienta fundamental para disminuir el tiempo de respuesta y eliminar los defectos en línea de panel

The ANDON system, as a fundamental tool to decrease the response time and eliminate defects in the panel line

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Abstract

Time is considered a fundamental element in any type of industry, which is why it is necessary to improve it, companies that cannot improve their processes through the reduction of waiting times or downtime, problems of serious damage to their operation daily.The company under study presents serious problems in the panel line, for example, laminated sheets, poor cutting, spillage of coating, paper tear, for the operation of this line there is an available time of 48 hours, it is important note that only 71% of the time is productive. The objective of this study is to implement an ANDON system, through the identification of problems that affect production, in order to reduce response times on the Panel Line.ANDON is a visual and auditory communication system used in the industry that allows workers to interact in a simple way to solve problems that arise during the workday when they occur (Vera, 2018). This project contributes to the continuous improvement of the panel line, as well as a change in the work philosophy of the operators.

Time, System, Production

Eficiencia energética con Generación Distribuida Fotovoltaica (GD-PV); caso de una Congeladora de Pescados y Mariscos en Campeche, México

Energy efficiency using Distributed Generation; a Fish and Seafood Freezer case in Campeche, Mexico

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Abstract

In this article, an energy efficiency study is presented for the fish and seafood freezer company which possesses a Photovoltaic Distributed Generation (GD-PV) plant of 60.32 kWp installed capacity. An energy audit is performed which consists of analyzing the principal electric variables for the utility billing service. Distributed Generation (GD) from renewable energy has been increasing worldwide as an effective mean to reduce electrical energy costs. It also directly helps companies to be more competitive and promote economic growth. Photovoltaic Distributed Generation (GD-PV) provides other additional benefits such as greenhouse gas mitigation and functioning as a roof barrier that prevents gaining solar radiation in buildings. This fact is particularly relevant in a hot-humid climate such as the state of Campeche, Mexico. The shading area due to GD-PV prevents a daily roof thermal gaining of approximately 236.62 kW. Moreover, the GD-PV prevents the atmospheric emission of 4,448.9 kg of CO_2 equivalent.

Distributed generation, Energy efficiency, Grid-connected photovoltaic systems, And photovoltaic distributed generation

Análisis térmico de una planta de potencia de ciclo combinado utilizando enfriamiento de aire a la entrada

Thermal análisis of a combined cycle power plant using inlet air cooling

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Abstract

In this article, a combined cycle power station (gas-steam) is analyzed, considering air cooling before entering the compressor. Currently what is sought are higher thermal efficiencies, which is why the combined cycle power plants have been chosen, since they make better use of the fuel, producing greater net power, all of which have led to innovative modifications in the combined cycle power plants, improving the performance of this. In this research work, a 243 MW combined cycle plant is taken as the base, whose air temperature when entering the compressor is 32 ° C. Knowing in advance that one of the factors that affects the operation of this plant is the condition of the air when entering the compressor, which when it cools will increase its density and with it its mass flow, obtaining an increase in the power of the gas turbine. In view of this, this work proposes that through the use of a mechanical refrigeration system, air cooling to 15 °C is carried out at the compressor inlet and with this achieve an increase in plant performance.

Combined cycle plant (Gas–Steam), Air Cooling, Compressor

Monitoreo de instalación fotovoltaica usando bus CAN

Photovoltaic installation monitoring using CAN bus

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Abstract

This paper addresses the problem of developing a system to monitor the behavior of solar modules using a CAN network. It is desired to measure current, voltage, and temperature under different operating conditions of a photovoltaic installation, in order to obtain the necessary information to later use it to determine its energy efficiency. In this work, current, voltage and temperature data are transmitted over a CAN network based on devices from the Microchip® family of microcontrollers. The network design is made up of slave nodes in charge of carrying out data acquisition and leading them to a CAN Central master node. This master node receives them, oversees timing tasks and connects via serial port to a personal computer. The programming environment used is MikroC® for dsPIC®. The process of sending the data can be observed through the MikroC® USART terminal, these are saved in a .txt file for later analysis with a scientific software. Experimental tests carried out with a group of commercial panels are reported under two operating conditions: short circuit and open circuit. The graphs are shown, and to validate the information provided by the acquired data, the relationships between the monitored variables are verified considering the knowledge obtained from the literature.

Solar panels monitoring, DsPIC, Can Bus

Alternativa energética sustentable mediante la utilización de aislantes térmicos de diferentes materiales en edificaciones con sistemas de aire acondicionado

Sustainable energy alternative, by using termal insulators of different materials in buildings with air conditioning systems

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Abstract

A methodology is proposed for calculating the cooling load and the energy consumption of air conditioning equipment in three scale models of buildings under study, using the ASHRAE CLTD / SCL / CLF method. The building in which the mentioned method is used are three scale models of buildings located in the city of Poza Rica, state of Veracruz, Mexico. This method is applied in order to obtain the cooling load as exact as possible and thus avoid oversizing in air conditioning equipment, and by using thermal insulation, achieve a decrease in energy consumption and thus contribute to the reduction of CO_2 emissions, to energy saving and therefore to sustainable development. The cooling load is calculated by applying the proposed methodology to three cases: model A, B and C. The results for the three test models, object of this study, are compared. Measurements of energy consumption are made to perform the error analysis of the actual energy consumption with respect to that calculated using the method. Finally, energy savings are quantified, in the cases mentioned.

Cooling load, Thermal insulator, Air Conditioning equipment

Diseño de molde para muñón de pierna con altura ajustable de bajo costo, para prótesis de rodilla con energía cinetica

Low cost adjustable height leg stump mold design for kinetic energy knee prostheses

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Abstract

Objective Design a leg stump mold and base and manufacture it, with variable center of gravity adjustment, the cost should not exceed 50% of the prostheses that exist in the market, for this it will be made with accessible materials that are easy to acquire and low cost.Methodology Take a mold of the stump of the subject in plaster, then make the male the same in plaster, to continue the mold in fiberglass and resin, with a metal support at the bottom, where it will be attached to a machined aluminum base. Cylindrical that allows us to adjust the height and also a horizontal adjustment, this mode adjusts the center of gravity, helping the person to have a better balance, and a better performance of the knee prosthesis with kinetic energy. Contribution: the materials they are using are easily on the market, and are inexpensive, for low-income people who have a similar problem, what they can get, and there is no impediment to the sea the lack of a limb to continue with his life

Prosthesis, Cost, Functional, Design

Raspberry Pi, conectividad y programación mediante puertos GPIO

Raspberry Pi, connectivity and programming through GPIO ports

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Abstract

Today, there is an innumerable amount of electronic devices and computer systems that are oriented as platforms for the management of information through the network; manipulating data and at the same time, performing tasks using low voltage electronic signals. They can activate, deactivate or control a device or a system using sensors. In this context, the *Raspberry Pi* platform has an interface composed of a set of pins (GPIO) through which voltage signals can be accessed, and can interact with other electrical and electronic systems for data acquisition and control. This article aims to facilitate access to the *Raspberry Pi* platform from its installation, configuration, to its programming of the ports through examples and instructions, considering the platform as a computer system. The interest of the authors is to provide the reader with the tools, so that the programming of specific applications is the new challenge.

Raspberry, GPIO, WebIOPi

Diseño y simulación preliminar del cubo del rotor para una turbina eólica de 50-kW clase II, de acuerdo a la norma IEC-61400-2

Preliminary design and simulation of the rotor hub for a 50-kW class II wind turbine, according to the IEC-61400-2 standard

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Abstract

Currently, wind energy in Mexico is growing and the same is happening worldwide, so projects with national technologies for the manufacture of wind turbine components must be developed. In this work, a proposal is made for the design of the hub of the rotor for a 50-kW turbine, the objective is to make a new proposal to improve the previous design of project P07 of the Centro Mexicano de Innovación en Energía Eólica (CEMIE-Eólico), which has a welded mechanical hub for a prototype turbine 30 kW. In addition, a simulation is performed through analysis of the finite element method (FEA) by applying certain load elements with the simplified load method of the international standard IEC 61400-2. In these simulations, the load cases of the norm that directly influence the cube are analyzed, then simulated in the ANSYS software to validate the proposed design, mainly analyzing the stresses and deformations. The results obtained will serve as a reference to manufacture the cube and evaluate the feasibility of carrying out a commercial stage with a view to making national components for wind farms.

Wind Turbine, Rotor hub, Design, Simulation

Sistema de recuperación de energía basado en emular el movimiento del flujo de agua en tuberías

Energy recovery system based on emulating the movement of water flow in pipes

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Abstract

Energy production is an important factor for the development of productive activities, transformation and services in the country, whose generation and consumption increases year by year, which leads to the use of clean energy more and more. Hydropower as a portable application option contributes little to energy production in industries or homes, so this situation presents an opportunity for the development of adaptive power generation systems that take advantage of the movement of water. In the present work, a test bench based on an energy recovery system was developed, which consists of simulating the flow of water that exists in the pipes in order to generate electrical energy through mechanical movement by coupling a permanent magnet generator, where the behavior of a turbine interconnected to a pipeline was emulated, through a DC motor whose speed is controlled through a power chopper. A storage and power conversion was developed, integrating a rectifier module with filter which converted the signal from alternating to direct, which would later be the input of a Buck reducing CD-CD converter, which has high efficiency and allows to reduce the voltage stabilized at 5V. To complete the storage system at different loads, a Boost power converter module was used which raises and converts the signal from CD to CD, obtaining a voltage output greater than its input, this energy can be stored in batteries and in the same way be used to power any CD device, thus allowing us to save a part of the energy that is consumed when transporting water in a pipe.

Hydraulic energy, Test Bench, Converters

Mejora en la parte mecánica a una propuesta de ventilador mecánico de transición

Mechanical upgrade to a proposed mechanical transition ventilation

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Abstract

Due to the contingency situation that has been generated in various parts of the world and the declaration of a pandemic carried out by the World Health Organization against the Sars-CoV-2 virus, various people, educational institutions and companies are carrying out the development of mechanical fans that can meet the need for this equipment in their countries. This work he experiences obtained in the design and construction of a transitional mechanical ventilator that allows compliance with the minimum requirements that doctors and healthcare professionals consider when a person is piped. Also, it helps in the seek to comply the regulations that the federal government agency elaborates with the purpose of reviewing the existing proposals for open source mechanical ventilators. It also contains the technical requirements that are need to be covered by the designers. These regulations cover the feasibility for replicating the ventilators proposed, based on certain factors that will be described in this paper. Once the ventilators have been tested, its improvement is carried out from the mechanical part, considering the electrical element to be used, in order to obtain a transitional mechanical fan that could be easily replicated with national suppliers.

COVID-19, Ventilator, Transition

Análisis de sistema mecánicos utilizando sistemas CAE, para estudiantes de Ingeniería Mecatrónica

Analysis of mechanical systems using CAE systems, for students of Mechatronic Engineering

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Abstract

This work shows that the fundamentals of CAE computer-aided engineering systems can be used as an effective tool for optimizing the analysis of mechanical systems and / or manufacturing processes in mechatronic engineering subjects. The simulation of operating conditions, as well as the analysis of different working conditions such as stress analysis, thermal analysis, process optimization and product optimization, allows the CAE tool to be used in a wide variety of processes from previous designs to digitization of reverse engineering processes.During the development of technological skills as mechatronic engineers, CAE tools are essential for students to simulate processes and operating conditions that integrate manufacturing machines or cells.Given the wide variety of tools, CAE techniques can be developed by different methods, however in this case, finite element analysis (FEA) will be used, as a numerical resolution technique that considers that any component can be particularized, in a set of small elements with simple geometry and known physical behavior, this method is generally applied to different engineering fields.

Engineering, Mechanics, Software

Redes neuronales para predecir el abandono académico en ingeniería

Neural networks to predict academic dropout in engineering

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Abstract

This project describes the design process of an artificial neural network model to predict the risk of dropping out of engineering students throughout their socioeconomic, academic, and personal data sing CRISP-DM methodology. The neural network used in the project considers backpropagation functionality with one hidden layer on data from a context questionnaire and academic data from the students in its CENEVAL's entrance exam and their academic status after one year in the institution. The data used to train the neural network it's from 781 records of the last four generations of freshmen year students at the Technological Institute of Motul organized in 48 attributes out of the almost 120 included in the original instrument. The result is a predictive model with a significance level of 75.42% and an F index of 0.6027. This model will be included in the comprehensive tutoring system that is been develop within the organization to monitor the student's academic performance.

Artificial Neural Network, Higher Education, Dropout

Análisis energético de un aerogenerador con diferentes grados de inclinación del aspa usando integral numérica

Energy analysis of a wind turbine with different blade inclination angle using numerical integral

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Abstract

The increase of renewable energy technologies provides a better way of implementation. One of the main problems for the renewable energy is that it depends of the local place topology or the weather conditions. Wind turbines are designed to obtain their maximum torque, this has the advantage of generating electricity with low air speed, but it has the disadvantage that it cannot be used in places with higher wind speeds, because the device can be broken.In the paper, an evaluation was made of the efficiency of a horizontal wind turbine of three blades with 10, 20 and 40 degrees of inclination, energy expenditure was obtained by means numerical integration.The purpose this article is to determine that the change of inclination of the blade has a direct influence on the performance of the wind turbine.

Wind Turbine, Blade Design, Efficiency of a Wind System, Inclination of Blades, Numerical Integration

La granulación de alimentos como medio sustentable y de supervivencia

Food granulation as a sustainable and survival means

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Abstract

The consumption of avocado is of great importance in the daily diet of the human being, since this fruit contains high levels of Omega 3 and various vitamins (B6, B9 and E) and minerals (magnesium, iron, zinc and phosphorus). Today, Mexico is one of the main avocado producers worldwide. However, the high demand and the low production of this fruit makes the price of avocado more expensive and, therefore, the Mexican population reduces its consumption and seeks nutritional alternatives. For this reason, this research aimed to propose the manufacture of solid avocado tablets (based on pharmaceutical techniques) by granulating and compacting the dehydrated powder of this fruit. This was carried out under a mixed approach by applying quantitative and qualitative technologies to systematic, critical and empirical processes in order to choose the best granulation technique, the ideal binder and the type of compaction to use to achieve solid tablets using dehydrated avocado powder. This tablet aims to preserve the same nutrients as natural avocado and reach all sectors of the population to generate a sustainable and human survival environment.

Food dehydration, Granulation, Binder

Diseño y construcción de un colorímetro para identificar el desgaste de fusibles comerciales usando sensores fotoeléctricos

Design and construction of a colorimeter to identify the condition of commercial fuses using photoelectric sensors

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Abstract

Color is a property that we are able to observe thanks to our visual perception; however, an instrument is necessary to perform the quantification on the RGB scale. The purpose of this work is to design and build a colorimeter to identify the wear degree of a conventional residential fuse, the fuse has been exposed to normal wear. The study is carried out using the quantification of light reflection on the RGB scale.
The developed sensor consists of:

- A cylindrical base made on a 3D printer, which allows the external light to be isolated and the upper part of the fuse socket inserted.
- An electronic circuit made up of RGB light emitting led and a photoresistor.
- An Arduino program that measures the reflection of the fuse on the RGB scale.

Implementing the sensor will allow the identification of fuses in poor condition, which can cause failures in the electrical system. Future work will be aimed at quantifying the increase of energy consumption due to the use of fuses in poor condition transferred in RGB space.

RGB scale, Residential fuse, 3D printing

Análisis de las irreversibilidades en un proceso de paro y arranque en un sistema de refrigeración con R-134a

Analysis of irreversibilities in a stop and start process in a refrigeration system with R-134a

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Abstract

In this work, an evaluation of the energy in a start-stop process is made by analyzing the generated irreversibilities in a refrigeration system by mechanical vapor compression with R-134a refrigerant at a flow of 1.0 L / s. This system is installed in the LABINTHAP of the SEPI-ESIME-IPN. For this analysis, there is software that captures data on the pressures and temperatures from the refrigerant at the inlet and outlet of the evaporator, compressor, condenser, and expansion valve at one-minute intervals. For the analysis of the generated irreversibilities, the first and second laws of thermodynamics were used. And, in the process evaluation of stopping and starting, it was shown that the compressor sets a trend of higher energy consumption, so a process of regulation of the refrigeration system by mechanical compression of steam is proposed.

COP, Real Cycle, T-s Diagram, Entropy, Enthalpy

Diseño e integración de un sistema modular para producción de hortalizas, peces y aves de corral, autosustentable

Design and integration of a modular system for the production of vegetables, fish and poultry, self-sustaining

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Abstract

Today, Mexico is facing a crisis over scarcity and the consequent rise in commodity prices. This situation is expected to continue, because the area available for cultivation, livestock and fishing is reaching its limit, while the population and its food needs are increasing. The proposed system presents an alternative in the production of food for self-consumption in rural and urban areas, consisting of three levels for fish rearing, poultry and vegetable production, and incorporates technology to control its development. The proposed prototype envisages a structural part that supports three modules. The first module is intended for the rearing of fish with a system of filtration and recirculation of water. The second module is intended for the cultivation of vegetables, with a system for the control of the necessary nutrients of vegetables, and in turn, the wastes of plants serve as food to poultry. The third module is intended for poultry rearing, with a system that concentrates and treats waste, which serve as nutrients for vegetables.

Self-sustainability, System, Production

Sistema de realidad virtual para la industria aerospacial

Virtual reality training system for aerospace industry

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Abstract

This document describes the process of design and development of a virtual reality system tailored to the Manufacturing environment of Aerospace industry using TRIZ metholodogy with the objective of reducing the learning curve in direct labor. There were identified the critical problems in Manufacturing that describe the longest timing of learning curve. The solution consists of conceiving a Virtual reality system introducing 3D technologies, interactive interfaces and Advanced software to help the user to learn faster and acquire the knowledge and skills in hours.Aircraft Manufacturing environment relies on human factor due to the high complexity of craftsmanship and product controls, severity and a high variety and specialization of many different components with different geometries that are assembled from minor to major assemblies to finally build an aerostructure sizing 63 ft x 20 ft (e.g. Cessna Sovereign+) that consists of 200 thousands sub-assemblies and details that require precisión and perfection to manufacture a product that meets functional and quality expectations.

TRIZ innovation, Virtual Reality systems in Manufacturing, Learning curve

Automatización y control de un prototipo modular autosustentable para la producción de alimentos

Automation and control of a self-sustaining modular prototype for food production

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Abstract

Since 2009, Mexico faces a crisis due to scarcity and the consequent increase in prices of basic products. This situation is expected to continue, because the area available for cultivation, livestock and fishing is reaching its limit, while the population and its food needs are increasing. Today, strategies must be used to accelerate the production of plant and animal food that reduce costs and counter shortages. This article presents the development of a self-supporting vertical modular prototype for the production of vegetables and meat (poultry and fish) for the Sierra Norte region of Puebla, through the design and integration of an automated control system responding to the need to provide an alternative in food production. The prototype is made up of three modules: the first module is for raising fish, the second module is for vegetable production, the third module is for raising poultry. In this way, the project intends that, based on the methodology put in place, it can be implemented for food production in our region.

Modular prototype, Self-sustaining, Food

La gestión ágil de proyectos de software en la formación académica universitaria: Una revisión sistemática de la literatura

Agile management of software projects in university academic training: A systemic review of literature

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Abstract

Agile project management is an iterative approach that allows you to plan and guide project processes that require special speed and flexibility to achieve project success. It is for this reason that today professionals must master the basic concepts of this work as disciplinary or professionalizing competence. The objective of the study lies mainly in compiling recent research, including the last three years, in relation to Agile Software Project Management, its current situation and its application in practice. The study shows the implementation of the methodology proposed by Kitchenham for the systematic literature review (RSL) analyzing 40 scientific publications, concluding that the agile management of software projects allows efficient and effective management with the application of a standard o priority methodology and with the unavoidable use of software tools of specific use for it.

Systematic literature review, Agile project management, Software

Estabilidad y diseño de un controlador LQR para un sistema Bola-Viga

Stability and design of a LQR controller for a Ball-Beam system

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Abstract

This article presents the design of an LQR controller for a Ball-Beam system, as well as its stability analysis, the control of a Ball-Beam system is one of the most interesting for control engineering since it is a highly non-dynamic system linear. The objectives of this document focus on the performance of the system using an LQR control for different disturbances as well as obtaining the phase plans. The work starts with the modeling of the ball-girder system, which consists of two mechanical arms, a gear box and a DC servomotor, later the LQR control is designed, this allows simulation and obtaining the response of the controller under different conditions. In the system the input torque is generated from the DC servo motor to control the position of the ball on the beam, where the ball rolls freely on the beam. Performance analysis is performed using robust LQR and the performance characteristics of the system are presented. Finally, the stability analysis is carried out by plotting the phase planes.

Ball and beam system, State space, Stability analysis

Simulación y Desarrollo de Horno Termosolar para el Cocimiento de Alimentos

Simulation and Development of Solar Thermal Oven for Food Cooking

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Abstract

This project implements a solar thermal oven for cooking food based on solar radiation to generate heat and transform food for consumption and, with it, have a sustainable proposal for renewable energy with the use of solar energy, an entrance to sustainability according to the sustainability objectives required for our country; The oven prototype establishes economic profitability, since there will be no expense for any type of fuel, allowing a more eco-friendly life with the environment, which will allow us an alternative focused on caring for the planet, the project is a solar thermal oven for cooking food, through the use of solar energy, specifically radiation and heat transfer, which obtains the temperature with a solar thermal system powered by a pump with a high pressure, which will move a thermal fluid through a coil which surrounds the oven from the inside and following the base of a sensor make a recirculation of the same which would avoid the increase in the cost of LP or natural gas and even firewood, which represents money invested for certain sectors of the population.

Oven, Solar Thermal, Cooking

Design of an intuitive web model for a school of higher education

Diseño de un modelo web intuitivo para una escuela de educación superior

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Abstract

Currently we are in the Information and Communication Society and the web pages in Higher Education institutions represent an impressive showcase to the world, since we cannot say that it is only in their environment, through these web platforms people are informed of the services that are made in each of these schools. This work presents the application of web development tools that facilitate its realization and implementation, giving the expert the opportunity to have enough alternatives to take them ad hoc to school. Providing the scope of projection to be at the fore front and competitiveness. New technologies currently open up the possibility of improving the control of tasks that are required by the user. In this case, the aim is to design an intuitive and comprehensive web model to promote the projection of the institution of higher education, in the East of Michoacán

Web, Intuitive, Integral, Competitive, Vanguard

Sistemas de Gestión en Mantenimiento: Propuesta de un TPM en una empresa productora de marcos y molduras de la región

Maintenance Management Systems: Proposal for a TPM in a company producing frames and moldings in the region

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Abstract

This research is carried out in a company that produces frames and moldings and addresses the need to develop a Total Productive Maintenance (TPM) program, as a result of the unavailability of machinery and equipment; and training that affects maintenance operations, which are not performed correctly causing costs. Currently there is a 76% availability of machinery; 78% in equipment; 42% in training and monthly average costs in machinery of $ 15,260 pesos; and in equipment of $ 1,860 pesos, in terms of maintenance costs there are no globales records.The objective was to carry out a proposal for maintenance activities, through the TPM methodology; to have an updated maintenance program.The procedure was: Describe the area under study; describe the situation of the area under study; establish TPM policies and goals; identify failures in machinery and equipment; and develop the maintenance program.It was contributed with the contribution of a maintenance program composed of: calendar, records of equipment in stock, corrective and preventive maintenance, maintenance scheduling, records of maintenance costs and catalog. Thus fulfilling the objective of this investigation.

Program, Maintenance, TPM

Plataforma educativa para desarrollo de sistemas de Software Radio mediante modulación QPSK en Octave y Arduino

Educational platform for Software Radio system development through QPSK modulation in Octave and Arduino

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Abstract

Nowadays, the development of software radio based systems has allowed the transmission of data at high speeds and frequencies in the order of Gigahertz (Jovanovic, 2018). For this, the digital system is characterized by using digital modulation techniques in software through transmission symbols in the Digital-End stage, applying digital-analog (DAC) and analog-digital (ADC) converters to vary the sampling frequency and transmit the data in the Front End, (Chien, 2001). This work presents a digital educational platform to simulate the characteristics of a Software Radio system and not a web platform. The present investigation is focused on the characterization of signals modulated by Octave considering in the first instance the quadrature modulation QPSK, where the transmission of the modulated signal is carried out by means of the Arduino board in a digital port, with a digital-analog approach (DAC) using PWM modulation a RC filter and an amplifier circuit, which synthesize the signal considering the limitations of the Arduino board. The proposed design presents an electronic platform that will allow the understanding of software-based radio systems.

Software Radio, Octave, Arduino

Evaluación comparativa de los resultados de la aplicación del cuestionario del estilo de aprendizaje honey-alonso a estudiantes del área de las ciencias computacionales

Comparative evaluation of the honey-alonso learning styles questionnaire to computer science selected students

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Abstract

In this article a first approach was made about the tracking of a student's learning styles preferences along their higher education. The investigation was applied to students of the Computer Science area, through a comparative evaluation of the Honey-Alonso Learning Styles Questionnaire to selected students, in three moments of their career path.In a first instance, the results show a change in the learning style of the students, later an analysis provides the nature of that change.The study presents the sample size as a limitation, because the tests had to be applied to the selected students and at different times of their professional studies.The interest for get knowledge about learning styles, aims to increasing the comprehension about how the students learn, and in the possibility of develop tools that allow, as far as possible, increasing the learning motivation and personalization.

Learning Style, High Education, Environment Learning

Estandarización del proceso de confección, a través de la Ingeniería de Métodos, para aumentar la productividad, en una empresa del ramo textil en el Estado de Puebla

Standardization of the making process, through Method Engineering, to increase productivity, in a company in the textile industry in the State of Puebla

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Abtract

The standardization of a process allows to validate a method to achieve the production objectives and the required quality characteristics, however, there are still companies that today allow each worker to develop their own method, which negatively affects the achievement of those goals. When a quality problem arises, it becomes complex to find the root cause, since it will derive from different working methods. In this context, the training process fails, by not specifically establishing the correct process to follow for each operation. These failures affect both the income and the profits that the companies may have, which is why it is relevant to have work standards. The objective of this work is to determine the standard of the making process, through Method Engineering, to increase productivity in a company in the textile industry, dedicated to the manufacture of sportswear. The result of this research shows a positive result, between setting a standard and increasing productivity.

Standardization, Method Engineering, Making process, Textile industry

Sistema inteligente para el monitoreo de motobombas en el suministro de agua para optimizar rotación en cultivos

Intelligent system for monitoring motor pumps in the water supply to optimize crop rotation

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Abstract

In the agricultural sector of the municipality of Guasave, diesel pumps are currently used to irrigate the various crops, this due to the lack of water that has occurred in recent years. To do this, these pumps are mostly manufactured with very rustic physical structures and only with analog markers that are not very precise. This situation keeps the equipment unprotected and only shows parameters analogically, this makes the process inefficient. With the present project, we designed, developed and simulated a prototype of a system that evaluates and monitors the physical parameters that influence the operation of different thermal machines used for pumping. To achieve the above mentioned, a series of sensors were installed, the signal is sent to Raspberry Pi 3, in which the data is processed, stored and shown to the user of the equipment through a graphic interface. A possible improvement of this system in the future would be to create a mobile application, which in real time, could alert the user of possible failures, decreasing the side effects on the environment, optimizing crop rotation for the continuous improvement of the competitiveness of the agro-industrial sector in northern Sinaloa.

Technological innovation, Virtual training, Improving industrial competitiveness

Aplicación de una herramienta de seguridad para la prevención de fuga de información

Application of a security tool for the prevention of leakage of information

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Abstract

Considering that day by day most of the services provided by any organization are being migrated to environments that involve the use of computer equipment, servers and data networks, the multiple attacks suffered by companies, focused on theft, must also be considered. information, falsification, modification of services, impersonations, vulnerabilities in systems, among many things. Despite the great usefulness and all the advantages that networks offer, it cannot be left aside, much less assume that the security of the organization is in optimal conditions, concepts such as implementation, administration and computer security. Therefore, the company must have an Information Leakage Prevention security scheme, based on a security system with the tools that provide these advantages.

Security, Prevention, Information

Estructura Tecnológica y Organizacional de Inclusión a la Industria 4.0 en Universidades como un Factor en la Eficiencia de Procesos Productivos y de Servicios en el Sector Empresarial

Technological and Organizational Structure of Inclusion to Industry 4.0 in Universities as a Factor in the Efficiency of Productive Processes and Services in the Business Sector

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Abstract

Currently, society lives governed by technology, which evolves day by day, an example of this is the transformation represented by the last indicated Industry 4.0 paradigm. This concept is oriented to fulfill two main objectives; automation in the improvement of industrial processes; and device interconnectivity, where techniques such as sensing and data analysis are used. Based on these tools, this technological transformation demands the study of industrial processes, or services, to identify key points in them where improvements can be made. Before implementation, these changes are visualized through scientific prototypes that have applied technology to predict their functionality in a real environment. These prototyping challenges create the perfect link between school and industry, as the latter need to improve research center support processes, such as links at universities. This article describes a flexible structure and methodology, designed for universities, to develop studies on processes in organizations and generate prototypes based on Industry 4.0 technology, from a scientific research perspective.

Methodologies for Technological projects, Industry 4.0, Scientific prototypes

Un Estudio Holístico para la comunicación asertiva de un sitio web empresarial con el cliente: Plugins

A Holistic Study for assertive communication of a business website with the client: Plugins

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Abstract

Today, the image of a company depends substantially on its online presence, the existence of a business website has become a necessity. With this, it is essential to establish assertive communication with customers in order to win and care for their preference. The general objective of this research is to apply a holistic approach and methodology that allows the use of plugins to be applied in practice as a tool to add value to the design, functionality, use and communication of customers with business websites. This as part of the necessary skills or competencies in the learning of students in the area of computer science and technologies with an innovative approach, helping to encourage research in this context. The methodology is carried out from the holistic research process proposed by Hurtado (2006), showing the ten phases in detail in the proposed technological application. Concluding that the holistic approach is fully adaptable for research in the area of computer science.

Holistic methodology, Business website, Communication

Prototype of natural user interface applied to a robotic arm for medical attention preventing nosocomial infections in healthcare personnel

Prototipo de interfaz de usuario natural aplicado a un brazo robótico para atención médica previniendo infecciones nosocomiales en personal sanitario

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Abstract

In this work, an experimental prototype of natural user interface based on Kinect for the tele-operation of a robotic arm, was developed as a technological support to contribute in facing the global crisis of health generated by COVID-19, a dangerous and highly transmissible virus. Until now, it is causing thousands of deaths and growing of contagion rates around the world, involving a serious situation for healthcare personnel that works in hospitals attending infected population. This system was proposed with the aim to control a robotic arm for medical purposes to achieve a quality medical care to COVID-19 patients without risk implications for healthcare workers associated to nosocomial infections due to direct contact with infected patients, contaminated medical equipment, surgical objects and surfaces.The developed prototype is able of being manipulated in real time requiring neither physical controller nor any contact device to carry out its functions, but simply motion or gesture from the user's arm. It can be applied in areas such as tele-operation, tele-rehabilitation, telehealth nursing, assistive and therapeutic robotic devices, elderly care which are the last tendency in medicine at this time. Kinect V2, the Software Development kit SDK 2.0, Microsoft visual C# and Arduino were used for this purpose.

Natural-user-interface, Robotic-arm, COVID-19

Analysis of the measurement system in an electronic assembly Factory

Análisis del sistema de medición en una fábrica ensambladora de electrónicos

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Abstract

The importance of developing statistical tools in the manufacturing labor field starts from the daily struggle of industrial production processes against variability. The analysis of the measurement system aims to assess the variability associated with the measurement method used in the production process. Considering the instrument (Gage) and the operator that performs the measurement, in order to identify if it can be considered as acceptable.The objective of the research is to evaluate the reliability of the measurement system used in the production line of electronic locks through a Gage R&R study, to reduce the number of defective parts.The production line under evaluation is dedicated to the assembly and manufacture of electronic padlocks, has three inspection stations in which a repeatability and reproducibility study is carried out to obtain as a result the percentage of accuracy associated with the performance of the machine in the measurement system and personnel.The methodology or procedure to be followed for the development of the repeatability and reproducibility study will be carried out as mentioned by Pulido (2009), in the described steps of a short and long R&R study, from which the most relevant and applicable steps were taken. according to the characteristics of the present problem.The contribution of the study is the development of an analysis of the measurement system offers the company the outline of the current situation in a quantitative and qualitative way and allows it to provide a solid basis for the recognition of improvement opportunities that can help to decrease reported defects.

Variability, Repeatability, Reproducibility

Alarma inteligente para prevenir el robo de bicicletas en la Ciudad de Oaxaca

Smart alarm to prevent bike theft in Oaxaca City

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Abstract

The objective of this article is to present the development of a smart alarm prototype that will help prevent bicycle theft in Oaxaca City, which is based on a programmable system.The project arises as a need for protection and safety of the bicycle as a means of transportation; since the thefts of bicycles parked on streets in Oaxaca City increase day by day. As, for example, Carrera (2018) notes that the responsible authority does not have a decisive participation in the abatement of bicycle thefts and that it is the citizens who seek them out by their own means and they not always get success.The research was carried out in two phases, in this document the first phase is presented, in which two functional prototypes of the smart alarm were designed and implemented.The applied development methodology is that of prototypes; since this facilitates the understanding of the needs of the users.With the present research, it is hoped to lay the foundations to continue with the improvement of the prototype and in this way, society will be offered an option to protect its heritage.

Smart alarm, Programmable system, Antitheft device

Variación de velocidad de un motor monofásico de inducción mediante el cambio de amplitud

Speed variation of a single-phase induction motor through the change of amplitude

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Abstract

An induction motor is a system that is made up of an electrical part and a mechanical part to form an electromechanical system.Conventional studies and analyzes of induction motors focus on the plate values provided by the manufacturer which already maintains the fixed motor functional characteristics, usually designed by software. Which provide an output response from an input signal.In this work an analytical model is proposed to know the dynamics of the induction motor and find the optimal parameters of some of its elements by the method of the geometric place of the roots; Since given the various changes in demand in the manufacture of industrial products, where manufacturing processes are governed by engines and that the rotor speed is kept constant at defined time intervals, the same energy is consumed during the process, therefore it is proposed to vary the speed to accelerate a process during peak hours, lowering the speed at certain times, leading to energy savings and avoiding overheating in the motor as described below.

Motor, Induction, Speed, Variation

Análisis de las prestaciones de un motor de combustión interna alternativo usando biocombustibles: (i) aceite de soya; (ii) aceite de canola

Analysis of performance of a reciprocating internal combustion engines using biofuels: (i) soybean oil; (ii) canola oil

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Abstract

In the present study, two biofuels derived from cooking oil are evaluated. To carry out this work, an reciprocating internal combustion engine will be used, which is ready on a fully instrumented engine test bench. Firstly, the biodiesel production process is described, where soybean oil and canola oil have been used. Subsequently, the experimental section that has been used for the present investigation is described. The experimental tests are carried out: (i) modifying the degree of opening of the accelerator and (ii) using a constant load of the dynamometer. On the other hand, in the results section shows the performance of the two biofuels generated against diesel commercial. Also, in this section shows the percentage differences of: (i) engine power; (ii) mass fuel, (iii) thermal efficiency engine and, (iv) exhaust temperaturas. The tests have been carried out under different engine speed conditions of the reciprocating internal combustion engine. Where, the main average differences that have been registered in the engine test bench were: for engine power, 32 and 33%; for the mass fuel consumption of -4.5 and 5%, when using soybean biodiesel and canola biodiesel, respectively. These differences are due to the energy capacity of each biofuel and, the instantaneous evolution of combustion process inside the reciprocating internal combustion engine.

Reciprocating internal combustión engine, Biodiesel, Polluting emissions

Aprovechamiento sustentable del recurso hídrico mediante un sistema de captación de agua de lluvia y red de suministro

Sustainable use of water resources through a rainwater harvesting system and supply network

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Abstract

The current energy need allows new technologies and methods to be applied to meet the needs of a population to pollute as little as possible and make systems more efficient. This work presents the design and installation of a rainwater harvesting system in the Faculty of Engineering of the Autonomous University of Campeche and its use in a garden made up of a body of water and vegetable irrigation, including the implementation of renewable energy, demonstrating that sustainable technologies applied correctly can be in harmony with the environment. The water potential of a free fall is usable for the generation of clean electrical energy using a hydraulic micro-turbine, capable of supplying a submersible pump that allows the recirculation of water within the system. The project focuses on agriculture, aquaculture and hydraulics that link the sustainability that could be achieved thanks to the application of renewable technologies.

Water potencial, Rainwater harvesting, Renewable energies

Diseño de un controlador para sistemas de refrigeración aplicando índice de confort térmico simplificado

Design of a controller for refrigeration systems applying a simplified thermal comfort index

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Abstract

This work, the objective is to study a simplified thermal comfort index and apply it to a model of a building with a cooling system in order to check if this simplified comfort index works as a substitute for the standardized index that is indicated in international standards and lead to the decrease in the use of six input variables to only two, which would present a reduction in the number of measuring instruments to be used in real applications. This application presents a Derivative Integral Proportional Controller (PID) to calculate the temperature that satisfies the conditions so that inside the building a comfortable environment is maintained following the scales of the comfort indices. Comparisons of temperatures, thermal comfort scales and percentage of dissatisfied people in both models are required to obtain a validation. The programming of the building's mathematical models as of the simplified and standard thermal comfort indices is planned to demonstrate based on block diagrams using the software Matlab® on its Simulink platform.

Thermal Comfort, PID Control, PMV

Modelos de Simulación Computarizados Aplicados a las Prácticas Tradicionales Pesqueras de los Huaves en San Francisco del Mar, Oaxaca

Computerized Simulation Models Applied to the Traditional Fishing Practices of the Huaves in San Francisco del Mar, Oaxaca

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Abstract

This research studies the use of techniques and practices used by the mareños (huaves of San Francisco del Mar) in traditional fishing, and thus obtain data on the current state of various activities, which are constantly threatened. Therefore, fishing techniques are represented in a specific software that will benefit fishermen and the community that makes use of it, the generation and/or creation of specialized software with a particular focus, without ruling out the possible expansion of this (or that serve as a basis) for the analysis of other techniques in different indigenous communities, other sectors of society or even at the industrial level.The results are reflected in an order of approach that primarily involves the cultural part of the entire study, the result of surveys and interviews carried out at different times throughout this research. In the end, an implementation of the proposed Hybrid Model of Fishing Forecast is obtained, which represents an advance in the field of technological development. The MHPP combines four theories based on three methods: scientific method (tidal theory), empirical-analytical method (solunar theory) and empirical method (general model of the moon + huave worldview: huave lunar calendar).

Models, Computerized, Fisheries

La tendencia del desarrollo sustentable en la educación en ingeniería en México

The tendency of the sustainable development of the Mexico's engineering study program

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Abstract

The article discusses the implementation of constant updates in the management of the National College study programs, with the main goal to advance in a constantly changing Industry sector that requires engineers who could adapt themselves to the tendencies that build solid relations between forming Institutions of engineers (colleges) and the Industry sector, with the purpose of creating sustainable projects obtain the technical and technological development to help our society. The article presents a stage in which the Engineering students and the companies obtain the firmness of an ideology based on the commitment to develop or to adapt projects focused to constructing a sustainable environment that would impulse the technology in the local region, modernizing it.Many studies show the necessity of teaching and transmitting a development capable of guiding the Engineering student's community to the path of a harmonic evolution with the society and the environment.

Tendencies, Engineering, Sustainable environment

Prototipo para el análisis del crecimiento vehicular y de estaciones de monitoreo atmosférico

Prototype for the analysis of vehicle growth and atmospheric monitoring stations

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Abstract

There is a universal recognition of the importance and need to establish more ambitious and effective climate actions in all the sectors involved; government, private sector and society with the aim of acting together to decrease and stop the increase in global temperature in the present century and thereby avoid devastating and irremediable effects on climate change. In this sense, the implementation of atmospheric monitoring systems has made it possible to identify the emissions of particulate and polluting gases directly related to gasoline and diesel engine vehicles; therefore, the objective of this project is to design a prototype system for mobile devices with the Android operating system, which allows projecting the increase or decrease of polluting gases using statistical data on vehicle growth and atmospheric monitoring stations in the State of Jalisco, Mexico, therefore it constitutes a valuable technological tool whose main contribution focuses on keeping the population informed about the importance of the reduction of contaminants that can deteriorate health.

Prototype, Vehicle growth, Atmospheric monitoring

Desarrollo de un sistema inalámbrico escalable de medición de humedad del suelo en un cultivo de vid

Development of a scalable wireless soil moisture measuring system for grape vine cultivation

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Abstract

We present a wireless system applied to precision agriculture, made up of sensor nodes that measure soil moisture at different depths, applied to vine crops where drip irrigation is applied. The intention is to prepare a system for scaling, and to create a Wireless Sensor Network (WSN) that communicates by radio frequency with a base station (ET), so that the gathered data is stored locally and can be sent out an Internet gateway.

Sensors, Soil moisture, Wireless sensor networks

Sistema web para la evaluación de los Programas Institucionales de Tutoría de las Instituciones de Educación Superior de la RCO de la ANUIES

Web system for the evaluation of the Institutional Tutoring Programs of the Higher Education Institutions of the RCO of the ANUIES

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Abstract

This article describes the process of analysis, design and implementation of a web system for the management of the evaluation processes of the Institutional Tutoring Programs of the Higher Education Institutions that make up the Central West Region of the Asociación Nacional de Universidades e Instituciones de Educación through the collaboration of the Tutoring Network and the Tutoring Department of the Universidad Tecnológica de Jalisco. This process was developed through the agile SCRUM methodology due to the periodicity of the phases and their implementation. The objective of the system is to automate the peer evaluation process in which the members of the Network participate as a continuous improvement strategy and that directly affects the comprehensive training of students, in addition to being consistent with the Quality Management Systems of the HEIs and with the recommendations of the Accrediting Experts of the Consejo para la Acreditación de la Educación Superior and the criteria of the Federación de Instituciones Mexicanas Particulares de Educación Superior as processes that ensure quality in Educational Programs, contributing to the continuous improvement of support services for students.

Institutional Tutoring System, Institutional Tutoring Program, Tutoring Evaluation

Hidroxiapatita sintetizada a partir del reciclaje de cascaron de huevo

Hydroxyapatite synthesized from the recycling of egg shells

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Abstract

There are different types of hydroxyapatites (HAp) which is why their uses have extended not only in the area of biomaterials, but in catalysis their possible use begins to be analyzed. Its properties depend on the Ca/P atomic ratio, where the type of synthesis and raw material influence this relationship. For this reason, in this work HA was synthesized from the waste of the egg shell, its structure is made up to 90% $CaCO_3$, phosphorus was impregnated, the material obtained was calcined at 800 °C, varying the time 2, 4 and 6 H.The material obtained was found to have characteristic functional groups of HAp, the Ca/P ratio was obtained byEDS, ranging from 4.8 to 44, indicating that you have HA with a large number of carbonate groups

Hydroxyapatite, Atomic radio, Catalysis

Diseño e implementación de un sistema de control a lazo cerrado PID para manipular la temperatura en el proceso de termoformado

Design and implementation of a PID closed-loop control system to manipulate the temperature in the thermoforming process

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Abstract

The purpose of this work lies in the design and implementation of a closed-circuit temperature control system (SCTLC), to control the temperature transfer in the mold of the thermo-prepared system, where the blocks are manufactured from multilayer containers. post-consumer.The plant (electrical resistance) was characterized, with the AC voltage levels (30V, 60V, 90V and 120V) in a time of 60 min each of the voltage levels, considering the initial temperature (ambient temperature), in function of the step signal, then, the plant model was determined using Matlab software and the analytical method with the data of the plant characteristic curve at a voltage of 120Vac, obtaining the first-order transfer function, then The PID controller implemented the Ziegler & Nichols method and the Matlab software were tuned and finally the reference input, the control, the power stage, the plant and the feedback were coupled.This project contributes to control and stabilize the resistance temperature, implemented in the thermoforming process, for the production of blocks using multilayer containers.

Closed loop control system, Temperature and blocks

Detección óptica en 3D de un objeto flotante en una superficie marina agitada

3D optical detection of the floating object on agitated sea surface

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Abstract

In this paper we realize a comparison between two detectors: Matched Subspace Detector (MSD) and Modify Matched Subspace Detector (MMSD) when there is a images secuence (3D detection), where the parameters of sea surface and the parameters of floating object are priori unknown in computer simulation, with help of computer software MATLAB. Both detectors (MSD and MMSD) are based in the General Likelihood Ratio Test (GLRT); this method helps solve detection problems when the sea surface and floating object parameters are unknown. The sea surface is simulated as a Gaussian random process, and the floating object is simulated as a priori unknown deterministic process. The paper considers the dependence of the probability of detection with a fixed probability of false alarm on the difference between the average values of reflections from the sea surface and from a floating object with different ratios of the power of fluctuations of reflections from the object and from the sea Surface.

3D detection target, Sea surface, Multipixel process

Modelado matemático de secado solar de orégano (Plectranthus amboinicus) con tecnologías directas e indirectas

Mathematical model and solar drying of oregano (plectranthus amboinicus) with direct and indirect technologies

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Abstract

Oregano is a plant with many nutritional and medicinal properties; there are also other applications in the chemical industry. In this work, the drying kinetics of oregano leaves are studied using a cabinet-type dryer with and without a forced convention, open sun drying, and indirect solar drying. The samples had an initial moisture content of 80 % and the final content of 9 %. The results indicate that indirect solar drying provides better control of operating conditions and greater protection against temperature effects, producing better quality in the dry product. The time required to reach the equilibrium moisture content in all experiments ranged from 375 to 600 min. The data were also adjusted to various mathematical models, resulting In Weibull, Logarithmic, and Page, which best represent the drying behavior of oregano leaves. The statistics used for indirect solar dryer are R^2 of 0.9969, 0.9968, and 0.9945, X^2 of 0.0363, 0.0363 and 0.0599 respectively.

Solar drying of oregano, Solar drying, Drying models

Innovación al Sistema de Tutorías para fortalecer su uso e impacto en la acción tutorial

Innovation to the Tutoring System to strengthen its use and impact in the tutorial action

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Abstract

Tutoring has been implemented in higher education institutions as a strategy that contributes to the improvement of the students' academic performance as well as their comprehensive training while improving efficiency in the institutions. At the Instituto Tecnológico de Tehuacán, a web system was developed with the aim of being a support tool in the development of the Tutoring initiatives. This system was operated in 2019, to analyze the impact of its implementation. This document presents the results of the system implementation as well as its innovative approach, which consists of using an open-source framework, compatible with a database that was developed with the objective of having a system that integrates the main actors from the tutoring program, and helps them develop tutoring initiatives in a simpler and more productive way by integrating improvements and new features. Therefore, the system will impact in successfully achieving the goals of the tutoring program. The analysis was executed under a qualitative methodology and the development of the system under an agile methodology.

Tutoring, Innovation, Tutorial action

Propuesta de un sistema de comunicación inalámbrico para una red de sensores bajo el agua en tiempo real aplicado a un sistema ROV

Proposal of a Study and implementation of a wireless communication system for a network of underwater sensors in real time applied to a ROV system

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Abstract

This work a novel approach in radio frequency communications applied to a underwater wireless sensors network UWSN is presented. The proposal is to manipulate in a bounded and controlled environment a Remote Operated Vehicle ROV without umbilical cable through a underwater sensors network based on radio frequency communication, taking advantage of the faculties of this underwater communication in conjunction with a sensor network, furter, a *dynamic redundancy* is used in the transmitters towards the ROV to increasing the range and avoiding communication loss, aditional a *static redundancy* is applied on the receiver to increase te reliability of comunication. The part of the ROV receiving sensors is based on a *statisc redundancy* of 3 sensors which will apply a vote taking in order to failure tolerantce, the sensor network will applied a *dinamic redundacy* in the transmitters in order to follow the communication with the ROV, in case of failure, the communication loss can be compensated with another sensor of the network that will take its role.

Underwater Wireless Sensor Networks, Remote Operated Vehicle, Redundancy

Radiación fotosintéticamente activa evaluada en la ciudad de Zacatecas

Photosynthetically active radiation evaluated in Zacatecas city

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Abstract

The present investigation is related to one of the most important processes for the development of life on Earth; photosynthesis, an essential process in the cycle and development of living beings, centered on solar radiation that is useful for plants to carry out this process, Photosynthetically Active Radiation (PAR). The objective of this work is to generate information on the PAR through a database to collaborate in the decision-making of farmers in the area. For this purpose, a quantum sensor installed in building 6 of the UAZ Siglo XXI Campus was used. According to Abal (2013), in agricultural and production planning, it is very important to have a detailed knowledge of incident solar radiation on the earth's surface (Abal and Durañona, 2013). When collecting, treating and analyzing the data, it was found that the daily average PAR is 819.52 μmol of photons m^{-2} s^{-1} (179.47 W m^{-2}), if only the sunny hours are taken into account. It can be concluded that according to the PAR received in the evaluation region and the type of nutrients in the soil, other crop alternatives to those traditionally used can be sought.

Quantum sensor, Photosynthesis, Solar radiation

Análisis de los efectos de la implementación de un software interactivo para la inclusión social de personas con discapacidad y su beneficio en niños del centro de atención múltiple (CAM)

Analysis of the effects of the implementation of an interactive software for the social inclusion of people with disabilities and their benefit in children of the multiple care center (CAM)

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Abstract

Social inclusion represents incorporating into community life people who live and relate to each other, regardless of their origin, social condition or activity. It Categorically represents bringing it closer to a dignified life, and that it has basic services for appropriate and reasonable personal and family development, however, social inclusion is the tendency to enable people at risk of poverty or social exclusion to have the opportunity to participate fully in social life, and thus can enjoy an adequate standard of living. The objective of this work shows the analysis of the effects of the implementation of interactive software whose intention was to integrate information and communication technologies to learning activities, achieving self-determination and full integration of people with disabilities. Based on the adaptive skills assessment model for people with cerebral palsy.

Disability, Social inclusion, Interactive software

Análisis de riesgos de trabajo en área de Sacrificio de un Rastro Tipo Inspección Federal

Job hazard Analysis in the Sacrifice area of a Federal Inpection Slaughterhouse

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Abstract

This research deals with occupational safety and health and its scope includes the conditions in which the worker must perform his tasks, the hazards to which the worker is exposed, their prevention and control. The study object is the Sacrifice area of a TIF slaughterhouse which handles the problem of reducing the number of accidents that jeopardizes the integrity of workers. The objective was to reduce the risk of the worker reflected in the number of accidents.The procedure was to Identify risks and threats in the work area, Analyze risks at work stations. Risk assessment and proposal development.The results show the risks present in the Sacrifice area in which the use of PPE is a common and most critical cause, an in-depth analysis reveals that the problem is common to the other areas, of a total of 326 incidents Sacrifice has a value of 49 and 89% of these incidents have a high probability of causing temporary loss of working capacity impacting directly to the risk premium, only 11% could cause permanent partial disability. Finally, after carrying out an inspection program, the partial result in number of accidents at the end of this research was 4 compared to the previous year with 10.

Risk, Meat industry, Safety and occupational health

Diseño de una base de datos para la entrevista inicial de tutoría

Designing a database to the initial tutoring interview

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Abstract

The present work consists of the design of a database, which will allow the storage of information obtained from the initial tutoring interview, applied to new students, which is divided into 5 sections: General Data, Socioeconomic Information, Academic Background, Health and Psychology, the purpose is to have a tool to apply the interview digitally, and optimize time and materials required, since currently it is done manually which generates printing and photocopying costs that later become waste, in addition to the fact that processing the information is complex.The cascade methodology will be used since it is characterized by dividing the development processes in successive project phases and each one of the phases serves as a starting point for the next one.As a first stage, it will only be implemented in the Computer Systems Engineering career and later on it will be shared with the other educational programs of the UPFIM.

Database, Tutoring, Interview

Rediseño del prototipo de sistema programable para prevenir el robo de bicicletas en Oaxaca

Redesign of programmable system prototype to prevent bicycle theft in Oaxaca

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Abstract

The objective of this article is to present the second phase of the development of a smart alarm prototype that contributed to the prevention of bicycle theft in Oaxaca City, as a result of a redesign of a previous prototype.In this second phase of the investigation, improvements were made in the autonomy of the alarm, adding a lithium battery to supply the energy of the circuit; thus, the size of the circuit is also decreased by changing some components; on the other hand, a mobile application is developed to complement the alarm functions. In addition, a real-time database manager is added in order to have the location data of the bicycle on real time, it means, when the data are being generated. Finally, the traced of a route is added using the Google Maps application that allows the user to focus in certain zone in order to searching their bicycle. In the second phase, also it was applied the prototyping methodology as in the first phase.

Redesign, Programmable System, Theft prevention

Remoción de arsénico presente en el agua potable del Municipio de Ojocaliente, Zac. empleando perlas de gel de quitosano

Removal of arsenic present in the drinking water of the Municipality of Ojocaliente, Zac. using chitosan gel beads

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Abstract

There is a great problem for the supply of drinking water in Mexico, the state of Zacatecas is no exception, in addition to this the water in the region has the presence of heavy metals, fluorine compounds, arsenic and high hardness. The objective of this work is to remove the arsenic present in the drinking water of the municipality of Ojocaliente, Zac. using chitosan gel beads. The initial sample was characterized giving an As concentration of 70 ppb, a high value in reference to the Official Mexican Standard NOM-127-SSA1-1994 for water for human consumption. A series of experiments were carried out at different concentrations, using drinking water sampled in Ojocaliente, Zac., The operation was in batches at an average temperature of 19 ° C and 250 rpm, in aliquots of 50 ml and 0.3 g of gel chitosan beads. The isotherm and kinetics model that fit the data was determined, being Langmuir and Pseudo first order, respectively, and 20% of the arsenic present in the water was removed in a separation step.

Arsenic, Langmuir isotherm, Chitosan

Product redesign to align with production processes

Rediseño de producto para alinear con procesos de producción

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Abstract

The development of products destined to cover specific needs plays an important role when it is possible to have feedback, in terms of functionality, on the part of the final user for the consolidation of the product. Seeking such consolidation and identifying opportunities for improvement, in this paper a redesign was made based on specific criteria to align the manufacturing to mass production. The following premises were raised: 1) validation of the de-sign proposal; 2) comparative and operational analysis; 3) geometry optimization for weight and production cost reduction. This paper proposes a new design of the drawbar body of a tractor (case study) and the theoretical framework is established taking the bases of the concurrent engineering to define and characterize the final architecture configuration. Is reported the methodology used for the development of this research and the results obtained by finite element analysis for architecture optimization. Finally, are presented the defined strategies for aligning manufacturing to production.

Redesign, Characterization, Optimization

Metodología para la detección de accidentes en la empresa con base en la Pirámide de Bird

Methodology for the detection of accidents in the company based on the Bird Pyramid

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Abstract

Accidents at work are a very important issue within companies, because they reflect losses not only economic or raw material, but can affect the lives of workers, therefore it is important to develop a Methodology for the detection of accidents that allows the control of accident investigations. To carry out this project, it was necessary to carry out three phases, the first of which was research, in which technical and regulatory information sources applicable to the program were reviewed. In the second stage, the accident investigation process was designed, in which variables such as: investigation time, communication time, personnel and accident investigation follow-up were considered. Finally, a pilot run was carried out to identify the areas of opportunity of the program and define the corrective actions. Through the detection, management and control of accidents, it is possible to decrease the accident rate, this methodology identifies the root cause of the problem and generates corrective or preventive actions to avoid repeating said accident.

Methodology Detection Accidents

Eficiencia energética dentro del sistema municipal de parques temáticos de Tijuana

Energy efficiency within the municipal system of Tijuana theme parks

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Abstract

Morelos Park is part of the Municipal System of Tijuana Theme Parks (SIMPATT). Due to the multiple activities carried out for the community, as well as the lack of maintenance to the electrical installation, among other factors, the cost for electricity consumption is around $ 1,022,107.00 M.N. yearly. Objective: the purpose of this project is to carry out an energy efficiency study to obtain energy performance indicators (KPI) with which improvements for the rational and efficient use of energy can be proposed. Methodology: the project was worked with the collaboration of students in renewable energy engineering program internship. The study includes the following stages: 1) gathering energy data to determine the current state of electrical energy consumption; 2) analysis of the information obtained inorder to detect improvement areas; and 3) proposals for an efficient use of electrical energy. Contribution: with the development of this study, in addition to providing a viable economic benefit to the park administration, it contributes to the integration and application of tools and knowledge of future engineers in real environment situations.

Energy Efficiency, Energy diagnostic, KPI

Simulación y optimización de estrategias de control para sistemas energéticos renovables de baja potencia

Simulation and optimization of control strategies for renewable energy low power systems

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Abstract

A methodology for the optimization of renewable hybrid low power generation systems (RHLPS) is presented, analyzing its performance under different control strategies and thus reducing the costs of power generation using the existing equipment, and varying only the configuration of the factory settings.The above is achieved through the use of software tools for simulations and sensitivity analysis. In the first instance, a description of the different control strategies that have been applied to the RHLPSs is made. Secondly, a RHLPS optimization methodology is developed by means of control strategies. As a third and last point, the methodology is applied to a system in operation, where, through simulations, the optimal values are obtained and those allow to analyze the operation of the system under different control strategies.The results show that an appropriate control strategy allows a better performance and operation of the systems, and therefore it is important to perform an optimization and operational analysis to the existing systems, to make a better use of the equipment, as well as the available renewable resources.

Control strategies, Renewable power systems, Wind/PV

Efecto del tipo de acero y su acabado superficial sobre la cinética de fosfatizado con manganeso

Effect of the type of steel and its surface finish on the kinetics of phosphatized with manganese

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Abstract

The objective of this work, is to study the process of phosphatizing with manganese by immersion. In the literature there is not enough information on the phosphate process with manganese phosphate, hence the main contribution of the present. The methodology involves an electrochemical study, using open circuit potential techniques in order to follow the kinetics of the process. In the same way, the characterization of the coating formed on the surface of each steel used was carried out using scanning electron microscopy and X-ray energy dispersion spectroscopy. Through this technique, the time was found in which the internal layer of the coating developed on the phosphatized substrates, both on the rough and the rough sides of the steel samples. The results obtained show that the formation of the manganese phosphate coating on the steels depends both on the grain size of the steels at the beginning of the process, as well as on the surface finish to which the steel surface is subjected, resulting in an increase in the size of the crystals, and affecting the rate of disintegration and growth of the same.

Steel, Phosphatized, Manganese

Prototipo de App de seguimiento escolar de estudiantes de ingenieria en sistemas computacionales del Tecnm Campus Oaxaca

School monitoring app prototype for computer systems engineering students of the Tecnm Campus Oaxaca

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Abstract

The Project proposes a solution to the academic problems that arise in the student departments and in the accountability of the directors of the school, for failing to achieve the recommended indicators of the percentage of school leavers or the decrease in the percentages of school degree that are presented by the low performance in students with levels of conditionality (Regular student, Irregular student and Deserter); through a computer solution that provides the academic follow-up of students of Computer Systems Engineering (ISC) of the Tecnológico Nacional de México (TecNM) campus Oaxaca and support in addressing the problem. This prototype integrade some processes that are carried out manually, resulting in cost and time savings, added to the fact that the student will also have quick and detailed access to their academic situation and suggestions in other areas such as tutorial support (scholarships, counseling, psychological support) if required. The solution proposed "Early Warning System (SAT) for students of the ISC of the TecNM Campus Oaxaca through a web apps is based theoretically on research on standard processes to low performance identification, the classification according to the academic status that the accreditation guidelines of subjects issued by the National Technological of Mexico and the academic follow-up of students.The methodology used for the analysis and design of the system was applied research, the collection of information through questionnaires and interviews. At the end of the research, a web app for the academic follow-up of students was obtained to support the School Services Department, Division of Professional Studies and Academic Development as the Institutional Coordinator of the Tutoring Program; in which SCRUM was used as an agile development methodology for software development. It is considered according to the initial evidence that the work carried out contributes to the line of research on educational technology management, since the proposal optimizes the management of resources and time.

Early Alerts, Educational Intervention, Retention

Uso de la arquitectura de mini servicios: Gestión de servicios

Using the mini service architecture: Service management

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Abstract

Objectives
General:
Implement the use of the mini-service architecture in the development of the resource management, control and project monitoring modules for the linking system between TecNM incubators and society in general.
Specific:
1. Represent processes using BPMN (Business Management Process).
2. Analyze the functional requirements of the resource and service monitoring module.
3. Design the architecture of miniservices.
4. Design the mini-services for the management of the resource module database and service monitoring.
5. Develop the mini-service for the management of the resource module database and service monitoring.
6. Develop the mini-service for the management of the resource module and service monitoring.

Methodology
The SCRUM methodology is used to carry out this project, since for its development the participants were divided into two teams, due to the extension of the computational system.
And SCRUM is characterized by offering a methodological framework that allows managing collaboration between various teams.
As well as offering great adaptability to modifications on designs or previous coding, a very important point in this case, since we are working on a topic that is current and there is no previous experience, which generates constant tests and changes.
SCRUM has another essential characteristic in this development, that it is designed for projects with a high level of uncertainty, as is our case, where the architecture of miniservices will be tested and the degree of improvements it provides will be identified.
For all the above, this work has been carried out following the stages set by SCRUM, namely:
1.- Sprint planning.
2.- Stage of development.
3.- Sprint review.
4.- Feedback.

Contribution
This work provides an architecture that supports rapid development, decoupled, reusable and with the possibility of migrating to a microservice architecture.

Miniservices, Microservices

Sistema web de solicitudes de acceso a la información

Web system of requests for access to information

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Abstract

The Secretariat of the Comptroller and Government Transparency of the State of Oaxaca (SCTGEO) has an objective with the development of the project called Web System of Requests for Access to Information. This objective is to contribute to internal control of the Requests for Access to Information that are sent to the dependencies, entities, auxiliary bodies, and, escrows that integrate State Public Administration. It also follows up that the Requests are attended to and are fulfilled within the terms established by the Law of Transparency and Access to Public Information for the State of Oaxaca (LGTAIPO).The web system has the following functionalities: a history of requests and responses, it allows the use of different response formats; it generates reports based on a period defined by the user; it allows you to schedule meetings, and it follows up if necessary.In addition, it has a Request, Dependencies module and an internal chat so that they can communicate with each other. The web system was based on the agile development model using Extreme Programming (XP) and the MySql database manager was used.

Information System, Requests, Dependencies

Aplicación móvil para el seguimiento de solicitudes de acceso a la información

Mobile application for monitoring requests for access to information

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Abstract

Currently, the use of mobile applications is of utmost importance, since it allows the availability of information at all times. The mobile application described in this article was made to follow up on the Requests for Access to Information and is part of a web system, with which an internal control of the Requests for Access to Information that are sent to the Dependencies, Entities, Auxiliary Bodies and Trusts of the State Public Administration. The application will attend to the requests and thus, the times of attention to them are met within the terms established by the Law of Transparency and Access to Public Information for the State of Oaxaca (LGTAIPO). The mobile application allows the monitoring of information requests received, shows the status in which they are through a colored traffic light, meetings can be scheduled, allows the registration of the user's profile, and, has an internal chat so that dependencies can communicate with each other and send notifications. The development methodology used for this project was Extreme Programming using the Dart programming language.

Mobile app, Requests, Notifications

Diseño de laboratorio lógico programable

Programmable logic lab design

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Abstract

In the present work, emerging technologies require rapid training in them for SOC (System On Chip) processing, which has improved characteristics such as power consumption, system design and processing speed, which is why electronic elements that help with the learning and practice time of these topics, therefore the objective is to design a prototype of a programmable logic laboratory at the Tecnológico de Estudios Superiores de Jilotepec considering the nature of the project, it was developed through a methodology that will guide step to I pass the activities such as the CDIO that is used in the engineering area which consists of four stages: conception, design, implementation, the main contribution is to help students to carry out their practices through a printed circuit board or PCB that basically it is a physical support where all the electronic and digital components that are They are used in different subjects such as digital electronics, basic programming, advanced programming, digital control, analog electronics, which require using the devices to know their interconnection operation and through programming when carrying out the practices that make it up using the least possible time to carry out each one.

Logic, Programmable, Electronic

Desarrollo de puntos cuánticos de CdS/dextrina como forma innovadora de entrega de fármacos: Estudio de biodisposición, biocompatibilidad, hemocompatibilidad y eficacia

Development of CdS/dextrin quantum dots as an innovative form of drug delivery: Study of bioavailability, biocompatibility, hemocompatibility, and efficacy

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Abstract

Nanomaterials are having a major impact in all areas of knowledge. In biomedicine they are being used to solve important health problems. Semiconductor nanoparticles (quantum dots), in particular, can bind to the cell membrane and be taken up by the cell, hence their usefulness in biology as cell markers and biosensors. However, due to their broad spectrum of fluorescence emission, these nanoparticles have important applications in medicine, they can be used in imaging for medical diagnosis and treatment, for the intelligent release of drugs or genetic material inside cells, for mention some. However, the main problem with these nanomaterials is their toxicity, since the nucleus of the quantum dots is made of toxic materials, such as cadmium, a harmful element for cells and organisms. The objective of the present work was to study the disposition, biocompatibility, hemocompatibility of dextrin-passivated CdS quantum dots, as well as to perform the biosynthesis of a CdS-dextrin/doxorubicin bioconjugate to show its use as a nanocarrier for drugs. *In vitro* and *in vivo* studies, as well spectrophotometric, epifluorescence microscopy, confocal microscopy, atomic force microscopy, X-ray diffraction and infrared spectroscopy by Fourier transform were also used to carry out the study.Present chapter shows evidence that CdS-dextrin quantum dots have a different tissue distribution profile, a different mean residence time in each organ studied and can cross biological barriers (blood-brain and testicular). Furthermore, the biocompatibility studies at 30, 60 and 90 days showed that they are biocompatible since they did not produce functional and tissue alterations in the different organs, except in testicles, where testicular atrophy occurred, after 90 days of exposure. The hemocompatibility study showed that they do not produce hemolysis, but they do induce morphological alterations of the erythrocytes. Finally, the synthesis of a nanoparticle / doxorubicin bioconjugate was carried out, and the pharmacological efficacy was studied. The bioconjugate was characterized with different techniques. In cells treated with doxorubicin conjugated to CdS-Dex nanoparticles, greater cytotoxicity, an increase in the size of cells and nuclei was observed than in those cells treated only with doxorubicin. Therefore, the CdS-Dex quantum dots that we study in this work have the potential to be used in biomedicine for bioimaging and as nanovehicles for drug transport, having the advantage that they can be distributed to any tissue, cross physiological barriers, be well tolerated, and biocompatible, in the short and medium term. In addition, it allows the drug to reach its target site to exert the pharmacological effect.

Quantum dots, Disposición, Biocompatibilidad, Hemocompatibilidad y Nanotransportador

Diseño mecatrónico implementado en el desarrollo de prototipos virtuales y físicos

Mechatronic design implemented in the development of virtual and physical prototypes

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Abstract

In the development of mechatronic and robotic systems, work has been done on the design and construction of prototypes, and some of the needs that arise are the reduction of design times, manufacturing, costs, accuracy and precision in movements or trajectories, among others variables. To solve this, various methodologies are proposed, which aim to use the foundations of the scientific method and concurrent engineering to generate mechatronic systems optimizing resources. In this work, we present the implementation of some mechatronic design methodologies in the development of virtual and physical functional prototypes with real and specific applications such as rehabilitation robotics, mobile robotics, and various manipulators and machines. The description of 6 prototypes showing the results of applying a mechatronic design methodology and assessing the activities from the time the idea is generated until a finished prototype is available.

Mechanical design, Design methodology, Prototype, Simulation

Preferencia en la percepción visual de las tonalidades cromáticas del modelo HSB hacia los Eventos de Instrucción (EI): Motivar, informar y atender

Preference in visual perception of the chromatic tones of the HSB model to the Events of Instruction (EI): Motivate, inform and attend

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Abstract

It is a quantitative and qualitative study, whose objective is to define the preference in the visual perception of the chromatic tones of the HSB model towards the instruction events (EI): to activate the motivation, to inform the student about the objective and to direct the attention. The sample is systematic of 260 higher education students of Engineering and Design. The results show that students recognize the tones commonly called, but have difficulties with unusual names, the color called "red" was recognized 238 times; they identify in a very acceptable way the four chromatic tones, clear, saturated, grayish and darkened; finally, in the (EI), the number of times that they selected the red color in the intermediate key, was: in motivating 86; report 94 and attention 102.

Perception, Color HSB, Events of Instruction (EI)

Aplicación de modelos de simulación en el diseño mecatrónico agrícola para la Agroindustria 4.0. “Modelado del dosificador de semillas para sembradora automática de charolas de germinación”

Application of simulation models in agricultural mechatronic design for Agroindustry 4.0. "Modeling of the seed dosing system for automatic germination tray seed drill"

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Abstract

This chapter deals with the process of mathematical modelling and computer simulation, which have become very useful and indispensable tools in the different fields of human knowledge, especially now that it has turned towards 4.0 technology. Nowadays, modeling is a very common tool in the study of systems and the accelerated development of computer techniques. By having more flexible platforms, this development has been allowed to reach all areas of knowledge. Modeling has acquired a general scientific methodological character, enriched by the conquests of mathematics, cybernetics and the systemic approach in scientific research, and has penetrated into the different specialties of knowledge application that has transformed the way man understands a process, that is, today we have to have certainty in all design phases, that the activities and decision making that are being carried out, comply correctly and completely with the specifications, before carrying out the construction or manufacture the modeling and simulation allow to know in an accurate way the behavior of the process or system, in such a way that you can count on the confidence of the acquisition of materials and materials, which reduces delays, losses or major errors.In the present work the analysis for the agricultural mechatronic design of a seed dispenser for automated pneumatic seed drills for germination trays was made, assuming that the design of agricultural machinery is not simple or easy, for a long time this type of development was worked under the concept of trial and error, the aim of this work was to model and simulate a seed metering device through the use of critical design parameters, such as speed and working pressure, by using the average air speed that produces the adhesion of a grain in the cylinder, as well as the geometric dimensions of the cylinder. This allows to determine the optimal parameters for the design of the system.

Agricultural mechatronic design, Agroindustry 4.0, Automatic pneumatic seed drill, Seed meter, Mathematical modeling

Motion control of output splitters of a spiral separator using IoT

Control de movimiento de los divisores de salida de un separador tipo espiral usando IoT

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Abstract

The output splitters in the spiral separators are manually manipulated by the operators to perform ore separation. The position of these separators is established by the visual inspection of the mineral flow identifying the stratification of particles at the outlet, or by the chemical analysis of the mineral according to the source deposit, which defines the distribution of densities of the particles, establishing a position angle for each of these. A system of movement control of the splitters by means of servo motors controlled with an Arduino card and graphical interface in Matlab, with direct connection of the system, as well as, a wireless control system, using Bluetooth connection under an Android application showed restrictions on the viability of the control system. This research paper proposes a system of movement of the splitters using servomotors controlled through a web page linked to an Arduino card with real-time output monitoring using a video camera under an IoT scheme. This option showed that monitoring and controlling the output separators can be performed remotely from any internet-connected device anywhere in the world, as well as, monitor the output section and changes in real time reducing the response time to make changes to the splitters when the characteristics of the mineral in the feed tank change improving separation efficiency.

Monitoring, Control system, Spiral separator, Splitters, IoT

Ingeniería de Software Basada en Búsqueda en Líneas de Productos de Software

Search-Based Software Engineering in Software Product Lines

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Abstract

Currently, software construction is moving towards industrialization by replacing the custom form of development with the use of approaches such as Software Product Lines (SPL) and Multiple Software Product Lines (MPL). These paradigms establish a common means of production to generate a variety of products through the reuse of inputs and automation of processes and thus meet the needs and requirements of the market instead of targeting specific customers. However, the management of multiple SPLs or MPLs is a challenge because the variant number of possible software products to be obtain expressed in the feature models is often large due to feature combinations. For this reason, it is not feasible to configure, deploy, or test all possible product variants. To support this decision-making process, this chapter investigates and applies a variant of the knapsack problem. Specifically, product configuration in an MPL is formulated as a Multiple-Choice Multi-dimensional Knapsack Problem (MMKP) and is solved with a Search-Based Software Engineering (SBSE) technique. First, a review of search and optimization techniques is provided to offer practical application elements for the development of software products based on SPL and Search-Based Software Engineering (SBSE). A genetic algorithm is then implemented in Python to solve the problem of configuring products in MPL.

Software Engineering, Software Product Lines, SBSE, Genetic algorithms

Análisis paramétrico de los elementos del actuador chevrón

Parametric analysis of chevron actuator elements

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Resumen

Los sistemas microelectromecánicos (MEMS) se forman de componentes eléctricos y mecánicos. Se fabrican utilizando tecnologías de micromaquinado, con base en la tecnología de circuitos integrados. Los MEMS son ampliamente utilizados en la vida diaria, en particular se destaca su uso en sectores como, el automotriz, médico, de rehabilitación etc. Entre los dispositivos que se desarrollan, se detectan constantemente sensores y actuadores nuevos o mejorados. Además, hay muchos grupos de investigación interesados en el desarrollo de los MEMS. Actualmente, para la optimización de los diseños, es posible desarrollar análisis paramétricos, mediante los cuales, se realizan barridos automatizados de forma rápida, lo cual genera información útil para analizar las tendencias de desempeño y, por tanto, para seleccionar los valores más adecuados de las variables, de acuerdo con los requisitos establecidos. La parametrización reduce tanto el tiempo, como los costos involucrados en el proceso de diseño. En este capítulo, analizamos la parametrización de los elementos básicos de un actuador chevrón, así como sus efectos sobre el desplazamiento y la fuerza de reacción en la flecha, para cada caso. Con base en los resultados obtenidos, usando ANSYS, se determina la tendencia de desempeño de los elementos bajo análisis y se muestra de manera gráfica.

Desplazamiento, Fuerza, Parametrización, ANSYS, Número de brazos

Infraestructura de telecomunicaciones para habilitar la Red Eléctrica Inteligente en México

Telecommunications infrastructure to enable the Smart Grid in México

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Abstract

The Smart Grid (SG) emerges in response to the modernization of the current power grid, transforming the way of distributing, marketing and consuming energy. The SG provides two-way communication between service providers and its connected users. In the SG the telecommunications infrastructure is considered as “the second network”, which is critical in the operation as the SG primary elements. Therefore, the telecommunications infrastructure must be planned, designed, implemented, and managed with the same care as the electrical infrastructure. In Mexico, it is necessary to determine the future telecommunications usage and requirements, and also it is indispensable to evaluate if the existing technologies will fulfill these requirements. This chapter is a literature review that aims to evaluate the current and emerging technologies as potential candidates to the SG, as well as, some challenges at network level are identified.

Smart Grid, Telecommunications, Network architecture

Importancia de la integración y transversalidad de técnicas administrativas a través de herramientas de ingeniería para mejorar el servicio al cliente en una microempresa como parte de trabajo colaborativo

Importance of the integration and transversely of administrative techniques through engineering tools to improve customer service in a microenterprise as part of collaborative work

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Abstract

This document is a project that integrates techniques and tools from various disciplines and sciences applied to a company with the aim of showing collaborative and transversal participation among them to improve the service offered by a micro-company. Seeking to detect areas for improvement, establishing activities of a strategic plan, evaluating and measuring them when implemented. To obtain the results, techniques from complementary disciplines were used that include: strategic planning, quality processes, electronic marketing, legal procedures, corporate finance, among others. For demonstration purposes, a company dedicated to providing aesthetic beauty and body care services for women and men is considered. Among its main services are: reductive massages, masks, scrubs, facials, hair straightening, makeup, hairstyles, manicures, pedicures. among others. Using the articulation of various subjects and the professional practice of various teachers.

Integration and transversality of subjects, Collaborative work, Administrative techniques and tools

Realidad Aumentada para facilitar la comprensión de tópicos de bases de datos

Augmented Reality to facilitate understanding of database topics

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Abstract

Technologies emerging in 21st century are modifying many spaces within our society. Education, being one of the most important fields within, must necessarily be integrated into this dynamic of change. In classrooms, the teaching-learning process must adapt to this new requirement in order to be consistent with the reality that surrounds it. With each technology that arises, there is also a new opportunity to ignite the improvement of a process; so, according to previous research works, augmented reality (AR) has been shown to be efficient in improving the process of valid, meaningful and ubiquitous learning through observation, analysis and understanding of complex issues. In this work are addressed two challenges that raised in the literature: that there are few applications for each specific topic and that there are few works that corroborate the results of the impact on the learning process. For this, along with a student an application has been developed, which integrates augmented reality in level 1 for the specific topics of migration, replication, mirroring and monitoring of a database. These topics are inserted in the curriculum of the subject of Database Administration corresponding to the Tecnológico Nacional de México (TecNM) Computer Systems Engineering curriculum. These topics were chosen because it was observed in previous years that academic performance in these subjects was low compared to the other subjects that are addressed in the subject. For the development of the application, the XP methodology was used and the process for the development of resources with level 1 AR was integrated into it. Tests applied directly in two focus groups confirm that students are encouraged with applications that they can install in their Smartphone. And by having the resources available and being able to observe them as many times as they require, they manage to reach a higher level of understanding with critical sense and they improve performance when entering the laboratory, because they can explain, interpret and infer about the addressed processes. This results contributes to the literature confirming the effectiveness of AR in educational resources and also contributes to the development of applications on specific topics.

Augmented reality, Meaningful learning, Mobile application, Management of databases

Evaluación del efecto de la radiación solar sobre la superficie de un sistema fotovoltaico

Evaluation of the effect of solar radiation on the surface of a photovoltaic system

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Abstract

Following a field study, the decrease in electricity generation was observed in a section of the photovoltaic installation located at UADY High School One, the study consisted of analyzing the surface temperature of the selected photovoltaic modules in peak solar hours in order to know the effect that temperature has on the generation of energy, taking into account the information provided by the manufacturer of the modules. The study was carried out in the month of May considered as the one with the highest solar intensity in the city of Merida, Yucatan. The data obtained were analyzed using a statistical tool (STATA) and modeled according to a mathematical expression. As a result, it was shown that for the photovoltaic installation under study, that the temperature decreased energy production by a 15 percent.

Solar radiation effect, Temperature, Afficiency

Afectación de la calidad de agua de los pozos del campus tecnológico de Cancún por mancha urbana

Affecting well water quality by population increase, at the Cancun technology campus

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Abstract

In order to develop a diagnosis of well water quality, the physical, chemical and bacteriological quality of groundwater was evaluated, with the aim of knowing how it affects the increase in the population that is limited by Itcancún.Our primary objective was to determine quality indices of the well that supplies water to our campus facilities taking into account the temporality of the years in 2016-2017, comparing the physical parameters of the total content of dissolved solids were evaluated, conductivity, pH, hardness, salinity, chemicals, fats and oils, biological E Collí y Coliformes totales por el Método Quanty Try Colilert, los resultados indican las concentraciones de los iones analizados, la hidrogeología de la península de Yucatán de tipo cavernoso, con permeabilidad, por el agua residual, la lluvia se produce en un proceso de contaminación antropogénica, the physical components analysed gave a high value to the maximum permissible limits according to NOM-127-SSA1-1994 modified 2000, Suspended solids 1200 mg/L, hardness 950 ppm, fats and oils 65 mg/l, E. Coli was used the method of E. Colilert the Colilert Quanty to determine the most likely number of bacteria the result of the sample gives us >2419.6 NPM a high content of faecal contamination

Well water, Pollution, Urban spot

Implementación Electrónica del Oscilador Caótico de Rössler

Electronic Implementation of the Rössler Chaotic Oscillator

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Abstract

Chaotic systems have attracted the attention of the scientific community due to their potential applications in many branches of science and engineering, chaos theory is used in cryptography, in the creation of population models in biology, studying turbulence in mechanics of fluids, in economics it is used to predict the behavior of the stock market, in astronomy it is used to describe the motion of many planetary bodies, to improve the prediction of trajectories in asteroids and to determine whether or not they come into contact with the earth, in More recent years have been applied in the prediction and / or control of the dynamics of the human brain, a large number of works have been reported in different areas in order to address some interesting problems, such as the determination of structural damage in materials or in secure communication systems. In this work the implementation of chaotic oscillators in analog electronics is addressed, the case study of the autonomous non-linear dynamic system of Rössler is presented, the stability analysis of the system is developed, analytical, numerical and experimental results are included, as well as its Electronic implementation measured under laboratory conditions to observe experimental chaotic attractors, which will be used in the implementation of random number generators and secure communication systems for image encryption.

Chaos, Oscillators, Analog Implementation

Gestión del Mantenimiento y la Industria 4.0

Maintenance Management and Industry 4.0

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Abstract

The purpose of the study is to explore on maintenance management in Industry 4.0 with its characteristics such as virtual reality, digitization of operations, connectivity, robotization, data in the cloud, automation, big data, etc., all to increase productivity in the cyber - physical system. The methodology developed is through a qualitative approach through an exploratory or approach study analyzing multiple subjective realities, derived from data mining and bibliographic search. For maintenance management, it seems more appropriate the proactive and predictive maintenance approach to achieve standard ISA 95 level 4 automation. This reflection seeks to contribute to identifying the challenges that companies must solve, in this case in the maintenance area using terotechnology, since it has a systemic approach that considers the Overall Equipment Effectiveness and CMD indicators (Reliability, Maintainability and Availability) and the horizontal and vertical structures as systems in the digitized factory, always taking into account personnel as a key element for success.

Industry 4.0, Maintenance management, Terotechnology

Tecnología aplicada a un modelo agroecológico parafomentar la cultura de la sustentabilidad en el tecmm, campus Puerto Vallarta

Technology applied to an agroecological model to promote the culture of sustainability at the tecmm, campus Puerto Vallarta

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Abstract

This is a project that aims to be a collective academic space for learning and research to strengthen processes of social activation linked to the management of the territory, the use of natural resources, the use of renewable energy and automation. It is to make the school a space for collective action in search of sustainability.The objective is to take advantage of the land, not yet built, of the José Mario Molina Pasquel y Henríquez Technological Institute, Campus Puerto Vallarta (TecMM, campus PV,) for organic planting, by integrating technological practices of sustainable management, promoting an experience of productive learning and community participation.The project has two approaches: educational and social. This investigation comprises, so far, two stages. The first stage was the manufacture of an automated hydroponic greenhouse for the ecology department of the Puerto Vallarta City Council. The second stage, currently under development, consists of implementing technology and automated mechanisms for farmland, proposes the total immersion of engineering for the interaction of man with nature. Relentlessly seeking, and accepting as our greatest challenge, the maximum use of resources, without neglecting the correct operation.

Engineering education, Agroecology, Sustainable technology, Alternative energy

Control PID Basado en Odometría Visual Monocular a un Vehículo de Superficie Marino

Monocular Visual Odometry Based PID Control to a Marine Surface Vehicle

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Abstract

The aim of this work is to study the behavior of a marine vehicle applying vision-based control. We use a DMVO algorithm (Direct Monocular Visual Odometry) that is based at the feature extraction of two image frames taken consecutively at two continuous tame frames in order to estimate a marine vehicle's position; vehicle's dynamics are modeled without external perturbations and therefore apply a vision based Proportional Integral Derivative (PID) control for the study of its behavior through simulations using computational tools to simulate a 3D scenario and get the matrix that contains the image from the inertial frame of reference view from the vehicle. First we need a static scenario that contains reference points such that we are able to apply the proposed vision based PID control; the virtual scenario was designed at the MATLAB's virtual world editor that let us add sensors such as cameras, and set their parameters for make the study and simulations such as path following.

Artificial Vision, PID Control, USV

Validación y Análisis de Eficiencia en la Producción de Agua Mediante la Implementación de Celdas Peltier

Validation and Analysis of Efficiency in Water Production Through the Implementation of Peltier Cells

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Abstract

At present, drought seasons are longer as a result of global warming, which has generated scarcity and rationing of water, these conditions become the main problem in towns far from 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 a possible depletion and contamination of its vital liquid to the country. For this reason, in order to contribute to a solution to the problem of water scarcity, when applying a control system to the technology used by Peltier cells, a moderate flow of water is generated, since it condenses the particles of water suspended in the air. In this way, a prototype was developed in which a Peltier cell arrangement is implemented to obtain as much water as possible under environmental factors, such as humidity and temperature, as well as an analysis of efficiency, cost and viability with a commercial generator system of water with similar capacities.

Renewable Energies, Water Condensation, Peltier Cells

Evaluación de un Clasificador de Textos Digitales basado en el Contenido Semántico a través de Ontologías

Evaluation of a Classifier of Digital Texts based on Semantic Content through Ontologies

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Abstract

Nowadays, the generation of information through digital text documents has increased exponentially, so there is a need to store documents in mass storage devices such as high capacity hard discs, storage servers, the cloud and others. However, the storage that is carried out lacks a thematic organization, therefore, a search for information becomes complex. Given this problem, this publication describes the development of a system that has the purpose of classifying a digital text document based on the thematic content. This system implements ontologies to achieve a better classification by taking advantage of its characteristics. The system is divided into five tasks: the first is the implementation of a word count to create a frequency vector; The second task performs a refinement on the frequency vector to eliminate the sentence connectors and prepositions; the third task orders the vector from the highest to the lowest frequency; the fourth task takes the most significant set of frequencies vector, in which the ontology of a domain is applied and the relation that the words have to determine the thematic of the document is sought; and the fifth task is to organize the documents in a folder structure based on the identified domains. The system was developed with the incremental development methodology. To validate the operation of the system, a set of tests was carried out in a controlled scenario in order to verify the correct classification of the documents.

Ontologies, Text classifier, Automata

Control de presion, modelado matematico y sintonización de controladores por el método de ziegler-nichols

Pressure control, mathematical modeling and controller tuning by the ziegler-nichols method

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Abstract

Obtaining the parameters of a PID controller is done through several steps, mathematical modeling is the first of them, where it is verified that the number of unknowns is equal to the number of equations. Using the Laplace transforms, one passes from the time domain to the Laplace domain. By the Ziegler-Nichols method, and substituting iw for s in the characteristic equation of the process, the frequency domain is passed and the ultimate gain is established and with which it is possible to deduce the values of a proportional, derivative and integral controller. The final gain obtained in an analytical way can be verified by means of the graphs of the place of the roots, which can be easily generated by means of programs in Matlab, but this is beyond the scope of this article.

Drivers, Characteristic equation, Ziegler-Nichols, Ultimate gain, Damping factor

Instrumentación Electrónica de una Estación Meteorológica Automática

Electronic Instrumentation of an Automatic Weather Station

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Abstract

Climatological studies present a common restriction in decision-making based on meteorological data, since climate models often lack precise values of their parameters depending on the geographical point where the information is acquired, therefore, climate acquisition in specific geographical positions is an interesting possibility. The objective of the present study was to develop the electronic instrumentation of an automatic weather station (AWS) using a controlling medium with sensors that measure air and soil temperature (°C), relative humidity (%), solar radiation (Wm^2) and wind speed (m/s). The acquired data were compared with commercial stations Vantage Pro (VP) and GroWeather (GW) of the Davis Instruments family where an R^2 of 0.93 was obtained in Temperature and Relative Humidity of the air and an R^2 of 0.94 for solar radiation. Thus, the developed AWS presents benefits in the quality of the acquired data that can be used for studies of mathematical modeling and generation of decision-making.

Automatic weather station (AWS), Climate monitoring, Electronic instrumentation

Instrumento virtual para adquisición de datos, análisis y evaluación de sistemas dinámicos

Virtual instrument for data acquisition, analysis and evaluation of dynamic systems

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Abstract

In this work, a program for signal acquisition and monitoring was carried out, with the purpose of evaluating the behavior of rotating systems. The monitoring program was carried out in the LabVIEW software, in which the behavior of the system is visualized and the different post-processes of the acquired signals are carried out. LabVIEW was chosen because it allows manipulating the obtained data to be used in various post-processes in different programs, which is one of the main advantages that they have over other systems, such as ADRE of Bently Nevada DAIU 208-P, which also , does not allow access to data. The operation of the designed program, its advantages and the secondary programs used for the different post-processes are explained in detail. The experimental platform where the tests were carried out is shown, showing the validations and the correct operation of the program designed in LabVIEW, compared to the monitoring system mentioned above ADRE. Finally, various possibilities are offered to expand the capabilities of this program, these options range from increasing the types of filters used for signals, as well as extracting non-linear characteristics, such as the Largest Lyapunov Exponent (LLE).

Condition monitoring, Instrumentation, Adquisition

Calculadora para dimensionar sistemas fotovoltaicos interconectados

Calculator for dimensioning interconnected photovoltaic systems

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Abstract

The generation of electrical energy by means of photovoltaic solar energy has become the most profitable today. The most important thing for an energy engineer are the calculations, for which an automated calculator in Excel has been designed, where the calculations of a dimensioning for a photovoltaic system interconnected to the electrical power network are summarized, including billing analyzes of the rate you are in and the DAC RATE (High Consumption Domestic), RATE 01, in order to save time and money, when calculating and studying economically, it is highly important to know this type of information Since people only sell projects without any knowledge and damage the reputation of the professional area, with this automated Excel calculator anyone with basic knowledge can manipulate it without any problem, giving an excellent service saving too much time on corrections where that costs money, the system itself graphically explains the generation of the SFVI, economic study and recovery time, the client will have a broad knowledge of what you pay for.

Solar energy, Photovoltaic systems, Automated calculator, Rates

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Objetivos
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Contribución

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