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Coordinators

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Volumen VI

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Interdisciplinary Congress on Renewable Energies - Industrial Maintenance - Mechatronics and Informatics

Colegio de Ingenieros en Energías Renovables de Querétaro A.C. October 27-29, 2021.

Preface

The Colegio de Ingenieros en Energías Renovables de Querétaro A.C. (CIER-QUERÉTARO), and its chapters of Renewable Energy, Industrial Maintenance, Mechatronics and Computer Science, technical sponsors of the Interdisciplinary Congress on Renewable Energy, Maintenance, Mechatronics and Computer Science, CIERMMI 2021, are pleased to invite you to the 6th edition of this congress, which will be held on 27, 28 and 29 October 2021, in the city of San Juan del Río, Querétaro, Mexico.

The general objective is to establish a space for discussion and reflection on topics related to the areas of: renewable energy, industrial maintenance, mechatronics and computer science with the participation of students, professors, researchers and national and international speakers, promoting the formation and consolidation of research networks. Contributing to provide a space for dissemination and discussion of the presentations of students, graduates, academics and researchers, representatives of the various institutions of higher education and research centers in our country. Promoting the formation of research networks among different institutions. Offering a space for undergraduate, master's, doctoral and postdoctoral students, in which they can present the progress of the research they are carrying out as thesis or graduate work. Providing a space in which study groups and members of academic bodies, linked to the curricular program of renewable energy, industrial maintenance, mechatronics and computer science careers, can present the research work developed within their institution and in collaboration with other national or international educational institutions. Establishing a training space for the attendees, through the development of specific lectures and conferences. This volume V-2021 contains 178 refereed participations dealing with these issues in chosen from among the contributions, we gathered some researchers and graduate students, from 32 states of Mexico. We thank the anonymous reviewers for their feedback who contributed greatly in improving the articles for publication in these proceedings by reviewing the manuscripts that were submitted. Finally, we wish to express our gratitude to Colegio de Ingenieros en Energías Renovables de Querétaro A.C. in the process of preparing this edition, which you can consult at http://ecorfan.org/ collections.php

San Juan del Río, Qro
Octubre 27-29, 2021

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Juan Manuel Olivares Ramírez
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Proposal and evaluation of didactic materials to support Physics teaching

Propuesta y evaluación de materiales didácticos en apoyo en la enseñanza de Física

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Abstract

The teaching of science has always faced multiple adversities for the construction of meaningful learning and the subject of Physics is no exception, however, if we consider that today the educational field has had to change due to the sanitary contingency caused by Covid-19, it has made it clear that the form of teaching must be modified to adapt to current conditions. Hence, the objective of this study was to design and evaluate the impact of a didactic material that contributes to improving the understanding of the learning that are most difficult for students in the subject of Physics III at the Escuela Nacional Colegio de Ciencias y Humanidades plantel Vallejo, through a pilot sample by convenience in which 22 students and 12 teachers participated. For this purpose, a hybrid methodology was used in which pedagogical, disciplinary, and technological aspects were aligned; finding that this is a viable option to improve the student performance. Therefore, it is required that teachers be trained in these topics, since a facilitator with greater variability is needed to adjust his teaching to current requirements.

Learning, Science, Evaluation

Use of a techno-pedagogical model in the teaching of Physics

Uso de un modelo tecno-pedagógico en la enseñanza de la Física

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Abstract

The challenges of education in the XXI century are diverse and multifactorial; now if we add that due to the new normality caused by the Covid-19, the importance of the use of technologies as an indispensable tool to continue with the educational process is retaken. However, different investigations have shown that if these are not correctly based, the results may not be the best, hence the importance of the use of techno-pedagogical models, therefore the objective of this study was to implement the TPACK Model in the teaching-learning of the subject of Physics III in the National School College of Sciences and Humanities (ENCCH) in order to promote meaningful and scientific learning, For this purpose, a non-probabilistic sample of 42 students from the Vallejo campus was used, with the purpose of promoting significant and scientific learning, in which approaches such as the flipped classroom, Bloom's taxonomy and the learning cone were integrated, obtaining that a significant number of young people achieved higher order learning levels, therefore it is deduced that this model is a feasible alternative to consolidate knowledge in a non-face-to-face modality.

Learning, Fluids, Bloom's Taxonomy

Elaboration of octagonal roses to represent the wind patterns in the Port de Veracruz during the last 10 years

Elaboración de rosas octagonales para representar el comportamiento del viento en el Puerto de Veracruz durante los últimos 10 años

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Abstract

The Port de Veracruz and its surroundings are affected by meteorological phenomena such as the passage of frontal systems, among others. The main objective of this writing is to carry out continuous monitoring to categorize wind behavior, in order to determine patterns in the last 10 years. Therefore, climatological records of the intensity and direction of the average wind speeds are presented; wind data from three Automatic Meteorological Surface Stations (EMAS) of the Meteorological Observation Network of the Secretariat of the Navy, one of the National Meteorological Service (SMN) and two buoys of the National Oceanic and Atmospheric Administration (NOAA) were processed and analyzed. The results indicated that the North (N) direction predominately governs during the cold front season, while the East (E) winds predominately govern during the warm months (June, July, August and September). The maximum gusts, which can be an important factor in accidents, especially when their intensity exceeds 20 knots, affect various human, maritime, agricultural and livestock activities and tourism.

Octagonal roses, Wind, Wind power

Methodology for processing meteorological and hydrometric data at basin level

Metodología para el tratamiento de datos meteorológicos e hidrométricos a escala de cuenca

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Abstract

Meteorological and hydrometric data recorded by stations require analysis and processing before being used in any study as recommended by the World Meteorological Organization to ensure the reliability of the results obtained from these series. Currently, there is a vast number of tests that can be used for this purpose, generally applied in isolation. However, there is no clear methodology that specifies the conditions of application of the tests, the order, and the conditions of application for meteorological and hydrometric series. This research proposes a methodology for the selection and validation of meteorological and hydrometric data according to the characteristics of the available information and the study area. This methodology is the result of the work carried out for several years, where through the analysis of different series it has been concluded that the methodology presented here allows the efficient treatment and discretization of meteorological and hydrometric information, where it has been verified that the results obtained from the different studies where this information has been used have given reliable results. An application case has been selected for the description of the methodology and the analysis of the results.This chapter will be developed through 6 sections. Section 1 gives a brief introduction to the treatment of meteorological and hydrometric stations. Section 2 shows the development of the methodology proposed in this work. Section 3 describes the application case and the characteristics of the implemented data. Sections 4 and 5 describe the development of the tests used for meteorological and hydrometric data processing, respectively. Finally, section 6 concentrates on the conclusions obtained from the application of this work.

Data processing, Meteorological, Hydrometric, Selection criteria

Evaluation of the Heavy Metals Levels in PM10 Particles in air of an urban site of Leon City, in the cold dry climatic season 2018

Evaluación de los Niveles de Metales Pesados en Partículas PM10 en aire de un sitio urbano de la Ciudad de León, en la temporada climática seca fría 2018

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Abstract

This work reports the levels of atmospheric particles concentrations PM10 and their content of trace metals (Cd, Co, Cu, Fe and Zn) collected in an urban site of Leon City, Guanajuato during the cold dry climatic season 2018. The analysis for heavy metals determination in the collected particulates were carried out by Atomic Absorption Spectrophotometry (AA). The elemental and morphological analysis of the particulates were carried out by scanning electronic microscopy with energy dispersive spectroscopy (SEM-EDS). Fe was the more abundant metal (1.50 µg m^{-3}), followed in order of importance by Zn (0.65 µg m^{-3}), due to these metals are abundant in the crustal. In minor proportions were found Cu (0.09 µg m^{-3}), Cd (0.28 µg m^{-3}) and Co (0.11 µg m^{-3}). Enrichment Factors analysis showed that all the analyzed metals were highly influenced by anthropogenic activity. Bi-variate and multivariate analysis confirm the anthropogenic origin of Cd, Cu and Zn. SEM-EDS analysis demonstrated Fe was the dominant metal and it was possible to relate the morphology of particulates with their elemental content and their emission sources.

PM10, Heavy metals, Leon

2 Biology, Chemistry and Life Sciences

Preparation advances of Activated-Carbon/ZnO composite using ground coffee

Avances en la preparación del compósito Carbón Activado/ZnO a partir de café molido usado

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Abstract

In present work, synthesis and characterization of ZnO/ activated carbon-based composite in proposed. Spent Coffee Grounds is used as carbon source. We pretend to take advantage of photocatalytic activity of ZnO and adsorption capacity of Activated Carbon. This composite can be applied in remotion/mineralization of organic dyes in waste water. Conditions for synthesis of composite's precursor were stablished. For electrosynthesis, the current density was 260 mA/cm^2 for 15 min under vigorous magnetic stirring at room temperature, followed by a calcination at 450 °C. Later, all materials were characterized using Raman Spectroscopy, Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDS) and Fourier-Trasform Infrared Spectroscopy (FTIR), in order to determine crystalline phase present, morphology, elemental composition and functional groups, respectively.

Composite, SCG, CA/ZnO

Cashew bagasse (*Anacardium occidentale* L.) as a source of fiber-antioxidant and its possible use in lipoinflammation models

Bagazo de anacardo (*Anacardium occidentale* L.) como fuente de fibra-antioxidante y su posible uso en modelos de lipoinflamación

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Abstract

Diet has a strong influence on health so that people with good eating habits and moderate exercise decrease the chance of developing diseases. As a result, the consumption of foods containing compounds with a value-added to the per se nutrient value is recommended; these compounds are known as bioactive compounds, such as fiber and antioxidants, which have been related to the decrease of oxidative stress and inflammation present in obesity and that, when not treated, they trigger multiple conditions such as diabetes, hypertension, metabolic syndrome, insulin resistance, and cardiovascular diseases. Cashew (*Anacardium occidentale* L.) is a fruit from Brazil that serves as a possible source of fiber-antioxidant by containing phenolic compounds and dietary fiber.

Fiber-Antioxidant, Cashew, Inflammation, Obesity

The relevance of the source of animal or vegetable proteins on the metabolic syndrome and its comorbidities

La relevancia de la fuente de proteínas animales o vegetales sobre el síndrome metabólico y sus comorbilidades

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Abstract

Metabolic Syndrome (MS) is one of the most serious health problems worldwide since 25% of the population suffers from it and 80% of these are at risk of cardiovascular diseases and diabetes mellitus. MS is defined as a series of metabolic abnormalities constituted by arterial hypertension (HTN), abdominal obesity, dyslipidemias, glucose intolerance and/or insulin resistance (IR). Proteins are long chains of amino acids and have a characteristic three-dimensional structure that is essential for their specific function. These are a source of bioactive peptides that can have beneficial effects on health. Bioactive peptides are small peptide chains composed of 2 to 15 amino acid residues, obtained by industrial food processing or during gastrointestinal digestion; after oral administration, they exert their beneficial effect on the cardiovascular, digestive, immune, and nervous systems. Therefore, the objective of this review is to describe investigations about the positive effects of different kinds and sources of protein, fractions, or peptides in MS.

Metabolic syndrome, Proteins, Bioactive peptides

Wanderings of a magic element: The biogeochemical cycle of manganese

Andanzas de un elemento mágico: El ciclo biogeoquímico del manganeso

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Abstract

This review is devoted to the biogeochemical cycle of manganese and the chemical characteristics of this element that make such a cycle possible, particularly its redox transformations. Through a journey of the five environmental spheres, namely the Earth's crust (and specifically the soil), the different parts of the hydrosphere, the biosphere, the anthroposphere, and the atmosphere, the main manganese species in each of these compartments are analyzed, among which manganese oxides (MnOx) stand out. The formation of submarine deposits of MnOx at the crust/hydrosphere interface is also presented since they represent the largest reservoir of this element in the Earth's crust. In reviewing the manganese redox reactions in the hydrosphere, its speciation in different types of natural water is presented, as well as the circumstances that turn this element into a matter of concern. The section dedicated to the biosphere shows how the terrestrial history of manganese is intimately intertwined with the emergence of photosynthesis and the oxygenation of the atmosphere. It also examines how manganese chemistry was crucial in fortuitously providing a defense against the free radicals that have, since its emergence, accompanied molecular oxygen and aerobic metabolism. Besides, some microbial redox transformations, the role of manganese as a nutrient, and relevant aspects of its toxicology are examined. Socio-industrial uses of manganese, which span several thousands of years, are summarized in the anthroposphere section. The article concludes with an overview of the non-redox mechanisms that mobilize this "magic" element between soil and water.

Biogeochemistry, Environmental chemistry, Biosphere, Oxygen, Redox reactions

Methods of physical control of pathogenic microorganisms in hospital áreas

Métodos de control físico de microorganismos patógenos en áreas hospitalarias

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Abstract

Hospitals are establishments that are open 24 hours a day, 365 days a year, and are responsible for providing the necessary care to patients, there are hospitals of different levels and each one of them fulfills its mandate with different equipment and materials.Cleaning and disinfection are important issues to address, so this paper explains under reliable information, the different physical methods that have been implemented to improve the cleaning process every day and to control the levels of viable pathogen microorganisms installed on surfaces or equipment, there are also chemicals that damage health, the above is distributed in different hospital areas where there is contact between health personnel, patient, administrative workers, family members, and others. The administration of physical disinfection methods such as sterilization by dry or wet methods, radiation, filtration, electricity, have shown to be effective over the years and have been reflected in the controls carried out by Mexico's Secretary of Health or various institutions responsible for implementing cleaning protocols and that these are applied.Within a hospital, everything must be planned for good work performance and that the impact is favorable, with the information provided by this research is expected to achieve a social impact especially in health centers or hospitals, so that the problems that occur every day are decreasing.

Hospital areas, Pathogens, Physical methods of control

Empleo de ultrasonidos de potencia, fluidos supercríticos y tecnología de membranas para la obtención y/o conservación de productos biológicos de uso clínico

Use of power ultrasound, supercritical fluids and membrane technology to obtain and/or preserve biological products for clinical use

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Abstract

The awareness of the population to acquire products based on natural components that provide health care benefits has become a necessity nowadays. From this situation arises the initiative to look for new and better alternatives to replace synthetic active ingredients with components obtained from biological extracts. Bioactive compounds are molecules that contain a variety of beneficial properties for people as they contribute to the prevention and treatment of diseases; therefore, obtaining and preserving these components requires processes that guarantee their functionality. The implementation of emerging technologies that do not require the use of heat or require it at low temperatures during the processes of extraction and/or microbial inactivation of biological products, is a solution to the global problem of replacing conventional methods that affect the quality of the products, in addition to negatively impacting the environment. During this work, a vast compilation of information from articles, books and theses on non-thermal technologies such as Power Ultrasound, Supercritical Fluids and Membrane Technologies was carried out. As a result, it was found that these technologies are suitable for the extraction, separation and microbial inactivation of biological products for clinical use, since they represent multiple advantages, such as time and energy savings during the processes, reduction of chemical waste, easy reproducibility at industrial level, higher yields of extracts, cost reduction and they are environmentally friendly. It could be said that the use of these emerging technologies is still new, but the results they have offered to date are really promising.

Bioactive compounds, High Power Ultrasounds, Supercritical Fluids, Membrane Technology

Obtaining and characterization of the ethanolic extract of the leaves of the *Tradescantia Spathacea SW*

Obtención y caracterización del extracto etanólico de las hojas de *Tradescantia Spathacea SW*

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Abstract

In the last 20 years, chemical studies of plants in México have increased notably, intending to provide society with alternative mechanisms without damaging the atmosphere and the environment, ensure effectiveness and efficiency. There is a great diversity of native plants in the Mexican southeast, such as *Tradescantia Spathacea SW*, which has antioxidant and antibacterial properties. For this reason, this work presents the obtaining and characterization of the ethanolic extract of the leaves of the Tradescantia *Spathacea SW* (Purple Maguey) plant. The leaves were obtained from Nayarit Castellot, Champotón Campeche, and the ethanolic extract was obtained by the traditional method using purification processes. As a result, the ethanolic extract was obtained without purification, which was characterized by phytochemical and spectroscopic techniques. Phytochemical tests and thin layer chromatography showed polyphenols, and UV-VIS and FTIR spectroscopy showed the presence of the phenol group. The extract obtained in this work will be subsequently evaluated as a corrosion inhibitor in API 5L-X52 steel.

Extract, Purple Maguey, Maceration, *Tradescantia Spathacea SW*

3 Medicine and Health Sciences

Análisis sensorial de producto alimenticio basado en lenteja

Sensory analysis of a food product based on lentil

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Abstract

The SARS-COV2 virus can cause various conditions if there are already persistent health conditions (Ho et al., 2021). Improving health through diet is a tangible alternative, which is why lentil is a possible option due to the amount of nutrients and polyphenols contained (Silva-Cristobal et al., 2010).The objective of this work was to carry out a sensory analysis at different concentrations of lentil added to a hamburger food to 15 people to know its acceptability, using the Likert scale. However, their habits and lifestyles were known. In addition, the *Lens culinaris* grain used for the elaboration of the nutritional product was characterized. The creation of a multifaceted nutritional product based on easy-to-prepare lentils aims to improve health through a balanced diet, allowing it to adapt to the lifestyle of those who consume it. The results found indicate that the sample T3 at 60% lentil concentration has a higher preference among the participants with respect to the base sample T0 (hamburger made with meat).

Lentil, Obesity, SARS-COV2

Effect of the consumption of a hypoproteic diet in pregnancy on brain and behavioral disorders in the postnatal stage

Efecto del consumo de una dieta hipoproteica en el embarazo sobre las alteraciones cerebrales y conductuales en la etapa posnatal

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Abstract

Feeding behavior during pregnancy is essential to fetal development, growth, and survival. The consumption of hypoprotein diets in this stage has a negative impact on the central nervous system (CNS) and sensorimotor skills, learning, and memory. This research summarizes the effects of low-protein diet intake during pregnancy in the brain and the behavioral responses of offspring. This review used information with the inclusion of some terms such as pregnancy, maternal, neonatal, and postnatal events, in combination with consumption, high protein diet, CNS, and behavior. The search was carried out in PubMed (May - Jun 2021) and was limited to the period from 1996 to 2021; consensus, positioning publications, reviews and meta-analyses were excluded. Twenty-three original research articles, in murine and human models, identified to integrate the current importance of low-protein diet intake. On the morphological and functional alterations in the postnatal brain and behavior.

Hippocampus, Low-protein, Malnutrition, Pregnancy, Postnatal age

Knowledge of health personnel about HPV screening tests: A systematic review

Conocimiento del personal de salud sobre pruebas de detección de VPH: Una revisión sistemática

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Abstract

Objective: to describe the scientific production published between 2009-2019, on the knowledge of health personnel about HPV detection tests.Methodology: A systematic review based on the PRISMA methodology was developed using three databases selecting studies in inglish and spanish that were published in indexed journals. Out of a total of 2,611 articles, 1,711 written in inglish and 6 in spanish were included in the research. After the analysis of the articles, it was observed that they reflect little knowledge about HPV detection tests by the health personnel involved in the Cervical Cancer Timely Detection Program.Contribution: The development of molecular tests for HPV detection represents a valuable tool, therefore, it is essential to investigate what knowledge the health personnel in charge of the Cervical Cancer Timely Detection program have in relation to these. This work reaffirms the need for continuous educational programs for health personnel so that they can provide correct information on the prevention of HPV infection and cervical cancer to their patients.

Systematic Review, Evidence-Based Medicine, Knowledge

Health Risk Behaviors and Emotional State of Medical Students

Conductas de riesgo para la salud y el estado emocional de los estudiantes de medicina

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Abstract

The promotion of healthy lifestyles amongst medical students is important in reducing alterations in their emotional state and the creation of healthier habits which, when adopted at this stage, could influence the promotion of better lifestyles for their patients. This current study intends to evaluate health risk behaviors and their relationship with the emotional state in medical students. An analytical cross-sectional study was carried out, evaluating 173 students of a public university between January and March of 2019, evaluating anxiety (Beck Anxiety Inventory, BAI), depression (Beck Depression Inventory, BDI-II), alcohol and nicotine dependence (Alcohol Use Disorders Identification Test, AUDIT, Fagerström Physical Nicotine Dependence), and Body mass index (BMI). sociodemographic and clinical data was collected through an interview. An association was found between anxiety and a sedentary ($p = 0.01$, OR = 0.446, CI = 0.24 - 0.83), and depression with alcohol consumption ($p = 0.005$, OR = 2.972, CI = 1.36-6.49). During collage students face various demands that can unleash alterations in their emotional and physical state, the results obtained in this study allow the development of intervention programs against risky behaviors and promote healthy lifestyles.

Lifestyles, Emotional state, Medical Students

Early trauma as conditioning of psychopathology in adult women

Trauma temprano como condicionante de la psicopatología en mujeres adultas

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Abstract

Violence is a public health problem, with severe negative consequences on the mental and physical health of people, female primarily; one of five women reports more child abuse or maltreatment than each one of 13 men; women who have suffered some form of child abuse, have up to four times the risk of developing symptoms of depression in adult life. According to the WHO, between 1990 and 2013, people with depression or anxiety increased by 50%, from 416 million to 615 million. About 10% of the world's population is affected, and mental disorders account for 30% of the global burden of non-fatal disease. Humanitarian emergencies and conflict increase the need to expand therapeutic options. Major Depressive Disorder is characterized by severe mood alteration, displeasure and these affect the social, work, and personal areas; the persistence of the disorder could cause distress and physical and functional disability. The women are at twice the risk of suffering depression and suffer more severe depressive symptoms. In addition, women who have been victims of physical or sexual abuse have higher rates of mental health problems. Exposure to child abuse is associated with a markedly increased risk of psychiatric and medical disorders; The hypothalamic-pituitary-adrenal (HPA) axis is one of the main signaling pathways activated in response to stress and trauma. Alterations in the HPA axis or allostatic load are a psychophysiological condition due to the chronic persistence of child abuse, increasing the risk of suffering from mental disorders in adulthood. It is necessary to emphasize the importance of early trauma when psychiatric diagnosis, offer better treatment options, and stop the family chain of adverse events.

Early Trauma, Allostatic Load, Psychopathology, Women

Growth and development of the craneofacial region and the stomatognátic apparatus

Crecimiento y desarrollo de la región craneofacial y el aparato estomatognático

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Abstract

The present chapter has the objective of recalling the importance of craniofacial growth and development in the human being, that is why concepts and follow-up of this important process are included.It is a compilation of information obtained based on the knowledge obtained from the literature as well as from the authors, it can be said that it is a systematic review of information or frame of reference.It is a contribution to the academic training of students and a brief journey through time on this topic for dentists in consultation and teachers in this area.It is concluded that growth and development in the theoretical aspect is very important to apply in practice the knowledge obtained and remembered in this contribution.

Growth, Development, Cephalometry

Assessment of physical activity, sedentary behaviors and physical fitness in perimenopausal women

Valoración de la actividad física, comportamientos sedentarios y aptitud física de mujeres perimenopaúsicas

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Abstract

Introduction. Promoting active lifestyles to maintain physical functionality in middle-aged women implies field assessments which could sometimes be considered subjective or problematic. The proposal was to analyze physical activity, sedentary behaviors, and physical fitness in perimenopausal women living in the urban area of Monterrey. Methods. An analytical and descriptive study that includes comparative and association aspects with a single measurement. A personal data form was applied, as well as accelerometry with an ActiGraph GT3X+ movement detector, the AMAI Socioeconomic Level Questionnaire, the Sedentary Behavior Questionnaire, and the International Physical Activity Questionnaire (IPAQ)-Long Form. Physical fitness was assessed in relation to strength in the upper limbs (dynamometry) and lower limbs (30 second Sit to Stand Test) in addition to balance (Unipedal Stance Test). Data analysis was performed with the SPPS software, version 21.0; with descriptive and inferential statistics considering a critical value of 0.05 for Cronbach's alpha. Results. According to the IPAQ report, 54.8% of the participants meet the global recommendations for health, whereas, with accelerometry, the result was 52.4% ($p > 0.05$). On average, the participants spend more than 850 minutes a day in sedentary activities. No differences were found between the self-report and the objective accelerometry measurement of PA and sedentary behaviors in the participants of this sample. In more than half of the participants, physical fitness is considered as of a low level for all the tests considered. The participants who are housewives presented more PA in their leisure time than those who work ($p < .05$). Excess weight exerted an effect on overall physical activity and on balance with the eyes open ($p < .05$).
Conclusions. Perimenopausal women usually present excess weight, sedentary behaviors, and low level of physical fitness. In this sample, no differences were found between the self-report of PA and sedentary behaviors in relation to the accelerometry measurement. Promoting active lifestyles and physical assessment in the life stage is advisable to maintain physical functionality prior to old age.

Behavior, Muscular strength, Balance, Health risk, Women health

Pro-Inflammatory cytokines: Leptin and visfatin associated to obesity in young university students

Citocinas pro-inflamatorias: Leptina y visfatina asociadas a obesidad en jóvenes universitarios

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Abstract

Obesity has been associated with the development of important degenerative diseases such as hypertension, metabolic syndrome, diabetes mellitus (DM), cardiovascular disease (CVD), cancer, among others. And is also described that the disease severity of infections illnesses such as coronavirus, influenza, parainfluenza, and rhinovirus in increased. Besides, in 2009 was recognized as a risk factor during the pandemic of influenza H1N1 Currently there are several studies which suggest that some adipocytokines as leptin, resistin, plasminogen activator inhibitor-1 (PAI-1), adiponectin, visfatina among others have mediators affects in cardiovascular system.Some authors had shown plasmatic levels of leptin seem to be one of the best biological markers of obesity, and hyperleptinemia is closely related with several metabolic risk factors on insulin resistance in DM Some studies reveals that visfatin have mimetic affects with insulin in muscle stimulation and in glucose transport in adipocyte, also inhibit glucose production in liver.The objective of this work was to describe the association between leptin and visfatina in the development of obesity in a young population to identify the possible risk factor or as a protective factor of this adipocytokines with obesity.Methodology. Cross-sectional study. The present study was carried out in the facilities of the Centro Universitario de Ciencias Exactas e Ingenierías of the Universidad de Guadalajara. We recruit 171 young students (57.6 % female, 42.4% male) with the following characteristics: age between 18- 25 years old, fasting of 8 to 10 hours to take the blood sample.The results shows that BMI is higher in male and triglycerides also. On the other hand, leptin levels and total cholesterol are higher in women. The group with hyperleptinemia has higher values of BMI, total cholesterol, triglycerides, LDL and visfatina comparing with the group with normal leptin levels.We observed that hyperleptinemia is a risk factor for the development of obesity with OR 5.86 (p=0.01), in the other hand, visfatina acts as a protector factor with OR 0.2901 (0.02).Conclusion. Therapeutic intervention in early stages previous the beginning of the metabolic complications could have a favorable cost-benefit. However, the incorporation of markers such as the size of the particle of LDL, insulin resistance index, adipocytokines pro inflammatory as leptin and visfatin could improve the current predictive capacity.

Obesity, Leptin, Visfatin, Young, Proinflammatory

Presence of neuroglobin in the *substantia nigra* in a murine model of parkinson´s disease: An immunohistochemical study

Presencia de neuroglobina en la sustancia negra en un modelo murino de enfermedad de Parkinson: Un estudio inmunohistoquímico

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Abstract

Neuroglobin (NGB) is a protein with antioxidant and antiapoptotic activity against conditions such as oxidative stress, oxygen / glucose deprivation and neuronal apoptosis. Its presence has been documented in different brain areas including the midbrain, a site of key importance for global motor control by the presence of dopaminergic neurons in the substantia nigra located inside and whose progressive loss culminates in the most common neurodegenerative movement disorder, Parkinson's disease (PD). PD is a condition characterized by motor disturbances such as resting tremor, muscle rigidity, bradykinesia and deterioration gait and balance. There are few studies that inquire about the role of this protein in this disease, including its expression in the substantia nigra. The present study evaluated the presence of NGB in a murine model of PD induced by 6-OHDA injury using immunohistochemistry. The results show a significant difference of NGB aggregates in the substantia nigra in compared to controls (p=0.003) These findings provide the first *in vivo* experimental evidence of an adaptive NGB response in a model of PD, supporting its probable neuroprotective action in the main area involved in the pathophysiology of this disease.

Neuroglobin, Substantia nigra, Neurodegeneration, Immunohistochemistry

Prevalence of ectopic eruption and intercanine distance in children aged 6 to 12 years. Cycle 2019-2020.

Prevalencia de erupción ectópica y distancia intercanina en niños de 6 a12 años. Ciclo 2019-2020.

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Abstract

The development of permanent teeth and their eruption is of utmost clinical importance, it is also useful in anthropology, demography, forensic medicine and paleontology studies. When the eruption sequence and the mechanisms are not adequate, it causes an ectopic eruption that must be detected in time in order to avoid damage to the occlusion that affects the aesthetics, function, self-esteem and quality of life of the child. Objective: To identify the prevalence of ectopic eruption and intercanine distance in children aged 6 to 12 years. Methodology: An epidemiological, cross-sectional, descriptive study was carried out in order to clinically detect this eruption anomaly. The selection of the sample was 77 children who met the selection criteria, during the 2019-2020 school year. In a rural primary school in a municipality of Zacatecas, the intercanine distance measurements were subsequently carried out with the help of a Vernier, after calibration and informed consent, the information was processed through the statistical program SPSS V 24 and Excel. Results: The prevalence of ectopic eruption was 22%, the female gender the most frequent age was 7 years. The average upper intercanine distance was 26.76mm * - and in the lower jaw it was 33.4mm + _: the tooth that presented the most frequent ectopic eruption was No. 22, the least frequent was 32 and 15. It was observed a decrease in the intercanine distance 26.7mm. In children with multiple ectopic eruption, the intercanine distance decreased, the lower lateral incisors were detected between the teeth with the highest prevalence of ectopic eruption. Conclusions: It is necessary to intervene in the early stages in order to avoid the installation of malocclusion and costly, long and more difficult orthodontic treatments. Prevention is better than cure.

Ectopic eruption, Intercanine distance, Children

Anxiety in medical students, during a covid-19 pandemic

Ansiedad en estudiantes de medicina, durante pandemia covid-19

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Abstract

Know the presence of anxiety in medical students from a private university in Colombia, during the COVID-19 pandemic. Non-experimental, quantitative, exploratory cross-sectional study; applied the DASS-21 scale. Cronbach's alpha of the total scale was 0 .79. Descriptive analysis was carried out in statistical package spss v21, data collection was by google forms during the month of December 2020, with prior informed consent. The convenience sample consisted of 115 students from the medical school of a private university in the city of Cartagena, Colombia. Of this, 60 were women and 55 men. 80 students were anxious (medium, moderate, severe, and very severe). Very severe and severe anxiety was more frequently expressed in women. It is concluded that during the COVID-19 pandemic, 80 of 115 medical students from a private university in Cartagena Colombia presented anxiety.

Anxiety, Students, Medicine

Effect of the consumption of Stevia rebaudiana Bertoni as a natural and artificial sweetener on fatigue and oxidative stress of skeletal muscle

Efecto del consumo de la *Stevia rebaudiana* Bertoni como edulcorante natural y artificial sobre la fatiga y el estrés oxidante del músculo esquelético

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Abstract

Stevia rebaudiana Bertoni has non-caloric sweetening properties and its use has been linked to therapeutic effects. However, Stevia sp is sold as a substitute for sugar commercially, not only includes steviosides but is also combined with other high-intensity artificial sweeteners, which questions its safety. Our objective was to evaluate the effect of natural and artificial Stevia rebaudiana Bertoni on fatigue and oxidative stress of skeletal muscle. Twenty-four male Wistar rats were divided into: (C) rats receiving water, (S); rats receiving 41.2 g/L sucrose solution (SRA); rats receiving solution with commercial sweetener (Svetia) 6 g/L; (SRN); rats receiving solution with the dried and powdered leaf of the Stevia sp. plant. 4.4 g/L. Eight weeks after the treatment, muscle tension recording and measurement of oxidative stress markers were performed: levels of reactive oxygen species (ROS) and catalase activity. Additionally, body weight, postprandial glucose, and food intake were recorded throughout the experiment. The SRA caused an increase in body weight and a significant reduction in the resistance time to muscle fatigue and the maximum and total muscle tension force. Treatment with SRN caused significant improvements in the parameters studied ($p < 0.05$). We conclude that natural S. rebaudiana is an essential alternative for weight control and the development of antioxidant defense against muscle fatigue but not in synergy with artificial sweeteners.

Stevia rebaudiana Bertoni, Muscle fatigue, Antioxidant

Overwiev of general plant toxicology uses and adverse effects

Generalidades de la toxicología forense usos y efectos adversos de las plantas

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Abstract

That is why this work aims to know the generalities and the toxic substances include those of the organic and inorganic type. Hence, those of the organic type can be ethanol, most of the medicines and poisons of both animal and vegetable and pharmacological origin. Regarding inorganics, we can consider heavy metals, as well as caustic toxins such as sodium hydroxide. Chemical exposure today in the social environment can be very aggressive in extremely low doses. Speaking of any chemical it can be toxic if it is consumed, ingested or absorbed in excess. This can be through food, water, air, or other sources. Therefore, individuals can respond to toxic chemicals in different ways since some are often more sensitive to a specific chemical and can be excessively dangerous toxicological effect when supplying plants such as castor, caper flower and giant in male wistar spraley rats.

Toxicology, Uses of plants Adverse effects

4 Humanities and Behavioral Sciences

Evaluative system design applied to transidiciplinary projects as a tool for the terminal efficiency increment

Diseño de sistema evaluativo aplicado a proyectos transdisciplinarios como herramienta para el incremento de la eficiencia terminal

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Abstract

The objective of this article is to show the design of an evaluative scheme that begins with the creation of Transdisciplinary projects, applied in students from the currently bachelor's degrees inside the Universidad Politécnica de Gómez Palacio.The projects that are counted into the *Transdisciplinary*, tend to relate agents from different specialties, with the main purpose of unite the knowledge and abilities in the creation of a complete integrating project, supported by diverse members of the team. The Transdisciplinary gives the disciplinary or methodological part the students learn in the classroom, meanwhile the transversally only unites the concepts among the environment where they are, characteristics like ages, sex, among others, this is why this Project emphasizes the discipliner part of the classroom.The way the design is created, sets off from the results obtained from the surveys applied to the eighth four-month period students; besides evaluates the former students from the generation 2014 – 2017. Once the results are obtained, the next step is to create a new evaluation methodology and with it, it is expected to create a change in the evaluation system in the Superior Educative Institutions.

Terminal Efficency, Evaluation, Transdisciplinarity

Energy poverty from a Oaxacan context: Towards an inclusive, pertinent and resilient characterization seen from the solidarity economy and the capabilities approach

La pobreza energética desde el contexto oaxaqueño: Hacia una caracterización incluyente, pertinente y resiliente vista desde la economía solidaria y el enfoque de capacidades

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Abstract

This article aims to redesign the concept of energy poverty through an inclusive and relevant characterization of the biosocial context of the state of Oaxaca, Mexico, since none of the existing concepts in the literature understand its particularities.Based on solidarity economy and the capabilities approach, we discuss the relevance of reflecting on the areas of energy needs and their satisfiers by integrating quantitative and qualitative aspects, as well as the desired outcomes of the communities who suffer from this type of poverty. In addition, this article highlights the cultural methods and capacities that people have to intervene favorably in their energy satisfaction.The methodology for the research relies on a work breakdown structure, where students searched, selected and analyzed the so-called areas of energy needs in Oaxaca. In the final reflections, we define the concept of energy poverty as: lack self-management, access, and affordability of energetic resources impacting social development, collective growth, and health without compromising cultural values and worldview informing the right to personal decision making on what type of energy source is chosen to satisfy essential services in a household.

Energy poverty, Energy development, Sustainability

Analysis of stress and anxiety in university students to identify correlated factors

Análisis del estrés y ansiedad en estudiantes universitarios para identificar factores correlacionados

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Abstract

In the present study, we analyze the stress, anxiety, state, and academic features of 478 higher-level students. We identify the correlated factors using multiple linear regression and Pearson's correlation coefficients. We use the SISCO and STAI instruments to measure academic stress at the anxiety level. We determine that the most representative stressors in students are the teachers' evaluations with 31% as almost always and 11% as always, physical reactions such as drowsiness or need to sleep 31% as almost always, 12% always. Besides, reactions of depression and sadness show a 9% as almost always, 9% as always. Behavioral and coping reactions show 9% almost always and 9% always. The most outstanding anxiety reactions in the present research revealed that 48% of the students never feel calm, 40% never have happiness like others, 41% are never satisfied or comfortable with themselves. Some psychological changes related to stress and anxiety are closely linked to the suicide rate, derived from the fact that the generated uncertainty becomes a potential source of stress and vulnerability to depressive or anxiety disorders.

Academic stress, Anxiety, Multiple linear regression

Analysis of the thermal sensation in cold period outdoor spaces, in the dry climate of the metropolitan area of Tijuana, Baja California, Mexico

Análisis de la sensación térmica en espacios exteriores periodo frío, en el clima seco de la zona metropolitana de Tijuana, Baja California, México

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Abstract

Weather variables affect the permanence of a user at an outdoor public space, the diverse aspects of these variables can affect the user's thermal sensation. Thus, by knowing the outdoor comfort temperatures or neutrality temperatures values, users can extend their stay in the areas that are exposed to outdoor weather conditions, a reason why we intend to find the values for those neutral temperatures on the outdoor spaces at the Valle de las Palmas area, in Tijuana, Baja California, because by knowing these values, there can be improved outdoor spaces designed in accordance to the city's climate variables. In order to find these temperature values, a case study was selected, in which an instrument or survey was applied, designed to inquire what the perceived thermal sensation of the user at the open space is, while thermal monitoring was carried out at the same time with the use of automated measurement tools and, once the data was gathered, diverse variables were collected based on the ISO 7730-2005 standard, while Microsoft Excel software was used to analyze the field data and, as a result, the appropriate neutrality temperature was obtained to be able to design future outdoor spaces or redesign and improve the existing ones.

Thermal Sensation, Neutral Temperature, Outdoor Spaces

Analysis of the level of stress in teachers

Análisis del nivel de estrés en los profesores

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Abstract

This research aims to know the stress level of teachers of one of the Santa Catarina Technological University majors and, if it is high, take the appropriate measures to try to reduce it to a safer proportion for teachers, and thus prevent teachers from getting sick or incapacitated very often. It is known to all that if the teacher does not fulfill his obligations, the one directly affected is the student, who will have a poor academic performance.To measure the level of stress, a questionnaire consisting of 23 questions will be applied to the teachers of the cited school, the options that will have to answer those questions are 4: nothing at all, a little, moderately and strongly, with values of 1, 2, 3 and 4 respectively; The answers selected by the teachers will be added and compared with a low, medium and high scale.Subsequently, a relationship of the level of stress against teacher performance will be established through a statistical treatment, where the correlation of these variables will be established by the method of the linear correlation coefficient r of Pearson. Likewise, the equation of the regression line by least squares will also be established with its corresponding graph for analysis.

Stress, Analysis, Performance

Intelligent system in sensory and cognitive development for the pre-reading stage

Sistema inteligente en el desarrollo sensorial y cognitivo para la etapa prelectura

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Abstract

The article is dedicated to the problem of acquiring knowledge and skills for the pre-reading stage in basic education. It examines the reciprocal relationship between the development of the cognitive and sensory system of the subjects in school classroom and knowledge formation. It is shown that the notion "tonal ear" is an ability to differentiate by ear the sound complexity in the ratios of sounds by height. At the same time, "the balance" of the ear is determined as a need for the development of the listening of the educator and the student. It will be granted that the game, as one of the valuable pedagogical strategies, must be the distinctive part of the intelligent system, represented by software's TOTEM 1.1, 1.2 and NOMOS 1.0. Objectives are to develop the tonal ear and its balance for the pre-reading stage in phonetic-phonological training through the realization, creation, and implementation of programs; to strengthen auditory knowledge of tone for the balance of the hearing system in school classroom subjects. Methodology: theoretical-experimental. Considerations: it is mentioned that the pre-reading stage is important in the development of phonetic-phonological knowledge and skills and inevitable in the communication between school classroom subjects.

Game, Software´s, Tonal ear

Prototype of an electronic system for innovation in the Papillomavirus test registration process

Prototipo de sistema electrónico para la innovación en el proceso de registro de la prueba del papilloma

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Abstract

The present work aims to show the results of the effectiveness of the prototype of an electronic system for innovation in the registration process of the Papillomavirus test. This is a technological innovation project, carried out in a University Health Center in which 32 records of patients who underwent test during the project execution period were included. The system was implemented by all the nurses who work in the Women's Care Module. Three dimensions were evaluated: structure (official indicators), process (registration) and results (staff satisfaction with the management of the system). Thus, the electronic system meet the structure indicators established by Official Mexican Standards. The percentage of completeness of the records was high in three sections: entry into the system, identification of the unit and HPV molecular biology. Most of the staff are satisfied with the handling of the electronic system, so it can be concluded that the prototype of the electronic system was effective in recording the information. Its design and implementation will make the work of health personnel more efficient.

Information Technology, Papillomavirus, Nursing Records, Nursing Process, Uterine Cervical Neoplasms

Women as literary creation: A diachronic-representative journey

La mujer como creación literaria: Un recorrido diacrónico-representativo

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Abstract

The following essay intends to show women presence in some scripts, mainly narrative, by authors and shea uthors who decided to recreate them in the literary artwork. The twentieth century will be the encompassing component and some of its decades, the encompassed parts; the classification follows the desire to deepen into those mentioned she characters which are already part of the Mexican literature history.We began the journey in 1903, with *Santa*, by Federico Gamboa and ended in 2009, with *The Insurgent by* Carlos Pascual, covering a little the present century, given the importance of some script that address the framework theme: women as a literary creation.We consider it important to mention that the contributions of this study are two, one, as its name indicates, highlighting the presence of women as creation in the literary work and, another, which, although we know, according to the Language Royal Academy LRA, character is a masculine noun, we propose, at least in this essay, to create the female noun: SHE CHARACTER, WOMEN CHARACTER as new noun.

She Character (Personaja), Woman, Literary creation, Narrative, Mexican literature

Intellectual Biography of Latin American Academic Women

Biografía intelectual de las académicas latinoamericanas

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Abstract

The text that we present here constitutes the progress of a collective investigation that emerged in the inter-institutional seminar on the history of women's education *Aquelarre* (Coven), named as a metaphor of the power of women and as a way to summon and describe the heterogeneous and vigorous group of academics that conform it, and who meet to debate, reflect and take action in the violent times in which we are living. From our first meetings, it was clear that the reason that brought us together was the need to understand –more deeply– the academic and Mexican women that we are approaching in this paper. But, in which way can we determine the main characters of these narratives? In what manner can we approach them? How to explain the plots these women have weaved to become the text they wanted to become? To apprehend these complex stories, we opted for a multidisciplinary perspective that combines history with gender perspective and intellectual biography. From there we tried to decipher the women summoned to our Coven. They are the Mexicans Luz Elena Galván (educational historian, author of multiple investigations and researcher trainer; we are focusing on her in this presentation), Belinda Arteaga and Marcela Santillán, as well as Peruvian Lucrecia Janqui. All of them willing to assert themselves to make their emotions, rational choices, alliances, proclamations and sedition acts visible. All of this with the intention of breaking apart, and emerging in the midst of silence, prohibition and obscurantism as victorious women who make their own way as they walk (as the poet once sung [reference to song]).

History of education, Academic, Women, Gender, Genre, Intellectual biography

Flipped classroom a model for autonomous learning

Flipped classroom un modelo para el aprendizaje autónomo

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Abstract

At the higher education level, autonomous learning is one of the most important challenges facing education today, especially with the current situation caused by the pandemic, where students must acquire good academic habits, work in a self-regulated manner and with their own criteria to support decision making. This paper describes the research conducted in a Technological University where the inverted classroom model was implemented in a subject to analyze the impact of the implementation of this model in the autonomous learning of students. The methodology used was based on a mixed type study, initially with an exploratory scope for the qualitative part and an experimental design for the quantitative part. The main contribution of this research is the Flipped Classroom Framework for its implementation for both teachers and students.As far as the specific objectives are concerned, the first is to define the framework to facilitate the teaching-learning process using the flipped classroom model in the context of the model of Technological Universities, the second is to know the advantages and disadvantages that the flipped classroom offers to students and the third is to promote autonomous learning of students of the subject of Multiplatform Mobile Development.

Inverted Classroom, Autonomous Learning, Educational Technology, ICT, ICT, Self-Directed Learning

Resistant personality and burnout in judo athletes from national teams

Personalidad resistente y burnout en deportistas de judo seleccionados nacionales

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Abstract

The objective of this book chapter is to identify the correlations between Hardy Personality (HP) and Burnout (MT), in high performance athletes. The participants were 162 Athletes from their national teams from 21 countries in Judo Sport, who participated in Mundial de Veteranos de Judo and Grand Prix in 2019 in Cancun Quintana Roo, Mexico, the age ranged from 18 to 70 years with an Average of 32.56 and a Standard Deviation of 11.48. The athletes answered two instruments, one that measures the RP that evaluates their resistance to stress, and the other that measures the Burnout. The methodology used is cross-sectional, associative empirical, and simple correlation. Descriptive analyzes, reliability, validity, and Spearman's correlations were performed, with SPSS software. The results found negative and significant relationships in the resistant trifactorial and unifactorial personality. Judokas are perceived as resistant to stress and capable of overcoming any obstacle, there is no depletion or devaluation of their sports practice.

Hardy Personality, Control, Resistance Personality, Commitment, Athletes

Educational innovation through techno-pedagogical tools in virtual education

Innovación educativa a través de herramientas tecno-pedagógicas en educación virtual

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Abstract

Virtual education is present more than ever at all educational levels, as a result it is essential that institutions incorporate technological advances in the way they teach their courses. In order to identify the influence of techno-pedagogical tools to facilitate and improve student learning, a longitudinal-quasi-experimental and applied research was carried out. A sample of 35 individuals chosen at the investigator's convenience, 19 from the treatment group and 16 from the control group, was considered. Adjustments were made in the treatment group courses and later, using the survey as a data collection instrument, the impact of the use of techno-pedagogical tools was evaluated, in addition a comparison of the results of the final grades of both was made. groups. The results show that the techno-pedagogical tools that include small capsules facilitate learning in students, therefore presenting improvements in their learning.

Educational Innovation, Techno-pedagogical Tools, Instructional Design

Necessary pedagogical innovations: University internationalization initiatives and virtual environments in front of covid 19

Innovaciones pedagógicas necesarias: Iniciativas de internacionalización universitaria y entornos virtuales frente a covid 19

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Abstract

The objective of this writing is to share innovative initiatives of internationalization at home (I at H) emerged at the Autonomous University of the State of Morelos, facing COVID 19, through technologies at the service of internationalization of universities "*internationatics*" (Juárez-Salomo, 2012) as the main resource of management and pedagogical strengthening of multinational institutions, emphasizing the "all of us", in front of a common cause: find ways to recover from the health emergency of COVID 19.The shared methodology includes the results of a research conducted among teachers from eight Latin American countries; some pedagogical strategies considering cognitive, behavioral, and emotional components; and provide examples of initiatives carried out, including the results of international collaborations achieved.Conceiving the internationalization not only as an indicator of quality of higher education institutions, but also as a strategy to provide academic alternatives aimed at addressing planetary challenges, it seeks to contribute punctually to the development of virtual environments for the training of professionals committed to the planet, aware of the diversity of thoughts, creative and flexible in their actions, adopting proactive initiatives, especially in the focus of the Sustainable Development Goals (UNESCO, 2017).

Pedagogy, Internationalization, Virtuality

Comparison of adaptation and family cohesion among adolescents with and without suicide risk in Tlaxcala

Comparación de la adaptación y cohesión familiar entre adolescentes con y sin riesgo de suicidio en Tlaxcala

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Abstract

Differences in adaptation and family cohesion among high school adolescents with and without suicide risk in Tlaxcala were analyzed. The participants were 50 adolescents between 12 and 14 years old; 28 women and 22 men, who applied the Suicide Risk Inventory for Adolescents (IRISA) by Hernández and Lucio (2011), which consists of 50 items and three subscales, whose validity is .95; and 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 there were no statistically significant differences in Adaptation, however, significant differences were observed in Family cohesion and with suicide risk factors among adolescents with and without suicide risk (** $p < .01$). Significant differences were also found in sex, school grade and place in the family (* $p < .05$) with some suicide risk factors. It is concluded that the family is an essential emotional support for the adolescent that helps to avoid the presence of suicidal behaviors.

Suicide risk, Adaptation, Cohesion, Adolescent

The broken glass of education in mexico from neuroeducation and the pymes

Los cristales rotos de la educación en méxico desde la neuroeducación y las pymes

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Abstract

As testimony, the situation that prevails in Mexico and the concept of the broken glass in education is seen with a sad argument where there are diverse and complicated broken pieces of educational reforms, for this reason neuroeducation was considered as a strategy to improve teachers and students. The objective was to identify the professionalization of teachers that allow raising the academic performance of students, which allows obtaining a recognition of PYMES based on education, The methodology, was considered to public universities and normal schools in Mexico. Methodology and a total of 3 instruments were applied in a sample of 150 students from a universe of 1500 students, through a multicenter observational design, where an evaluation instrument was a strategy. The study was carried out with a non-experimental quantitative approach of an instrumental type with the age and average. 100 teachers from educational institutions participated. The results of the exploratory factor analysis technique validated subscales related to strategies with a learning context, the contribution was among the main data, it was found that pedagogical skills, emotional affective and psychosocial aspects affect academic performance. It was detected that 10% of the students manifested emotional affective disorders.

Cognitive strategies, Pedagogical ability, Teacher professionalization

5 Social Sciences

Risk management in local microenterprises

Gestión de riesgos en la microempresa local

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Abstract

Risk management within the microenterprise implies the identification of future impacts, as well as anticipating the negative impacts to face effects that make the production process impossible, so that from this, actions are designed to eliminate the possibility of the risk occurring . Hence the importance derives since with the design of prevention actions and with the implementation of this, by the workers themselves it is feasible to avoid its occurrence, in order to achieve safer work spaces. The research was carried out in a local carpentry workshop whose objective is: to design an Occupational Risk Prevention Plan. Method used: and carried out the risk assessment, key risk factors were identified, to later define the appropriate preventive measures and the management of the business training plan. This research contributed to the design of a plan fully adapted to the productive characteristics of the company, which responds to more specific situations and that can be implemented during the working day, to achieve the sustainability of the organization by obtaining workspace cleaner and safer.

Risk management, Preventive actions, Business training

A didactic sequence design for the use of augmented reality in the teaching process of the human body in elementary education

Diseño de una secuencia didáctica para la utilización de la realidad aumentada en el proceso de enseñanza del cuerpo humano en educación primaria

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Abstract

The following research evaluates the impact on 4th grade elementary school students´ meaningful learning through the design and implementation of a didactic sequence that includes the use of augmented reality applications in order to teach about the circulatory, respiratory and digestive systems. Such didactic sequence was designed over the content of the SEP free text books, including as an augmented reality tool the application called Arloon Anatomy. The results obtained through statistical tests, U de Mann-Whitney and Wilcoxon, show that the impact is positive in the teaching-learning process, finding that the use of Augmented Reality aroused interest and stimulated the desire to learn motivating students to be more proactive, increased the level of attention and fostered an investigative spirit through the discovery of the functioning of the human body.

Augmented Reality, Meaningful learning and Didactic sequence

Standardization of the driver certification processes of the company Bebidas M Mundial S. de R.L. de C.V.

Estandarización de los procesos de certificación de choferes de la empresa Bebidas Mundiales S. de R.L. de C.V.

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Abstract

The purpose of this work is to standardize the certification processes for delivery and administrative drivers under the CESVI Standard at Betides Mondial's, S. de R.L. de C.V. To fulfill this objective, a mixed investigation was proposed with a design of the Deming methodology "the PDCA cycle".The specific objectives were to carry out a diagnosis to the Human Capital area to know specific data of the driver training, determine the number of drivers who are certified or not and have a driver's license, design a procedure manual that allows effective control of the certification process and participate in the current awareness campaign. The result was the standardization of the certification process, the standardization manual, Excel database, the credentialing of drivers, strengthening the "Safe Fleet" campaign

Process standardization, Certification, Drivers

The Impact of Covid-19 in Higher Education: Case Study students of the Tecnológico de Estudios de Villa Guerrero Bachelor's Degree in Business Administration

El Impacto del Covid-19 en la Educación Superior: Caso de Estudio alumnos del Tecnológico de Estudios de Villa Guerrero Licenciatura en Administración

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Abstract

The COVID-19 pandemic led to the temporary closure of institutions from elementary to higher education, which implied that students had to learn from home through digital platforms, this made education migrate to these channels, channels that not all students can easily access, so this work aims to expose the different academic situations that university students are going through in the midst of this pandemic in order to continue their education.Therefore, in order to carry out this study, a quantitative methodology was used due to the use of tools for the collection and analysis of statistical data. All the above to show that the students of the Tecnológico de Estudios superiores de Villa Guerrero of the Administration career do not have the digital, technological and even economic means to continue with their studies and adapt to this new learning modality.

Higher Education, COVID-19, Management, Administration

Strategic diagnosis of rural populations

Diagnóstico estratégico de poblaciones rurales

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Abstract

The present project is part of an applied research carried out in the rural area called the southeastern micro-region of La Paz municipality in the state of Baja California Sur, which is formed by three towns: San Antonio, El Triunfo and El Rosario. The subject of study is the elaboration of a strategic diagnosis, which will emerge from an integrated study and will function as the foundation for the implementation of a future strategic plan containing proposals for alliances between the State, society, and the private sector, which allow economic, social and cultural development. The methodology used was the proposal of the Latin American and Caribbean Institute for Economic and Social Planning (ILPES) and the Economic Commission for Latin America and the Caribbean (CEPAL), presented by Silva Lira and Sandoval (2012). Additionally, Chiavenato's basic model of a Strategic Planning System was used in its first stage, competitive and operational knowledge, that is, its implementation is not included. Different tools were applied, such as interviews, questionnaires, sessions, etc., analyzing the information with the SPSS software and as a result, the Strategic Diagnosis is presented.

Development, Diagnosis, Tools

Analysis of the Mechanical and Electrical Laboratory Service at the Faculty of Electrical Mechanical Engineering of the Universidad Veracruzana in Poza Rica Veracruz, Mexico

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

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Abstract

It is important to mention that educational quality and excellence within any Higher Education Institution lies in the importance of implementing continuous improvement in each of its different departments or areas, that is why constant analysis and self-evaluations of the services provided offered within it take on more and more importance, these are carried out in order to locate areas of opportunity in which it is necessary to implement strategies that help to achieve the desired levels of quality. This research is an analysis study focused on the services provided by the Mechanical and Electrical Laboratory to its users of the Faculty of Electrical Mechanical Engineering of the Universidad Veracruzana in Poza Rica Veracruz, Mexico, using an applied opinion survey. to a sample of 169 people, which allows identifying the indices of each of the services that are provided, the results obtained provide relevant data that will later be used for the design of an improvement plan that allows generating actions that favor the continuation being a quality educational institution.

Quality, Education, Continuous improvement

Proposal to improve services to students in the computer laboratory of the Faculty of Electrical Mechanical Engineering of the Universidad Veracruzana Poza Rica - Tuxpan region, based on section 10 of the ISO 9001: 2015 Standard

Propuesta de mejora en los servicios a alumnos dentro del laboratorio de cómputo de la Facultad de Ingeniería Mecánica Eléctrica de la Universidad Veracruzana región Poza Rica – Tuxpan, basada en el apartado 10 de la Norma ISO 9001:2015

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Abstract

This research aims to make a proposal in the computer laboratory of the Faculty of Electrical Mechanical Engineering Poza Rica-Tuxpan Region of the Veracruzana University based on the standard ISO 9001: 2015 section 10 by the analysis of the perception of the quality of services provided to students in the academic unit to complement their training in a comprehensive manner, thus identifying the main areas of opportunity. The present research is carried out by collecting information by the students through a survey applied in a non-probabilistic way to 100 students who have had the experience of occupying the services in the laboratory, subsequently the degree of satisfaction of the students is analyzed. services that were shown in the surveys to be able to carry out an improvement plan in each of the identified opportunity areas, and in this way to be able to propose a corrective action plan for each of the non-conformities that may arise and of this way to ensure increasing levels of satisfaction with the services offered.

Proposal, Quality, Service

Transaction modeling on e-Commerce

Modelado de transacciones en comercio electrónico

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Abstract

This article presents the formal representation of the sale and purchase transaction process that occurs in *electronic commerce (e-Commerce)*. *E-Commerce* is an area of study that has acquired a marked interest in recent times. A direct transaction between *provider* and *consumer* is analyzed with two variants of the resulting model that follows the criteria considered from a representation of *conceptual maps*. The *conceptual map* resembles a graph, with labels of concepts associated with the nodes and labels, of connectors between concepts, associated with the arcs. The description of the process, using *conceptual maps*, is accompanied by a narrative of events. *Conceptual maps* are used because they are a resource that facilitates the presentation of complex processes and gives way to their formalization. Formalizing a process is convenient because it enables its subsequent analysis, modification, improvement, control, and/or monitoring. The previous formal representation consists of a graph and a series of equations derived from the narrative sequence of the *conceptual map*.

E-commerce, ICT, Modeling

Importance of Human Capital in the agricultural development of Durango

Importancia del capital humano en el desarrollo agrícola de Durango

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Abstract

Studies carried out in the agricultural field of Durango must assess the sociodemographic factors that this sector presents, such as academic training, age and experience**.** These factors determine the capacities and competencies of the people who make up the Family Production Unit (FPU) (Unidad de Producción Familiar - UPF) to deal with their daily tasks and to resolve eventualities. The human capital index was calculated through the Portela index, since this formula allows us to analyze the experience acquired over the years along with the level of studies that the people subject to the analysis have. The findings reflect the relatively low rate that occurs in the academic training of FPU owners which has a negative impact on their results. The core of the agricultural sector's backwardness is the lack of academic training and the loss of experience due to generational replacement being limited. This study shows the determination of the human capital of the people who form and are in charge of the family production units, analyzing the differences presented in each agricultural District, having as its main contribution an index of comparison between the producers of the different agricultural Districts.

Human capital, The agricultural sector and marginalization

Quantitative analysis of the incorporation of undergraduate students to scientific work in a public university in Jalisco

Análisis cuantitativo de la incorporación de estudiantes de pregrado a la labor científica en una universidad pública en Jalisco

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Abstract

Generating interest in undergraduate students, with their participation in science for scientific development, which affects the main problems that human beings face, is a primary task for both universities, government and society. Therefore, the objectives of this article are focused on analyzing the participation of undergraduate students in the development and implementation of scientific research projects, based on their academic training, as well as the dissemination of their findings and the staging of problems of the state of Jalisco, with practical solutions, within the Multidisciplinary Program for the Development of Modular Projects (PMDPM).In this sense, a quantitative analysis of the participation of 809 undergraduate students incorporated into the PMDPM was carried out, regarding the development of scientific projects, scientific dissemination in congresses, the publication of scientific papers and the development of theatrical works from 2014 to 2020. The notable results are: 138 modular projects, 60 scientific disclosures in national and international congresses and 5 papers published in peer-reviewed and indexed journals, and the creation of the Spontaneous Reaction theater group.

Project-based learning, Early research, Popular science

The importance of women in the preservation of the companies dedicated to the production and sale of the Jipi-Japa hat in the Mayan Area Of Calkiní.

Importancia de la mujer en la preservación de las empresas dedicadas a la producción y venta del sombrero de Jipi-Japa en la Zona Maya De Calkiní.

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Abstract

In the Yucatán península, the handicraft businesses tend to disappear when the master craftsman dies, losing these family type companies. According with researches applied by Santos y Barroso (2016), point out that the 66% of the companies are run by handicraft woman, who preserve their customs, traditions and handicraft heritage. This document aims to appreciate the importance of the women in the preservation of the companies dedicated to the production and commercialization of the Jipi-Japa hat in the mayan area from Calkiní, in order to know the strengths and weaknesses of these companies for the export to European Markets. The research proposal was mixed and it was carried out in the four mayan localities: Tankuche, Bécal, Santa Cruz ex-Hacienda y San Nicólas from the municipality of Calkiní, in the state of Campeche, in two phases: Phase 1.- Internal analysis of the handicraft's companies. Phase 2.- External analysis of the handicraft´s companies through key informants. The results point out that even when the woman has an important leading role in this activity, there is a significant decrease in their number; which indicates, that the new generations do not see the handicraft production attractive perhaps because of the work it implies and the low remuneration, putting at risk the generation of jobs derived from this activity; For this reason, it is urgent to implement strategies in the production and commercialization of the hat that help to strengthen this activity and prevent its extinction.

Preservation, Production, Hat, Handicrafts

Internal organizational communication, applicable to home office, in the company

Comunicación interna organizacional, aplicable ante home office, en la empresa

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Abstract

For companies today it is necessary to have an avant-garde competitiveness, which can adapt to any activity to be undertaken by companies, that is why the internal organizational communication, applicable to the home office, seeks through the viability of the design of an organizational communication plan in the small digital company, obtain greater control and management of internal communication by employees, thereby strengthening the relationship of employees and their corporate culture. A case study is applied, through which the methodology established for this research is distinguished, initially giving a guideline to the previous analysis, problems of time management, staff needs to communicate, interview results and survey to build a benchmarking analysis matrix, as well as the development and implementation of a communication plan. The contribution that this work, is the efficiency of communication through the optimal use of communication technologies (ICT).

Efficient Communication, Home Office, Communication Technologies

The influence that opening to change has on academic development in a public higher education institution

La influencia que tiene la apertura al cambio en el desarrollo académico en una institución de educación superior pública

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Abstract

Openness to change is the willingness of individuals to integrate into a process of change. In this work, the significant elements in the models of resistance to change are assumed as elements of openness to change and their influence on academic development in a Public Higher Education Institution (HEI) of the TecNM system is analyzed. The elements of change evaluated are: motivation, habits, professional projects and educational policies.A non-experimental, causal correlational quantitative research was carried out, with a cross-section generating contrasted explanations through descriptive and inferential statistics. The data collection instrument was the questionnaire with sociodemographic and analytical variables, which was applied to a sample of 55 teachers. Cronbach's alpha was used through the item variance method to verify the degree of reliability of the instrument. For the data analysis, the Pearson correlation coefficient and the Chi-square independence test were applied for the statistical significance of the results. Concluding that there is an influence between openness to change and academic development, determining that openness to change has a positive average correlation in the academic development of public HEI.

Openness to change, Academic Development, Higher education institution

Business strategies most frequently applied in companies in the municipality of Poza Rica, Veracruz

Estrategias empresariales con mayor frecuencia de aplicación en empresas del Municipio de Poza Rica, Veracruz

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Abstract

This document presents the results obtained from the study conducted in order to know which were the most frequently applied strategies in the companies of Poza Rica, Veracruz, Mexico, to which a strategic plan was developed as part of academic projects carried out by students of the Business Management Engineering career, considering as axis the subject of Strategic Management of the academic program of the National Technology of Mexico with key AED-1035, during the years 2018, 2019 and 2020.The objective of the study is to identify the strategies that are most frequently presented, and in this way, help entrepreneurs to have a reference of the areas that are more susceptible to analyze in their companies. The study consisted of classifying the strategies by areas, based on the existing theoretical framework in this regard, resulting in that the strategies that appear most frequently are financial, marketing, processes and human resources, and some less frequent ones called others.

Functional areas, Strategies, Strategic management

Indigenous youth in the Monterrey Metropolitan Area. Risk factors for their university careers

Jóvenes indígenas en la Zona Metropolitana de Monterrey. Factores de riesgo para sus trayectorias universitarias

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Abstract

This investigation's objective is to understand the risk factors that play a role in the formation and consolidation of college-level educational trajectories of indigenous youth. Via a qualitative approach based on the biographical method and in-depth interviews, we reconstructed the life courses of 10 indigenous young adults who study, completed or had been dropped out their university careers at conventional universities in the Monterrey Metropolitan Area.We find that the lack of cultural, economic, and emotional capital generates risk factors during pre-University education. These factors are strengthened or minimized by the characteristics of the family environment and the pre-University educational trajectories. Therefore, once enrolled in university, indigenous students have differing types of conditioning that either hinder or facilitate their university trajectories. We conclude that, the risk factors that threaten university educational trajectories are the low volume of emotional, cultural, and economic capital. In addition, the lack of social capital difficult that youth people create the support networks that make it possible to reduce the threats associated with the three types of capital. Therefore, it becomes a key risk factor that increases the chances of abandonment of school.

Higher education, Indigenous youth, Educational trajectories

The use of alternative media as means of social insertion to generate corporate social responsibility

El uso de medios alternativos como medios de inserción social para generar responsabilidad social corporativa

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Abstract

Social responsibility has been a term that day by day is taking more seriously at the moment of how and what to do of actions as individuals or members of a social group. Taking companies to the design and implementation of actions with commitment inside and outside, for the contribution in favor of society. This article proposes the use of alternative means of communication to generate actions of social responsibility, where their high degree of creative impact generate a change of attitude and motivation in the participants, leading them to a participatory autonomy. Allowing organizations new forms of interactivity with their audiences. So, this article presents two examples where from the use of ambient media strategies and guerrilla marketing, social insertion is achieved in a natural way in social responsibility issues, sensitizing participants with alternative practices. These types of strategies are new ways to interact and transmit messages to audiences in a natural way

Social responsibility, Social insertion, Alternative media, Ambient media, Guerrilla advertising

Capacities and abilities: Factors of entrepreneurial intention among young students

Capacidades y habilidades: Factores de la intención empresarial entre los jóvenes estudiantes

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Abstract

Creating companies is undoubtedly an activity that generates important benefits, in this sense it is well known that companies owned by women in recent decades have been increasing in number, managing to establish solid companies, the business field study, as far as we know, is of a multidisciplinary character, in this sense, the theory of entrepreneurial behavior can explain the entrepreneurial intentions of an individual to start a business, therefore this work aims to relate the factors of entrepreneurial intention (capacities and abilities) among young women who are students of six bachelor's degrees at UAEM Atlacomulco University Center. Statistics were carried out to identify the relationship between entrepreneurial intention (capacities and abilities), which in turn includes eight indicators such as recognition of opportunities, writing a business plan, recruiting, estimating costs, marketing, convincing, negotiating and, productivity and women students. The main results indicate that this group of factors are not related in all degrees in the same way, even in some it is not significant.

Entrepreneurial intention, Capacities, Skills, Entrepreneurs, Business creation

Sustainability: Notes on human relationship with the environment in Baja California Sur

La sustentabilidad: Notas sobre la relación humana con el medio ambiente en Baja California Sur

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Abstract

The human relationship with the environment in Baja California Sur has undergone an extremely interesting process, since it managed to remain in balance from the time of the hunter-gatherers until the 20th century thanks to its insularity; However, based on bibliographic and newspaper analysis, interviews and participant observation, our inquiries suggest that it is, perhaps, in the last three decades of the 20th century with the inauguration of the transpeninsular highway that the ecological balance that was sustained during several centuries. Indeed, with the inauguration of the transpeninsular highway in 1973, new extractive industries and also new inhabitants arrived, in addition to the increasingly large flow of visitors that also damages and pollutes, proof of this is that COVID-19 arrived by plane on board of an Englishman invited to a wedding in Cabo San Lucas.

Sustainability, Environment, Society, Insularity

Interactions of the Digital Creative City with the engines of the development of Guadalajara and the fulfillment of its goals

Interacciones de la Ciudad Creativa Digital con los motores del desarrollo de Guadalajara y el cumplimiento de sus metas

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Abstract

In this work, the Digital Creative City (CCD) project represented the opportunity to learn about the plans and actions of a modern city, its population, its activities and customs; the prerogatives that its inhabitants have as a fundamental right to income for their work, education, culture and mobility, within a healthy environment that gives them well-being and quality of life through technological impulse. The area of greatest interest is the economic benefit that an innovative project in a thriving city and the use of technology can bring to the people at a time when health and economic problems have undermined their stability.The polygon where it is located is a site of great social and historical value in the tradition of the Guadalajara of yesteryear, which has been invaded by the neglect of authorities and neighbors, the lack of cleanliness, crime and vandalism, there is also a great barrier between the benefits that can be achieved and what the population perceives; the plan represents a great change and an economic challenge of the western zone of Mexico. In this there are great opportunities for women entrepreneurs, who being curious and inquisitive, we believe that categorizing the benefits of the digital creative city (CCD) of the Metropolitan Zone of Guadalajara (ZMG) based on the Economic, Social, Cultural and Environmental Rights (ESCR) can turn expectations into reality.Therefore, it is the people and the environment that are considered in this project, which have a special impact on these ESCR, based on the American Convention on Human Rights (ACHR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR), as well as the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, "Protocol of San Salvador". With the support of a series of surveys, a series of studies is analyzed, synthesized and proposed with the support of Dyane, of which this one represents a first part.

Smart Cities, Economic, Social, Cultural and Environmental Rights (ESCR), Sustainability

Ethical-legal dilemmas of the application of vaccines

Dilemas ético-jurídicos de la aplicación de vacunas

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Abstract

In a context in which an unprecedented pandemic has upsetting the entire world, there are collisions of rights and ethical problems that the legal system must resolve and whose solution is clearly not easy. We must start from the different environments in which society develops its fears, beliefs and even the misinformation that is emitted by irresponsible people without any or little degree of preparation in the matter. This paper focuses on vaccines and the series of conflicts that are triggered by their application and possible mandatory. We start from the hypothesis that the collective interest should prevail over the individual interest and beliefs; applying legal hermeneutics and epistemology and the technique of literature review we arrive at valid conclusions that allow us to confirm that modern states and in particular the Mexican State choose to protect in a privileged way the collective interest represented by the right to health and access to vaccines as a means of alleviating the pandemic and resuming the social and economic life that has been paused.

Collision of rights, Right to health, Religious

Academic stress of students of the bachelor's degree in administration of the tecnologico de estudios superiores de Villa Guerrero

Estrés académico en los alumnos de la licenciatura en administración del tecnológico de estudios superiores de Villa Guerrero en tiempos de covid 19.

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Abstract

Higher education in Mexico has important challenges, one of them to face in the almost immediate future, is the mental health of its community, both student and teacher, finding in academic stress one of the most important factors that the COVID-19 pandemic has left.The present study allows to recognize this condition in university students of the Degree in Administration of the Technological of Superior Studies of Villa Guerrero, in the state of Mexico, same that, according to the recognition of three important elements such as: stressors, symptoms and coping strategies, it will be possible to diagnose the effects of this, during the health contingency, to propose alternatives to the management of academic stress in the school community.

Academic stress, Students, Administration

Strategic alliances in governance for the resolution of the public problem of citizen security and public security: Analysis of the case of the European Union, Colombia and Mexico

Alianzas estratégicas en la gobernanza para la resolución del problema público de seguridad ciudadana y seguridad pública: Análisis del caso de la Unión Europea, Colombia y México

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Abstract

The importance of public governance is analyzed through alliances between public-private actors at the state level to ensure the well-being of citizens through citizen security and public security, by developing a common front through strategies and actions focused on confrontation and combat. of delinquency and criminality. The objective of this study is to highlight the need for the government to reinforce and execute efficient long-term security strategies through the collaborative action with different social actors such as businessmen, universities, students, neighborhood judges and the police.

Sustainability, Governance, Citizen security, Public security, Citizen participation

Correlation Between Attitude and Physical Activity Levels in Gym Users at a Private University

Relación entre actitud y niveles de actividad física de los usuarios de un gimnasio en una universidad privada

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Abstract

Currently, only 42% of the adult population in Mexico takes part in physical activity during their free time. Among the relevant social determinants in this regard, the figure of a fitness instructor stands out. Objective: to analyze the relationship between attitudes toward fitness instructors and their users' levels of physical activity. Sample: 259 users of the gym, selected in a non-probabilistic way. Method: Two scales applied to measure attitudes towards the fitness instructors; users classified as ACTIVE or NON-ACTIVE according to the hours of physical activity performed per week; the correlation analysis between attitude and level of physical activity performed through the correlation method for the Product Moment interval scale and a linear regression analysis was also performed. Results and conclusions: There is a correlation level of .888 between users' attitudes toward the instructor and their physical activity levels, which confirms that the instructor is an important factor in promoting health through physical activity.

Correlation, Attitudes, Physical activity, Fitness instructor

Marketing for the recovery of customers lost in time of pandemic in the Municipality of Tampico, Tamaulipas

Marketing para la recuperación de clientes perdidos en tiempo de pandemia en el Municipio de Tampico, Tamaulipas

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Abstract

This article presents the findings of the analysis of the preferences of customers lost in the period 2017-2020 in the National Chamber of Commerce, Services and Tourism of Tampico, taking into account the COVID-19 situation and the measures adopted by the Municipal Government of Tampico in the face of pressure from partners. The methodology consisted in the application of a survey to 384 companies in the town, with the purpose of knowing their needs and generating marketing strategies for decision-making. The main result observed is the need to establish actions aimed at the efficient use of the portfolio of available clients, in order to meet the needs of customers and face unexpected situations.

Analysis, Research, Clients

How do the people of Tenancingo and Pilcaya spend their money?

¿En qué gastan su dinero las personas de Tenancingo y Pilcaya?

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Abstract

One of the serious issues today is that people spend more than their income, so the objective of this study is to investigate the behavior of the citizens of Pilcaya Guerrero and Tenancingo, Mexico with respect to their personal expenses and make a comparison between them in order to find differences and similarities as well as areas of opportunity in education and financial literacy.Based on this context, the research hypothesis arises: People who do not have financial education, do not properly manage their money which leads them to make unnecessary expenses. For the verification of the hypothesis a quantitative methodology of descriptive, explanatory and correlational cut was used, using as a technique for data collection surveys of closed questions Likert type, with a non-probabilistic sample and convenience sampling, which were applied through forms in Google forms, and then analyzed with descriptive and correlational statistical techniques in the SPSS program.The results obtained show that 3 out of 10 people save, and only 2 out of 10 people make unnecessary purchases, but despite the fact that few people make unnecessary purchases they do not know about financial education because more than 85% have misconceptions about the basic concepts of finance, so the hypothesis is rejected, because even though they do not make unnecessary expenses they do not know how to manage their money and therefore try not to overspend.

Financial Education, Personal Spending, Financial Literacy, Tenancingo, Pilcaya

Determination of competitive advantage: Human Capital in the footwear industry, Plaza Azul, San Mateo Atenco, Mexico

Determinación de la ventaja competitiva: Capital Humano en la industria del calzado, Plaza Azul, San Mateo Atenco, México

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Abstract

In San Mateo Atenco, Mexico, the traditional marketing system has been maintained. Shoe stores continue to handle products at a low price and, most critically, at a low competitive level. In the last 3 years the economic situation of the municipality has been affected because it is more frequent each year that workshops and shoe stores are forced to close. The problem in question lies in the lack of recognition of the situation: more than 70% of the families are dedicated to the production of footwear and depend on this line to be able to cover their expenses. Hence the relevance of analyzing the competitiveness of footwear SMEs. Therefore, the objective of this research was focused on determining the competitive advantage from the area of human talent. Considering that of the resources that make up an organization, human capital is the one that can make a significant difference. The work is of a descriptive transactional type. The results obtained were the design of strategies to improve the personnel integration process, the formalization of a training and development program aimed at certifying skills and the establishment of an incentive plan

Competitive advantage, Personal, Footwear industry

Determination of the strategic competitive advantage of the footwear industry in Plaza Azul, San Mateo Atenco, State of Mexico

Determinación de la Ventaja competitiva estratégica de la industria del calzado de la Plaza Azul, San Mateo Atenco, Estado de México

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Abstract

The manufacture of footwear in the State of Mexico is an activity of the utmost importance, since it represents an important source of income for the community of San Mateo Atenco; in the last ten years just over 40% of family workshops have closed. Plaza Azul has also been affected with a considerable decrease in sales volume, a situation that is considered critical today. The purpose of this research is to determine the strategic competitive level of the footwear producers of the Plaza Azul and from this, to design strategies that allow them to increase their competitiveness. The present study is of a descriptive transectional type. To determine strategic competitiveness, 18 variables are evaluated. Based on the results obtained, which show that the highest optimization factor is the strength of the commercial network and the highest risk factor is the dependence on customers, proposed strategies are presented to expand their market niche to neglected sectors as well as strategies that allow them to have access to various sources of financing, to gain access to the necessary capital to expand their operations and achieve the desired competitiveness.

Competitive, Strategic advantage, Footwear industry

Positioning: Plaza Azul, of the Footwear Industry in San Mateo Atenco, State of Mexico

Posicionamiento: Plaza Azul, de la Industria del Calzado en San Mateo Atenco, Estado de México

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Abstract

In Mexico, the manufacture of footwear has a history of approximately 400 years according to data published by the Ministry of Economy, little by little it has positioned itself to be a renowned and prestigious commercial activity, the State of Mexico represents 5% of the national value of production, being San Mateo Atenco the most representative municipality of that entity. At present, different strategies must be used to achieve a place that stands out before the different footwear stores and have an image and identification, positioning being a strategy, to build this taking into account the attributes and benefits that are going to be provided. to the consumer, offering something that is different from the competition and with which the customer identifies; this can change according to the needs of the consumer. This research was developed with a mixed approach, identifying how the blue square is positioned in the consumer's mind, considering factors and competition.To carry out this study, documentary, field and descriptive research was used to make a diagnosis of said positioning. In the documentary part, various sources were consulted, such as: books, magazines, articles and the internet.

Positioning, Attributes and competence

Hybrid model of strategic planning for decision making in family businesses

Modelo híbrido de planeación estratégica para la toma de decisiones en las empresas familiares

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Abstract

This article consists of a proposal that allows promoting the implementation of strategic planning as a tool that supports decision-making in family businesses. This considers a set of elements derived from a hybrid strategic planning model designed by the authors of this document. This was done once a content analysis on strategic planning models for family businesses had been carried out; The proposed model is based on family philosophy and the stages of the strategic planning process, which are: philosophical stage, analytical stage, operational stage and control stage. The first stage, which is the philosophical one, is made up of the following topics: corporate mission, corporate vision, and corporate values. While the second stage, which is analytics, is composed of: both internal and external analysis of the company and the strategies. Then the third stage, which is the operative one, considers: the strategic objectives, policies, plans, programs, procedures and budgets. Finally, the fourth stage considers the strategy map and the control board as a tool.

Strategic planning, Decision making, Family businesses

Comparison of rail and road transportation costs for general freight distribution in Mexico

Comparativo de costos de transporte férreo y carretero para la distribución de carga en general en México

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Abstract

Mexico, have an extension of railways that has not presented great variations through time, in spite of this it does not lose importance in comparison with highways that have been increasing their construction and modernization, therefore the objective of the present investigation is to analyze the costs of rail and road land transportation, as a proposal that optimizes the distribution of cargo merchandise in general in Mexico.Its development is broken down into: the identification and selection of general cargo transportation routes to gather information on distances, time, transportation costs; the calculation of rail and road transportation costs of the selected routes as a comparative for decision making in the mobilization of merchandise; and finally the processing and modeling of the information that allows minimizing the costs of the routes in the mobilization of general cargo merchandise in the transportation modes.The analysis carried out allows us to conclude that great efforts have been made focused on developing and increasing competitiveness in the railway system in Mexico, but it has not been able to strengthen itself as the most used means of transporting cargo, even so, reporting that transportation costs are lower within the same route and that its use by motor transport is minimized.

Rail transport, Road transport, Transportation costs

6 Agricultural Sciences and Biotechnology

Implementation of Community Wetlands for the sanitation of the Cajititlan Lake, Jalisco

Implementación de Humedales Comunitarios para el saneamiento de la Laguna de Cajititlán, Jalisco

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Abstract

Wetlands are systems that promote the sustainability and development of a society. The goal of this research was the implementation of a prototype aquatic garden to assess the quality of water in Cajititlán Lake, using sewage treatment plants with the purpose of removing nutrients, phosphates and nitrates among others parameters. This was made possible by floating structures containing aquatic vegetation species like.: *Typha latifolia, Lemna minor, Canna indica, Iris pseudacorus, Equisetum arvense, etc.* whose basic function is to retain nutrients through phytoremediation processes. The results indicate that the implementation of community wetlands made possible to reduce BOD levels from 220 mg/lt to 12 mg/lt across a surface of 120 m², treating a flow rate of approximately 5.30 gal/min to obtain an effluent in accordance with norm NMX-AA-012-SCFI. It is concluded that community wetlands are suitable ecological alternatives for the treatment of the wastewater discharged directly into the lake.

Community wetlands, Phytoremediation, Sustainability

Fertilizers in the yield of chile habanero (capsicum chínense) in úrsulo Galván, Veracruz

Fertilizantes en el rendimiento de chile habanero (capsicum chínense jacq) en úrsulo Galván, Veracruz

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Abstract

Mexico is the country in the world with the greatest genetic variety of Capsicum: its richness is largely due to the diversity of climates and soils, which is why the commonly called “habanero” pepper is found throughout the peninsula. The objective of this project is to evaluate their adaptation to edaphoclimatic conditions different from those prevailing in their area of origin. As well as different mineral and organic fertilizers, which meet the nutritional needs in the cultivation of habanero pepper to obtain better yields and better profits for the producer. The experiment was carried out at the Tecnológico Nacional de Mexico Campus Úrsulo Galván. The experiment was carried out in a shade mesh cover, the experimental design was completely randomized with 5 treatments and 7 repetitions with a total of 35 experimental units. Therefore, it is expected that fertilizers and fertilizers have a greater significant response in the increase of the habanero pepper (Capsicum chínense Jacq) in Úrsulo Galván, Ver.

Fertilizers, Mineral fertilizers, Increase

Estimation of evapotranspiration of forage corn supported with an Unmanned Aerial Vehicle (UAV) in the Comarca Lagunera

Estimación de la evapotranspiración en maíz forrajero mediante vehículos aéreos no tripulados (VANT) en la Comarca Lagunera

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Abstract

Knowing the water needs of crops contributes to saving considerable volumes of water. In recent years, the use of remote sensing has become a basic tool for estimating water use for crops. Unmanned Aerial Vehicles (UAVs) are emerging as a tool with great potential to be used in planning, monitoring and control activities of agricultural activities including Evapotranspiration.The objective of the present work was to implement the two-step methodology (KCNDVI-ETo) to estimate ET with UAV images in forage corn crops in the Lagunera Region for local conditions.The ET values obtained vary from 5.79 and 8.97 mmday-1. Its evolution with the use of the image is congruent according to the development phases of the crop.The use of this methodology using UAV images can be a promising tool for farmers to estimate water consumption in growing forage corn under surface irrigated conditions.

Evapotranspiration, Unmanned Aerial Vehicles (UAVs), Corn

Effect of drying on the nutritional and colorimetric properties of quelite leaves (*Amaranthus* spp.)

Efecto del secado en las propiedades nutricionales y colorimétricas de hojas de quelite (*Amaranthus* spp.)

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Abstract

Objectives. Determine the influence of air temperature on the water loss from quelite leaves (*Amaranthus* spp.), model drying kinetics and measuring of post-drying functional properties effect. Methodology. The kinetics of drying quelite leaves were carried out in an oven at 45, 55 and 65 ° C and in a direct cabinet-type solar dryer. Several models from the literature were evaluated, also colorimetry, phenolic content, chlorophyll and antioxidant activity pre and post drying were also determined.Contribution. The solar dryer reached a maximum of 60 ° C with a minimum indoor moisture of 17%. The solar dryer and oven at 65 ° C reached equilibrium moisture in 270 min. At 45 ° C the drying oven time was 510 minutes. The Modified Page model best fits all thin layer drying curves, with greater than 96.7 values. The drying oven at 55 ° C better conserved the color and the functional properties concerning the fresh leaves with 73, 41 and 24% of the chlorophylls a, b, and c respectively. The residual antioxidant activity was between 38-42% with respect to the fresh content. There was no difference between the drying oven treatments ($\alpha = 0.05$).

Drying kinetics, Mathematical model, Nutritional properties

Develop an automated monitoring system that allows the creation of an efficient hydroponic ecosystem, which increases the production of lettuce per square meter

Desarrollar un sistema de monitoreo automatizado que permita la creación de un ecosistema hidropónico eficiente, que eleve la producción de lechugas por metro cuadrado

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Abstract

The agricultural production methods of the last decades, have stood out for the use of the spaces, leaving aside even the land, mediating the greenhouses; in order to protect crops from climate variations, pests, raising their quality through better physicochemical characteristics and longer shelf life.The purpose of this work is to develop an automated system by means of materials such as sensors and microcontrollers capable of controlling physicochemical variables in a greenhouse, in order to provide the concentrations of nutrients, for the creation of an efficient hydroponic ecosystem, and standardized for an increase to production, in the cultivation of Romain variety lettuce. It is important to point out that within the hydroponic system, the Romain lettuce variety is harvested, obtaining larger products with an approximate weight of 1200 to 1500 g per piece, compared to those grown by the traditional method whose weights range between 1100 to 1300 g per piece, with a shelf life of 8 days in refrigeration.

Automated system, Microcontrollers, Hydroponic ecosystem

Bio-based antimicrobial packaging: A response to a reduction in the use of plastics and an advance in food safety. A review

Empaques antimicrobianos de base biológica: Una respuesta a la reducción del uso de plásticos y un avance en la inocuidad de los alimentos

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Abstract

Packaging has been developed to facilitate the transport, handling of food and providing a barrier against external factors. However, it has led to an increase in municipal solid waste (MSW) caused by plastics and waste produced during transport and distribution, which has prompted the development of bio-based antimicrobial packaging (BBA). One of the functions of BBAs is to inhibit the growth of microorganisms and reduce environmental contamination by using biodegradable materials, which is why the development of this type of packaging has become of great interest for research. This compilation provides an overview of the importance of BBAs, the methods and materials used for their production. Also, the most studied antimicrobial agents, their effect on the mechanical and barrier properties of packaging, and the advances have been made in BBAs.

Antimicrobial packaging, Biopolymers, Antimicrobial agents

Importance of peptidoglycan hydrolases, bactericidal enzymes produced by lactic acid bacteria, in the reduction of antibiotic

Importancia de las hidrolasas de peptidoglucano, enzimas bactericidas producidas por bacterias acido lácticas, en la disminución de la resistencia a antibióticos

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Abstract

The World Health Organization (WHO) and the Food and Agriculture Organization (FAO) highlight in their global action, the problem of antimicrobial resistance (AMR), focusing on the concern about the effect every time minor of antibiotics, which is considered a threat in human medicine, veterinary, food sector and environment. In recent years, the interest in generating new technological alternatives for this problem has increased; this is the case of bioactive metabolites obtained from bacteria, viruses and fungi, such as protein molecules with bactericidal activity, as bacteriocins and enzymes and non-protein origin diacetyl and reuterin.Peptidoglycan hydrolases (PGH), also called autolysins, are enzymes involved in various cellular functions. These enzymes can hydrolyze the peptidoglycan bonds in a controlled way, and they are classified as N- acetylmuramidases, N-acetylglucosaminases, N-acetylmuramoyl-L-alanine amidases and peptidases.PGH are secreted by the pathway dependent on the General Secretion Pathway (Sec) or by the Double Arginine Translocation System (TAT) and have molecular weights in a range of 27 kDa to 137 kDa. Their importance liesin being used as bactericidal compounds, inhibiting the growth of bacteria of clinical relevance, which are currently a global public health problem.

Antibiotic resistance, Bactericidal enzymes, Peptidoglycan hydrolases

Relevance of genic expression studies to understand pollutants biodegradation

Importancia de los estudios de expresión génica en la comprensión de la biodegradación de contaminantes

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Abstract

Nowadays, pollution is a global problem that affects the environment and human health. The primary pollutants are hydrocarbons, plastics, heavy metals and pesticides, all of which are essential for basic human needs. For this reason, research into environmentally friendly and viable degradation methods has become key, e.g., biodegradation. Biodegradation is a technology that uses the enzymes or metabolism of an organism to hydrolyze pollutants but is limited by factors such type of substrates, environmental conditions and organism physiology. The study of gene expression, i.e., protein production from genetic information at a specific time and condition of biodegradation, provides valuable information about the genes and enzymes expressed during the degradation process, the response to stress and the pathways involved. This information can be applied to increase biodegradation efficiency, find new enzymes, improve enzyme activity, or optimize metabolic pathways. Gene expression studies can be performed by applying omics technologies. This chapter aims to describe the importance of studying the gene expression of organisms used in the pollutant biodegradation process.

Gene expression, Biodegradation, Pollutants

Application of homeopathic preparations and biofungicides to prevent and control anthracnose (*Colletotrichum gloeosporioides*) in Haas avocado crops

Aplicación de preparados homeopáticos y biofungicidas para prevenir y controlar la antracnosis (Colletotrichum gloeosporioides) en los cultivos de aguacate Haas

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Abstract

Avocado production in Mexican territory is considered the most important in the world because it contributes 45.95% of agri-food exports, various states contribute to position Mexico as the main producer, approximately 175 thousand hectares with fruits of different sizes are counted that are cultivated in the states of Michoacán, Jalisco and Nayarit to later be commercialized nationally and internationally to Guatemala, Canada, Japan and El Salvador.The import and export process is restricted to the phytosanity variable as a consequence of the appearance of pests and the lack of control for the elimination or reduction of the main sources that cause them, the consumer states / countries demand a continuous application of plant health measures in the field and in the shipping processes to ensure that the systems of prevention, growth, elimination of pests are supported and evidenced in a scientific and technical way; seeking to provide the Mexican countryside with the best techniques for the preservation, control and sale of the fruit. Within the implemented techniques, Agrohomeopathy manages the reduction of pests and diseases, considering economic and ecological effects, this research shows the application of homeopathic preparations and commercial biofungicides, to prevent and control the presence of anthracnose (*Collectotrichum gloeosporioides*) in the cultivation of hass avocado, the experimental process was established with 64 trees infected with anthracnose; Through a random sampling, 10 treatments and a control of homeopathic preparations and biofungicides were applied, placing the foliage by means of aspersion., The effect was observed by means of the decrease in the number of pustules in leaves and fruit, decrease in the length of the pustule (cm), pustule width (cm) both in fruits and leaves. The treatments used showed an effective control in the development of the *C. gloeosporioides* infection: the agrohomepathic doses of the *C. gloeosporioides* preparation at 10 CH showed an influence on the parameter of length by width in fruit and leaf; The microbiological product formulated from 5 strains of bacillus Fungizar 5B controlled the damage in the parameter of length by width in leaf, through the described implementation the effectiveness of Agrohomeopathy for the preservation of avocado and the reduction of the treated plague was verified.

Avocado, Agrohomeapatia, Homeopathic Preparations, Anthracnose

Biosynthesis of Metallic Nanoparticles and their Applications

Biosíntesis de Nanopartículas Metálicas y sus Aplicaciones

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Abstract

The development of nano-sized materials increasingly requires the implementation of synthesis methods that are friendly to the environment and that have the ability to implement them in medical, therapeutic, pharmacological, food and environmental areas. As such, green methods have been gaining ground in recent years. Within these processes, there is a huge range of species belonging to different groups (such as bacteria, algae, yeasts, fungi, and plants) with the necessary qualities to generate metallic NPs with particular size and shape characteristics, within which plants stand out. This is due to the simplicity of the process as well as their easy scaling. Additionally, the studies carried out indicate the parameters to be considered in order to carry out a good bioreduction process and obtain both monometallic and highly functional bimetallic nanoparticles. It should be noted that in addition to the economic and ecological advantages of the nature of these methods, the biological molecules that participate as reducing agents also provide stability to the NPs, in some cases conferring superior qualities in catalytic and clinical applications.

Bioreduction, Vegetal extract, Phytochemicals, Catalyst

Application of beneficial microorganisms rhizobacteria to improve plant production in protected natural areas

Aplicación de rizobacterias de microorganismos beneficiosos para mejorar la producción vegetal en espacios naturales protegidos

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Abstract

Protected Natural Areas generate environmental services, form soil, are habitats of wide biodiversity of plants, animals, insects and microorganisms, recharge of aquifers, capture of CO_2, buffer the effects of global climate change. They provide economic resources for the communities that live in the areas. Numerous actions have been generated to maintain the conservation of biological diversity. Through comprehensive strategies and actions, the impact of damage caused by anthropocentric activities can be reduced.Forest soils have an enormous variety of living forms that obtain their energy mainly from forms of organic matter derived from plants and animals. The major biological component of forest soils are the roots of plants, microorganisms and animals in the soil. A group of beneficial bacteria that inhabit the rhizosphere region receive organic acids from plants, and the bacteria provide plant protection and better nutrient uptake. Among the benefits that bacteria provide directly are: nitrogen fixation, phosphorus solubilization, production of phytohormones such as: auxins, gibberellins, indole acetic acid. In the state of Guanajuato, the works that have been carried out with isolated rhizobacteria from the soil are from several Protected Natural Areas and guava orchards. Rhizobacteria isolates have been tested on fruit, food and ornamental plants.

Soil, Forest, Conservation, Bacteria

Adaptability and rusticity of zebu breeds over pure european breeds in the climates of the mexican tropics

Adaptabilidad y rusticidad de las razas cebú sobre las razas europeas puras en los climas del trópico mexicano

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Abstract

This investigation was carried out in a production unit in the north of the state of Puebla, Mexico, located between the parallels 19º 47 '06 "and 19º 58 '12" north latitude and 97º 18 '54 "and 97º 23 '18" in western longitude. With the aim of carrying out the phenotypic differences (coat color, ear morphology, horns, profile and body condition) between the zebu breeds (Brahman, Guzerat, Indubrasil) with the highest demand in the livestock region. Likewise, describe its adaptability to tropical climates that exceed 30 ° C and its superiority over synthetic and pure European breeds destined for meat production (Beefmaster, Charbray, Brangus, European Swiss, Angus and Hertford). Phenotypic characteristics were recorded individually for each of the animals using descriptive statistics to establish the breed patterns. A total of 37 stallions with variable age and weights were evaluated. The main breeds evaluated were Brahman (2.70%), Indubrasil (54.05%), Guzerat (2.70%) crossbreeds European Swiss (13.51%) and Zebu x European Swiss (27.02%), which presented very specific phenotypic characteristics among these breeds. Despite the data collected from the zebu breeder associations, there is very little information on the phenotypic differences of the zebu breeds that have been present for centuries in the systems under which it survives, demonstrating at the same time its greater adaptability and superiority. to tropical soils and pastures, when compared with synthetic and pure European breeds intended for meat production.

Cattle, Zebu, Adaptability, Breeds, Tropics

Preparation and use of intravaginal sponges for induction of estrus in hair sheep

Elaboración y uso de esponjas intravaginales para la inducción del estro en ovejas de pelo

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Abstract

The aim of the study was to assess the effectiveness of handmade sponges for the induction of estrus in hair sheep. Sixty multiparous females were used, which were divided into three groups: 1) ChronogestCR commercial sponge, 2) FGA commercial sponge and 3) handmade sponge. A sponge was inserted intravaginally to each sheep according to the assigned treatment and remained *in situ* for 12 days, two days before the sponge was removed 300 IU of eCG was administered intramuscularly, and 24 hours after removal of the sponge, estrus was detected using tester ram, and were controlled breeding (morning and afternoon). At 17±1 day, the estrous detection was performed again to obtain the percentage of repetition of estrus. All the sheep in the three groups were in estrus. The percentage of non-return to estrus was 73% in ewes with Chronogest sponge, 65% in ewes with handmade sponge and 63% in ewes with FGA sponge, without statistically differentiating ($p>0.05$). In conclusion, the use of a handmade sponge for the induction of estrus in sheep was as effective as the two commercial sponges in the presentation of estrus.

Sheep, Estrus induction, Intravaginal sponge

Evaluation of an alternative nixtamalization method in maize landraces from Chiapas

Evaluación de un método alternativo de nixtamalización en maices criollos de Chiapas

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Abstract

In the State of Chiapas, México there is a great diversity of maize landraces (*Zea mays L.*) among which there are pigmented grain variants that have been little used in nixtamalization. The objective of this research was to evaluate an alternative cold method using four different creole genotypes corn (white, yellow, red and purple) in order to propose a process alternative focused on reducing the process time and having similar product characteristics to traditional nixtamalization. A pre-treatment was used in the corn with an excess of water with calcium hydroxide (2%) at room temperature called "Cold Nixtamalization". Different treatments were evaluated with soaking times before cooking (8, 10 and 12 h) and repose time in the nejayote water (6, 8 and 12 h). The variables studied were dry grain moisture, wet grain (nixtamal) and dough, coccion time, pH of the nejayote and dough yield. The best treatment to reduce the coccion time was 12 h of soaking up at room temperature before coccion and 8 h of repose, which caused a decrease in the consumption of gas or firewood, the physicochemical characteristics of dough and tortillas were obtained similar to that of traditional nixtmalization, as well as in pH conditions, process performance.

Pigmented corn, Physicochemical characteristics, Time and process performance

Tomato growth and productivity promotion using two plant biostimulants: arbuscular mycorrhizal fungus and seaweed extract

Promoción de crecimiento y productividad de tomate utilizando dos bioestimulantes de plantas: Hongo micorrízico arbuscular y extracto de alga marina

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Abstract

Plant biostimulants include different substances, compounds, and formulations of growth-promoting microorganisms, such as those derived from arbuscular mycorrhizal fungi (AMF) or seaweed extracts (SWE), which are used to regulate or enhance physiological and morphological processes in plants. This study analyzed the morphological implications of the addition of two biostimulants, AMF *Rhizophagus intraradices* and a SWE obtained from *Ulva lactuca* (both alone and in combination), in tomato plants (*Solanum lycopersicum*). The responses evaluated were related to plant growth, flowering, and crop productivity. Likewise, the success of AMF colonization in plants was also assessed. The application of AMF increased the length and root area of the plants. The SWE induced an early flowering and thus a greater number of fruits with greater weights. However, the combination of both biostimulants (AMF + SWE) was less beneficial for the plants, which was reflected in a decrease in both foliar and root growth as well as in the number of flowers and fruits. In addition, it was also observed that the SWE showed a positive effect over mycorrhizal establishment, as evidenced by greater root colonization. In the present study, evidence is presented of the benefits of using SWE to improve plant performance, in addition to the positive effects observed in the establishment of mycorrhizal symbiosis between *R. intraradices* and tomato plant roots. These results constitute an important contribution to the research on biostimulants, their development, and functional design, highlighting those complementary effects and the action mechanisms of each biostimulant should be considered.

Marine algae, Biostimulant, Mycorrhizal symbiosis, Tomato, *Ulva lactuca*

7 Engineering

Proposal for structural testing of double root low capacity wind turbine blades based on the iec 61400-2 standard

Propuesta de ensayos estructurales de aspas de turbina de viento de baja capacidad de doble raíz con base a la norma iec 61400-2

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Abstract

In this article, the results of the numerical simulation are shown, as well as the results of the structural tests using extensometry, for a low capacity double root wind turbine blade based on the IEC 61400-2 standard. A methodology was developed to carry out the experimental plan. The results obtained by means of numerical simulation were compared with those obtained by extensometry, concluding that the blade will work safely already in operation because the values obtained from microdeformations are far from the blade failure limit.

Blade, Tests, Simulation

Prospective of the need for a heuristic model for the improvement of home electricity consumption in favor of an energy transition in Mexico

Prospectiva de la necesidad de un modelo heurístico para el mejoramiento del consumo eléctrico domiciliario en pro a una transición energética en México

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Abstract

Environmental problems have shown that as the days go by, the estimated negative scenarios are closer to being achieved. Despite this, in Mexico there are few programs that are directed or implemented in response to this need, and those that do exist do not have a systemic vision that ensures sustainability for the different factors that have a correlation with the system. On this premise, the research was carried out from a descriptive theoretical study method that allowed to visualize the background of this sector in a global way and its subsequent territorial delimitation, which when encompassed from the approach of the Transdisciplinary Cyber Cyber System, the different types of the knowledge. All with the purpose of seeking the transition towards beings more aware of their environment and the impact of their actions, for which, using the Cyber-Systemic Planning-Action Process, the different tools available to solve the need under study and with this, the creation of the adaptive methodology to the context and the model for environmental awareness based on contextualization, with the aim that the student population reaches more significant knowledge in relation to their surrounding environment.

Energy, Awareness, Education

Impact of Technology for Educational Development at the Higher Education Level at the Veracruzana University in Times of SARS-CoV2 in Poza Rica Veracruz, Mexico

Impacto de la Tecnología para el Desarrollo Educativo a Nivel de Educación Superior en la Universidad Veracruzana en Tiempos de SARS-CoV2 en Poza Rica Veracruz, México

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Abstract

Evaluating the use of ICT at the higher education level is essential for every educational institution, because it allows knowing the degree of user satisfaction and the required needs, to later carry out a planning with strategies and actions that support their improvement. This research work is an analysis study carried out on the digital strategies used by the Faculty of Mechanical and Electrical Engineering of the "Universidad Veracruzana" in Poza Rica Veracruz, Mexico, during the covid-19 contingency. Through an opinion survey applied to a sample of 300 students. Which allows us to identify the strengths and weaknesses of using a 100% virtual teaching in turn to know the difficulties that students presented, the attention they received, and how confinement affects school performance.

Virtual Education, Sars-Covid2, ICT

Construction of kaplan turbine test bench for mini hydraulic power generation

Construcción de un banco de pruebas de turbinas kaplan para la generación de energía minihidráulica

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Abstract

The general objective of the work was the design, development, and construction of a Test Bench for Kaplan type turbines suitable to be installed in a rural environment, through which we can check if the characteristics of the turbines are ideal to meet the generation goals of electrical power required. To carry out this purpose, a Kaplan-type turbine prototype was designed and built-in order to install it in our Test Bench and verify that this Bench is adequate to check the operation of the turbine subjected to different input conditions and for Therefore, this will help us to arrive at an ideal turbine design to take advantage of the mechanical energy of water and therefore the generation of electrical energy.This is a project that was developed with the design objectives from scratch to the physical creation of a test bench for turbines, specifically for a Kaplan type turbine where tests can be carried out in a controlled environment where new designs are put into practice. of turbines to know their operation in a scaled manner and then be able to take them to production and installation in different regions.

Kaplan, Mini hydraulic, Testing bench, Electricity

Inductor Disc CFD Analysis for VAWT

Análisis CFD de Discos Inductores para Turbina Eólica de Eje Vertical

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Abstract

This work shows the computational simulation of the fluid dynamics of inductor discs (patent pending reception number MX/E/2021/002395) applied to vertical axis wind turbines (VAWT). These inductor discs have a unique and innovative design that can be classified as wind concentrators. The purpose of these devices is to increase wind velocity at the wind turbine entrance; this increase in velocity exponentially boosts the mechanical power of the turbine, according to Betz's theory, increasing the electrical energy production of the turbine and, at the same time, reducing its dimensions.The objective of this investigation is to carry out the fluid dynamic simulation (CFD) of two of the inductor disc geometries: an elliptical one and a truncated conical one, varying the entrance wind velocities of the VAWT from 3 m/s to 12 m/s.The proposed methodology consists of employing a CFD software (ANSYS) to model the two inductor disc geometries and extract them from a static control volume. Mesh this volume, establish boundary conditions, and vary wind velocities to carry out the fluid dynamic analysis. Finally, the obtained velocities are compared at different representative points of both geometries.

Simulation, VAWT, Optimization

Programming: From abstraction to practice

Programación: De la abstracción a la practica

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Abstract

This article presents a study based on the experience acquired in 18 years working as a teacher in the Information Technology career in the area of software development. Where it has been seen that when students enter the career the range of knowledge is very varied, since there are students who come from technical high schools in which they have already had experience in the programming area and on the other hand we have students who come from a non-technical high school in which they have no experience in the area.Hence the problem of teaching a programming class in which we can achieve the goal that all students develop their logic.This is why a survey is applied to find out if the student has the basic concepts of the programming area since most students learn to program mechanically, not developing their critical thinking to solve problems other than those solved in class. The contribution of the study shows us that to a certain degree, most of the students have the theoretical concept, but they do not know how to apply it in practice.

Abstraction, Programming, Paradigm

Analysis of manufacturing companies in ciudad juárez that are currently certified

Análisis de las empresas manufactureras de ciudad juárez que actualmente están certificadas

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Abstract

The lack of specific information on the internet and in other media with reference to currently certified companies, which is intended to create a database of companies that are certified and those that are not ISO 9000 certified, show them the benefits, as well as give them the opportunity to know the advantages of being certified in ISO 9000 and if they are interested to present a proposal for a quality management system. And even generate a link with Índex de Juarez to share this information with this institution to give extra value to this research. The research approach is mixed with the combination of the quantitative and qualitative approach, for the first phase of this research a field investigation of the background of companies that are currently certified and which are the certifying companies as well as the preparation of a standard questionnaire for other entities and Ciudad Juarez that will be applied throughout this study to collect relevant data and present the number of companies that have their ISO 9001 certification, if they are interested in being certified and which ones are not certified.

ISO 9001 Certification, Análisis, Quality of companies (SGC), Manufacturing companies

Factors influencing the Welding Process to generate the Phenomenon of Cut off Fingers in Photovoltaic Modules

Factores que influyen en el proceso de soldadura para generar el fenómeno de los dedos cortados en los módulos fotovoltaicos

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Abstract

In the production process of photovoltaic modules, there are defects of bad welding, defects in the raw material, degradation by environmental factors, as well as bad handling of the material or lack of maintenance, affecting the quality of the product. The omission of control of the temperature in the welding process causes the defect called cut fingers, which consists of the rupture presented by the collectors of the cell. The present research focused on studying the factors that influence the welding process for the generation of cut fingers, emphasizing the temperature measurement during the welding process. The methodology used consisted of describing the materials involved in the welding process and monitoring the temperature in the welding machine, as well as the ambient temperature. Some cells without solder were found. The temperature variation in the welding heads ranged from -14.9 to -121 ° C. With this study it is concluded that the temperature of the welding heads should continue to be monitored, since the variation is out of specification, the pH of the fluss must be verified, and the periodicity of its distillation must be determined to purify it and be able to reuse it.

Photovoltaic module, Welding, Cut Fingers

Comparative study between biological treatment and a physicochemical treatment for the removal of butyl acetate in industrial residual effluents

Estudio comparativo entre un tratamiento biológico y un tratamiento fisicoquimico para la remoción de butil acetato en efluentes residuales industriales

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Abstract

A comparison was made between a fixed aerobic biological process and a physicochemical treatment for waste effluents with butyl acetate. An acrylic tank with 100 L capacity and a support medium for PET bottles was implemented for the formation of the biofilm and thus develop the biological reactor. In the experimental phase, concentrations of 10, 20 and 30% of butyl acetate containing sample, using hydraulic retention times of: (16, 8, 5.33 and 4 days) for each concentration. After the experimentation, a removal of 99% of COD and 97% of BOD was obtained. For the physicochemical treatment, coagulant, flocculant, and adjuvants were used, by a jar test. A decrease in 74%, 53.8%, 55%, 97% and 37%, for electrical conductivity, total suspended solids, color, turbidity, COD and BOD respectively, were obtained compared to the initial sample. Both treatments were filtered through a bed packed with activated carbon, sand, and silica gravel. The aim of this work was to evaluate / quantify butyl acetate removal efficiency in each treatment for its subsequent comparison, with prospect to the reduction of similar pollutants in residual effluents is intended.

Biological treatment, Physicochemical treatment, Butyl acetate

Study of the drying kinetics of red chili (*capsicum annuum*) in an indirect solar dryer tunnel type

Estudio de la cinética de secado de chile rojo (*capsicum annuum*) en un tipo túnel secador solar indirecto

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Abstract

The drying process is very intensive in energy consumption. Mexico is a major producer of food, especially of varieties of chilies, with quality culinary and medicinal properties. The 65% of the national market as a dry product, which gives a benefit. In the drying process, the convective technology was used, using a horizontal tunnel with direct solar heating air. The kinetics of the solar dryer with direct heating is possible, with an average drying time of 16 hours of solar irradiance. The tests were performed in Temixco, Morelos, Mexico, located at 18 º 51 'of LN and 99º 14' of LO, with average values of 850 W/m^2 irradiance maximum. The chamber temperatures were in a range between 31 and 45 °C. The air velocity range was set between 1.3 and 2.4 m/s. Final moisture contents of the dried chili were obtained in a range between 8% and 6% h.b. with an average drying velocity of 4.7 humidity degree/h. The solar direct drying is a technology that allows recovering and trying different agricultural surpluses and could promote the establishment of agro-industries.

Solar drying, Indirect solar dryer, Solar air collector

Cybersecurity dashboard

Cuadro de mando de ciberseguridad

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Abstract

The main objective of the present article is to report results gathered from an interactive dashboard application, which main objective is to apply new software and IT technologies to collect information by using several APIS in order to get information and centralize it, then it can be visualized in an interactive dashboard. The methodology used in this project was based mainly by using an specialized software for data analysis which offers an structured an ordered information of data, besides this software also displays alarms that are found in the organization's web pages that are located in cloud services and integrated through Microsoft Azure. In order to weave the different possible attacks which each individual platform could detect such as: malware, authentication bypass, phishing on e-mails, targeted attacks to the companie's virtual machines, malicious ip, etc.The contribution of this project is the integration of several local platforms or those ones located in cloud services serving to SME (Small and medium enterprises) and which are distributed in several branches, either domestic or abroad, then after the interactive dashboard would show live alerts in order to make the correct decisions concerned to cybersecurity issues.

Interactive dashboard , Cybersecurity, Azure

Big data processes and tools learning environment for bachelor's degree students in computer engineering

Entorno de aprendizaje de procesos y herramientas de big data para alumnos de licenciaturas en ingeniería en computación

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Abstract

The set of technologies related to the Big Data environment is broad and continues to grow; undergraduate students interested in venturing into learning this type of technology are, in the first instance, overwhelmed because the learning curve is extensive; The objective of the project is to reduce this curve; For which a massive data processing environment has been designed and generated, accompanied by notes with fundamental concepts of Big Data, workshops and theoretical-practical courses, all supervised by academics from FES ARAGÓN. This document shares the experience gained in one year of its application and the various products that are detailed in the extensive. The methodology to meet the objective consisted of the following phases: Documentary research, content design and development, creation and configuration of the environment for Big Data tools, environmental operation tests, generation of teaching material, teaching of courses and workshops. and publication of the materials in a MOOC. The contribution proposed in this article is to socialize the experience obtained from the teaching support and innovation project, in order for other academic centers to take it up, replicate or improve it.

Bigdata, Workshop, Education

CO_2 emissions of an asphalt pavement in kg of CO_2 per m^2

Emisiones de CO_2 de un pavimento asfáltico en kg de CO_2 por m^2

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Abstract

Climate change is one of the world's major problems and concerns the entire human population as its effects are global in scope. Climate change is driven by the greenhouse effect, which is generated by greenhouse gases (GHG). The construction industry is important in the development of a country, both economically and culturally, since it is through it that the infrastructure needs required for a nation's economic and social activities are met. Urban environments are composed of various structures that favor economic, social and any other activities of interest within the existing population; such urban environment is mainly connected by a system that is constituted by asphalt pavements of flexible or rigid type. This project analyzes the environmental impacts generated during the construction process of an asphalt pavement corresponding to the Real de Sevilla III subdivision, located in Obregon City, Sonora, Mexico, applying the Simapro 9.0 Software, obtaining a result of 12.618 Kg CO_2 eq/m2 and 1,140, 863.493 Kg-CO_2/fractionation generated by its main materials and activities and equipment consumptions.

Carbon footprint, CO2, Pavement

The Sun, Energetic option for Universidad Tecnológica de Salamanca

El Sol, una opción de Energía para la Universidad Tecnológica de Salamanca

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Abstract

For the Universidad Tecnológica de Salamanca it has been necessary and very important its building become sustainable, therefore, the sun is an energy option to achieve it, this study shows the use of clean energy to produce electrical energy, the objective is to use the photovoltaic effect using technology and regional suppliers, so that when it is a sunny day, electricity is generated and when this resource is not available, the service of the electricity company, CFE in Mexico provides it. It begins by locating within the globe the point where the SFVI (interconnected photovoltaic system) will be installed, in this case latitude 20.577136 and longitude -101.232293, there are two requirements prior to meeting, which has to do with the selection of the location, the first It refers to technical aspects, such as solar resources, type of terrain and the shadows that could be generated in the place, according to the fulfillment of legal requirements and necessary permits for the selected place. The criteria used in the Interconnected photovoltaic system are shown, to achieve sustainability for Universidad Tecnológica de Salamanca.

Systems, Photovoltaics, Energy

Design and Construction of an ALD Reactor by Growth of Al_2O_3 Nanostructure Films

Diseño y construcción de un reactor ALD por crecimiento de películas de nanoestructuras de Al2O3

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Abstract

Objective. This project focuses on designing, building and commissioning work the atomic layer deposition (ALD) reactor for Al_2O_3 ultrathin film, which it will be contain specific components and a system's own control unit.Methodology. The ALD reactor was designed under a system to minimize components, flow lines and connections; to reduce manufacturing costs, volume of precursors, among others. Currently, ALD reactors are expensive to sell, maintain and replace parts. The design and manufacture of the ALD reactor manufactured at the University of Sonora (UNISON) is based on the state art with sequential binary reactions of the precursors, for the proposal for the manufacture of solar cells.Contribution. It was possible to build and commission the ALD reactor for the deposition of ultra-thin films, with the characteristics of being reproducible and scalable, which makes it attractive for commercialization. The homemade ALD reactor at UNISON is considered a very interesting equipment for the semiconductor research area, since it is possible to combine different types of materials in the form of films such as oxides and nitrides in the order of Angstroms (Å).

ALD, Reactor, Thin films

Interactive assistant tool for the evaluation of kinematic patterns and EMG signals in patients with a forearm injury

Herramienta de asistente interactivo para la evaluación de patrones cinemáticos y señales EMG en pacientes con lesión del antebrazo

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Abstract

Subjective feelings feedbacks are commonly employed by a patient during forearm rehabilitation therapy without real-time data, leading to suboptimal recovery results in some patients. Technological innovations in the field of assisted rehabilitation have enabled the evolution of real-time monitoring systems. In this paper, interactive assistant development is presented as the interface to define the relationship between the kinematics patterns and the electromyographic signals during the forearm rehabilitation routine. Leap Motion (LM) and Shimmer3 EMG sensors read the routine behavior by following the movements that appear on the software. Real-time targets are programmed to lead the necessary forearm movements that the therapist sets to determine the recovery progress. The integration of software and hardware shows a dataset basis on interaction variables such as arm velocity, arm position, performance rate, and electrical muscle pulse. The results obtained from tests show that the system works effectively within a range of movement of 9 to 88 degrees in rotation about the axes, and velocities under 190 mm/s show stable movement representation on software. Finally, the outcomes ranges show an alternative tool to evaluate patients with a forearm injury.

Subjective feelings, EMG, Data Set

Analysis of the scientific production on renewable energies within the framework of sustainability in Mexico

Análisis de la producción científica sobre las energías renovables en el marco de la sostenibilidad en México

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Abstract

With the turn of the 20th century to the 21st, the urgent need to carry out a critique of the current techno-energy pattern, which is based on the intensive use of fossil fuels, becomes more evident. Derived from this productive, energy and material consumption of gas and oil, the conditions have been generated for the configuration of an environmental crisis. In such a way that, there is an urgent need to carry out research that explores the various alternative sources of energy that today appear as an alternative to reduce the negative impact of industrial, agro-industrial and urban activities on the environment. This paper reflects on the problems that exist in Mexico around the development and marginal adoption of renewable energies as a productive source. While 91.2% of energy in Mexico is produced by burning fossil fuels, it can be established that the energy structure in Mexico is unsustainable. For this reason, a change in energy thinking based on efficiency and sustainability is required, considering both as axes for the use of renewable energies. The goals of the article are: 1) to present a context study, analyzing the production of electrical energy with fossil sources in Mexico, alluding to the difficulty of the transition towards the use of renewable energies. Second, the production of renewable energies in the country is analyzed to find out if investment in them is sustainable.

Energy, Renewable, Sustainable

Development of an application for the estimation of vegetation indices using SENTINEL remote sensing data

Desarrollo de una aplicación para la estimación de índices de vegetación en imágenes del sensor SENTINEL

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Abstract

Geomatics is an application that covers various topics; sustainable land use, identification and monitoring of crops, production estimation, marketing, evaluation of other lands, environmental impact analysis, among. It groups techniques related to data collection using remote and proximal sensors which allow determining wavelengths and spectral responses to estimate variables that allow quantification of statistical data.Vegetation indices are combinations of spectral bands recorded by the different remote sensing satellites, their basic function is to enhance the vegetation based on its spectral response and thus attenuate the details.The objective of this research was to provide the user with a tool developed by means of GIS that allows to execute complex processes in an automated way and with optimal results whose impact is mainly focused on optimizing production time and obtaining variables whose application can have an impact on the optimal use of fertilizers in agricultural activities.The results obtained are a total of 21 automated vegetation indices having as input the scenes obtained through the SENTINEL 2A and 2B sensor.

Sentinel, Vegetation index, Python

Online evidence application platform

Plataforma de solicitud de pruebas en línea

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Abstract

Due to the fact that one of the main activities carried out during the teaching of a course is the evaluation of evidence generated by students, safeguarding those evidences in an adequate way so that it can be graded later, becomes an important practice to carry out. This article addresses the development of a tool that allows the management of the evidence generated in a programming course of the Ingeniería en Informática in the Universidad Politécnica del Estado de Morelos (UPEMOR). This tool was developed under the software development model called improved cascade, using technologies that allow operation through the Internet, which would allow faster access to students' evidence, as well as keeping them better organized and accessible. In addition, this tool would allow defining the items that will be evaluated in each evidence, as well as being able to carry out the evaluation of them from the same place.

Platform, Evidence, Online

Thermodynamic analysis of a combined gas-steam cycle without and with afterburner

Análisis termodinámico de un ciclo combinado gas-vapor sin y con Postcombustión

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Abstract

Currently in power plants what is sought are higher thermal efficiencies, which is why combined cycle plants have been chosen, since they make better use of fuel, producing greater net power, all this It has led to innovative modifications to combined cycle power plants, improving their performance. In this article the thermodynamic analysis of a combined cycle (Gas-Steam) without and with Afterburner is carried out, in said analysis adequate thermodynamic indices have been used and the calculations have been carried out taking into account the state of the art for gas turbines and the typical values for steam cycle quantities. The purpose of this study is to analyze the combined plants where the exhaust gas at the outlet of the gas turbine is used in a waste heat recovery boiler to produce steam that is expanded in a turbine and discharged in a condenser. Since the air-fuel ratio in the combustion chamber of a gas turbine is higher than the stoichiometric, fuel can be added in the boiler (Afterburner) to increase steam production or to improve the quality of the steam produced.

Combined cycle plant (Gas–Steam), Afterburner, Recovery boiler

Upper extremity prosthesis 3D bio-pneumatic self-adjusting clamping to non-homogeneous surfaces under the principle of communicating vessel

Prótesis de extremidad superior 3D bio-neumática de sujeción autoajustable a superficies no homogéneas bajo el principio de vasos comunicantes

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Abstract

There are several models that emulate the mechanical behavior of biological tissues. Its automation, new materials and manufacturing techniques will enable its use in the near future. This research is based on the use of compressed air in pneumatic muscles that actuate the phalanges. The research is important because it proposes a system that adapts to the needs and economic accessibility or people with limited resources. The problem to solve is that it meets certain standards such as: stable grip and pressure and that it adapts to irregularly shaped objects with more natural movements. The principle of communicating vessels and the force exerted by a fluid on the walls of the container that is used. Consequently, the fluid exerts pressure in all directions. The prosthesis with the design of the Flexy Hand 2 is manufactured by inserting pneumatic muscles to each of the fingers connecting them by means of nylon ropes that are attached to the homemade pneumatic muscles connected to a common manifold, regulating the pressure by means of a valve and a degree of freedom. As a result of the above, it can be concluded that the prototype worked favorably.

Prosthesis, Muscle, Pneumatics

Reactive power compensation considering a maintenance management model in an industrial plant

Compensación de potencia reactiva considerando un modelo de gestión de mantenimiento en una planta industrial

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Abstract

Nowadays, the development of electrical systems implies addressing issues of profitability in their processes, where decision-making aimed at energy efficiency without considering possible impacts on certain risks that can present high unprofitable costs for a plant. Integration of energy efficiency, maintenance and asset management is important for organizations. This work shows a case study where a reactive power compensation problem is presented, through the analysis from a maintenance management model aligned with an asset management. The application of different technical indicators of maintenance, reliability and economic management related to electrical parameters such as they are; active power, reactive power, apparent power, power factor (FP), peak demand current, energy losses and voltage drop, considering impacts of reliability, maintenance, energy consumption costs and penalties, showing a new way of address **energy efficiency** issues aligned with **maintenance** and **asset management**.

Management system of smart warehouses using IIoT for optimize inventory control

Sistema de gestión de almacenes inteligentes usando IIoT para optimizar el control de inventario

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Abstract

In the industry, the supply chain develops activities related to the flow of goods. A nerve point of this chain is warehouses, whose operational efficiency allows to minimize product losses and reduce overall costs.This work proposes the automation of a goods warehouse through its integration and interoperation with emerging technologies based on the Industrial Internet of Things (IIoT), with the aim of knowing and planning the stock in real time to optimize its management, since a recurring problem is having outdated inventories, which impact on the lack of traceability of the product. A methodology based on the design of an experimental management system is propose, through RFID devices and a microcontroller allows to monitor the inputs and outputs of goods, the second part of the system is a web application with a user interface where information about inventories could be viewed and analyzed in real time. This research will allow to lay the foundations of automation through IIoT of a warehouse with the purpose of turning it into an intelligent unit that provide strategic information.

Smart Warehouses, IIoT, Industry 4.0, intralogistics

Application of CAD, CAM, CAE, in prototype design and manufacturing of electric car lift

Aplicación de CAD, CAM, CAE, en diseño y manufactura de prototipo, de elevador eléctrico para autos

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Abstract

Industry 4.0 is currently supported by additive technologies that are increasingly accessible, which allow us to use them in different applications within the industry, such as designing devices, mechanisms or machinery in less time and cost, within the technologies. Additive, there is 3D printing, simulation software (CAD, CAM, CAE) that allows us to visualize and simulate the operation before manufacturing it, avoiding errors and costs.The use of additive technologies in the design of an electrical device for a car scissor lift, commonly known as a "scissor jack", will be demonstrated.First step, the components that already exist such as the standard scissor lift are drawn, to be able to manipulate it in design software, later we will design the elements, such as motor fastening and other components.Second, perform a finite analysis of the components, to analyze that the parts and materials with which they were designed will withstand the stress to which they will be subjected, so that if necessary, corrects the model before making the prototype.Third, assemble and simulate its operation in software, verifying any anomaly in the simulation to correct before manufacturing.Fourth, carry out field tests, for their validation

Design, Innovation, Cost

Potencial of energy saving in the fish and seafood cold storage in San Francisco de Campeche

Potencial de ahorro energético en cámara de refrigeración de pescados y mariscos en San Francisco de Campeche

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Abstract

The following paper focuses on energy efficiency applied to a company dedicated to the conservation and freezing of seafood products located in the city of San Francisco de Campeche, Camp, Mexico. For this, a theoretical study is carried out to determine the energy saving potential of one of the refrigeration systems currently installed in the company to fulfill the hypothesis of obtaining savings of up to 3% in energy consumption by reducing 1 °C the condensing temperature of the system. The main thermal loads of the system are Mayan octopus, shrimp, and fish (various). With the help of the Genetron Properties Software, the different calculations are carried out by making variations in the condensation and conservation temperatures, without varying the thermal load, but considering a correct and incorrect heat exchange of the condensing units with the outside.

Energy efficiency, Refrigeration and energy saving

Energy saving in air conditioning systems, by using thermal insulators in an academic classroom

Ahorro de energía en sistemas de aire acondicionado, mediante el uso de aislantes térmicos en un aula académica

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Abstract

This article proposes a methodology of calculating the cooling load in an academic classroom at The Universidad Veracruzana located at Poza Rica, in the state of Veracruz, Mexico., using the ASHRAE CLTD / SCL / CLF method. The method of calculating the cooling load CLTD / SLC / CLF consists in applying the cooling load as accurately as possible so, in consequence the air-conditioning equipment will not oversize. By using thermal insulation, a decrease in energy consumption is achieved and thus contributes to sustainable development. Next, we will proceed to calculate the cooling load as follows, applying the proposed methodology in two cases: In the first case, it will be in a classroom with an air-conditioning unit with-out thermal insulation, first with 30 students and then with only 3 students in the classroom. In the second case we used the same method in a classroom with an air-conditioning unit but this time with thermal insulation, and we proceed to compare the results first with 30 students and then with only 3 students in the classroom. What we discovered when reviewing the results of these two cases is that based on energy consumption measurements, the saving is much greater using an air-conditioning unit with thermal insulation than an air-conditioning unit that is not thermally insulated

Energy saving, Thermal insulators, Academic classroom

Numerical analysis of residential energy consumption using IoT

Análisis numérico del consumo energético residencial usando IoT

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Abstract

Modern technology has changed our lives in many aspects revolutionizing how we work, live, and communicate. This fourth industrial revolution allows the organizations to be easily monitored and efficient management. The efficiency and supply of electrical energy is important issue for human development. In this work the analysis of the electrical energy of a residential house is approached. The methodology used for the analysis of the efficiency electrical energy is based initially on the determination of the numerical areas to obtain the respective energy consumption. The information obtained is stored in real time in ThingSpeak. NodeMCU comes with the ESP8266, this chip used in the development of the electronic device of this work is open-source Lua based firmware with development board specially targeted for IoT applications. In this paper the numerical integral is used to obtain the energy consumption. The main contribution of this work is obtaining a reliable tool to measure and store data in the cloud in real time.

Internet of Things, Numerical Analysis and Energy Consumption

Rupture voltage in mineral oil using the megger ots 60pb equipment to determine its quality and use in transformers

Tensión de ruptura en aceite mineral empleando el equipo megger ots 60pb para determinar su calidad y utilizarse en transformadores

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Abstract

In this project some practices of mineral oil were made to determine the quality for its application in the electrical industry. Then the practices were developed in the laboratory of the Faculty of Mechanical and Electrical Engineering at Universidad Veracruzana using the Megger OTS 60 PB equipment, according to the current IEC 60156 and ASTM D1816 standards, new oil was used in a first analysis which proved to be of correct quality according to the standard, In the second case, oil polluted by the environment was used and it was of less quality since it did not pass the test according to the standard, and finally, degraded oil was used, which was less quality (15°C) and heat was supplied up to 40°C, taking readings at 40°C, 35°C, 30°C and 25°C, giving favorable results due to the influence of the temperature on the mineral oil. In conclusion, according to the results of the test and the comparison with the parameters of the standards, the OTS60PB equipment operates correctly and the results of the equipment are reliable and it can be recommended that mineral oil can be used in transformers.

Quality, Mineral oil, Rupture Voltage

Design of a Digital Communication Platform to Food Donations

Diseño de una Plataforma Digital de Comunicación para la Donación de Alimentos

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Abstract

In this paper, a communication strategy between the individuals involved in the donation and collection of food is presented and thus, in this way, reduce the loss or waste of the same, which is one of the causes of food insecurity in Mexico and in the world.The platform is implemented as a distributed computing system. The system is accessed through a mobile application that operates on Android. The server implements the PHP language and stores the information in a relational model using the MySQL manager. In addition, the communication between the client and the server is done through the REST protocol encapsulating the data in JSONIn this system, donors can see the location of nearby altruistic organizations, consult information and contact them through social networks. (WhatsApp, Facebook, and Twitter). It also publishes donation offers for organizations to contact them and view reports of donations made. Organizations visualize the offer of users and contact them through social networks. Likewise, they must record the follow-up of each donation received in order to ensure the delivery of the food.

Food insecurity, Communication platform, Food waste or loss

Biometric technological security for data and information protection

Seguridad tecnológica biométrica para obtener datos y protección de la información

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Abstract

Technological systems based on biometrics are an effective and efficient method for human recognition, data collection, and information protection. The objective of the research is to analyze the security and privacy offered by these systems, which include signature recognition, facial recognition, iris pattern and fingerprint recognition. The mixed analysis methodology will help in implementing protection, showing the strengths and weaknesses of these systems. By differentiating itself as the best at present for data protection, by collecting important information of each human being, through elements that make this technology the most reliable, its description makes it clear that these systems will have a great impact, also renewable energies can be used in the infrastructure avoiding polluting agents. Emphasizing to remain as a precedent of research in information technology. Future generations will see that security is not just about passwords. Currently, the trend is to generate security through biometric traits.

Safety, Protection, Privacy

Design and construction of a Darrieus vertical axis turbine and analyzed by reverse engineering

Diseño y construcción de una turbina de eje vertical Darrieus y analizada por ingeniería inversa

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Abstract

The implementation of sustainable generation systems satisfying the demands of the electric power line has begun to become a necessity given the climatic consequences adjacent to the means of obtaining energy by burning fossil fuels. Today, Mexico has 30.14% of sustainable means installed as generators to the Electric Power System, but only as secondary feeders given their intermittency. However, wind farms have shown promise, being able to satisfy more than 30% of the Southeast Peninsula line at peak hours. Therefore, this research aimed to design and build a prototype of a reverse-engineered back-fed Darrieus vertical axis wind turbine. With the psychrometric chart data at 2135 masl, the parameters of angular velocity, tip speed ratio and wind rotor power were identified. In addition, the wind flow behavior was analyzed by means of a finite element modeling bounded by the K-Epsilon turbulence system and the boundary conditions pertinent to the State of Puebla. Finally, the results obtained will be discussed and based on these, how the implementation of this turbine in urban areas benefits.

Darrieus Wind Turbine, Reverse Engineering, CFD

Morphing wing models analysis and synthesis for the sustainable aeronautics industry

Análisis y síntesis de modelos de alas tipo morphing para la industria de aeronáutica sostenible

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Abstract

The morphing type wings aim is to improve their aerodynamic performance in each flight condition as a bird would do it, this improvement is obtained by modifying its shape through intelligent mechanisms. Optimizing and dynamically adapting the shape of the wings to various flight conditions, leads to many unexplored possibilities for improvement that have been identified beyond current model test demonstrations. This research aimed to analyze the most prominent examples of morphing concepts in models of previous wing experimentation. Morphing concepts have certain limitations on a large scale, however some consortia have chosen to investigate it, in full-scale models. In this work, a mixed type methodology is presented covering qualitative and quantitative research studies on morphing-type wings. Finally, it is mentioned the importance of continuing to investigate these models and it is considered that the implementation of real models will aid to optimize the conditions leading to sustainable development models.

Morphing, Aeronautical industry, Wing modeling

Performance indicators in the sustainable management of the company Metalyzinc

Desempeño de indicadores en la gestión sostenible de la empresa Metalyzinc

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Abstract

The research has been developed according to the result of the experimental study of the anti-corrosion protection service of the company Metalyzinc, in the period September 2020 - April 2021, where it is proposed that the performance of the indicators favors the competitiveness of the industrial service of the company of the COBOS Group founded in 1989, therefore, how is the sustainable impact by the management of the indicators in the service of the anti-corrosion protection system?; question that has allowed the content analysis of the reference framework of the context of the study, the knowledge of the operating process that involves the types of variables of the Galvanizinc System service, with the purpose of examining the impact of management, and the evaluation of the performance of the process with the support of diagnosis, application of statistical tools, innovation methodology and use of operational diagrams, contributing to the strengthening of strategic planning, the development of proposals for improvement and sustainable management.

Indicators, Galvanized, Management

Analysis of granulation systems using idealistic modeling-principle of similarity for scaling up sustainable production lines

Análisis de sistemas de granulación utilizando modelado idealista-principio de similitud para el escalamiento de líneas productivas sostenibles

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Abstract

Pharmaceutical industry produces safe, effective, affordable, and quality medicines used to guarantee a healthy life and promote the well-being of the entire population in a sustainable way. Currently, the solid dosage form is the preferred formulation for human use. However, the large scale production of these medicines it requires well-tested formulation and appropriate equipment because any substantial variation in the development of the pharmaceutical product can alter the final quality of the product, causing the entire manufactured batch to be discarded. For this reason, this research aimed to analyze and understand the behavior of the variables involved in the wet granulation process while scaling from a laboratory system and a production line unit to transfer the results obtained to a large-scale production unit of solid dosage forms to meet the health needs of the world population. This study was carried out under a mixed approach applying quantitative and qualitative technologies to explain and predict the behavior of the involved variables while scaling from a laboratory system to a production line unit. It was found that there are some regularities and causal relationships between geometric, kinematic, and dynamic similarities.

Solid dosage form, Scaling, Similarity

Experimental teaching of the subjects of the energy area of the study plan of the Mechanical Electrical Engineering career of the FES Cuautitlan

Enseñanza experimental de las asignaturas del área de energía del plan de estudios de la carrera de Ingeniería Mecánica Eléctrica de la FES Cuautitlán

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Abstract

This paper describes the activities that have been carried out to improve the teaching of some of the subjects in the energy area of the study plan for the Mechanical Electrical Engineer career at the Facultad de Estudios Superiores Cuautitlán. The activities carried out both by academics and by social service students and thesis students, include the preparation of notes, laboratory practice manuals and the design and construction of the experimental prototypes required in the practices. The subjects that were considered are: Heat transfer, Air conditioning and refrigeration, Alternative sources of energy, Conventional generation plants, Use of solar energy and Energy saving techniques. It should be mentioned that most of these subjects are electives of the energy module of the study plan and are considered as totally theoretical subjects, therefore, the contribution of the work is to implement experimental teaching to these subjects. At the end of the work, the experimental prototypes that were elaborated to carry out the practices of the different manuals presented are described.

Experimental teaching, Notes and manuals, Experimental prototypes

Industrial safety analysis based on national and international standards for the operation of boilers in Mexico

Análisis de seguridad industrial basado en normas nacionales e internacionales para la operación de calderas en México

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Abstract

At present, there are still explosions caused by boilers, either due to lack of maintenance or because of poorly qualified personnel to operate them, causing human and economic losses and environmental damage. In Mexico, the government authority responsible for the protection and promotion of employment is the Secretary of Labor and Social Security (STPS), the regulations they manage are known as Official Mexican Standards (NOM). The regulation that establishes the safety requirements for the operation of boilers is NOM-020-STPS-2011. The objective of this research is to analyze referred standard, adequately promote its use and propose a sustainable maintenance plan. This was carried out under a mixed approach, analyzing quantitative and qualitative parameters considering statistical and technical data, it was also necessary to assess the norm through cause-effect laws. This paper aims to promote the use of safety measures for the efficient and sustainable use of boilers to generate a culture of compliance with international standards and preserve the important factors of this sector.

Boiler, Industrial Security, Standard-Sustainable

Water distribution system coupled to a sustainable purification plant for low-income communities in México

Red de distribución de agua acoplada a una purificadora sustentable para comunidades de bajos recursos en México

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Abstract

The National Water Commission (CONAGUA), determined that in Mexico approximately 10% of the population does not have water in their homes. In addition, Mexico is the country that consumes the most bottled water in the world, although there are communities that do not have water for their consumption. This research proposed a drinking water distribution network coupled to a disinfection plant for low-income communities in Mexico. It was carried out using a mixed methodology, applying quantitative techniques to find out the number of people without drinking water service in Mexico and qualitative ones to determine the best option of materials, purification method and type of supply. However, certain parameters must be met in the communities such as the maximum number of 1200 inhabitants for this option to be viable. This research served as a base project for implementation in remote communities and that will be proposed to government agencies and projects.

Drinking wáter, Distribution, Nanofiltration

Adaptation of a container tank to a savonius vertical axis turbine analyzed by reverse engineering

Adaptación de tanque contenedor a una turbina de eje vertical savonius analizada por ingeniería inversa

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Abstract

Due to the alarming climatic situation experienced by all nations, we are in the need to urgently develop and improve sustainable technologies for power generation in order to supply the growing demand for power generation in power systems worldwide.This project aims to design and build a prototype vertical axis wind turbine Savonius analyzed by reverse engineering process by adapting the structure of a tank and taking advantage of its shape and dimensions, with the intention of building a wind turbine with the lowest possible budget, In addition, data from the psychrometric chart of the state of Puebla (winter-spring) will be used so that by means of numerical simulations of fluid flow using CFD software we can obtain the parameters of linear velocity, angular velocity, drag coefficient and projected power that the wind rotor will be able to develop.

Savonius, Wind Energy, CFD

Design and Automation of a vertical electrospinning system for manufacturing nanofibers

Diseño y Automatización de un sistema de electrohilado vertical para fabricación de nanofibras

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Abstract

The objective of this research consists of the design, construction and automation of the electrospinning mechatronic system to obtain nanofibers.As a first stage, the structure of the electrospinning mechatronic system and the distribution, injection and manifold system were designed and built. In the second stage, the open-loop control system was outlined and implemented. It is made up of: control, isolation stage, and the plant. In the first element, the LabView interface and ATMega2560 microcontroller were used to manipulate the variables of the injection speed and distribution of the solution, the speed of the nanofiber collector and the height between the capillary tube and the collector, the magnitude of the temperature and humidity from the environment, also, the graphic interface was developed, the second element consists of isolating the control and power stage in addition to amplifying the command signals and enabling the correction elements, the third element receiving the signals from the power stage to perform the action and produce a change in the controlled variables in the process. With this prototype, it is intended to obtain nanofibers from different polymer solutions for use in the area of catalysis and biomaterials.

Open loop control system, Electrospinning, Control

Passive absorber design for mechanical vibrations with base excitation

Diseño de amortiguadores pasivos para vibraciones mecánicas con excitación en la base

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Abstract

The dynamic coupling of mechanical vibratory systems results in the oscillatory interaction between the bodies of the system as a whole, for a certain selection of some parameters the phenomenon of vibration absorption occurs, in this phenomenon the main system transfers its mechanical energy to the absorber, resulting in a minimum amplitude of movement of the primary system and the absorber develops a certain amplitude. In this work it is proposed to design a vibration absorber for a primary system that in turn is affected by the motion in the base, which produces vibrations, the motion in the base includes elastic and viscous actions. It has been possible to determine a set of parameters that allow the absorption of vibrations, likewise, the parameters determined not only allow the absorption, but also establish a transfer of the effect of the damping present in the base to the absorber.

Passive control, Damping transference, Vibrations absorber

Analysis of the coefficient of linear relationship, generated by the exponential heating during the welding process for an A36 steel plate

Análisis del coeficiente de relación lineal, generado por el calentamiento exponencial durante el proceso de soldadura para una placa de acero A36.

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Abstract

The present study presents the relationship of temperature and deformation as well as the analysis of heat transfer and deformation produced during welding of a steel plate. The method consists of strategically welding a base metal plate (A-36) with a high-hardness filler material to obtain an overall increment in wear resistance. However, the thermal cycles generated during welding produced deformation, thus changing the flatness of the plate. Different sequences of welding were applied to obtain a relationship between the heat transfer and deformation. A filler material was applied to 100 holes (1/2” diameter and 8 mm depth) in a ½” steel plate. The temperature and deformation were measured for 3 different welding sequences. Plate 1 reached a final mean temperature of 467 °C and deformation of 0.016”, plate 2 reached 472.9 °C and -0.008”, and plate 3 reached 354.2 °C and 0.020”. The results indicate that the deformation is not function of the final temperature, instead the deformation is function of the slope of the curve temperature vs deformation. The behavior of the curve temperature vs deformation is linear for all cases studied, confirming the findings of the lowest deformation for plate 2 which exhibited the lowest slope.

Temperatura, Deformation, Linear equation

Reference evapotranspiration prediction using neural network method

Predicción de evapotranspiración de referencia utilizando redes neuronales Artificiales

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Abstract

Water is the most vital resource for life on earth, At present we know that irrigation systems have currently acquired great importance due to the scarcity that is affecting worldwide, since there is no awareness about this important resource, however, for years we have worked to try to solve this problem. The objective of this research work was to develop a Feedforward Backpropagation type neural network algorithm with three layers: in the input layer include the operating factors such as the maximum temperature (°C), the minimum temperature (°C), the average temperature (°C) and solar radiation (mm / day) and the hidden layer three neurons and yet in the output layer only one neuron, this algorithm has been trained by the Levenberg-Marquardt algorithm to predict the evapotranspiration. The results were satisfactory because the algorithm was able to predict the reference evapotranspiration with a correlation coefficient of 99.99% and with an error of 0.0001. Therefore, this technique can be considered to automate the online irrigation system by monitoring plant transpiration and soil evaporation.

Artificial Neural Networks, Irrigation System, Evapotranspiration

Control system for parameter estimation in plastic injection for the automotive industry

Sistema de control para la estimación de parámetros en la inyección de plásticos para la industria automotriz

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Abstract

Objectives: Establish a control system for the estimation of parameters in the injection of molds to meet product quality standards in the automotive industry.Methodology: Estimates are made through mathematical tools and error analysis to determine the estimators related to the process that is carried out in a heuristic way.Contribution: Establish the automation of the calculation of the parameters involved in the injection process, which would avoid material waste and achieve the quality standards established by automotive companies

Control, Injection, Parameters

Kinetics, modeling and colorimetry of celery leaves dehydration by direct and mixed solar drying

Cinéticas, modelado y colorimetría del deshidratado de hojas de apio mediante secado solar directo y mixto

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Abstract

In celery, leaves, roots, and fruit contain a high value in medicinal properties and are used to prepare syrups, tinctures, infusions, or oils; however, its leaves are commonly discarded, wasting their nutritional and medicinal content. The dehydration of these leaves is a conservation option, increasing their shelf life. This study analyzes direct and mixed solar drying (SD and SM) kinetics and their effect on celery leaves. The moisture contents, drying rate, water activity, and colorimetry were obtained. Moreover, the fitting of experimental data to the mathematical models proposed in the literature. The moisture content stabilized at 150 min in the SM at the shortest time with a maximum drying rate of 0.1179 g·water/g·dm·min. The initial and final water activity was 0.98 and 0.412 in the SM and 0.403 in the SD. The SD better conserved the leaf color, with a total color change (ΔE) of 2.56, while the value obtained with the SM was 5.42. The experimental results of both technologies were better adjusted to the model Two exponential terms with an R^2 of 0.999. The results show that the solar drying of the celery leaves is feasible, and a quality product is obtained sustainably.

Celery, Drying models, Direct solar dryer, Mixed solar dryer, Colorimetry, Drying kinetics

Ethanol as an alternative to water vapor for saving energy and fossil fuels in thermoelectric plants

El etanol como alternativa al vapor de agua para el ahorro de energía y de combustibles fósiles en plantas termoeléctricas

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Abstract

This article proposes the use of ethanol in a 96% azeotropic mixture as an alternative to water vapor in thermoelectric generators with notable advantages in saving fuel. As is known, water is a cheap resource, available everywhere in a liquid state. However, water has an unusually high heat of vaporization and an equally high boiling point, so converting water to steam requires consuming large amounts of fossil fuels to break the hydrogen bonds in this substance. In contrast, evaporating ethanol requires only 37 percent of the fuel needed to evaporate water. In addition, water, before turning into steam, needs to be softened and treated with chemicals to prevent oxidation and scale deposits in pipes. If quality ethanol is used, this process of adjusting the water would not be necessary, which represents another saving. On the other hand, it is possible to resort to the use of solar heaters to raise the temperature of the ethanol to around 70ºC to later heat it to 80ºC or more, if necessary, with fossil fuels, making more significant savings.Objectives: To propose the replacement of water vapor by ethanol vapor as a working fluid to move the turbines of thermoelectric plants to reduce the consumption of fossil fuels.Methodology: Analyze the physical properties of water and compare them with those of ethanol to know the advantages and disadvantages of one and the other as working fluids. Contribution: Through small modifications in thermoelectric plants it is possible to reconvert them to operate with ethanol vapor and save on fossil fuels.

Ethanol, Hydrogen bonds, Water

Efficiency from a pneumatic system to a mechanical traction system

Eficiencia de un sistema neumático a un sistema de tracción mecánica

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Abstract

Pneumatic traction systems have already been used since Denise Papín, who apparently already had the idea of using compressed air in cars. Currently in Uruguay and India with Armando Miguel Regusci Campomar and the French inventor Guy Negre respectively, they make use of this energy and mention high efficiency in their compressed air motors. In this vein and in order to continue research with this energy, explore non-polluting alternative energies and their efficiency, a Pneumatic-Mechanical traction system is proposed in this research, in a mobile of our own manufacture. The system works under two principles of elementary physics; Pascal's pneumatic energy and Tesla's alternating pneumatic energy, that is, alternating pneumatic energy, their efficiency is tested with the energy of the compressed air tank and the displacement energy of the mobile.

Compressed air, Pascal, Pneumatic

Development of a web management system for the internship process at the TecNM campus Lerdo

Desarrollo del sistema web para la gestión del proceso de residencia del TecNM campus Lerdo

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Abstract

The TecNM campus Lerdo is developing a Web Based System for the Management of the Residence Procedures (SIGEPRORE), in order to adhere to the ISO 9001:2015, which this institution of higher education currently operates under, for which it is necessary to automate the current professional residency quality management system. SIGEPRORE is an institutional software package designed to support all those involved in the professional residency procedure. It has a new and improved web design, which allows the integration of new modules, functionalities, and technological tools for increased user optimization. Participants in this project are students from the engineering degree in computer systems of the ITSL and professors' part of the academic body in consolidation "Software engineering applied to solutions". The agile methodology used as a guideline to develop the project was the SCRUM.The impact of the project is of great relevance as it is intended to establish a web system which will contain all the operating policies of the professional residence and quality management system.

Development, Software, Intership

Design and implementation of an ecological cooler

Diseño e implementación de un enfriador ecológico

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Abstract

This work shows the construction of an ecological cooler capable of fulfilling the functions of a conventional refrigerator, its operation is based on using Peltier cells which create cold on one side and heat on the other. It is about eliminating the use of refrigerant gases, which damage the ozone layer, in addition to oils and accessories that are harmful to the environment, electrical energy is also saved with the prototype. The construction of the prototype is based on the construction of a panel that has 2 Peltier cells, 3 fans and a radiator system, which is integrated into a cooling drawer, the system is connected to a direct current voltage source. The prototype is designed to be used as a cooling system to contain food mainly, in addition to completely eliminating the refrigerants and mechanical components that are used in conventional refrigeration, which cause contamination of the ozone layer and the environment.

Peltier cells, Savings, Environment

Standardization of a furniture manufacturing process

Estandarización de un proceso de fabricación de muebles

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Abstract

The company where the project was carried out is Muebles Quiché, located at Av. José María Chávez 1317 interior D. The project was carried out in the "Unique Designs" process, to optimize workstations, through the implementation of methodologies and solutions for the company.Through the study of times and movements, each of the operations that make up the process were analyzed, as well as identifying the operator's movements and subsequently generating a proposal that improves the efficiency of the line. The manufacturing process has evolved empirically, the first area of opportunity was to put order in the process and based on the observation of the operation, and the continuous improvement methodology (Prioritization matrix, Pareto diagram, Kaizen newspaper among others), starting with the clarification the path of operations, also gave order to the materials, and to the standardization of operations; These activities generated savings in costs, distances, times.

Kaizen, 5´s, Unnecessary movements, Spaghetti diagram

Analysis of the relationship of the input parameters in an independent way and their effect on the efficiency of the treatment of wastewater with activated sludge technology

Análisis de la relación de los parámetros de entrada de forma independiente y su efecto en la eficiencia del tratamiento de aguas residuales con tecnología de lodos activados

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Abstract

The research analyzes the possible effects of three design parameters: flow, biochemical oxygen demand and suspended solids in mixed liquor in the operation of a domestic wastewater treatment plant with activated sludge technology from a conventional process. Applying the elementary calculations equations for this type of treatment, each of the three design parameters was varied, keeping the others constant, it was observed and analyzed how the dependent variables respond: hydraulic retention time, mass load, volumetric load, needs oxygen, sludge recirculation, excess sludge and treatment efficiency. Observing the results of each of these behaviors, it is verified that the most important factors to achieve high efficiency are the reactor volume, the regulation of Suspended Solids in Mixed Liquor (SSLM) through the operation of the recirculation flow and the regulation of the oxygen entering the reactor. This work is an alternative analysis to understand the operation of the reactor in a treatment with activated sludge.

Treatment water, Sludge activated, Suspend Solids in the Mixture Liqueur, Reactor volume

Dynamics of a plastic aging chamber with PI temperature control

Dinámica de una cámara de envejecimiento de plástico con control de temperatura PI

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Abstract

Plastic pollution has become a global environmental problem, as rapidly increasing production of plastic products, increased international measures are being taken to reduce the problem. This paper aims to present the dynamics of a plastic aging chamber with PI temperature control, this study was conducted according to ASTM D-4329 standard. In this work, three transfer functions are obtained which represent the different times (morning, noon, and night), the results of the transfer functions parameters are analyzed using Matlab PID Tunner to show the effectiveness of the proposed method. Finally, the temperature-time graph for a cycle is shown in the results.

Transfer Function, Digital Control, Thermal Systems, and Aging Chamber

Thermal evaluation of an indirect air heating system using solar collectors

Evaluación térmica de un sistema de calentamiento indirecto de aire mediante captadores solares

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Abstract

One of the current problems is the use of energy obtained from fossil fuels, especially due to the emission of greenhouse gases. An option to replace fossil fuels is the use of alternative energies such as solar or wind energy. The objective of this work is to carry out a thermal and energy analysis of an indirect air heating system that receives energy through solar collectors that operate with water as the thermal fluid used in a food dehydration system, in order to know the efficiency of the system and therefore, make improvements to the circuit, in addition to the characterization of the water storage tank of the system, obtain the amount of energy that can be provided and the behavior of temperatures at different operating flows. According to the methodology, the temperature profile was obtained inside the hot water tank in two modes of operation (heating and energy extraction) reaching temperatures of 50 to 70 ° C, where the optimum temperature for drying is found and in turn reaching an efficiency 84%, compared to a conventional drying system that uses LP gas.

Solar collectors, Dehydration, Alternative energies

Analysis of objective functions and weighting parameters syntonization for protection optimization

Análisis de funciones de aptitudes y sintonización de parámetros de pesos para la optimización de protecciones

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Abstract

The protection coordination problem can be a very complicated task when dealing with meshed networks. Hence, many researchers have formulated the complex coordination problem as an optimization one. Different optimization methods have been proposed for solving the protection coordination problem. However, the different optimization methods are all sensitive to the objective function and the respective weighting parameters. A good optimization method suitable for certain task may not perform successfully if this optimization method does not have the appropriate objective function and/or syntonization of weighting parameters. Therefore, in this article, several proposed objective functions are analyzed and compared. Then the weighting parameters of the proposed objective function are syntonized. Genetic Algorithm is used as a heuristic searching motor for protection optimization. The objective function and the weighting parameters suit different optimization algorithms.

Genetic Algorithm, Heuristic Optimization, Objective Function, Protection Optimization, Weighting Parameter Syntonization

The numerical characterization of the power turbine blade with static stress analysis applying finite element method

La caracterización numérica del álabe de la turbina eléctrica con el análisis de la tensión estática aplicando el método de los elementos finitos

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Abstract

The lifespan of a blade is reduced due to the operating environment and high mechanical and thermal stresses, where typically two or more factors act simultaneously. The most common degradation mechanisms are: contamination, blade pitting, opening of the gap between rotor and stator, and erosion of the leading and trailing edge of the gas turbine blade. Degradation is mainly caused by scale, corrosion, hot corrosion, oxidation, erosion, abrasion, particle melting and mechanical degradation.The research that has been carried out in turbine blades are based on visual observations, optical microscopy, scanning electron microscopy, fractography analysis, metallography, structural analysis and hardness tests. This work proposes a methodology to carry out numerical analysis of the nozzle blade of a gas turbine. The investigation will perform a scan to obtain a 3D model using reverse engineering. Reverse engineering technology can be used to assist in the manufacture of replacement parts when the original parts inventory is depleted. The numerical analysis with the point mesh of the nozzle blade and static stress modeling in ANSYS were made. The main objective of this work is to know the maximum and minimum values at which a turbine blade is operating and located the area of the gas turbine blade is more prone to failure due to different wear mechanisms and to the stresses that the blades are subjected during the operation of the gas turbine.

Blades, Gas turbine, ANSYS, Static modeling

Viable model of the Mexican legal system: A Transdisciplinary Systemic Vision

Modelo viable del sistema jurídico Mexicano: Una visión sistémica transdisciplinaria

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Abstract

In Mexico, the Legal System contemplates a broad set of agencies responsible to the justice imparting, therefore for its management it is necessary to have a systemic model that allows to contribute, in a more adequate way, to the entire set of subsystems; in such a way that the institutions responsible to administering justice are capable of accurately and expeditiously determining the results and conclusions in the areas responsible to the administration of justice. The implementation and application of models with a systemic approach, such as Viable Systems Models, allow us to respond to many problems at different integrated levels of abstraction of sociotechnical systems, such as those responsible to justice administration in Mexico. This research work purpose is to design a Viable Model for the Mexican Legal System, which will allow to provide justice delivery systems with a tool that streamlines, and facilitates the management, control and handling of the information used in the National Legal System. The systems approach application in the design of viable systems allows to unite different expert's views to give a comprehensive response to the analyzed cases.

Legal System, Viable System Model, Sociotechnical Systems

Simplified nonlinear rotational inertia model for the simulation and analysis of the characteristics of an unconventional vawt type wind turbine with variable pitch

Modelo de inercia rotacional no lineal simplificado para la simulación y el análisis de las características de un aerogenerador de tipo vawt no convencional de paso variable

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Abstract

This paper shows a double multiple stream tube model coupling to a rotational inertia model. It allows the simulation and analysis of the characteristics of an unconventional vertical-axis wind turbine (VAWT) with Variable Pitch. This implementation permits to employ a stationary response of the wind turbine calculated across the main characteristics of output torque based on experimental aerodynamic coefficients and the Reynolds at each station, can be transformed into a transient response by a simplified non-linear rotational inertia dynamic model to predict the start-up, idle, stabilization and sudden stop of our device.

VAWT, Variable pitch angle, Multiple stream tube model, Rotational inertia

Applying the use of technologies in preventive measures against the COVID-19

Aplicando el uso de tecnologías en medidas preventivas ante el COVID-19

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Abstract

This article carries out applied research for the use and integration of Technologies in the implementation of an autonomous system, which allows to ensure compliance with preventive health measures when entering public places. This, in order to contribute to the reduction of infections in the face of the COVID-19 pandemic. The main objective of the study is to glimpse the application of technologies to provide effective and efficient mechanisms that favor the monitoring of health measures for the benefit of health. The "COVID-19 Preventive Robot" Project is presented, composed of four functional modules that allow temperature taking, the supply of anti-bacterial gel, the control of entry (passage) and the maximum capacity of people. Initially, the problem is exposed and the research study is proposed together with the prototypes of each module. The Technologies used throughout the project are briefly described below. Finally, as a result, the functional schemes are deployed using the Fritzing software and the source codes in Arduino IDE developed for the automation of the mechanism of each of the proposed modules. From the above, it is concluded that the Technologies used in the project "Preventive Robot of COVID-19" empower automation and autonomy to the process of preventive measures foreseen in the access to crowded physical places reducing the latent risk of contagion.

Prevention, Technology, Pandemic

Fault diagnostic proposal for an induction motor using combined models of parity equations

Propuesta de diagnóstico de fallas para un motor de inducción utilizando modelos combinados de ecuaciones de paridad

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Abstract

This work consists of a combined technique of two residual arrays for additive and parametric detection faults in a three-phase induction motor based on parity equations applied through a hybrid model with stable state behavior in the DQ reference frame. The main idea of this technique is to approximate the nonlinear model of induction motor to the linear model of DC motor, during the synchronous reference frame, with the intention of generating a significant change in the residues obtained by the combinations of parity equations in presence of faults. On the other hand, a more simplified and reliable analysis is used in the detection of the fault. Final mathematical analysis can be validated using a reliable simulation environment that enables interaction with power electronics, motor control, data analysis, numerical calculation, and dynamic system model design such as the software of PSIM or MATLAB.

Diagnostic, Fault detection, Induction motor

Vibration analysis in a rotodynamic system

Análisis de vibraciones en un sistema rotodinámico

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Abstract

In this paper, a study of vibrations for a rotodynamic system connected to a three-phase induction motor with mass imbalance is analyzed. The study is carried out using a test bench interacting with different scenarios of mechanical speed and rotational mass imbalance and translational mass imbalance. The critical rotational mass imbalance causes maximum vibration, then vibration and current signals are measurement in the rotodynamic and motor system respectively, which are processed and analyzed in the frequency domain. The operation scenarios of the rotodynamic system focus on the parametric variation as, separation of bearing, inertial mass unbalance and speed of the induction motor. The instrumentation for data acquisition is made up of accelerometers, current meters, frequency inverter. Open programming in LabVIEW is used to process the signals. Finally, the measured vibration, the faults found, the problems of the faults and the operation of the process are explained.

Rotodynamic system, Out-of-phase, Unbalance

Disposal of mouth covers, masks or respirators, after they are used, to minimize the environmental impact and contages by covid 19

Disposición de cubre bocas, mascarillas o respiradores, depués de ser utilizados, para minimizar el impacto ambiental y contagios por covid 19

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Abstract

This article addresses the problem that is being generated by the use of mouth covers, gloves and masks used as protection against covid 19. After more than a year in a pandemic, the demand and waste of these protective implements has increased exponentially, which is why it is necessary to dispose of these sanitary wastes safely, to guarantee community health and the integrity of the environment.On the contrary, improper handling of such a volume of these wastes can have a rebound effect, both on people's health and on the environment.The objective of the research is to properly dispose of these wastes, through the use of special containers for this type of waste, as well as the proposal with the government and companies that use ovens for the production of their products, so that with the necessary measures They could dispose of this type of waste as raw material for their furnaces, since these companies have standards that they comply with to regulate the Co2 emissions that they emit into the environment, and thus minimize the impact that these wastes bring to the environment.

Waste, Environment, Disposal

Proposal to treat leachate from the open-air dump of the Municipality of Zacatecas

Propuesta de tratamiento del lixiviado proveniente del tiradero a cielo abierto del Municipio de Zacatecas

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Abstract

In this work, a feasible proposal is generated for the treatment of leachate from the municipal dump of the city of Zacatecas. Solid waste disposal sites that were not technically planned are commonly known as "open-air" dumps. These sites are basically lands where municipal solid waste is deposited and accumulated without any technical, sanitary and operational control, as well as the absence of infrastructure works to minimize negative impacts on the environment. The waste that ends up in these final disposal sites is decomposed by the presence of water, forming leachate. Due to the above, different pollutants are produced, which makes proper management necessary to preserve the environment, as well as public health. Current leachate treatment options include recycling, re-injection, on-site treatment, discharge to a municipal water treatment plant, or a combination of several.

Leachate treatment, Garbage dump, Contamination

Implementation of a computer system for life: "Manage your refrigerator Bth-GTR"

Implementación de una solución informática para la vida: El proyecto “Gestiona tu refrigerador Bth-GTR”

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Abstract

This article carries out applied research for the use and integration of technology in everyday life. The main objective of the study is to apply Bluetooth technology in a project called "Manage your Bth-GTR refrigerator" with the use of a sensor, an Arduino card and the development of a mobile application that provides the user with the ability to handle information related to the temperature and humidity of the refrigerator, and at the same time, store and manage the supply of the products. The knowledge society faces the importance of information in any area of life, particularly its usefulness in devices for everyday use, which is critical and indispensable in our day to day. The assumed methodology is divided into two main phases: the analysis of the IT solution and the integration of the Technologies provided for this purpose. Finally, the functionalities of the implemented mobile application are specified. The proposal evidences the opportunity to carry out future studies on the use, application, integration and implementation of new technologies that provide the human being with efficient and useful tools for daily activities.

Daily life, Mobile technology, Bluetooth

Design of edges in contour and half moons from edaphoclimatic parameters, for the endorrheic basin of lagunas de tajzara - ramsar site 1030

Diseño de bordes en contorno y medias lunas a partir de parámetros edafoclimáticos, para la cuenca endorreica de las lagunas de tajzara - sitio ramsar 1030

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Abstract

The collection of water is proposed from the design of contour borders and half moons, green infrastructure measures, to reduce surface runoff and increase the availability of water for vegetation. The contour and crescent ridges have land ridges with a trapezoidal section, which follow the contour lines, to compartmentalize the slope into smaller hydrological units, the ends of which are located on contour lines. With the data of maximum rainfall every 24 hours and parameters of Gumbel's Law modified, the equations of maximum daily rainfall height (hdT), rainfall height for a duration ´´t´´ (htT), and the Intensity Duration Frequency curve (ItT), for a duration of t <2h. Then considering the values of basic infiltration, vegetation cover, soil type and hydrological condition, the curve numbers were determined for different soil moisture conditions, later the separation length (L) between the Half Moons, and the borders was calculated. in contour, which were designed by means of 10 configurations between diameter and height, for the two infrastructures, being in Copacabana Valle, the greatest separation distance.

Infiltration, Crescent moons, Borders in contour

Design proposal for a progressive die

Propuesta de diseño de un troquel progresivo

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Abstract

The objective of this project is to elaborate a design proposal for a progressive die to help reduce the manufacturing cycle time of a metal part in a die-cutting machine and contribute to increasing the number of parts produced.The methodology used to prepare the progressive die design proposal is concurrent engineering, also known as simultaneous engineering or total engineering; it consists of a methodology where the design of the product is integrated into all the necessary processes to manufacture it. (F, 2003); It is the guide of each one of the phases that have been set in the design, such as conceptual and functional design and retail design; all this in order to take into account the requirements, parts, functions, manufacturing and construction to materialize the ideas that are proposed in this.

Proposal, Design, Machine

Active disturbance rejection control of a permanent magnet synchronous generator for wind turbine applications

Control por rechazo activo de perturbaciones de un generador síncrono de imanes permanentes para aplicaciones en aerogeneradores

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Abstract

With sight on maximizing the amount of energy that can be extracted, by a wind turbine, from the wind, this article solves the maximum power point tracking problem for a permanent magnet synchronous generator-based horizontal wind turbine connected to the electrical grid. A three-phase back-to-back converter, which allows a decoupling between the electrical grid and the generator, is employed as an interphase between the wind turbine and the utility grid. Based on the mathematical model in the synchronous reference frame and taking advantage of the differential flatness property the system exhibits, controllers based on the active disturbance rejection methodology are designed, in this work, to track the curve of maximum extracted power from the wind and manage the generated electricity into the grid. At the same time, the phase angle of the electricity generated is synchronized with the phase angle of the electrical grid. Numerical simulations are performed to support the controllers presented in this work.

Wind Turbine, Differential flatness, ADRC

App Design for Teaching Academic English Vocabulary using Spaced Repetition Method

Diseño de Aplicación para la Enseñanza de Vocabulario Académico Inglés utilizando el Método de Repetición Espaciada

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Abstract

In this paper, it is presented a proposal of app for teaching English vocabulary oriented to computer science field, using a spaced repetition method based on SuperMemo 2 (SM-2) algorithm, which allows reinforce the vocabulary acquired in previous studies, and dynamically generate a plan for learning the most appropriated words according to an easiness factor and word practice time interval. Also, an assessment instrument is presented, which can be used for demonstrating the acceptance of the technology throughout measuring use attitude to proposed app and usefulness perception from users. Through this learning way, students from many educational institutions can achieve a better vocabulary retention, which carries to having a better comprehension of academic texts that are required for acquiring more knowledge in their study fields.

Academic english vocabulary, Spaced repetition, Technology acceptance model

AC Home Appliances in a DC Home Nanogrid

Electrodomésticos de CA en una nanorred doméstica de CC

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Abstract

In order to satisfy needs at home, a way of incorporating renewable energy sources, storage devices and home appliances into a Direct Current Home Nanogrid, is shown. This technological option could increase the participation of the end users in the energy market. Currently, the electric system transition from Altern Current to Direct Current systems is easier due the availability of cheapest DC home appliances. Finally, we demonstrate that the energy saving when the DC home nanogridis used, it represents around of 15 %.

Energy Democracy, Direct Current, Efficiency

Redesigning a product: Assembly, manufacture and production strategies

Rediseño de un producto: Estrategias de ensamble, fabricación y producción

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Abstract

In the design of a product, several factors are involved to define it as functional and is also important to clearly state its life cycle. On the other hand, the participation of the client or end user is very important for the approach of the main specification and with the purpose of conforming a product that has ample possibilities of competition in the global market. Looking for the consolidation of a new product, in the present work the redesign of a harvester (case study) was carried out. For the proposal of the new design, the reference framework is based on design for disassembly (DFD) to propose the development of the technical process and design for manufacturing (DFM) to optimize the production process. Is also presented the procedure used to structure the harvester redesign under the approach of production quality improvement and cost reduction, which helped to define a final functional configuration able to be aligned to mass production.

Redesign, New product, Production

Design and optimization of a renewable hybrid system applied in airports

Diseño y optimización de un sistema hibrido renovable aplicado en aeropuertos

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Abstract

This paper shows the development of a methodology for the optimization of a hybrid generation system applied in airports. First, the renewable resources available in the area are characterized, the commercial demand profile of electricity consumption is obtained, and the system configuration is proposed. Later, we proceed to the optimization, where the simulation tool HOMER is used for this purpose. The software can determine the net present cost (NPC) and the cost of energy (COE) of different combinations. With the information obtained, it is possible to find the optimal combination of components to satisfy the load demand at the most affordable cost. The proposed methodology is applied to the General Heriberto Jara Corona International Airport, with the purpose of reducing the costs of electric energy consumption and greenhouse gas (GHG) emissions, considering the aeronautical physical easements established by the International Civil Aviation Organization (ICAO). Finally, the profitability of the optimized renewable system is evaluated, thus contributing to sustainable development of the airport.

Airport, Optimization, Renewable hybrid system

Implementation of improvement actions in a company that produces frames and moldings

Implementación de acciones de mejora en una empresa que produce marcos y molduras

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Abstract

This research was developed in a company that manufactures frames and moldings in the production and quality area and addresses the need to implement improvement actions due to rework and low production in the patching workstation, derived from flaws such as poor patching, bump, bubble and porosity in the products. Currently there is a production record of 1.75% and rework of 19.25% in the first hours of the working day. The objective was to implement improvement actions, through the 8D's methodology, to reduce rework and increase production. The procedure implied forming a team; defining the problem; implementing containment actions; identifying and verifying the root cause; determining permanent corrective actions; identifying and implementing permanent corrective actions; preventing the recurrence of the problem and/or root cause, and acknowledging the effort of the team.It contributed with the increase in production and reduction of rework in the patching workstation, thus fulfilling the objective of this research.

Improvement actions, Implementation, 8D's

Proposal for an animatronic to promote the teaching of the nahuatl language in the Huauchinango region

Propuesta de un animatrónico para el fomento de la enseñanza de la lengua náhuatl en la región de Huauchinango

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Abstract

Today the indigenous groups of the Sierra Norte de Puebla no longer want to practice their mother tongue, due to the discrimination and aggressions they suffer in the street, school, city, work, etc., they prefer to communicate in Spanish. Communication in the indigenous language of the region is very minor, that is, it is only spoken by adults, it is also mixed with words from the Spanish language. The present project aims to develop a proposal for a prototype based on an animatronic puppet to support the learning of the Nahuatl language, through practical activities such as greeting, numbering, parts of the human body, everyday words, sentences, stories, legends, stories and dialogues, so that any infant or young person interested in learning the language in a dynamic way. The animatronic is presented with indigenous features and clothing, as well as movements such as the head, mouth, and eyes. With the development of this project, it will contribute to the rescue, dissemination, preservation, development, teaching and learning of the Nahuatl language of the region.

Animatronic, Nahuatl, Huauchinango región

Meteorological patterns recognition using Artificial Neural Networks programmed with the Swish activation function

Reconocimiento de patrones meteorológicos utilizando Redes Neuronales Artificiales programadas con la función de activación Swish

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Abstract

Artificial neural networks are a set of tools that are widely used for the information classification. Its expansion within artificial intelligence has been due to its use in the Machine Learning area. A fundamental part of the artificial neural networks algorithm is the so-called activation function, the above because it is the part that triggers the process as a whole and due to its result the neuron/perceptron sends its outputs. Back-propagation activation function of an artificial neural network is also described; this is artificial neural network with a simpler functioning whose adaptation has made it especially attractive to pattern recognition; also, a different algorithm such as Swish is introduced. As part of the pattern recognition study, three wind classifications present on the Mexican Republic Atlantic coast are formed, each group is made up of graphic files referring to meteorological maps with wind indicators in order to feed the network and as new maps are generated, the Artificial Neural Network will be an aid in the meteorological patterns detection.

Artificial Neural Network, Swish, Pattern recognition

Preliminary development of a system to manipulate and monitoring a flexible manufacturing cell

Desarrollo preliminar de un sistema para la manipulación y monitoreo de una celda de manufactura flexible

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Abstract

Flexible Manufacturing Systems (FMS) are more commonly used in modern industry due to the benefits offered, such as: low-cost production, easy adaptation to elaborate different products according to the client necessities. A Flexible Manufacturing Cell (FMC) has two or three workstations; moreover, a system to control and manipulate de process. Industrial communications protocols are used to communicate workstations of a FMC, such as: Profibus, Ethernet, Device Net, etc. For the case of not have such protocol to communicate devices, due to an incompatibility between protocols, an alternative solution has been implemented in order to perform the same function. In this work, is presented the obtained results of a preliminary development of a system capable to manipulate and monitoring a flexible manufacturing cell using a communication card using a microcontroller to communicate a HAAS VF2 machining center and a FANUC robot M6iB. Moreover, an user interface is developed using LabVIEW with a web cam, which communicates with the microcontroller via RS-232, with the capability of monitoring the system via internet.

Flexible Manufacturing System, Microcontroller, LabVIEW

Obtaining particulate agglomerates from the recycling of multilayer containers and low density polyethylene

Obtención de aglomerados particulados a partir del reciclaje de envases multicapa y polietileno de baja densidad

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Abstract

Currently, the interest and the need to innovate new materials through the use of waste materials has grown, which meet similar or improved physical, chemical and mechanical characteristics of the materials they will replace. During the present investigation, Multilayer Containers (EM) and Low Density Polyethylene (LDPE) were collected, particulate agglomerates with different proportions were obtained, the apparent density, water absorption, mass, volume, heat behavior, angle were determined. contact, machining and compression tests. With the objective of evaluating the proportions p / p in the properties. The advantage of the material obtained is that they do not generate waste and are 100% recyclable. The 90:10 ratio is the one that could be used in the construction industry as false walls, with a modulus of rupture of 52.7 N / mm2 and a compressive stress of 32.9 MP, because it can be machined without altering its characteristics. -physical houses; While the 85:15 and 80:20 proportions, since they cannot be machined, could be used as a floating support with a photocatalyst catalyst, due to the fact that these agglomerates have dimensional stability when in contact with water.

W/w ratio, Agglomerates, Compresion test

Prototype simulation for the measurement of energy consumption in watts for alternating current systems

Simulación de prototipo para la medición del consumo de energía en watts para sistemas de corriente alterna

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Abstract

This research deals with the simulation of a prototype for the measurement of energy consumption in watts for alternating current systems, the purpose is to validate the proposed circuit for its implementation and in turn it provides a low-cost and easy-to-use measurement option for the public generally in their homes. The development of the prototype simulation will be carried out using the Arduino development environment with the components, Simulino Uno and the current sensor ACS712ELCTR-05B-T, from the Proteus Software. The current signal will be taken by the sensor to later pass it through a conditioning stage so that it is received by the microcontroller, where the programming will be carried out so that with the value obtained and the configuration of the voltage value, the power calculation in watts can be made, which will be displayed on a virtual monitor for viewing. This proposal seeks a device that performs the calculation of energy consumption in Watts that can lead the user to quantify and take better advantage of the use of electrical appliances or devices, and thus reduce the cost of their bill.

Simulation, Arduino, Energy consumption

Design of the Operation of a Rotating Machine for the Acquisition of Multi-view Stereoscopic Images for the 3D Reconstruction of Objects

Diseño de la Operación de una Máquina Rotativa de Adquisición de Múltiples Vistas de Imágenes Estereoscópicas para la Reconstrucción 3D de Objetos

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Abstract

This work presents a machine to locate a stereoscopic camera in different positions around an object to acquire a sequence of images that allows the reconstruction of such object through artificial vision algorithms. The GEMMA guide was used to define the modes of operation of the proposed machine. In addition, the mechanical and electronic elements that make up the machine and the programming logic for its control with PLC were also defined.It was demonstrated using a graphical interface that the mode of operation of the machine is carried out satisfactorily. Additionally, this work presents synthetic image results to represent a sequence of images acquired from different points of view considering different levels of elevation of the camera, showing the type of results obtained with the proposed machine.

Automation and control, Image acquisition, Multiple views, Stereo camera, 3D reconstruction

Design and simulation of Dynamic Voltage Restorer (DVR) supported by solar panels

Diseño y simulación de un Restaurador Dinámico de Voltaje (DVR) soportado por paneles solares

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Abstract

This work presents the design and simulation of a Dynamic Voltage Restorer (DVR) to mitigate power quality problems such as voltage sags and swells at sensitive loads to these types of disturbances, but with a compensation topology using one the most popular of the renewable energies, currently employed, which is photovoltaic solar energy. The DVR must operate with a control loop, monitoring the voltage at the load side and generating the voltage for compensation during the disturbances. The energy is obtained, from an array of solar panels for the injection of active power. The control algorithm discussed in this article is based on the Clark and Park transformations to generate the required signals for voltage compensation, these mathematical techniques allow fixing the variables and hence simplicity for the controller design. The results of the simulation in MATLAB/Simulink are used to show the performance of the proposed topology with symmetrical voltage sags in the distribution system.

Power quality, Solar energy, Voltage sag

Electronics Engineering virtual laboratory for COVID 19 pandemic

Laboratorio virtual de Ingeniería Electrónica para la pandemia de COVID-19

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Abstract

Due to the COVID 19 pandemic, many aspects of everyday life change how Higher Education Institutions work. The teaching of subjects containing laboratory practices had to adapt to remote working conditions. As a response, we adopted the software Proteus to develop laboratory practices in electronics engineering. We present Some conventional face-to-face practices adapted to be developed remotely in Proteus during this contingency by COVID-19. We present examples of laboratory activities applied to the Control area of the Electronic Engineering study program of the School of Chemical Sciences and Engineering of the Autonomous University of Baja California (UABC) in 2020 and 2021. To develop these laboratory practices, the Collaborate tool of the Blackboard platform, which is the institutional virtual classroom of the UABC, was used as a virtual classroom. These combined tools provide the student with most of the competencies obtained in the laboratory but are now under pandemic conditions. They also serve as a basis to continue applying them in distance education.

Virtual Laboratory, Electronics, Proteus

Energy sustainability alternatives for the home for the elderly maty, in the community of Villa Juárez, Aguascalientes

Alternativas de sustentabilidad energética para el asilo hogar del abuelo maty, en la comunidad de Villa Juárez, Aguascalientes

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Abstract

Base on the objectives of the 2030 Schedule, for sustainable development for the benefit of people and the planet and, with the visionary commitment of the Universidad Tecnológica de Aguascalientes to contribute to the sustainable development of the various sectors, this article presents five alternatives of energy sustainability for the benefit of the Hogar del Abuelo Maty nursing home, located in the community of Villa Juárez, municipality of Asientos in the state of Aguascalientes. The document describes the context of this Institution, its energy consumption situation, the dynamics and operating status of equipment that requires electricity for basic healthcare services. Under a sustainability approach, the objective of this work is to provide resilient energy alternatives, aimed at generating, saving or efficient use of energy and caring for the environment. Following the applied research methodology, knowledge of photovoltaic systems allows the development of alternatives to meet a need for social impact. The main contributions derived from any of these are the positive impact generated in reducing the cost of energy consumption, caring for the environment and adult care services provided with clean energy.

Sustainability, Energy, Nursing homes

Website with thematic maps to consult agricultural production in Hidalgo State

Sitio web con mapas temáticos para consultar la producción agrícola en el Estado de Hidalgo

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Abstract

In Hidalgo State, agriculture is one of the main economic activities. In order that, in a large part of the territorial extension different types of crops are sown, among them and according to the volume of production 7 stand out, mainly: Green Alfalfa, grain corn, green forage oats, grain barley, green forage corn, maguey pulquero and orange. (SIAP, 2020). However, there is a need to promote commercialization due to the facts that ignorance of productivity prompts there are no suppliers interested in acquiring the different products, which generates losses, sales at very low prices and impacts the income of farmers.Due to the notable demand to publish the products that are grown in Hidalgo, the main objective of this project is to develop a tool that allows showing the agricultural production of Hidalgo State, through a website and thematic maps.As a result, a website was developed where production by municipality can be consulted and visualized on thematic maps.

Website, Thematic Maps, Agriculture

Design of an app for smartphones for the teaching-learning of basic algebra through Algesquares

Diseño de una app para smartphones para la enseñanza-aprendizaje de álgebra básica a través de Algesquares

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Abstract

Algesquares is a different method from the traditional one, for the teaching-learning of Basic Algebra, it is inspired by the algebraic cards of Caleb Gattegno as well as other similar methods. The present work aimed to present the design of an application that works as a tool for students and teachers, seeking a dynamic experience between students and educators. Algesquares works with colored tiles, some positive, some negative, and a "play" board. Students will be protagonists of their own learning, advancing through different levels of difficulty, unlocking new challenges, accumulating points and keeping track of their progress; while the teachers will be able to carry out individual and general control of the groups under their charge. With this application, it is sought to capture the attention of the student, encouraging students to be self-taught, to be curious and ingenious to play with the tiles, achieving significant learning that will help them solve similar situations.

Algebra, Application, Tool, Teaching, Learning

Distributed generation with a photovoltaic generating plant interconnected to a medium voltage network in the marginalized town of Xbilincoc, Campeche

Generación distribuida con central generadora fotovoltaica interconectada a red de media tensión en el poblado marginado de Xbilincoc, Campeche

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Abstract

In this paper, it is proposed to lay the foundations for the implementation of a Photovoltaic Systems Interconnected onto Network Distribution Systems that benefits the marginalized population of the town of Xbilincoc, Campeche. Through Distributed Generation (DG) it will be possible to direct the electrical energy produced by this plant for its own consumption and / or sale to the electrical company denomined Comision Federal de Electricidad (CFE), depending on the analysis of consideration for services that is most convenient for the producers.The power generating plant will be managed by the fishing cooperative formed by the commissioner and the most active fishermen of the town and the economic resources necessary for its construction and commissioning will be through a financing mechanism granted by a governing body denomined Fideicomiso de Ahorro de Energía (FIDE) and when it has been paid in full, the economic benefits for families will be to ensure that the cost of their consumption of electric energy does not increase, and to strengthen the economic development of the town of Punta Xen by administering the resources obtained from the sale of electrical energy to the CFE.

Distributed Generation, Self-consumption, Marginalized population

Development of stability control applied to a non-linear mechanism

Desarrollo de control de estabilidad aplicado a un mecanismo no lineal

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Abstract

This article presents the development of a stability control applied to a non-linear mechanism based on the principles of optimal control in order to offer a more appropriate alternative to the nature of non-linear systems. The developed control is based on the system called a rocker with engine and propeller which, despite not being a faithful model, represents one of the peculiarities of real non-linear systems such as unmanned aerial vehicles and that peculiarity is stability. For the realization of this control, the mathematical model of the rocker system with motor and propeller is considered as a starting point, which provides the mathematical equations and parameters necessary for the development of the control. Based on the information obtained from the mathematical model and the control that derives from it, simulations are developed that allow an analysis of the behavior of the control developed in the selected structure. In addition to this, we use our own computer tools to carry out this type of work, such as Matlab and Simulink, through which it will be possible to carry out the necessary models and simulations.

Control, Optimal, Stability

Labor inclusion analysis for people with disabilities in Huauchinango Puebla

Análisis de inclusión laboral para personas con discapacidad en Huauchinango Puebla

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Abstract

In Mexico, people with disabilities have difficulties to fully exercise their rights, due to social and cultural obstacles because of their physical, psychological and/or behavioral conditions; public spaces are not planned according to their needs and, in addition to this, most of them suffer a double discrimination because gender, socioeconomic status, race and ethnicity can accentuate this situation. In the Municipality of Huauchinango it is not known what are the employment opportunities for people with some type of disability, so in the following work an analysis was made based on an exploratory type of research, taking as a source of information the database of companies registered in the National Chamber of Commerce (CANACO) of Huauchinango, Puebla and surveys were applied to a representative sample of registered companies, which reflected that 33% of the companies have staff with disabilities. 60% of people who are hired by a company are in the age range of 26 to 40 years old and only 40% are between 18 and 25 years old. 90% of the companies are willing to hire people with disabilities and 81% of the companies know the benefits of hiring people with disabilities.

Business, Employers, Disability, Employment opportunity

Eficiencia energética con Generación Distribuida Fotovoltaica (GD-PV); cafetería de la Facultad de Ingeniería de la Universidad Autónoma de Campeche, México

Energy efficiency using Distributed Generation; cafeteria of Engineer Faculty Campeche, Mexico

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Abstract

In the present work, an integral design of the cafeteria located at Faculty of Engineering of Autonomous University of Campeche is carried out. Four scenarios of Photo Voltaic (PV) generation have been studied. A 14 PV modules arrangement of 440 each, with azimuthal angle of 180º and a slope angle of 15º; the other is similar to the previous, but the slope angle was 19.85º. The following was a 24 PV modules arrangement of 440, with an azimuthal angle of 218º and a slope angle of 15º. The last arrangement consists of 24 PV modules arrangement of 440, with azimuthal angle of 218º and a slope angle of 19.85º. Where all of them are associated with the economic aspect to obtain greater efficiency of the plant with minimum recovery time. The free software System Advisor Model (SAM) developed by the National Renewable Energy Laboratory (NREL) has been employed. Complete seasonal analysis has also been performed considering Gran Demanda Media Ordinaria en México (GDMO de CFE in Mexico) within the period January 2020 to March 2021. The best results are energy generation 17,570 kWh. Capacity factor 19%. Energy performance 1,671 kWh/kW. Performance relation 0.74. Leveled cost 5.39 ¢/kWh. And return on investment in 0.6 years. The GD-PV plant prevents the emission into the atmosphere of 778.85 kg of CO_2 equivalent.

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

Vermicompost production monitoring and the Internet of Things

Monitoreo de la producción de lombricomposta y el internet de las cosas

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Abstract

This article presents the results obtained by implementing an application with an architecture based on the Internet of Things, applied to the production of red California earthworm, using an interface with which it is possible to monitor and collect data on temperature, humidity and PH with sensors that allow recording the necessary data. For the implementation, an experimental module was built in which the temperature and humidity variables were monitored, with the data obtained from the sensor measurements, the constant changes in temperature (between 20 to 29 ºC) and humidity (from 35% to 50%) were observed, This information made it possible to keep a weekly plan in which irrigation, aeration and compost mixing were attended to in a timely manner, reducing time, cost and human labor in the production of the red California earthworm and maintaining the reproduction of the red California earthworm in optimal conditions

Vermiculture, Eisenia foétida, Humus, Internet of things

Lean Manufacturing: Efficiency improvement application in multi-product area of the aerospace industry

Manufactura esbelta: Aplicación de mejora de la eficiencia en área multiproducto de la industria aeroespacial

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Abstract

This research addresses the problem of leveling workloads in a multi-product final assembly area. In which it was found that 27.4% of the time is used for set up and the current distribution presents areas of opportunity. The target was to implement improvement actions to make use of resources more efficient in the production process in the aforementioned area through Lean Manufacturing tools. The results obtained consist of eight products generated with the support of lean manufacturing support tools such as SMED, Workload Balancing and MUDA waste identification, achieving important results among which productivity in the area stands out from 109% to 125%, as well as a reduction in set-up time from 17 min to 4.4 min.

Lean, Productivity, Kaizen, Manufacturing

Ergonomic culture level in managers and supervisors in manufacturing centers

Nivel de cultura ergonómica en supervisores y alta direccion en una empresa manufacturera

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Abstract

The purpose of the following project is to measure the level of ergonomic culture of a manufacturing company that is dedicated to the development of cables, fiber optics, cabling systems and related services for the automotive sector and cable systems; To carry out this study, the ergonomic culture questionnaire in work centers (CCE-T) was used as a tool and it was applied to a sample of 26 people between supervisors and managers. This questionnaire made it possible to measure the level of development of ergonomic culture in work centers from the perspective of supervisors and senior management (managers) and to know their perception of the development and application of ergonomics in their company. Therefore,

Ergonomic Culture, Management, Evaluation

Virtual communications laboratory as a tool for the subject of selected telecommunications topics

Laboratorio virtual de comunicaciones como herramienta para la asignatura de temas seleccionados de telecomunicaciones

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Abstract

The pandemic has forced to abandon classrooms, replacing them with virtual learning spaces, generating various problems due to not being able to interact physically. These problems increase even more in subjects with laboratory hours. This article addresses the proposal to create a virtual laboratory for subjects related to the telecommunications area, particularly those that include the topic of microwave network links. Radio Mobile software was used for the creation of the laboratory, which is freely accessible. The objective of this research is to obtain information that allows visualizing if the use of this web tool contributes to the learningof the students, allowing to simulate the main practices that can be carried out in a laboratory or in physical form. The software was used during the teaching of a course in the subject Selected Topics in Telecommunications, through the action-research method, obtaining favorable results, achieving a better academic performance in the matter.

Educational software, Virtual lab, Telecommunications

TIC applied to collection management. SOFIPA CORPORATION. Case study

Las TIC aplicadas a la gestión de cobros. SOFIPA CORPORATION. Estudio de caso

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Abstract

The developed project aims to automate and streamline the collection management processes of the SOFIPA CORPORATION Company through a web system and a mobile application that provides support to managers and the collection coordinator.The system has modules for portfolio recovery, managers, agreements, settlements, visit scheduling and the option to print reports of the activities carried out by managers.The mobile application is installed on 2 types of devices: mobile point of sale (mPOS) or smart phones, both must be permanently connected to the Internet. With them, the managers who visit the clients assigned by route and register their payments; once updated in the system, they will be able to print receipts on portable USB printers.This project contributes to streamline and automate processes and increase response capacity, mainly in the recovery of portfolio of delinquent clients. The Web system was based on the SCRUM agile development methodology, the SPRING framework was used for the development, the mobile development ide was Eclipse and as a MySQL database manager.The purpose is to guarantee efficient work.

Web system, Debt recovery, Payment reconciliation

Microservices architecture as a viable option to support the organic growth of PYMEs

La arquitectura de microservicios como una opción viable para apoyar el crecimiento orgánico de las PYMEs

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Abstract

Generally, computer developments for business activities are focused on systematizing data processing. Activities that as the company grows or changes, they also undergo changes.However, computer systems are not easy to modify when they are done through traditional methodologies.The microservices architecture is characterized by being a modular development, specifically it is divided into independent services that communicate with each other through APIs. These services run independently and autonomously, so if an PYME changes its needs, only new services are added that can interact with the existing ones. Therefore, the ability to respond to changes is increased.Objective:General: Implementation of a Computational System based on Microservices for the management of a PYME.Specific: Identification of horizontal and vertical scalability needs, Identification of technologies and services. Development and testing of services, Coupling and testing.Methodology used: SCRUM is designed for projects with a high level of uncertainty. In this project, it was not known at the outset which technologies should be implemented.Contribution: Serve as a guide in the identification of viable technologies to implement microservices, focused on scalability in PYMEs.

PYME, Microservices, Scalability

Analysis of power quality in photovoltaic systems interconnected to the grid

Análisis de calidad de la energía en sistemas fotovoltaicos interconectados a la red

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Abstract

A lot of authors are concluded that photovoltaic systems distort the waveform of voltage and current, the evaluation of these distortion indices is carried out in accordance with IEEE Std 519-2014, equipment sensitive to variations in the voltage wave, are affected in their operation, causing a rise in temperature, a decrease in speed in rotating machines, among others, these variations are accentuated by low irradiance values. In this work, the results of the online monitoring of electrical parameters are shown, when connecting a network analyzer Hioki® model PQ3198, class A, in the terminals of the alternating current side of the Fronius® inverter, SYMO 10.0-3 208 / 240V of a 10 kWp commercial photovoltaic system and a GOODWE® inverter, model GW-2000-NS with 220 output voltage in a 2 kWp home photovoltaic system; The measurement period was one week, the analyzer was programmed to sample every 5 minutes. Finding effects on voltage and current harmonics greater than 5% established in the IEEE 1100-1999 standard, but less than 10% established in the Mexican legal framework, in accordance with CFE Specification L0000-45 "Permissible deviations in waveforms of voltage and current in the supply and consumption of electrical energy" the values of the harmonic distortion indices have a variation of 8%.

Photovoltaic systems, Disturbances, Power quality

Proposals to improve the coaxial cable assembly process in an aerospace company

Propuestas para mejorar el proceso de montaje de cables coaxiales en una empresa aeroespacial

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Abstract

For any company it is of utmost importance to have quality processes and products to deliver to its customers and that they are satisfied with them. In the same way, take care of your economy and the expenses that you have for this. This project revolves around the quality that is presented in the products. In the company under study there was a problem specifically in the area of coaxial cable assembly, in which a considerable number of defects were identified from the electrical and continuity test. To solve the problem, the objective is to develop an improvement proposal that helps to minimize the defects found in the aforementioned area. Regarding the applied method, the modified Six Sigma DMAIC procedure was followed. Statistical tools were used to analyze the results obtained, to have evidence of their behavior for the problem posed and that the best decision could be made to improve the coaxial cable assembly process. Having as a main result a proposal to improve the coaxial cable assembly process which will significantly reduce the defects generated in the electrical and conductivity test.

DMAIC, Continuous improvement, Quality

Application of finite automates for the light point trace in a solar tracking positioning system on two axes

Aplicación de autómatas finitos para el rastreo de punto luminoso en un sistema de posicionamiento para seguimiento solar en dos ejes

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Abstract

This article presents the application of finite automata for light point tracking in a two-axis solar tracking positioning system.The finite automaton sets the rules of reactive control when the ultraviolet radiation sensor is activated, estimating the averages of the signals sent by the photoresistors determines the angle of greats light incidence and codes the rules of motion to which the vertical axis and the horizontal axis must conform.The reactive control algorithm for the automaton is programmed in a C++ language and implemented in an Arduino UNO microcontroller. The validation of the results is carried out by manipulating the prototype of a two-axis solar tracking system that uses a photovoltaic solar panel as a collector.The results also show that the application of finite automata solves the problem of deviations between the positioning of the tracking system and the incidence of the sunbeam on the collector since it includes a self-adjustable function that verifies the correct orientation of the positioning system avoiding manual adjustments and mechanical recalibration alignments, this extends the service life of the system monitoring by reducing wear on the servomotors.

Finite automates, Positioning on two axes, Light point trace, Solar tracking

Prototype of technical boxes to increase productivity in native bee meliponaria (Scaptotrígona)

Prototipo de cajas técnicas para aumentar la productividad en la meliponaria autóctona (Scaptotrígona)

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Abstract

Obtaining different products derived from honey has become relevant in recent years in the State of Puebla and considering that Mexico is the fifth largest exporter of honey in the world, the need arises to generate breeding alternatives to improve the productivity of native bees; being the Tetragonisca Angustula bee the domesticated species of the northern region of the State and the main producer of sweet and viscous substances for human consumption. The general objective of this work is based on the design and construction of the physical prototype of a technified box model, making use of materials extracted from the region that are characterized by having various physical and mechanical properties adaptable to environmental conditions to favor the reproduction of the aforementioned native bee and improve the productivity rates of the different hive communities that make up the established meliponaria; The specific objectives are structured in 3 Phases; Phase 1 determines the optimal dimensions of the model considering the different areas that make up the nest, later it was designed using SolidWorks technological software; Phase 2 develops a qualitative study of the properties of the types of wood in the region considering the environmental characteristics for the reproduction of bees, likewise includes a quantitative analysis through a logistical intervention to include the variables that intervene in the generation of costs to acquire materials; Regarding Phase 3, the physical manufacture of the prototype is presented. The technified box will provide the Meliponarians with a means of safe housing, suitable to increase the reproduction of native bees; increased honey productivity in the region and providing a utility model for regional economic growth, based on operations (breeding and management) typical of Meliponiculture.

Meliponiculture, Bees, Prototype, Technified Boxes

Value chain design to open a recycling plant in the municipalities of Huauchinango-Xicotepec, Puebla

Diseño de la cadena de valor para abrir una planta de reciclaje en los municipios de Huauchinango-Xicotepec, Puebla

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Abstract

At present, the integral conservation of the environment represents one of the concerns with the greatest impact in the social sphere because the preservation and management of the environment are directly interrelated with the different productive activities that contribute to the economic and family well-being of the individuals.With population growth, the generation of urban solid waste (RSU) has increased, causing various problems that affect health, pollution and image aspects of urban sites, for this reason, it seeks to put into practice viable alternatives that lead to designing efficient recycling processes for the transformation of solid waste and the protection of natural resources located in the region and the area of influence. The exposed research develops a value chain prototype for the opening of a recycling plant making use of the Lean Manufacturing technique called VSM proposed for two production lines of MSW obtained from a recycling system of PET, cardboard and paper implementing a work methodology developed from this improvement,later a design of the physical elements (machinery) was elaborated using SolidWorks technological software; Thus, it is also concisely shown the benefits that it will bring to sustainable development and the contribution to ODS 12 through community intervention and the generation of employment sources with the creation of the recycling plant in the proposed municipality.

VSM, Recycling Plant, Prototype, Value Chain

Biogas Production, through low-cost tubular system for energy in the Tlalmanalco municipality

Producción de biogás, por medio de sistemas tubulares de bajo costo, para la generación de energía en el municipio de Tlalmanalco

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Abstract

Biogas is a renewable biofuel product of anaerobic digestion, of the decomposition of organic matter (biomass) generating methane (CH_4) with high energy value that represents 50 and 75% gas, it is an excellent ecological alternative in energy production, in order to take advantage of the biogas production from human and animals generated feces in the municipality of Tlalmanalco in the State of Mexico, a theoretical study was carried out in order to verify how feasible it is to implement a system of tubular biodigesters of low cost favoring the community with the lowest resources, as well as reducing the environmental impact of CO_2 emissions.

Tubular biodigester, Fecal matter, Energy systems, Biogas, Municipality of Tlalmanalco

Ion exchange of heavy metals using a modified zeolite filter integrated into a prototype autonomous water purifier (AWP) on a community scale

Intercambio iónico de metales pesados mediante un filtro de zeolita modificado integrado en un prototipo de depurador de agua autónomo (AWP) a escala comunitaria

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Abstract

In Latin America and the Caribbean, the second leading cause of death is from diarrheal diseases. The main causes come from the consumption of water contaminated mainly by *Escherichia coli (E. coli)* and heavy metals, both associated with toxicity and bioaccumulation in living beings. In this chapter we study the exchange of ions of mercury (Hg^{2+}), lead (Pb^{2+}), cadmium (Cd^{2+}) and copper (Cu^{2+}) from aqueous solutions on an unmodified and modified clinoptilolite-K zeolite. To validate a prototype of the Autonomous Water Purifier (AWP) with the integrated zeolite filter, which helps solve problems in marginalized communities where they do not have access to drinking water, electricity and suffer from water-borne diseases. For this, adsorption and removal tests were carried out at different concentrations from 20 to 100 mg/l of heavy metals in aqueous solution with a certain amount of unmodified and modified zeolite. The recorded data represented by the Langmuir isotherm show that the metal ions Hg^{2+} and Cu^{2+} were exchanged very slightly, on the other hand, the metal ions of Pb^{2+} and Cd^{2+} were exchanged on the zeolites in greater quantity than the previous ions.

Heavy metals removal, Water purification, Water treatment, Zeolite

Bifunctional catalysts applied to produce biodiesel from waste cooking oil

Catalizadores bifuncionales aplicados a la producción de biodiésel a partir de aceite de cocina usado

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Abstract

This work aims to present the analysis of the catalytic performance of Fe_2O_3/CaO as a bifunctional catalyst in the production of biodiesel from waste cooking oil. The clamshell was used as a source of calcium oxide by calcination. The catalyst was characterized by Thermogravimetric analysis and Differential scanning calorimetry (TGA-DSC), X-ray diffraction (XRD) and Inductively coupled plasma atomic emission spectroscopy (ICP-AES). The catalytic tests were conducted at 55 °C, the methanol:oil ratio was 12:1, amount of catalyst of 6%wt and reaction time of 5 h. The content of methyl esters in the produced biodiesel was >98% and was found to fulfill the specifications of European Norm UNE-EN 14214.

Biodiesel, Waste cooking oil, Clamshell, Bifunctional, Transesterification

Biodiesel production as an alternative to reduce the environmental impact of University food courts

Producción de biodiesel como escenario alternativo para mejorar el desempeño ambiental de cafeterías universitarias

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Abstract

The objective of this work was to assess the environmental impacts of producing biodiesel by heterogeneous and homogeneous catalysis. The raw material for the process was the waste cooking oil (WCO) generated at 27 food courts of Autonomous University of the State of Mexico. The study was conducted by applying Life Cycle Assessment methodology and the environmental impacts were calculated with the SimaPro 9.1.0.11 PhD software with the Ecoinvent database. The method was CML-IA base line C3.06/EU25. The assessed impact categories were: Abiotic Depletion Potencial (ADP, elements), Abiotic Depletion Potencial (ADP, fossil fuels), Global Warming Potential (100 years) (GWP), Ozone Layer Depletion (ODP), Human Toxicity (HT), Freshwater Aquatic Ecotoxicity (FWAE), Marine Aquatic Ecotoxicity (MAE), Terrestrial Ecotoxicity (TE), Photochemical Oxidation (PO), Acidification (A) and Eutrophication (E). In addition, end point environmental indicators were also calculated (Ecosystems Quality, Human Health Damage and Resources Availability) by the method ReCiPe 2016 Endpoint (H) V1.04 / World (2010) H/A. The system boundary enclosed three main stages, WCO collection, pre-treatment and reaction (to produce biodiesel). It was concluded that the reaction stage is the one with the highest environmental impact. In this sense, the highest impact categories were ADP (fossil fuels) (105.56 MJ), GWP (8.91 kg $CO_{2\ eq}$) and MAE (2387.89 kg 1,4-DB $_{eq}$). Nevertheless, it was also found that the GWP for the heterogeneous process is 82.52 % lower than that calculated for the homogeneous process. In addition, the human health damage of the homogeneous process is 1.77 points and is higher than the observed with the heterogeneous process.

Waste cooking oil, Life cycle analysis, Heterogeneous process, Homogeneous process, And bifuntional catalyst

Absorption and reaction of CO_2 in capillaries

Absorción y reacción de CO_2 en capilares

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Abstract

The process of carbon dioxide (CO_2) reduction to value-added chemicals is being extensively studied worldwide. The main purpose is to diminish emissions to the environment, that are associated with global warming, as well as the creation of renewable and sustainable energy sources. In the aforementioned process, the absorption of CO_2 is of paramount importance as well as the reactor where the CO_2 conversion takes place. In this context, the objective of this chapter is to present and analyze the results of the CO_2 absorption in alkaline solutions in capillary reactors. A hydrodynamic study is included in order to establish the operational window of liquid and gas velocities in order to achieve the Taylor flow regime. All experiments were conducted in a capillary reactor (d_c = 3 mm). The studied variables were temperature, NaOH concentration (0-0.75 M) and capillary length (300 and 100 mm). It was found that the volumetric mass transfer coefficient of the absorption of CO_2 in water increases when the temperature decreases, while the CO_2 absorption in NaOH solutions increases directly with temperature. By means of the Ha number, it was concluded that the mass transfer controlled the absorption process when using alkaline solutions.

CO_2 absorption, Capillary reactor, Mass transfer, pH, Reactive absorption

Mechanical characterization of the L4 and L5 lumbar vertebrae

Caracterización mecánica de las vértebras lumbares L4 y L5

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Abstract

Compression fractures in the lumbar region are usually caused by excessive pressure at the level of the vertebral body. The fracture occurs when the vertebral body is crushed, causing the anterior part of the vertebral body to acquire a wedge shape. Bone tissue inside the vertebral body is crushed or compressed. Compression fractures due to trauma may be due to a fall, a strong jump, a car accident, or any other event that emphasizes the spine beyond its breaking point [1].

In a simulation of the fracture in recent studies, loads are applied to real vertebral samples (destructive tests), where both compression loads are fixed on the upper and lower faces of the vertebral body. The literature mentions tests with loads of approximately 8000N emulating a daily accident, so this research aims to obtain a precise model with the use of an optical scanner, which will allow the obtaining of points (meshing) of the piece in real time with an individual measurement of up to 16 million independent measurement points captured from 1 to 2 seconds. The measurement data is characterized by a very detailed reproduction and therefore also allows the measurement of sample components up to 38mm.

The following study will begin with the acquisition of plaster and aluminum models, for the different types of samples mentioned below:

- Swine lumbar vertebral simple.
- Human lumbar vertebral simple 4.
- Human lumbar vertebral simple 5.

With the help of the ATOS&GOM® optical scanner, point clouds were acquired from each of the samples that were used to acquire 3D printing models and obtain 3D solid digital models to perform the Von-Mises stress analysis.As a result of the Von-Mises stress analysis process, when applying compressive loads of 960 N and shear of 8000 N distributed in each lumbar vertebra, a maximum Von Mises effort of 134.82 MPa Max and 6.203e-10 MPa Min was obtained for lumbar vertebra 4, 189.6 MPa Max and 2.0437e-9 for lumbar vertebra 5 and 101.2 MPa Max and 0 Min for porcine lumbar vertebra. Critical points are above 100 MPa for all three cases. The maximum values of effort in the vertebral body and the minimum in the spinous process were presented.

Lumbar, Compression fracture, Point cloud, Model acquisition, Von-Mises analysis

Applied study of training projects as a learning strategy

Estudio aplicado de proyectos formativos como estrategia de aprendizaje

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Abstract

This article analyzes the use of Training Projects as a learning strategy, a two-step methodology is carried out: the first corresponds to an applied research, in which the phases of the Training Project are implemented during the course of a learning unit (Software Project Management). The second, once the case study has been put into practice, a field investigation is applied, for the self-evaluation of the applied strategy. The data collection instrument is a survey designed with the Google Forms tool and shared via institutional email. The results of the study are promising, the use of Formative Projects in learning, they are fully aligned to the learning unit and the achievement of its competence was very satisfactory, showing that 96.1% of the students agree or fully agree that they successfully completed their projects and clearly identify the disciplinary competence achieved in the process. There is no doubt that this study opens the gap to design methodologies and/or action plans where Training Projects can contribute to the achievement of the skills of knowledge, know-how and know-how in the disciplinary field of any area.

Training projects, Competencies, Learning

Remediation of soils contaminated by hydrocarbons using a polymeric material (carboxymethylcellulose gel)

Remediación de suelos contaminados por hidrocarburos mediante un material polimérico (gel de carboximetilcelulosa)

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Abstract

In recent years, the pollution caused by hydrocarbon spills has increased, and this leads to research to mitigate the deterioration caused to the environment, therefore, this work has the purpose of remedying a contaminated soil due to the explosion of the Well Terra 123 of Mexican Oil (PEMEX) occurred in October 2013, which left in its wake contamination, death of animals and diseases in the population, causing both environmental and health effects on the inhabitants of the region such as vitiligo, problems vision, throat, cough and flu (Reporte Indigo, 2019).The studies carried out by Duran in 2015 on "Environmental impact on the indigenous communities of Nacajuca, Tabasco, due to the explosion of the Well Terra 123", gathered evidence of the impact that this oil accident had on the health of those close to it to the facilities and the environment.This chapter will deal with the remediation of soil contaminated by hydrocarbons due to the explosion of the Terra 123 Well, using a polymeric material (carboxymethylcellulose gel), which was synthesized at the laboratory level using carboxymethylcellulose (CMC), glutaraldehyde (GA) as agent of crosslinking and hydrochloric acid (HCl) as a catalyst for synthesis. The CMC gel was incorporated into the contaminated soil for the absorption of the hydrocarbon for a period of three months.The samples were collected from the soil contaminated with hydrocarbon from Terra 123 well, located in Oxiacaque, Nacajuca, Tabasco, and the effectiveness was studied in two stages: (1) The soil particle was decreased by sieving and (2) Pre and post soil analyzes were carried out (moisture percentage and fat content). In addition, the CMC gels were analyzed using infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) techniques before and after being incorporated into the contaminated soil. The amount of hydrocarbon initially contained in the soil was made using the Soxhlet method, obtaining 0.99 mg of hydrocarbon / kg of soil.

Remediation, Gel, Carboxymethylcellulose, Hydrocarbons, Polymers

A review on electrospinning technologies and their potential use in the biomedical industry

Una revisión sobre las tecnologías de electrohilado y su uso potencial en la industria biomédica

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Abstract

Electrospinning is a technique to obtain new fibrous structures from synthetic or natural polymers for the development of materials used in pharmaceutical and biomedical industries, among others. However, the low production rate of electrospinning has limited industrial application.This review comments on the various electrospinning technologies to increase productivity based on specific examples from the literature.

Review, Nanofibers, Electrospinning

Green infrastructure: An ally to improve urban runoff management in semi-arid areas

Infraestructura verde: Una aliada para mejorar la gestión de escorrentías urbanas en zonas semiáridas

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Abstract

The growth of cities negatively alters the urban hydrological cycle, and causes problems such as the reduction of their permeable surfaces, increases in temperature that affect the thermal comfort of buildings, large volumes of urban runoff that produce floods, and its contamination. This work highlights the hydrological, hydraulic, and ecosystem advantages of green infrastructure as a strategy of climate change adaptation in cities with a semi-arid climate. Case studies published in international journals, design criteria in technical manuals, national and international standards, and regulations were reviewed. The types of green infrastructure most studied and implemented in various regions with a semi-arid climate were selected, and the most frequently applied criteria and recommendations were chosen. It was possible to determine the most appropriate design and construction parameters for their adaptation in spaces already provided with gray infrastructure, where they can be applied as complementary works that help to solve problems of water shortages to the population, as well as damage to infrastructure due to floods, aquifer overexploitation and pollution.

Water scarcity, Floods, Sustainable infrastructure

Microencapsulation of acachul (*Ardisia Compressa)* extract by spray drying using diferente polymeric materials as encapsulating agents

Microencapsulación de extractos de acachul (*Ardisia Compressa*) mediante secado por aspersión utilizando diferentes materiales poliméricos como agentes encapsulantes

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Abstract

The microencapsulation process is a technique whose purpose is to protect liquid, solid and gaseous compounds susceptible to thermal, light or oxidative deterioration, among other factors. The particular substance may be individually coated with an encapsulating material to protect it from the environment, from the reaction with other compounds or to prevent oxidation reactions from light or oxygen present in its surroundings. There is a wide variety of biopolymeric materials used as barrier materials for encapsulation. Among the materials that serve as encapsulating or entraining agents are carbohydrates, lipids, proteins and polymers, while the active or encapsulated compounds may be antimicrobials, pigments, vitamins, minerals or microorganisms. Therefore there is a need to find the best option, to encapsulate the desired active ingredients using different biopolymeric materials as barrier materials. Whence, in the present work, the effect and characteristics from acachul (*Ardisia Compressa*) pigments were determined, encapsulated them using maltodextrin, gum arabic and a combination of gum arabic- maltodextrin in a 1:1 ratio as encapsulating agents. Determining that acachul (*Ardisia Compressa*) pigments were better encapsulated when maltodextrin was utilized as the encapsulating agent.

Microencapsulation, Pigments, Encapsulation agents, Acachul

Approach to the optimization of parameters of a truncated cone solar concentrator using the Excel Solver tool

Acercamiento a la optimización de parámetros de un concentrador solar troncocónico, utilizando la herramienta Solver de Excel

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Abstract

This chapter deals with the optimization of the design parameters of a truncated cone type concentrator to capture, transfer and diffuse sunlight, so that the light reflections are concentrated and multiplied on the walls of the cone and then inside the tube to project them to the interior of any building. As an initial parameter, the length of the zenithal opening of an active Ciralight dome with a square section through which the sun's rays enter vertically was considered. Considering the aperture length as the largest diameter (b) and a concentration factor (CF) of 2.46, an Excel Solver tool was used to calculate the optimal fundamental dimensions: angle of the generatrix (α), cone height (h) and smallest diameter (a), for which a desired concentration is achieved. In addition, a truncated cone concentrator was calculated and designed graphically in Mechanical Desktop 6 Power Pack, starting from a unit cone according to the active dome previously mentioned. Finally, a 1:100 scale model was built to measure the illuminance under open sky and controlled conditions, using temperature sensor and photo detectors with ranges of $0 - 130\,Klx$, finding a FC of 1,78 under open sky and 1,89 with a halogen lamp under controlled conditions.

Sunlight, Concentrator, Dome, Illuminance, Optimization

Design and construction of an educational software that can be used as a teaching resource to improvereading learning in 1st and 2nd grade children

Software educativo como recurso didáctico para el aprendizaje de la lectura en niños de 1° y 2° grado de educación primaria

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Abstract

This research aims to show the results obtained in the elaboration of the design and construction of an educational software that can be used as a teaching resource to improve reading learning in 1st and 2nd grade children of the Ignacio Allende elementary school of the community of La laguna, Pisaflores Hidalgo, in the development of the application was taken as a guide the agile methodology XP since this methodology is focused on small projects and with small time periods for which it was based on 5 phases (idea generation, analysis, design, development and testing or implementation) of which only the first three and 50% of phase 4 were achieved. In order to achieve the results obtained, research was carried out on similar projects that would help to inform the research as well as to know if both students could accept it and teachers qualitative research was used and the data collection tools were the interview and survey, Applied to the students and teachers of the institution. The scope of such research was to generate the design of the application "game with Kika" as well as part of its programming.

Educational software, Methodologies, Reading learning

Direct design process of aerodynamic profiles using the Joukowsky transformation

Proceso de diseño directo de perfiles aerodinámicos mediante la transformación de Joukowsky

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Abstract

This document shows the results of a part of the direct design process of airfoils. The research and design of these geometric shapes are of great relevance for their application in aerodynamic devices, since, if a wing profile with a great aerodynamic fineness is developed, the efficiency of the devices that have this geometric shape will be improved on its wings, propellers, etc. This project started from two analytical processes, the first was to obtain the shape of the wing profiles through the Joukowsky transformation, later the pressure distribution of each aerodynamic profile was obtained through the methodology developed by Theodorsen, the profiles that achieved optimal results were subjected to the third and last analysis in the Qblade software, this software allows to find the angle of attack that produces the maximum aerodynamic fineness, in addition to an approximation to the lift and drag coefficients, in this way several curved and aerodynamic profiles were obtained. Various thicknesses whose aerodynamic fines range between 100 and 250 at the optimum angle of attack.

Aerodynamic Fineness, Direct Design Process, Joukowsky Transformation, Theodorsen Methodology

Mathematical modeling of a MOSFET transistor as modulator in AM transsmision

Modelado Matemático de un transistor MOSFET como modulador en transmisión en AM

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Abstract

The necessary methodology is presented to characterize the alternating signal transistor in the time and frequency domain and obtain its characteristic equations including its transfer function. The behavior of the transistor gate is studied in different models of manufacturers in alternating signal, therefore the difference between the behavior relationship between the theory and the information obtained in the experimentation is shown. All of the above to have an optimization, control or description of the operation of a real transistor and be used in an electrical / electronic application in general, in this case, for an AM modulation.

MOSFET, Mathematical modeling, Modulated amplitude

Comparative Study of Inorganic Pollutant (Chromo) in a Surface Body Water in Frontera, Centla, Tabasco

Estudio Comparativo del Contaminante Inorgánico (Cromo) en un Cuerpo de Agua Superficial de Frontera, Centla, Tabasco

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Abstract

Human activity has been increasing, generating more contamination in air, soil and particularly in water, which is the reason for the following work that aims to measure the levels of heavy metal contamination such as chromium, considering other factors of the vital liquid such as pH and Total Suspended Solids (TSS); to know some characteristics of the body of water analyzed. The water body of study is a lagoon called Fonapo I in the city of Frontera, Centla, Tabasco, which has an 80% population around the lagoon, who are influencing the concentration levels of heavy metals, particularly chromium. The work consisted of two rainy season samplings in the lagoon, in September 2019 and September 2020. An increase in chromium concentration was observed in sampling number two in September 2020, with a direct relationship between chromium concentrations in 2019 and 2020, with a confidence level of 95% between both samplings. This statistically demonstrates that there are significant increases of chromium in this water body, and even though they are within the permissible limits of the NOM-001-SEMARNAT-1996 standard, this increase can lead to damage to society, which uses this water body for fish farming, likewise the pH recorded in the first and second samples are bases as indicated in the pH table, the Total Suspended Solids (TSS) in both samples are above what is indicated by the standard.

Heavy Metal, Chromium, Physicochemical parameters, Water pollution, pollutant

Design of a smart application model for the teaching of a language in high school

Diseño de un modelo de aplicación inteligente para la enseñanza de una lengua en secundaria

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Abstract

Access to learning in any context, inside and outside the classroom there is a great interaction of the users, breaking with the classic passive learning, allowing a substantial and effective learning in which the student becomes an active participant. The great popularity of mobile devices among young people of all ages means that educational applications have a positive influence on student motivation since they have an important playful component allowing learning through play. ENGLISHTEC pioneering project in the design of a mobile application for the teaching of the English language, ad hoc to Secondary Education in the Eastern Zone of Michoacán. Case study Technical Secondary 49 Samuel Ramos. Initiating the insertion of mobile applications in the classroom, which is a resource used by students in their daily lives, becoming an educational tool, enhancing their learning, in addition to allowing participation and social inclusion in any context, promoting identity and culture inclusive in our Mexico society.

Mobile application, Learning, Inclusion

BPM in the analysis of sale energy electric

BPM en el análisis de venta de energía eléctrica

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Abstract

This article presents the results of an investigation carried out in the agency Zitácuaro for sale of energy, with the BPM ideology which strengthens the processes in an organization, becomes more transparent and manageable by all. In combination with software engineering, they are responsible for transforming, defining, executing and managing processes and tasks, providing solutions and improvements, these transformations based on added value, generating customer satisfaction, so if these transformations are strengthened, It will be influencing process improvements, emphasizing that it provides satisfactory quantitative results. Sales results have been of great impact in the eastern region of Michoacán.

BPM, Process improvement, Transparente

Influence of digital technologies on higher education students in times of the Covid-19 pandemic and the repercussions on their study habits

Influencia de las tecnologías digitales en los estudiantes de educación superior en tiempos de pandemia del Covid-19 y las repercusiones en sus hábitos de estudio

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Abstract

In this article, a second analysis is carried out that consists of monitoring the study habits of a group of 17 students, during the period of their higher education. The study was carried out on students who correspond to the area of Computational Sciences and consists of making a comparative evaluation of the application of the study habits questionnaire to such a group of students in four moments of their career path. In the first, second and third moments, the students attended classes in a face-to-face modality and in the fourth moment the students attended due to COVID-19 pandemic situations in a virtual modality. Based on the second context, the analysis has been carried out. The interest in delving into study habits is to identify areas of opportunity and implement strategies that allow students to improve their study habits and avoid vices that hinder their study habits are sufficient to obtain better academic performance.

Information and communication technologies, Study habits, Virtual modality

Greenhouse temperature control based on fuzzy logic

Control de temperatura para un invernadero basado en lógica difusa

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Abstract

There is a close relationship between crop growth and the control of environmental variables, as well as irrigation and fertilizers supplied. This article presents a system for collecting a greenhouse temperature, capable of acting in the opening or closing window system as a regulator of this environmental variable. Controlling the temperature acting on the opening or closing of the windows is convenient, since it does not require additional fuel, resulting in an economical alternative.Regarding control algorithm, Fuzzy Logic was used as a correction temperature technique. The proposal can be a good option for greenhouses that are not automated yet, saving costs by moving from human-assisted monitoring to automatic temperature monitoring.

Diffuse control, Temperature control, Protected agriculture

Analysis, design, and creation of a learning program in Big Data at the higher education level: Case study Instituto Tecnológico Superior de Rioverde, SLP

Análisis, diseño y creación de un programa de aprendizaje en Big Data a nivel de educación superior: aso de estudio Instituto Tecnológico Superior de Rioverde, SLP

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Abstract

In this paper results of a quantitative and qualitative study are shown to identify interest and acceptance level of Big Data in university students. The creation of a learning program is proposed that will allow students to obtain the necessary knowledge to form a solid foundation regarding Big Data, as well as the necessary tools to start working with this technology. A survey has been carried out of students who study the Educational Programs of Computer Engineering and Engineering in Computer Systems at ITSRV, the results show that 41% of the respondent's report having zero knowledge of Big Data, 51.28% mention that it is important to learn about the subject by development professional and the most suitable way, according to the answers, is through a workshop or a certification. Of the eight most used Big Data tools, Hadoop and Spark were the ones identified by the respondents, due to this, and the literature reviewed, it is important that spaces and Big Data learning programs are generated in higher level institutions that allow Students obtain the necessary basic knowledge and identify applications of Big Data in the professional and job context.

Big Data, Learning program, Hadoop

Saponification index determines the efficiency in the transesterification process in the production of biodiesel

Índice de saponificación determina la eficiencia en el proceso de transesterificación en la producción de biodiesel

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Abstract

For the production of biodiesel from a mixture of used edible oils, the saponification index has played an important role in the elaboration and particularities of biodiesel in its transesterification process by alkaline methanolysis, reaction temperature 35 ° C and molar ratio 6 :1. The objective is to determine the saponification index of used edible oils, from the El Cafecito cafeteria located in the ITCancún, to prevent the free fatty acids from the transesterification process from saponifying, being the causes of saponification the excess of catalyst, or Due to poor treatment in the elimination of the water content in the used edible oil samples, it considerably affects the biodiesel process. The methodology used was based on the analysis of national and international standards in the Determination of the Saponification index by means of the Covenin 323 standard of the NMX-F-174-SCFI-2014, - AOCS Cd 3-25, to the 6 samples of used edible oils. The results of the saponification index test are not acceptable since to saponify said raw material requires a large amount of potassium hydroxide. The contribution is to prevent used edible oils from contaminating the water table, due to its poor disposal.

Saponification index, Biodiesel, Used edible oils

Use of Augmented Reality App as a means of motivation for high secondary education in times of COVID-19

Uso de App de Realidad aumentada como medio de motivación para la educación media superior en tiempos de COVID-19

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Abstract

As the COVID-19 health crisis continues, schools have been forced to close their doors, leading school systems to find innovative ways to reach and teach their students. A novel way of reaching students is Augmented Reality. High secondary level students have abandoned their studies and / or the idea of studying at a college, this derived from the methodology of teaching and monitoring their learning.The virtual environment developed in this research is intended to motivate the student of high secondary education of specialty related to the career of engineering in computer systems to continue with their studies at a college by showing them the applications that can develop themselves with the tools technologies and the knowledge to be acquired within the computer systems engineering study program. For this proposal, the Unity 3D software was used, since it presents flexibility for the creation of any type of environment. An initial and final survey was implemented after presenting the AR app to determine whether after its use the students feel motivated to continue with their studies.

COVID-19, Augmented Reality, Educational apps

Artificial vision system for object classification in real time using Raspberry Pi and a Web camera

Sistema de visión artificial para la clasificación de objetos en tiempo real utilizando Raspberry Pi y una cámara web

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Abstract

Computer vision systems are an essential part in industrial automation tasks such as: identification, selection, measurement, defect detection and quality control in parts and components. There are smart cameras used to perform tasks, however, their high acquisition and maintenance cost is restrictive. In this work, a novel low-cost artificial vision system is proposed for classifying objects in real time, using the Raspberry Pi 3B + embedded system, a Web camera and the Open CV artificial vision library. The suggested technique comprises the training of a supervised classification system of the Haar Cascade type, with image banks of the object to be recognized, subsequently generating a predictive model which is put to the test with real-time detection, as well as the calculation for the prediction error. This seeks to build a powerful vision system, affordable and also developed using free software.

Computer vision, Raspberry Pi, OpenCV

Working impact in the Puebla-Tlaxcala region of graduates of Mechatronics Engineering

Impacto laboral en la región Puebla-Tlaxcala, de los egresados de Ingeniería Mecatrónica

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Abstract

This work shows an analysis of the impact on the productive sector that graduates of the academic program of mechatronics engineering have had in the period 2017-2020. Said analysis was carried out to determine the competencies that should be re-considered or re-considered. -propose to improve the profile of graduation at the higher level of the mechatronics career and try to satisfy the demand of the business sector in the region.The analysis was carried out through surveys that were applied to companies in the Puebla-Tlaxcala region, and to graduates of the 2017-2020 generations, in this way, more elements were obtained for the analysis of the graduation profile, as well as make proposals for adjustments to the curriculum map.The work was carried out with the intention of having basic statistical information of state representation on the impact and occupational characteristics of the graduates of the Mechatronics Engineering Career, in the same way this information will allow to deepen on the analysis of occupational characteristics and generate proposals of continuing education with companies in the region, as well as with graduates.

Labor, Mechatronics, Puebla-Tlaxcala Region

Classification and counting system for bacteria in microbiological culture media using image processing

Sistema de clasificación y recuento de bacterias en medios de cultivo microbiológicos mediante el procesamiento de imágenes

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Abstract

Monitoring water quality requires microbiological methods with the aim to provide to population, access to this essential source in appropriate conditions. Currently, conducting microbiological tests involves long periods of time and a high economic investment with the aim to identify and quantitatively determine the microorganisms in the medium. In this work, the use of image processing techniques involving K-means algorithm, Python language and OpenCV library are proposed in order to, through devices such as smartphones or conventional cameras, the samples can be analyzed through images, basing results on the morphological features of microorganisms in a specific growth medium, involving low cost as well as a reduced period of time. Specifically, the results obtained of *Escherichia coli* and *Salmonella Typhimurium* bacteria in Red Bile Violet agar are presented. The developed system was carried out detection and quantification of colonies of these microorganisms correctly. Also, it was possible to identify influencing factors during its operation, which allow to implement improvements to the proposed system.

Processing, Bacterial-counting, Classification

Bioethanol production of second generation from corn cob

Producción de bioetanol de segunda generación a partir de olote de maíz

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Abstract

Bioethanol production from lignocellulosic materials has several environmental and economic advantages. In this work, corn cob was used to produce ethanol by fermentation. The cob was grounded, hydrolyzed chemically, and then enzymatically. Later, hydrolysates were used as a carbon source to formulate culture media that were inoculated with *Saccharomyces cerevisiae*; hollocellulose content was quantified by the ASTM D-1104 method; cellulose content by the TAPPTI 212 method; lignin content by the NREL / TP-510-42618 method; and ethanol was quantified by HPLC. In fermentation, bioethanol yields of up to 3.5 g / L were found, equivalent to $Y_{P/S}$ value of 0.46, representing approximately 90% of the theoretical yield.

Pretreatment, Enzymatic hydrolysis, Lignocellulose

Prototype of a web and mobile application for inventory management of a parts store using QR code

Prototipo de aplicación web y móvil para la gestión de inventario de una refaccionaria utilizando código QR

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Abstract

Micro-companies have been a sector with a great disadvantage in recent months due to the global health problem; hence, the interest in offering a technological tool that allows them to improve customer service. The objective of this article is to present a project, which it was developed for an automotive parts store in Oaxaca city. The idea of introducing technologies such as the use of web applications integrating the QR code to facilitate inventory management will allow these micro-companies to offer an improved service. The contribution of this project is that it can be adapted to different types of micro-companies that require technological tools that support them in their survival in an increasingly competitive market. The prototype is developed with the agile Extreme Programming (XP) methodology, and the tools used are Laravel and Boostrap frameworks for the web application and for the mobile application: Android Studio and Material Design.

QR code, Web application, Mobile app

Use of the Learning Management System (LMS) at the Instituto Tecnológico de Oaxaca

Uso del Sistema de Gestión del Aprendizaje (LMS) en el Instituto Tecnológico de Oaxaca

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Abstract

Educational platforms are tools that facilitate the teaching learning process. The LMS platforms: Edmodo, Schollogy and Moodle complement this process between students and professors. The use of these platforms was analyzed at the Technological Institute of Oaxaca, with the participation of students from the following careers: Electronic Engineer, Electrical Engineer, Civil Engineer, Mechanical Engineer, Industrial Engineer, Chemical Engineer, Business Management Engineer, Computer Systems Engineer, Bachelor of Administration and professors; all of them agree with that the most used platform is Moodle. One of the main objective is identify and classify the LMS used by students of the semesters: second, fourth, sixth, eighth and tenth, as well as teachers during the period January-June 2019. In addition, it was analyzed the use of LMS and the percentage of students and professors who use the platform as a teaching-learning strategy is determined. For the analysis of the use of LMS in the Technological Institute of Oaxaca, the methodology that was considered consists in the next phases: problem statement, definition of objective, elaboration of the theoretical framework, elaboration and analysis of surveys, process design and conclusions.

LMS, Moodle, Platforms

Web Application for the Management of Projects of the Division of Postgraduate Studies and Research of the Technological Institute of Oaxaca

Aplicación web para la Gestión de proyectos de la División de Estudios de Posgrado e Investigación del Instituto Tecnológico de Oaxaca

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Abstract

In accordance with the calls for proposals for technological development and innovation and scientific research projects, issued by the National Technological Institute of Mexico (TecNM), each campus belonging to the TecNM must carry out the management of the projects that are authorized in each period in order to have timely information on the status of each project in terms of progress, application of resources, goals achieved, etc.Based on these needs in the Technological Institute of Oaxaca, specifically in the Coordination of the Division of Postgraduate Studies and Research, the need to have a web tool that supports said project management becomes clear. The objective of this web tool is precisely the management, control and monitoring of the stages, advances, items and sub-items of the research project financing, based on the periods established by the TecNM, maintaining effective communication between the institutional coordinator and the project leader through notifications. The agile extreme programming model, JavaScript and the Express framework were used in the development of the software.

Web application, Research project, Management

Neural network for crop rotation and soil analysis in a Greenhouse

Red Neuronal para la rotación de cultivos y análisis de suelo en un Invernadero

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Abstract

Currently, Artificial intelligence (AI) is a very important area, the way in which it has revolutionized has allowed it to be an essential part of technological evolution in different sectors of society such as agriculture, it is a fundamental activity in the development of our country, and one of the developing areas is implementation of greenhouse crop. This article describes the use of artificial intelligence for a greenhouse through an Artificial Neural Network (ANN) of the multilayer perceptron type using the BackPropagation algorithm. The main aim is obtain the most optimal type of crop to be sown by means of the crop rotation, which, supported by a data acquisition device through sensors, obtains the values of temperature and humidity of the environment and soil pH, with those data the ANN makes the soil analysis. Through the interfaces of the data analysis module and the measurement module, the data collection process, the calculation and the results produced by the artificial neural network are shown. For this project, the Prototype model was used using the Java programming language.

Artificial Neural Network, Crop rotation, Soil analysis

Antibacterial gel dispenser with automated thermometer

Dispensador de gel antibacterial con termómetro automatizado

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Abstract

The SARS-CoV-2 virus. Declared a health emergency at the international level since its origin in Wuhan (China) in December 2019, the spread occurs by an infected person who exhales droplets of saliva and contagion occurs when we touch contaminated surfaces or people and touch our eyes, nostrils or mouth. Therefore, some prevention measures are used to avoid contagion, such as social distancing, the use of face masks or a mask and the use of antibacterial gel which is of great importance because it is used in all public places to prevent the risk. contagion. Therefore, the objective is to make an automatic antibacterial gel dispenser for the Tecnológico de Estudios Superiores de Jilotepec to minimize the risk of contagion. The device itself works by means of a sensor that when putting the hand detects and dispenses the gel, at the same time it takes the temperature that the reading shows on the screen, considering that it is one of the main symptoms of the disease, this contributes to have a preventive in the disinfection of the hands with gel and temperature measurement.

Automated, Dispenser, Prevention

Automated Sanitizing Tunnel

Túnel Sanitizante automatizado

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Abstract

Currently COVID 19 is a contagious virus that affects in different ways depending on each person, most of the people who are infected have symptoms of mild or moderate or very high intensity because in such a short time thousands of people are infected by contact being in a single area, the objective is to make an automated sanitizing tunnel in the Tecnológico de Estudios Superiores de Jilotepec so that students, teachers and staff entering the tunnel are sprayed with a disinfectant substance that will cover the entire body including hands as well as shoes and thus minimize the possibility of contagion; This is considered in the interest of the application of useful measures for the prevention of the contagion of the virus when entering the institution since this will avoid if bringing the virus in clothing, hair, face, hands, shoes. be neutralized by contact with the disinfecting substance.

Automated, Sanitizing, Covid

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