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International Interdisciplinary Congress on Renewable Energies, Industrial Maintenance, Mechatronics and Informatics

15th ANNIVERSARY ECORFAN Special Edition

ECORFAN®

ISBN 978-607-8948-49-9
ECORFAN Editorial Label: 607-8948
AC Control Number: 2024-01
AC Classification (2024): 241024-0001

Abstracts Collection

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Volumen IX

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International Interdisciplinary Congress on Renewable Energies, Industrial Maintenance, Mechatronics and Informatics

Association of Renewable Energy Engineers of Querétaro A.C Octubre 24-25, 2024.

Preface

The Colegio de Ingenieros en Energías Renovables de Querétaro A.C. (CIER-QUERÉTARO), and its chapters of Renewable Energy, Industrial Maintenance, Mechatronics and Informatics, technical sponsors of the Interdisciplinary Congress of Renewable Energy, Maintenance, Mechatronics and Informatics, CIERMMI 2024, are pleased to invite you to the 4th, edition of this congress, which will be held on October 24-25, 2024, 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 papers and conferences. This volume IX-2024 contains 114 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 the Colegio de Ingenieros en Energías Renovables de Querétaro A.C. in the process of preparing this edition which can be consulted at http://ecorfan.org/ collections.php.

San Juan del Río, Qro.
October 24-25, 2024.

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Gómez - Vega, Paola BsC.
Garcia - Huerta, Verónica BsC.
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Contenido Pág

Physical and Mathematical Sciences and Earth Sciences

Electromagnetic Theory: Electromagnetic Pulse in the laboratory

Teoría Electromagnética: Pulso Electromagnético en el laboratorio

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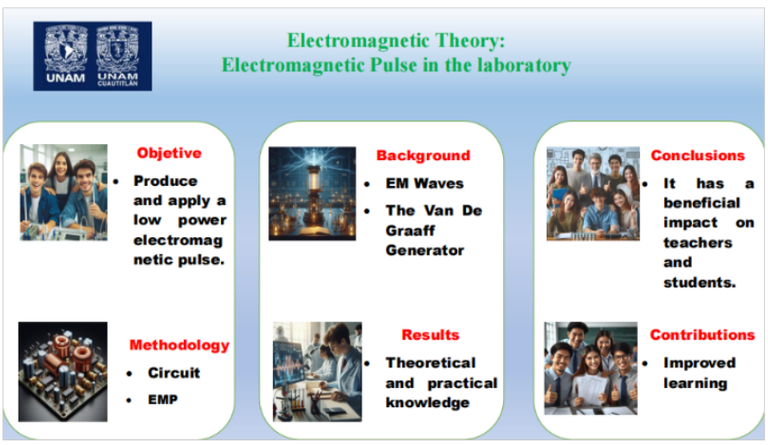
Abstract

This article shows the process in the development of a laboratory practice of Electromagnetic Theory, applied to the Telecommunications, Systems and Electronics Engineering Career, of the Facultad de Estudios Superiores Cuautitlán (FESC) belonging to the Universidad Nacional Autónoma de México (UNAM). The objective for future engineers is to learn about the impact of an electromagnetic pulse on electronic equipment. It begins with the theoretical background of the electromagnetic pulse, then basic oscillator circuits are addressed and an experiment with a low-power electromagnetic pulse is developed. The impact of the practice on the students is measured and with it, conclusions are drawn, indicating the importance of this knowledge for future engineers in telecommunications systems and electronics.



Telecommunications, Laboratory, Pulse

3d printing and modelling with practical applications in BIM Engineering

Impresión y modelado en 3d con aplicaciones prácticas en Ingeniería BIM

CARO-BECERRA, Juan Luis, ROBLES-CASOLCO, Said, MUÑOZ-AGUIÑAGA, Ma. Guadalupe and HERNÁNDEZ-MAGDALENO, Alfonso Manuel

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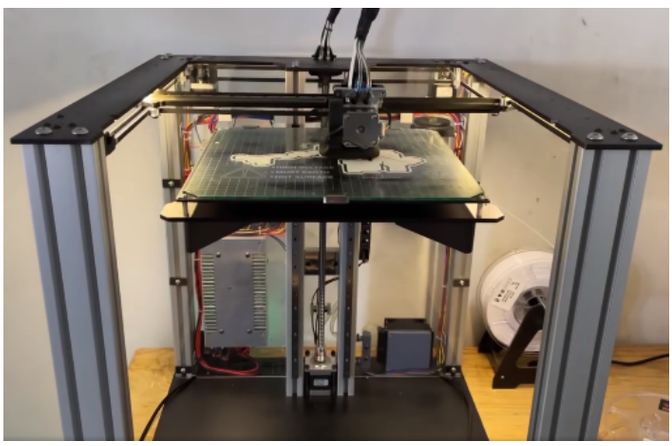
Abstract

On the one hand, Artificial Intelligence (AI) is solving everyday problems that until recently were impossible to imagine solving. ¿How can a powerful supercomputer be program med to solve all kinds of algorithms? Phyton (multi-paradigm programming), big data (data intelligence), help us to solve all kinds of such complex problems with multifunctional computing applications, to name just a few. The goal of this work is to design an automated prototype from 3D CAD files to create a world of new possibilities and generate new knowledge in the field of 3D printing applied to BIM Building Information Modeling engineering. It is concluded that 3D printing is a digital process that helps us to create physical objects, based on one principle: digital model converted into three-dimensional solid objet.



Prototype, 3D printing, digital model

Implementation of an Gel Dispenser with LED Traffic Light for Early Fever Detection inPublic Spaces

Implementación de un Despachador de Gel con Semáforo LED para la Detección Tempranade Fiebre en Espacios Públicos

GONZÁLEZ-GALINDO, Edgar Alfredo, FERNÁNDEZ-ACOSTA, Luis Eduardo, JUÁREZ-GUTIÉRREZ, José de Jesús and DOMÍNGUEZ-ROMERO, Francisco Javier

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Abstract

This project introduces a Gel Dispenser with LED Traffic Light for Early Fever Detection in Public Spaces. The LED traffic light changes color based on detected body temperature: red indicates fever, amber indicates elevated non-fever temperature, and green shows normal temperature. It utilizes an MLX90614 infrared temperature sensor, which, along with the FC-51 sensor, detects a hand, measures the temperature, and activates a pump to dispense antibacterial gel. Data are recorded on a MicroSD cardand displayed on a screen. Designed during the late stages of COVID-19, it promotes hand hygiene by encouraging the use of antibacterial gel and reducing water consumption. Additionally, it offers a more comfortable temperature measurement by taking readings from the palm rather than the forehead. It has been effective in detecting febrile temperatures in students, proving to be a valuable solution for future pandemics.

Thermometer, Dispenser, Hygiene

Morphological analysis and its effect on the optical properties of carbon nanospheres as a function of synthesis time

Análisis morfológico y su efecto en las propiedades ópticas de las nanoesferas de carbono en función del tiempo de síntesis

ORDÓÑEZ-CASANOVA, Elsa Gabriela, TREJO-MANDUJANO, Héctor Alejandro, SAUCEDO-ACUÑA, Rosa Alicia and VILLANUEVA-MONTELLANO, Alfredo

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Abstract

The effect of synthesis time on the morphology and its influence on the optical properties of microwave-assisted carbon nanospheres are presented in this work. To analyze the correlation between the synthesis time and the growth in size of the nanospheres, the morphology of the nanostructures was characterized by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Their optical properties were analyzed by UV-Vis spectrophotometry, and the Tauc method was used to estimate the optical band gap. The results reveal that the time variation in the synthesis does have a significant influence on the size, shape, and amount of sample obtained. The optical properties presented slight modifications. With these results, we can provide an easy reproducibility of simple and inexpensive methods to optimize the growth of carbon-based nanoparticles, which can bring advances in the synthesis of materials and improvements in their optoelectronic applications.

Nanospheres, Morphology, UV-Vis

Electric parameters analysis for the detection of possible failures in the insulation of electric motor windings

Análisis de parámetros eléctricos para la detección de posibles fallas en el aislamiento de los devanados de motores eléctricos

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Abstract

Knowledge of electric motors is of utmost importance in the industry. Knowing the anticipated data on the good or bad functioning of the equipment we work with allows us to make better decisions for their optimal development. This article presents a proposal for analyzing electrical data in induction motors, allowing a study of their behavior to be carried out to detect a possible failure in the windings due to a short circuit, defect or degradation of the insulation. With the help of a simulator it is easier to develop this analysis. The Simulink software provided by the Matlab software shows us graphic results that we can view to predict and take preventive measures for the equipment.

Electric parameters analysis for the detection of possible failures in the insulation of electric motor windings.		
Objetives	Methodology	Contribution
Detection of possible faults in the electric motor windings. 	• Engine data analysis • Develop simulation model • They compare results to know the	The development of a simulation model predicts the detection of a short circuit in the winding of an electric motor.

Induction, Circuit, Windings

Analysis of the behavior of the seabed of the mouth of the Grijalva River, Tabasco in the years 2012, 2017 and 2021

Análisis del comportamiento del fondo marino de la desembocadura del río Grijalva, Tabasco en los años 2012,2017 y 2021

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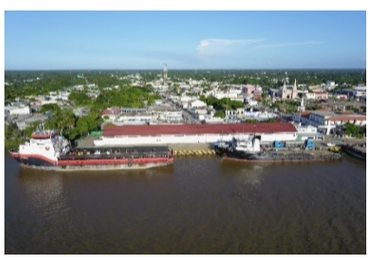
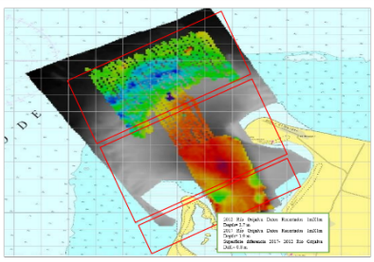
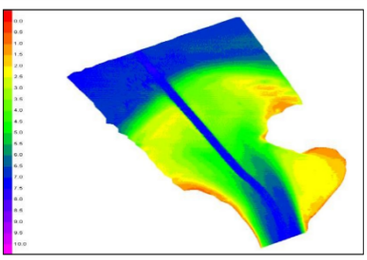
Abstract

Bathymetric surfaces created from bathymetric data obtained by Hydrographic Survey Brigades allow the representation of the relief of the seabed of a specific area and thus perform the analysis of its behavior. Therefore, the main objective is to characterize the seabed of the mouth of the Grijalva Tabasco River, by means of the difference surfaces and the TIN Model, and thus make a comparison between them, defining their variability as a result of sedimentation. The bathymetries of the hydrographic surveys that were considered for the study were those carried out in 2012 with the R2Sonic multi-beam echosounder, in 2021 with the Hydrotrac II ODOM single-beam echosounder and in 2021 with the Geoswathplus Compact multibeam echosounder, processing the data obtained with the hydrographic programs Caris Base Editor 5.5 and Hypack Software version 17.0 2021, obtaining the bathymetric surfaces of each year mentioned. The results obtained are that there are areas in the lateral parts of the mouth with a higher concentration of sediment, forming a coastal bar 2,500 m long by 612 m wide that reduces the depth to 1.8 m. In addition, it was determined that the period of greatest presence of rain and drag of material was the month of May to November. The above allows the implementation of actions to guarantee the safety of navigation of those larger vessels that sail towards the port of Frontera Tabasco.

"Analysis of the behavior of the seabed of the mouth of the Grijalva River, Tabasco in the years 2012, 2017 and 2021".		
Objectives	Methodology	Contribution
		

Bathymetric Surfaces, Depth, Sedimentation

Innovative Ti/Fe/Eu-Carbon composite for Cephalexin adsorption

Compósito innovador de Ti/Fe/Eu-Carbón para la adsorción de cefalexina

GÓMEZ-VILCHIS, J.C., GARCÍA-ROSALES, G., LÓNGORIA-GÁNDARA, L.C. and TENORIO-CASTILLEROS, D.

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Abstract

The research focused on developing an innovative material for the removal of antibiotics from contaminated water. A biocarbon modified with titanium (Ti), iron (Fe), and europium (Eu) (Ti/Fe/Eu-Carbon) was created to adsorb cephalexin (CEX) from aqueous solutions. The biocarbon was characterized using techniques such as SEM, EDS, and XPS, which confirmed the presence and energetic states of Ti, Fe, and Eu. This material exhibited a high specific surface area of 232 $m^2\ g^{-1}$ and a mesoporous structure. Tests showed that the adsorption of CEX occurs through a chemical process, achieving a maximum capacity of 600 $\mu g\ g^{-1}$, compared to 90 $\mu g\ g^{-1}$ for the unmodified biocarbon. The adsorption takes place at pH 7 and is more efficient at lower temperatures, as the process is exothermic and spontaneous. Additionally, the material can be reused up to 8 times.

Adsorption, Composite, Cephalexin

Comparison of methods for obtaining a hydroxyapatite and zinc oxide composite (HAp/ZnO)

Comparación de métodos para la obtención de un compósito de hidroxiapatita y óxido de zinc (HAp/ZnO)

DÁVALOS-ROSAS, V. G., GARCÍA-GONZÁLEZ, N., ENRÍQUEZ-PÉREZ, Ma. Angeles and CASTREJÓN-SÁNCHEZ, V.H.

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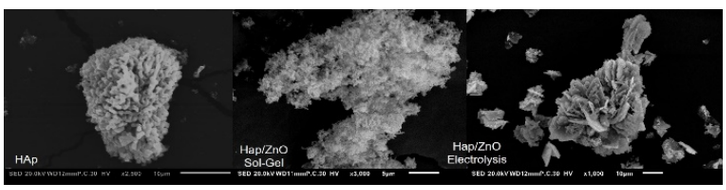
Abstract

In this work, the synthesis of a composite material based on hydroxyapatite (HAp) and zinc oxide (ZnO) is reported. Two types of synthesis were evaluated, in order to know which of them allows to obtain a homogeneous composite material of HAp and ZnO, since making a composite material implies that two or more compounds must be integrated and do not separated; the HAp will be obtained from eggshell residue, ZnO will be synthesized by Sol-Gel and electrolysis; in the ZnO obtention, the previously synthesized HAp was incorporated and it is followed by a thermal treatment obtain the oxide. To evaluated the incorporation of ZnO with hydroxyapatite, Scanning Electron Microscopy, Elemental Analysis and Mapping by Energy Dispersive Spectrometry, Infrared Spectroscopy Analysis and X-ray Diffraction were performed. These two synthesis methods are aiming to obtain a homogeneous material, establishing a methodology to produce the material composite, as well as improve the photocatalytic properties.



Synthesis, Characterization, Composite

Determination of the risk level from btex inhalation at a gas station in Ciudad Del Carmen, Campeche

Determinación del nivel de riesgo por inhalación de btex en una estación de gasolina en Ciudad Del Carmen, Campeche

PÉREZ-VERA, Joselin Itzell, CERÓN-BRETÓN, Rosa María, CERÓN-BRETÓN, Julia Griselda and LARA-SEVERINO, Reyna del Carmen

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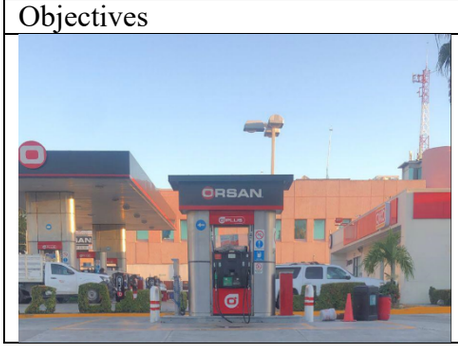
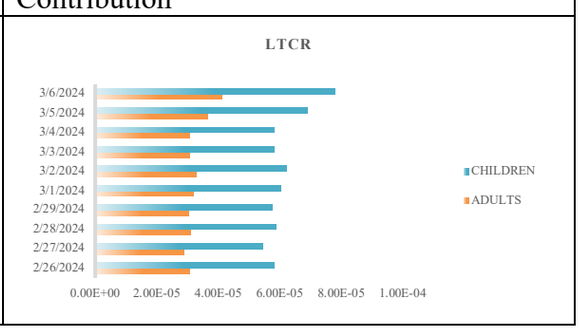
Abstract

Health risks associated with inhalation of BTEX were determined near a service station in Ciudad del Carmen, Campeche. BTEX levels and meteorological parameters were measured in the ambient air of an urban site during the dry season. Samples were analyzed by GC with FID detection. The BTEX showed high concentrations during sampling B1. The X/E and B/T ratios indicate that the emissions were recent, of local origin and from vehicle and service station emissions. The cancer risk index for benzene exposure exceeded the guideline value proposed by the US EPA, suggesting significant risk. The overall potential for non-carcinogenic effects was determined as a hazard ratio (HQ). The value of HQ<1 indicates that the population is not exposed to a significant risk of contracting diseases other than cancer.

DETERMINATION OF THE RISK LEVEL FROM BTEX INHALATION AT A GAS STATION IN CIUDAD DEL CARMEN, CAMPECHE		
Objectives	Methodology	Contribution
		

BTEX, Health Risk, Gas Station, Carcinogenic, Exposure

Biology, Chemistry and Life Sciences

Social impact of renewable energy: Women as agents of change from the family environment in Tamaulipas

Impacto social de las energias renovables: Las mujeres como agentes de cambio desde el entorno familiar en Tamaulipas

GONZÁLEZ-GRAZIANO, Augusto Federico, PICAZO-GALÁN, Karina Alejandra, GRACIANO-CASAS, Lucía and HERNÁNDEZ-ILIZALITURRI, Alma Amalia

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Abstract

The research on the potential of renewable energy to empower women in Tamaulipas is crucial in the current social context. By addressing the integration of values, technologies, and socio-emotional education, this study proposes a comprehensive approach to improve quality of life and foster peace in rural and indigenous communities. Implementing renewable energy not only generates economic opportunities for women but also promotes social cohesion and sustainable development. Moreover, this research highlights the need for public policies supporting training, access to financing, and gender equality in the energy sector. Including critical reflections and empirical analyses, the study provides a practical guide to transform the educational and energy systems, benefiting both women and their families in Tamaulipas.

Renewable energy, Women empowerment, Public policies

Microplastics research in Mexico (2015-2024) in aquatic and terrestrial ecosystems: a summary of locations, media, characterization methods and findings

Investigaciones sobre microplásticos en México (2016-2024) en ecosistemas acuáticos y terrestres: un resumen de ubicaciones, medios, métodos de caracterización y hallazgos

MORENO-RODRÍGUEZ, Bertha María, GONZÁLEZ-MORENO, Humberto Raymundo, LOYA-ESCALANTE, María Teresa and HENÁNDEZ-MORALES, Gleybis

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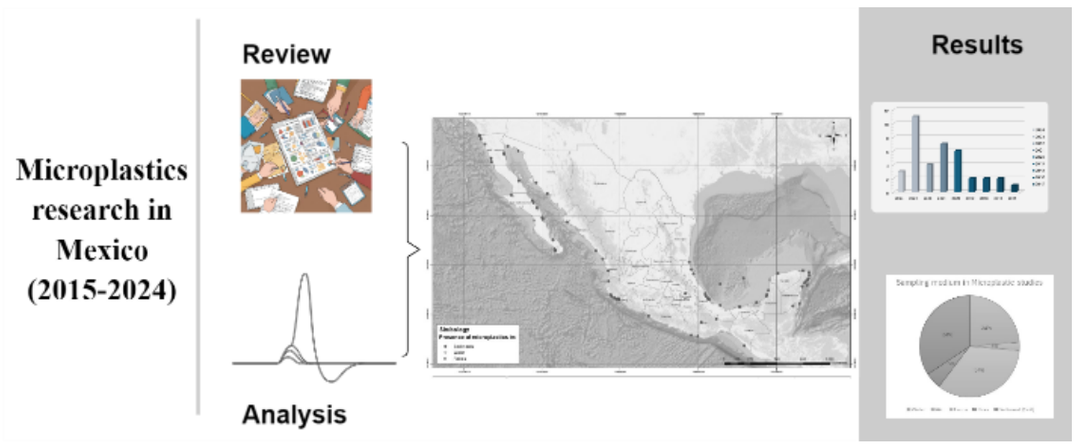
Abstract

The current state of microplastics (MPs) research in Mexico is examined through a sample of 38 articles published in indexed, high-impact databases, which analyzed concentrations of MPs in aquatic and terrestrial ecosystems between 2015 and 2024. Of these studies, 34% focused on soils and sediments, another 34% on fauna (mainly fish), 24% on water, 5% on flora and 3% on air. There is great variability in the methods, protocols and parameters used to detect and characterize microplastics, which can be attributed to the lack of specific standards for these studies. This analysis underscores the need to implement standardized protocols and guidelines.



Microplastic, Methodology, Mexico

Xerophilic bioethanol: A modern alternative for biofuel production

Bioetanol xerófilo: Una alternativa moderna para la producción de biocombustibles

LUGO-PALACIOS, Oscar, PÉREZ-GARCÍA, Laura Andrea, ÁLVAREZ-MACÍAS, Carlos and VARELA-MORENO, Rubén Ociel

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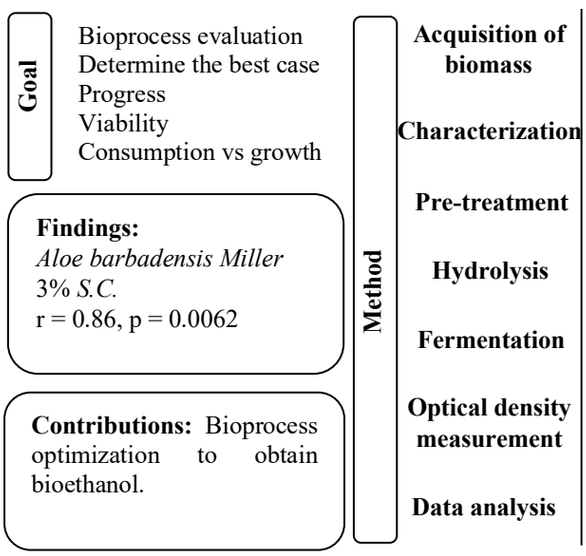
Abstract

The cell growth behavior and the effect of the acid hydrolysis percentage for the treatment of *Agave americana* and *Aloe barbadensis Miller* waste for bioethanol production were evaluated. *Saccharomyces cerevisiae* and Lalvin EC-1118 were used as yeasts, which were pretreated with acid solutions at a concentration of 3% and 7%, in addition to a heat treatment at 175 °C for 2 hours. The hydrolysates were inoculated with yeasts to measure bacterial growth by turbidimetry. The treatment with both strains at 3% was the one that presented the most significant microbial growth. Lalvin EC-1118 performed better than *Saccharomyces cerevisiae* in *Agave americana*; the opposite occurred in *Aloe barbadensis Miller*. Consumed sugars and yeast growth showed that the appropriate bioprocess to produce bioethanol is *Aloe barbadensis Miller* 3%, using *Saccharomyces cerevisiae*. The correlation between consumed sugars and yeast growth and characterization suggests that xerophilous plants are a viable alternative for biofuel production.



Bioprocess Evaluation, Xerophilous Plants, Yeast Growth

Evaluation of Mexican Avocado (*Persea americana*) Seed Starch as a Carbon Source for PHA Production

Evaluación del Almidón de Semilla de Aguacate Mexicano (*Persea americana*) como Fuente de Carbono para la Producción de PHA

VARELA-MORENO, Rubén Ociel, PÉREZ-GARCÍA, Laura Andrea, ÁLVAREZ-MACÍAS, Carlos and LUGO-PALACIOS, Oscar

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Abstract

The study evaluates Mexican avocado (*Persea americana*) seed starch as an economical carbon source to produce polyhydroxyalkanoates (PHA). Extraction and quantification methods were used to determine the efficiency of starch extraction and its acid hydrolysis with 0.4 M HCl, releasing up to 46.7% glucose. Spectrophotometric techniques, such as the turbidity test and the DNS method, analyzed bacterial growth and glucose consumption. The results indicate that this agro- industrial by-product is a viable alternative for PHA production, with the help of a suitable microorganism and a viable fermentation mode, and may be the future of biopolymer production.

General Objetive

Evaluation of Mexican Avocado (Persea americana) Seed Starch as a Carbon Source for PHA Production.

Contribution

Propose new sources of carbon and study their applications.

Methodology

Characterization

Starch extraction

Acid hydrolysis

Fermentation

analysis

Polyhydroxyalkanoates (PHA), Starch, Avocado seed

Development of Hydroxyapatite Materials for Dental Applications

Desarrollo de Materiales de Hidroxiapatita Para Aplicaciones Dentales

FUENTES-ROMERO, María Teresa, BERMUDEZ, Jesús Nicolás, MEDINA-MENDOZA, Manuel and MALDONADO-MONDRAGÓN, Erick Antonio

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Abstract

Nowadays, multiple materials have been developed to reconstruct human bone tissue and bone through organic waste materials in order to reduce environmental pollution, such as "chicken eggshells" due to their high calcium content from which we can synthesize a bioceramic called "hydroxyapatite", that has mimetic similarities with human tissues and bones. Within this study, "San Juan" brand eggshells from "Nicolás Romero, State of Mexico, Mexico" were used to synthesize materials that can be used for calcium phosphate dental grafts; where this biomaterial was synthesized and afterwards applied in dental grafts focusing on cavities being damashed by caries produced through time.

Development of Hydroxyapatite Materials for Dental Applications		
Objetives	Methodology	Contribution
Development and characterization of dental hydoxyapatite products obtained from eggshells.	The synthesis by chemical precipitation was used, using as main product the "eggshell" of the "San Juan" brand, where the process will be carried out through two calcinations for the crystallization process of the apatite material obtained from the eggshell calcium using as chemical precursor "phosphoric acid" and an optimization of the particle size through a planetary mill.	1. Control of particle size and morphology. 2. Modification of the precipitation process 3. Specialized characterization 4. Scalability and reproducibility

Desarrollo de Materiales de Hidroxiapatita para Aplicaciones Dentales		
Objetivos	Metodología	Contribución
Desarrollo y caracterización de productos dentales de hidoxiapatita obtenidos a través de cascaron de huevo	Se utilizó la síntesis por precipitación química, utilizando como producto principal el "cascaron de huevo" de la marca "San Juan", en donde se realizará el proceso a través de dos calcinaciones para el proceso de cristalización del material de apatita obtenida del calcio del cascaron de huevo utilizando como precursor químico "ácido fosfórico" y una optimización del tamaño de particula a través de un molino planetario	1. Control del tamaño y morfología de partículas. 2. Modificación del proceso de precipitación 3. Caracterización especializada 4. Escalabilidad y reproducibilidad

Biomaterial, Graft, hydroxyapatite

Bridging the world of enzymes with electric fields

Integrando el mundo de las enzimas con los campos eléctricos

ALONSO-VARGAS, Monserrat, GARCÍA-ESQUIVEL, Yarely and CADENA-RAMÍREZ, Arturo

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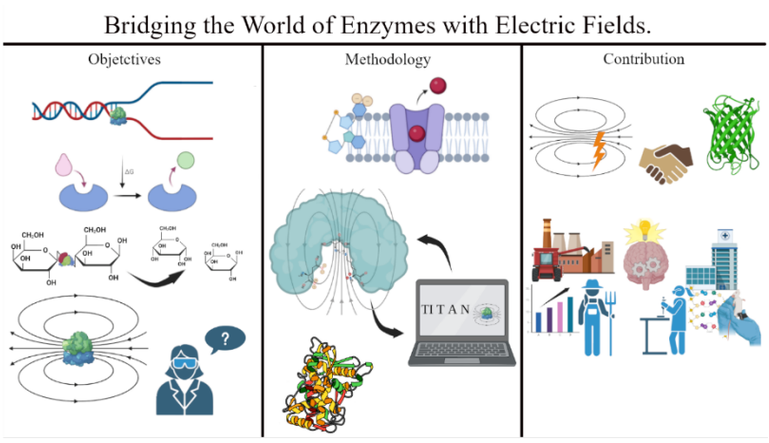
Abstract

Enzymes are essential proteins involved in metabolism, gene expression, cell division, and immune responses. They play a significant role in industry due to their efficient catalysis of chemical reactions. The diversity of enzyme actions is attributed to their varying substrate specificities and reaction types. Recently, researchers have studied electric fields as a biophysical factor that can stimulate or inhibit biological or catalytic responses, although the mechanisms remain unclear. Understanding the role of enzyme amino acid structures and electric fields offers new insights into catalysis. It is crucial to establish a foundational understanding to comprehend these phenomena. By reviewing and relating fundamental concepts, we can broaden our interpretation and study of enzyme technology, leading to future research and potential applications.



Electrostatic, Catalysis, Biophysical

Association of the Arg51Gln Polymorphism of the Ghrelin Gene and Serum Ghrelin Levels with Overweight and Obesity in young individuals

Asociación del polimorfismo Arg51Gln del gen de grelina y de los niveles séricos de grelina con sobrepeso y obesidad en población joven

UVALLE-NAVARRO, Rosario-Lizette, GONZÁLEZ-SANDOVAL, Claudia-Elena, DÍAZ-BURKE, Yolanda and MEDEROS-TORRES, Claudia-Verónica

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Abstract

Obesity and overweight are growing public health concerns, especially among young people. Ghrelin, an appetite-regulating hormone, and the Arg51Gln polymorphism in the ghrelin gene have been associated with obesity. Methodology: Serum ghrelin levels and the Arg51Gln polymorphism were studied in 289 university students from western Mexico. Anthropometric measurements and blood samples were taken to analyze ghrelin levels and genotype the polymorphism. Results: The polymorphic allele (T) was not found in the participants; all were homozygous for the wild-type allele (C/C). Ghrelin levels were higher in the obesity group and lower in the overweight group. A significant association was found between ghrelin levels and overweight, but not with obesity. Conclusions: Serum ghrelin levels are associated with overweight in young individuals, but the Arg51Gln polymorphism is not present in this population. These findings may inform prevention and treatment strategies for obesity**.**

Association of the Arg51Gln Polymorphism of the Ghrelin Gene and Serum Ghrelin Levels with Overweight and Obesity in young individuals

Objectives	Methodology	Contribution
		
Describe the association of ghrelin and the Arg51Gln polymorphism with overweight and obesity in young populations	*Selection of young subjects with overweight and obesity *Determination of Ghrelin by sandwich ELISA *Characterization of the polymorphism through real-time PCR	Joint analysis of obesity with ghrelin Evidence of the possible existence of the monomorphic region for this coding zone in the Mexican population from the western region

These images were created with AI Dall-E

Obesity, Ghrelin, Polymorphism

Medicine and Health Sciences

Study of working conditions, lighting and noise in a local commercial company

Estudio de las condiciones de trabajo, iluminación y ruido en una empresa de giro comercial de la localidad

RAMIREZ-CARDENAS, Ernesto, LOPEZ-ACOSTA, Mauricio, CERVANTES-SOTELO, Mayra Yamile and RIVERA-CEBALLOS, Alba Jazmín

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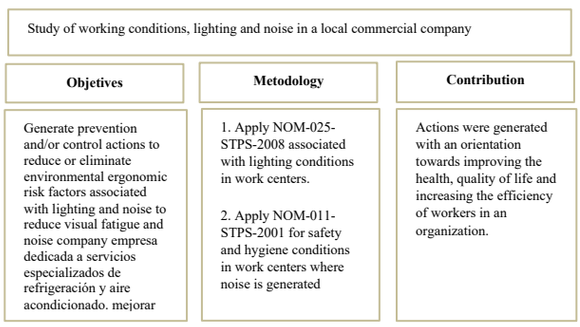
Abstract

Possible actions to improve performance and job security in organizations emerge from work environment studies. The objective of this study was to generate prevention and/or control actions to reduce risk factors associated with lighting and noise. For its development, a questionnaire from the National Institute of Safety and Hygiene at Work (INSHT) was applied to establish the risk perception that workers have in relation to the lighting conditions in their workplace. Following this, Standards NOM-025-STPS-2008 and NOM-011-STPS-2001 were applied, both related to Lighting and Noise Conditions in work centers respectively. As results, the levels of noise and lighting in different areas of the company were obtained, these levels were compared with what was stipulated in the Regulations and actions were generated with an orientation towards improving health, quality of life and increasing the efficiency of the workers.



Ergonomic, Environment and Improvement

Development and testing of a mobile application prototype for counseling on the correct use of contraceptive methods, prevention of HPV and other sexually transmitted infections aimed at adolescents

Desarrollo y prueba de un prototipo de aplicación móvil para la consejería sobre el uso correcto de métodos anticonceptivos, prevención del VPH y otras infecciones de transmisión sexual dirigida a adolescentes

GUTIÉRREZ-ENRÍQUEZ, Sandra Olimpia, RIVERA-GÓMEZ, Jessica Margarita, TERÁN-FIGUEROA, Yolanda and ACUÑA-ARADILLAS, Jorge Martín

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Abstract

Objective: To develop and test a prototype mobile application. Methods: For the development and evaluation of the prototype, 7 levels were applied according to the TRLS methodology (NASA technological maturity levels). The study was conducted from October 2021 to June 2023. 22 students from a public high school in San Luis Potosí, Mexico, participated. Results: In the global measurement, a mean of 54.48 was obtained in the pre-intervention and the post-intervention 67.67 (t=-9.12 p= <.001). In the indicator of sexually transmitted infections, a mean of 19.14 before the intervention and after 22.38 (t=-4.269 p= <.001). In risk sexual behaviors before the intervention 14.61 and after 22.38 (t=-6.00 p= <.001). In the secure sources of information, 4.95 before and 4.85 after the intervention (t= -54,3 p= .325). In contraceptive methods before the intervention 15.76 and after 18.04. (t=20.7 p=<.001). Conclusion: the educational intervention through digital technologies was effective.

Development and testing of a mobile application prototype for counseling on the correct use of contraceptive methods, prevention of HPV and other sexually transmitted infections aimed at adolescents				
Objetive		Methodology		Contribution
To develop and test a prototype mobile application to provide counseling to adolescents on the correct use of contraceptive methods and the prevention of HPV and other sexually transmitted infections.		For the development and evaluation of the prototype, 7 levels were applied according to the TRLS methodology (NASA technological maturity levels). The study was conducted from October 2021 to June 2023. 22 students from a public high school in San Luis Potosí, Mexico.		The participants' experience using the mobile app was outstanding. The indicators in which the most important increases in knowledge were identified were risk sexual behaviors, prevention of HPV and other sexually transmitted infections, contraceptive methods, and safe means of information. The educational intervention through digital technologies was effective.

Mobile Application, Prototype, Sexually Transmitted Infections

Nursing experiences before and after the use of an electronic clinical records system for the early detection of cervical cancer

Experiencias de enfermería antes y después del uso de un sistema electrónico de registros clínicos para la detección oportuna de cáncer cervicouterino

GUTIÉRREZ-ENRÍQUEZ, Sandra Olimpia, RODRÍGUEZ-SOLÍS, Cintia Nayely, TERÁN-FIGUEROA, Yolanda and ACUÑA-ARADILLAS, Jorge Martín

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Abstract

Objective: To analyze the experiences of nurses before and after the use of an electronic system for cervical screening records of the Cervical Cancer Timely Detection program, called "SISCAP-DOCACU". Methodology: A Qualitative study was conducted in a public health institution in San Luis Potosí, S.L.P., Mexico. 8 nurses from three health centers participated. Data collection was carried out through a systematization of experiences. The Taguette program was used for the analysis of the information. Results: Before the implementation of the electronic system, limitations were identified in manual recordings. After applying it, the nursing staff was very satisfied with the training and use of it. Conclusions: The analysis of the nurses' experience allowed us to know the self-perception of their practice, recognize the limitations and broaden their perspective on the importance of process innovation through health technology.

Nursing experiences before and after the use of an electronic clinical records system for the early detection of cervical cancer				
Objetive		Methodology		Contribution
To analyze the experiences of nurses before and after the use of an electronic system for cervical screening records of the Cervical Cancer Timely Detection program, called "SISCAP-DOCACU"		A qualitative study was conducted in a public health institution in San Luis Potosí, S.L.P., Mexico. 8 nurses from three health centers participated. Data collection was carried out through a systematization of experiences. The Taguette program was used for the analysis of the information		The analysis of the nurses' experience allowed us to know the self-perception of their practice, recognize the limitations and broaden their perspective on the importance of process innovation through health technology.

Screening Cervical Cancer, Innovation, Nursing Perception

Humanities and Behavioral Sciences

Per-Q as an intervention project in virtual education for virtual learning environments

Per-Q como proyecto de intervención en educación virtual para ambientes virtuales de aprendizaje

MARTÍNEZ-GONZÁLEZ, Fernando Eduardo, MACÍAS-BRAMBILA, Hassem Rubén, RODRÍGUEZ-JIMÉNEZ, Liza Mayela and LÓPEZ-LAGUNA, Ana Bertha

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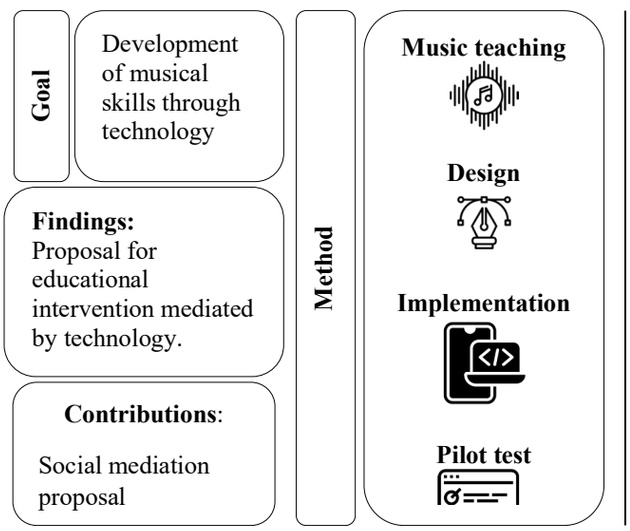
Abstract

This article describes the methodological process in the design, implementation, and evaluation of Per-Q as an intervention project for educational practice in music teaching through the design of multimedia educational resources, social networks, software development and instructional design for virtual learning environments. Considering rhythm as the main element, based on the Rhythmic Dalcroze, Dum-Dum, How to Play, Slap Happy and Rhythm stories methods, as methods that incorporate activities with movements, the game as a didactic element, improvisation, and the possibility of doing it without musical instruments implemented through traditional, constructivist and critical musical didactics approaches. Project aimed at a children's audience based on Jean Piaget's Theory of Cognitive Development and the stage of concrete operations, where initial rhythmic learning is associated with logical operations such as serialization, numbering and classification that are presented at the ages of the target audience. and that contemplates the possibility of implementing social mediation models in existing study programs at various levels of education.



Musical Education, Virtual Learning Environments, Didactic Approaches

Use of Kahoot, Quizizz and Educaplay as formative assessment for student learning in elementary school

Uso de Kahoot, Quizizz y Educaplay como evaluación formativa para el aprendizaje de los estudiantes en la educación primaria

DOMÍNGUEZ-GUTÚ, Jesús, TREJO-TREJO, Gilberto Abelino, GORDILLO-ESPINOZA, Emmnauel and CONSTANTINO-GONZÁLEZ, Ferndado Exiquio

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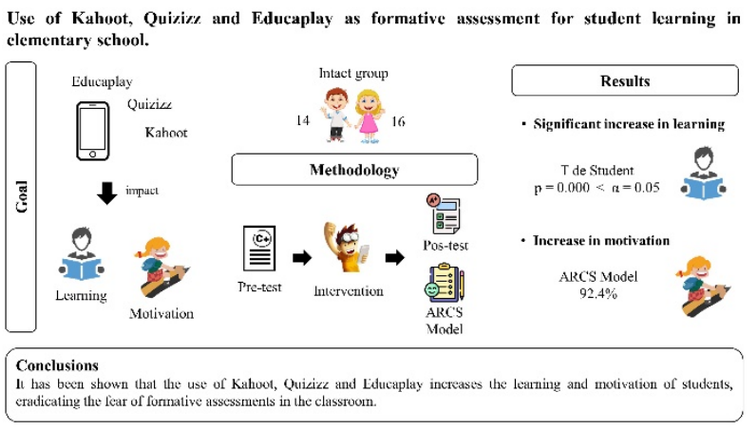
Abstract

The present research was developed in an elementary school in the city of Ocosingo, Chiapas, Mexico; It focused on the use of applications such as Kahoot, Quizizz, Educaplay, internet and mobile devices, to carry out formative evaluation in the classroom and determine its impact on the learning of 4th grade students, on the topic of Mesoamerican Cultures in the subject of History. The study was carried out under a descriptive quantitative approach with a quasi-experimental design, using as data collection instruments a performance test and a questionnaire to measure students' Motivation through the ARCS Model (Attention, Relevance, Confidence and Satisfaction). The results show that the use of these applications significantly increases student learning, developing motivation to study and learn the topic addressed.



Applications, ARCS Model, Formative evaluation, Elementary school

Management of relationships with Stakeholders in Chemical Engineering of the UACQ of the UAZ

Gestión de las relaciones con Stakeholders en Ingeniería Química de la UACQ de la UAZ

CONEJO-FLORES, Ricardo, GARCÍA-GONZÁLEZ, Juan Manuel, CARRERA-ARELLANO, Ethson Uriel and VILLEGAS-MARTÍNEZ, Rodrigo Cervando

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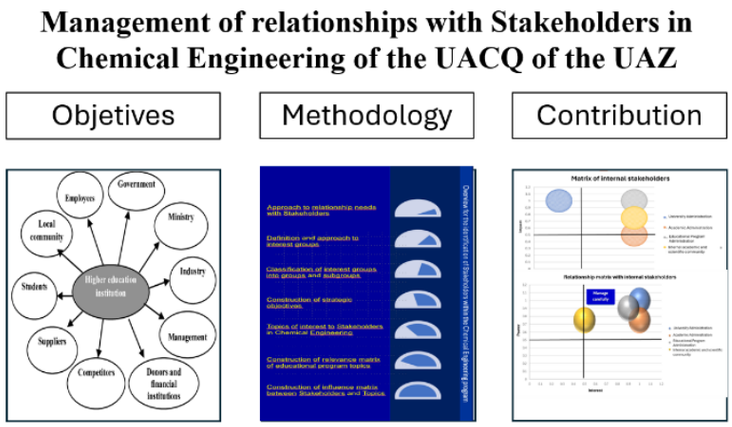
Abstract

The fundamental premise of this research is to provide a detailed description of the usefulness and importance of the relationships within Higher Education Institutions (HEIs) with Stakeholders or Interest Groups. It is based on qualitative and descriptive research on the importance and generation of procedures to meet the demands of interest groups and their degree of importance in institutional functioning. The result is a set of identification and relationship matrices that will mark one of the fundamental pillars and attention in the management of quality and academic excellence from the pedagogical, institutional and school dimension of the Chemical Engineering (IQ) educational program of the Unit. Academic of Chemical Sciences (UACQ) from the Autonomous University of Zacatecas (UAZ).



Stakeholders, Identification, Matrices

Developing 21st century skills: A proposal for a didactic sequence with a STEAM approach and active methodologies for basic education students in the Mexican Southeast

Desarrollando habilidades del siglo XXI: Una propuesta de secuencia didáctica con enfoque STEAM y metodologías activas para alumnos de educación básica en el Sureste Mexicano

TREJO-TREJO, Gilberto Abelino, DOMÍNGUEZ-GUTÚ, Jesús, GORDILLO-ESPINOZA, Emmanuel and CONSTANTINO-GONZÁLEZ, Fernando Exiquio

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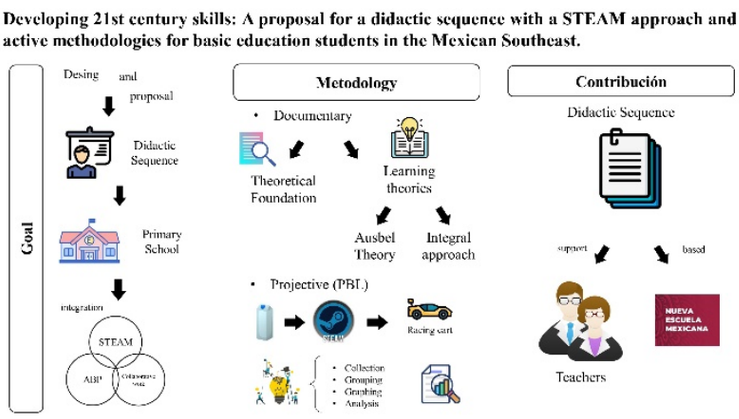
Abstract

The objective of this article is to develop a didactic sequence to work on teaching in the classroom, comprising successive activities in order to teach educational content in basic education, in the context of a rural school in the Mexican Southeast; based on the theories of David Ausubel and adapting the model of a didactic sequence with a comprehensive approach; integrating Project Based Learning (PBL) and Collaborative Work with the STEAM methodology. This didactic sequence will be useful as a planning instrument for Basic Education teachers to improve their educational practice by making use of transversality between subjects so that the student can transfer learning to their environment and daily life, as well as reflect. on their actions and have the ability to make proposals for improvement.



Teaching proposal, STEAM, Comprehensive Approach

About the validation of a questionnaire on behavioral addiction to the internet and its relationship with the student population

Acerca de la validación de un cuestionario sobre la adicción conductual al internet y su relación con la población estudiantil

ORTIZ- Y OJEDA, Pedro Tomás, ORTIZ-SÁNCHEZ, Pedro Alfonso Guadalupe, SÁNCHEZ-ITURBE, Patricia Guadalupe and BASAVE-TORRES, Rosy Ilda

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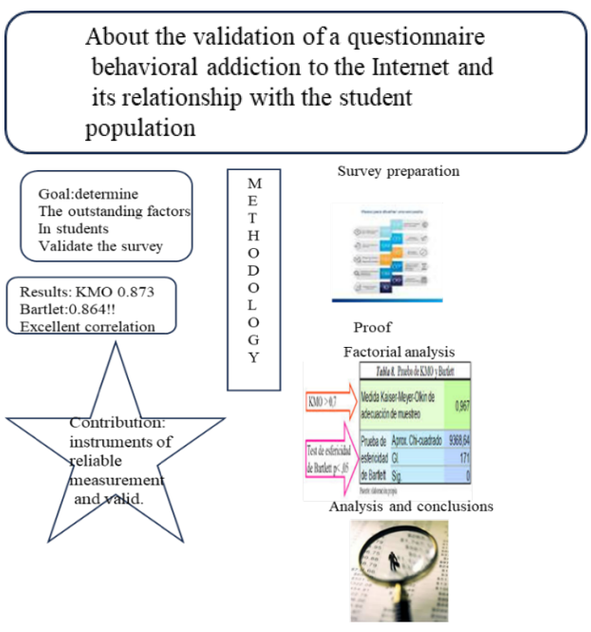
Abstract

Factor analysis is considered to be a very important technique for the investigation of complex situations, in the particular case of Internet addiction, as it allows complex behavior to be broken down into more manageable and understandable factors. This process facilitates the evaluation, intervention and understanding of its implicit dimensions, so that a relationship of its impact on mental health could be established. The validation of a questionnaire is a fundamental part of ensuring that the measurement instruments are reliable and valid. One of the most used statistical methods is factor analysis, this examines the hidden structure of the data and has a certainty that measures what you want to quantify. The method of principal factors and not principal components is used here. The objective of this research is to determine the outstanding factors in the students of TecNM, Campus Mérida and Campus Tuxtla Gutiérrez, who interact with the use of the Internet in a non-academic way; subsequently validate the survey applied. A series of questions were considered to determine if its use is excessive, the questionnaire contains 14 questions that deal with addictions related to behavior and its effect on their daily performance and its possible relationship with academic performance.



Innovation in Chemical Engineering Education with Augmented Reality

Innovación en la enseñanza de la Ingeniería Química con Realidad Aumentada

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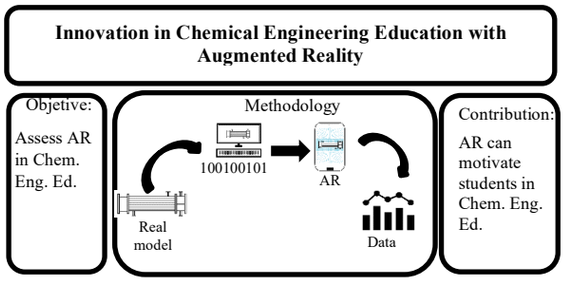
Abstract

The teaching of Chemical Engineering is a potential area for the application of immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR). This study evaluated the impact of an educational experience using a 3D Heat Exchanger model on Instagram with Chemical Engineering students to understand how these technologies can enhance comprehension and learning. An experimental group of 37 volunteer students used their own mobile phones. The methodology included questionnaires with Likert scales to assess learning, the app experience, satisfaction, and educational usefulness. Results indicate that students are enthusiastic about incorporating AR into their learning and desire these innovations to extend to other academic areas. It was evident that AR has promising educational potential for teaching Chemical Engineering.



Augmented Reality, Inmersive, Educational Technology

Factors influencing career choice in students entering administrative profile careers at the Instituto Tecnológico Superior Zacatecas Norte

Factores que influyen en la elección de carrera en los estudiantes que ingresan a las carreras de perfil administrativo del Instituto Tecnológico Superior Zacatecas Norte

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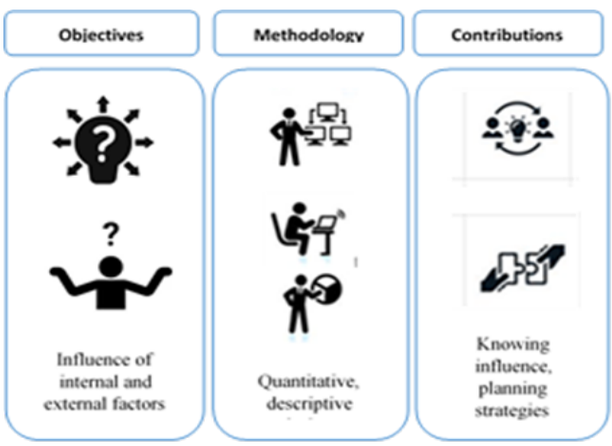
Abstract

The objective of this research was to analyze the influence of internal and external factors on the career choice of incoming students in the careers of Engineering in Administration, Public Accountant and Engineering in Business Management at Tecnológico Superior Zacatecas Norte. The sample consisted of 83 students who were selected through a stratified probability sampling proportional to the size of each stratum. As for the results, internal factors had a greater influence than external factors. Feeling satisfied with oneself, studying as a form of self-improvement to achieve personal challenges in life, and valuing personal abilities to meet the academic demands of the career were the internal factors with the greatest influence. The external factors that influenced the students' career choice were the opportunity to obtain a stable job and having the possibility of relating to other people.



Career choice, Factors, Stratified

Study of the organizational behavior of the sales force in medium-sized companies through the comparative method

Estudio del comportamiento organizativo de la fuerza de ventas en medianas empresas a través del método comparativo

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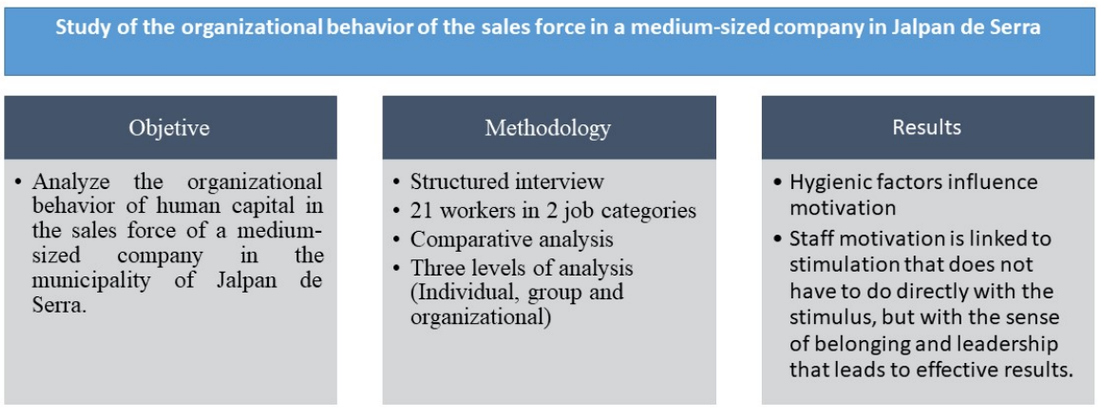
Abstract

The study focuses on the organizational behavior of a medium-sized company in the Sierra Gorda of Querétaro, emphasizing the performance of the sales department in relation to various variables. The analysis is comparative and considers different levels and job categories within the sales department, facilitating the understanding of performance. The results were obtained from 21 structured interviews in two job categories. At the individual level, age was found to be a differential variable between general assistants and salespeople, with the latter being more experienced. Additionally, a decrease in physical abilities was observed in both groups. At the group level, there is a perception of a good work environment regarding personal relationships, where personal interaction influences the evaluation of leaders.



Hunger relief, Economic Feasibility to Establish a Healthy, Sustainable and Community Kitchen

Alivio de Hambre, Factibilidad Económica para Establecer una Cocina Saludable, Sostenible y Comunitaria

PEÑA-MONTES DE OCA, Adriana Isela, PEREZ-NUÑO, Maricela and ROBLES-GARCIA, Francisco J.

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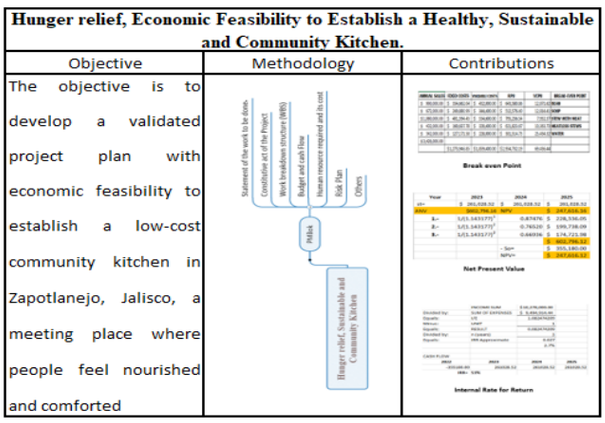
Abstract

The purpose of this work is to develop a strategic model to establish a community kitchen as an alternative to alleviate hunger in order to address one of the challenges proposed in the sustainable development goals by the OCDE. A methodology was developed integrating tools such as Project Plan and PMBOK methodology in order to establish responsibilities, scope, times and resources; acquiring or adapting existing resources, combined with the economic feasibility study, through the application of various financial and economic instruments for this purpose, such as the Net Present Value (NPV), the Internal Rate of Return (IRR), the Minimum Acceptable Rate Performance (TMAR), Cash Flows, among others. The results allowed a projection to ensure the success of the company mediating educational systems and compliance with applicable regulations among others, to reduce risks to the company or people. Future lines of research are proposed to evaluate mechanisms of transparency, effective and relevant accountability, measurement of the level of satisfaction, so as to allow the evolution of the community kitchen in harmony with the development of continuous improvement, in order to avoid dependency of social programs.



Hunger relief, Community Kitchen, Economic Feasibility

Supported Learning in STEAM and PBL Methodology; Using 3D CAD Software for the Mechanical Design of Sumo Robot

Aprendizaje sustentado en metodología steam y abp; empleando software tipo cad 3d para el diseño mecánico de un robot sumo

PEÑA-MONTES DE OCA, Adriana Isela, GALLARDO-DE LA ROCHA, Alfonso and HERNÁNDEZ-HERNÁNDEZ, Adriana Janette

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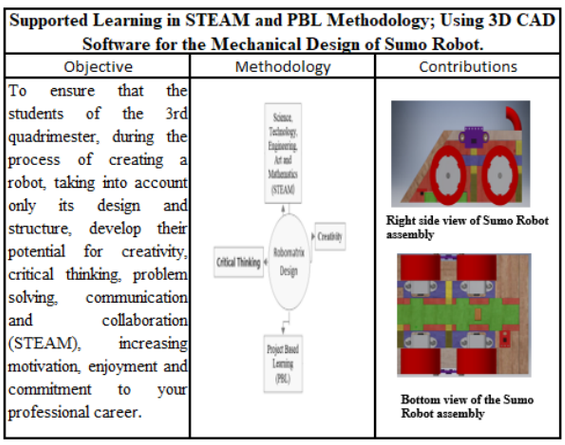
Abstract

The objective of this work was to ensure that the students of the 3rd quadrimester, during the process of creating a robot, focusing only on its design and structure, develop their potential for creativity, critical thinking, problem solving, communication and collaboration (STEAM), increasing motivation, enjoyment and commitment to your professional career. The creation of the mechanical design, supported by the rules of participation for the Robomatrix competition, was carried out through the application of knowledge, skills, tools and techniques applicable to the methodology based on the disciplines: science, technology, engineering, art and mathematics (STEAM).), with the focus on problem solving through Project-Based Learning (PBL) and the use of CAD-type design software; in addition to physical resources, materials, equipment, software, licenses, etc. As a result, the mechanical design of the structure of a sumo robot was obtained, for which the manufactured parts were assembled according to the design and functional tests were carried out. It was evident that the development of experiences in the area of robotics have allowed the participating students to improve their performance by an approximate percentage of 18%, mainly due to the development of creativity, responsibility and social leadership.



Educational Robotics, Mechatronics, STEAM

Proposal for student entry profile into software projects under the ISO/IEC 29110 standard

Propuesta de perfil de ingreso de estudiantes a proyectos de software bajo la norma ISO/IEC 29110

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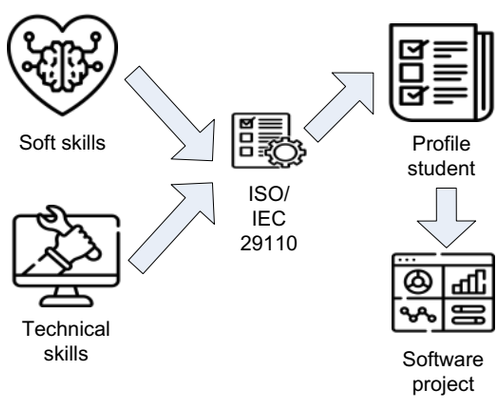
Abstract

This article presents a profile of minimum desirable competencies that engineering students should meet when developing software projects within the ISO/IEC 29110 standard. Starting by presenting related works on skills and attitudes in software development, a literature review is made on the key skills of software engineers and these key skills are mapped to the roles of the work team of the ISO/IEC 29110 standard. Finally, the desirable soft skills and technical skills for students who will join work teams under the ISO/IEC 29110 standard are shown.

Student entry profile ISO/IEC 29910



Skills, software engineering, ISO/IEC 29110

Correlational study between learning styles and study habits in Computer Systems Engineering students

Estudio correlacional entre los estilos de aprendizaje y hábitos de estudio en estudiantes de Ingeniería en Sistemas Computacionales

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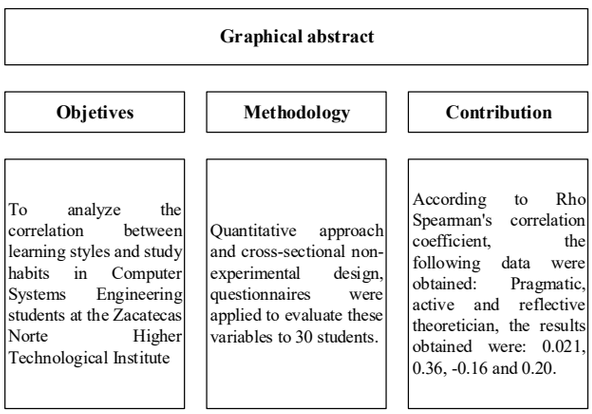
Abstract

This study analyzes the correlation between learning styles and study habits in Computer Systems Engineering students at the Zacatecas Norte Higher Technological Institute, attached to the National Technological Institute of Mexico. With a quantitative approach and cross-sectional non-experimental design, questionnaires were applied to evaluate these variables to 30 students. In the determination of the Rho Spearman correlation coefficient, the data of study habits and each of the variables of learning styles such as: Pragmatic, active theoretical and reflective, were statistically analyzed, the results obtained were: 0.021, 0.36, -0.16 and 0.20 respectively.



Learning Styles, Study Habits, Correlation

Emotional intelligence and Locus of control in college students

La inteligencia emocional y su relación con el locus de control en estudiantes universitarios

CORONADO-SAUCEDA, Angelyn, BOJÓRQUEZ-DÍAZ, Cecilia Ivonne, QUINTANA-LÓPEZ, Víctor Alexander and SOTELO-CASTILLO, Mirsha Alicia

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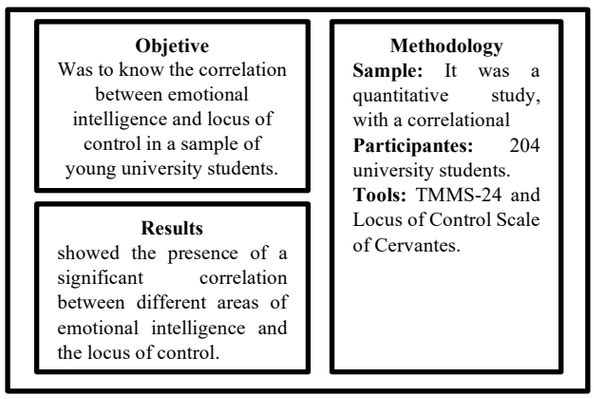
Abstract

The objective of this research was to know the correlation between emotional intelligence and locus of control in a sample of young university students from southern Sonora, as well as to know the levels of emotional intelligence and locus of control of the participants. It was a quantitative study, with a correlational scope and included the random participation of 204 students whose average age was 21 years, all belonging to the seventh semester of their respective educational programs. The results showed the presence of a significant correlation between different areas of emotional intelligence and the locus of control, which coincides with what was found by different authors. It is recommended to implement intervention programs in young people to help them better identify, understand and regulate their emotions, as well as remember the importance of perceiving themselves as self-sufficient and as a causal agent of what happens in their daily lives.



Intelligence, Emotions, Control

Designers' interpretations in the creation of digital ephemera on social media platforms using the Qualitative Comparative Analysis (QCA) method

Interpretaciones de diseñadores en la creación de efímeros digitales en plataformas de redes sociales utilizando el método de Análisis comparativo cualitativo (ACQ)

IZABAL-BAILÓN, Astrid Carolina, SALINAS-GUTIÉRREZ, Isabel, TORRES-DE LEÓN, Gloria Azucena and CARAVEO-MENA, Camilo

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Abstract

Technology advancements have significantly impacted the speed and efficiency of the design process, leading to changes in content production and dissemination on digital platforms. Consequently, the attention span and relevance of these messages have become ephemeral. This new scenario involves the graphic designer creating messages for digital media, especially in virtual communities. Thus, first, we seek to establish a solid and comprehensive definition of digital ephemera within the context of graphic design. The methodology consists of data analysis through semi-structured interviews conducted with graphic designers from Tijuana and San Diego via conferencing platforms. The data collected is then analyzed using the Qualitative Comparative Analysis (QCA) method. This research aims to describe and analyze the phenomenon of designing messages with a 60-second lifespan on social media platforms. Therefore, a systematic approach and categorization of concepts are explored across the interconnected domains, ensuring a comprehensive definition of digital ephemera.

Ephemeral, Phenomenon, Platforms

Social media analysis in digital campaigns: #Istop #cyberbullying

Análisis de redes sociales en campañas digitales: #Istop #cyberbullying

URBINA-NÁJERA, Argelia Berenice, MARTÍNEZ-MIRÓN, Erika Annabel, JUÁREZ-GUTIÉRREZ, Rossana Enith and SÁNCHEZ-ROMÁN, Guillermina

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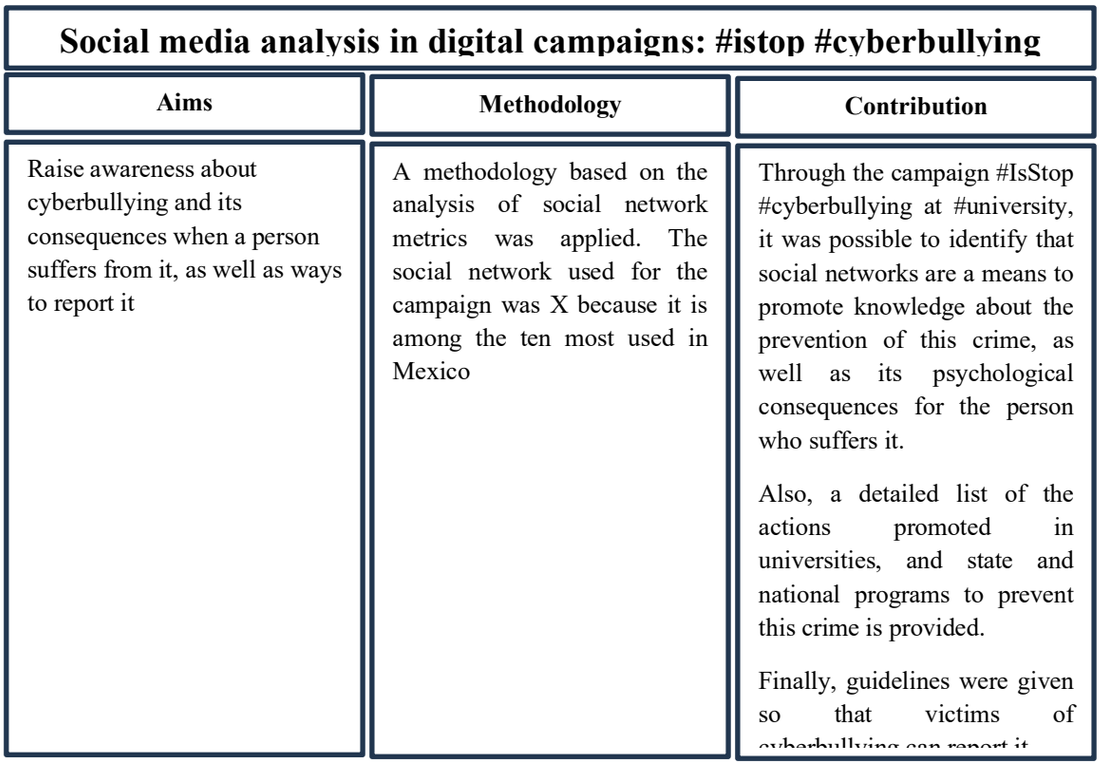
Abstract

In this paper, we present the results of the campaign #detengo el #cyberbullying en la #universidad to generate knowledge about the issue and its consequences when a person suffers it, as well as the ways to report it. A methodology based on the analysis of social network metrics was applied. The social network used for the campaign was X because it is among the ten most used in Mexico. The results show that videos cause a more significant number of impressions and that 100% of the people who interacted with the campaign content do not know how to report cyberbullying. Likewise, there was no evidence of the generation of knowledge or awareness, so it is not possible to say if this campaign prevented or reduced this crime. However, it has been a favorable means to inform people about the issue. In this sense, we seek to implement strategies to estimate whether this campaign can generate knowledge to change behavior to prevent, reduce, eradicate, or encourage reporting it



Social media analysis in digital campaigns: #istop #cyberbullying		
Aims	**Methodology**	**Contribution**
Raise awareness about cyberbullying and its consequences when a person suffers from it, as well as ways to report it	A methodology based on the analysis of social network metrics was applied. The social network used for the campaign was X because it is among the ten most used in Mexico	Through the campaign #IsStop #cyberbullying at #university, it was possible to identify that social networks are a means to promote knowledge about the prevention of this crime, as well as its psychological consequences for the person who suffers it. Also, a detailed list of the actions promoted in universities, and state and national programs to prevent this crime is provided. Finally, guidelines were given so that victims of cyberbullying can report it

Cyberbullying, Social media Campaigns, Social media

Intertwined modernities: the figure of the witch in the comic Rumbo a las Ánimas (2021)

Modernidades entrelazadas: la figura de la bruja en la historieta Rumbo a las Ánimas (2021)

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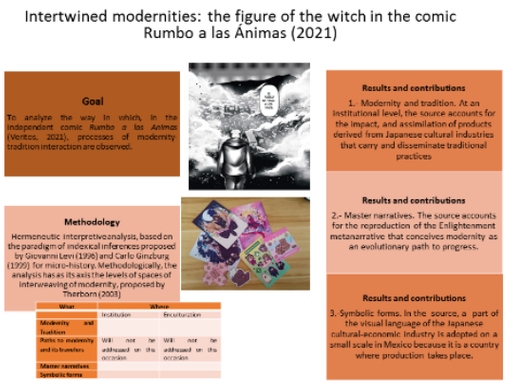
Abstract

In this work, we aim to analyze the way in which, in the comic *Rumbo a las Ánimas*, processes of modernity-tradition interaction are observed, where the latter is presented from the re-situation of its elements in the narrative structure. Methodologically and epistemically, we support this work with a hermeneutic interpretive analysis, based on the paradigm of indicative inferences proposed by Giovanni Levi (1996) and Carlo Ginzburg (1999) for microhistory. This work has as its axis the levels of spaces of interweaving of modernity, proposed by Therborn, (2003), of which we return to three: the dimension of modernity and tradition, master narratives and symbolic forms. We provide a case study, which examines both in content and context, the way in which a contemporary media accounts for multiple, complex and intertwined contextual modernities, observed in relation to the reiteration of narratives and the re situation of institutionalized and enculturalized traditional elements.



Interweaving, Narratives, Modernity

Review of Learning Theories Applied to Physics subject at University Level

Revisión de las teorías del aprendizaje aplicadas a la asignatura de Física en el nivel universitario

BELTRAN-ZHIZHKO, Gali Aleksandra, GARCIA-ARAMBULA, Cintia Germania, ZHIZHKO, Elena Anatolievna and GUERRERO-RODRIGUEZ, Rebeca

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Abstract

This chapter explores various learning theories, from behaviorism to constructivism, and their application in teaching classical physics at the university level. The analysis highlights the transition from behaviorist theories, which focus on observable behavior changes and often lead to rote learning, to cognitive and constructivist theories like Ausubel's, which emphasize meaningful learning through reflection, understanding, and active knowledge construction. Ausubel underscores the importance of linking new content with students' prior knowledge for substantive learning. The chapter argues that addressing learning difficulties in physics requires instruction based on conceptual analysis and hierarchical knowledge organization. It critiques the prevailing behavioral approach in Mexican education and advocates for a shift towards meaningful learning strategies that foster active student participation and deeper understanding, ultimately enhancing instructional effectiveness in physics and other disciplines.

Review of Learning Theories Applied to Physics subject at University Level

OBJECTIVES	METHODOLOGY	CONTRIBUTION
To describe the main features of learning theories, from behavioral to constructivism theories, and their application to the teaching-learning process of natural sciences at the university level, specifically in the subject of classical physics.	A qualitative research was performed, with the use of a documentary analysis technique.	The main contribution of this research is in the analysis of the main learning theories, from the Behavioral theories to the Significant Learning Theory, focusing on how they apply to the physics subject for university level students in Mexico.

Learning theories, Physics subject, University Level

Intellectual biography of Latin American academics II

Biografía intelectual de académicos latinoamericanos II

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Abstract

The text we present here constitutes a second partial report of the research *Women in Science: intellectual biographies of Latin American academics*, which aims to decipher the women who, from the scientific field, influence the development of knowledge. But how to identify the protagonists of these narratives? How to approach them? How to account for the plots they built to be what they decided to be? To answer these questions, mere descriptions of their lives are not enough, it is necessary to contact the deepest levels of their subjectivities that explain their uncertainties but also their certainties, their ruptures, and alliances as well as their most intimate convictions that led them to struggle against the current to carry out vigorous projects that impacted their time and context, sowing deep footprints that are worth recognizing and valuing. Under this logic, it is important to recognize, in dialogue with their intellectual biographies, their voices, their desires, their strength and their legacy.

History Of Education, Women, Gender, Intellectual Biographies

Exploring the Kawaii Phenomenon: A Study for Its Classification

Exploración del Fenómeno Kawaii: Un estudio para su clasificación

MARTINEZ-RAMIREZ, Frida Paola, RODRÍGUEZ-GUTIÉRREZ, Susana, LANDEROS-LORENZANA, Karina Hildelisa and HERNANDEZ-TORRES, Ervey Leonel

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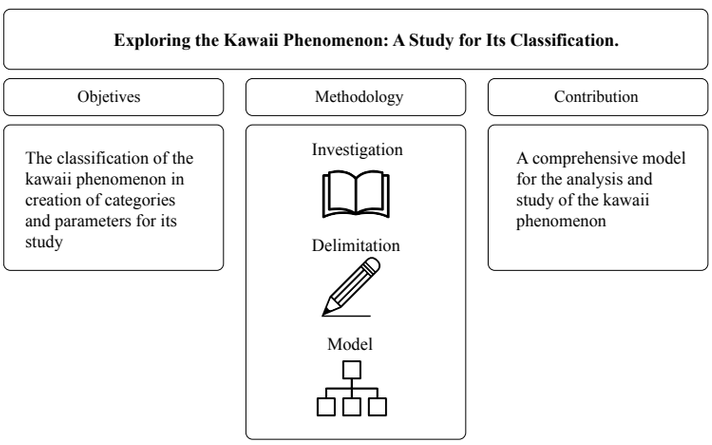
Abstract

This article aims to offer a comprehensive view of the kawaii phenomenon by exploring its dimensions. Consequently, providing a conceptual framework to understand and analyze this significant aspect of contemporary culture. Through a multidisciplinary approach, we seek to unravel the complexities of kawaii and its impact on diverse areas, from visual arts to popular culture, through fashion, graphic design, and social dynamics. The starting point for this exploration is the Kawaii Classification model proposed by Marcus, A., Kurosu, M., Ma, X., & Hashizume, A. (2017), the starting point for the organization and categorization of the elements that make up the kawaii phenomenon. However, this article introduces a different and comprehensive version of said model, including a new dimension: the Graphic Kawaii. This new category is incorporated to reflect the evolution and expansion of kawaii in the visual field, recognizing its growing influence in graphic design, illustration, and other forms of visual expression. Which have contributed to popularizing and adapting this aesthetic locally and globally.



Kawaii, Dimensions, Model

5 Social Sciences

Study case: educational-cognitive impact of university responsibility social

Estudio de caso: impacto educativo-cognitivo de la responsabilidad social universitaria

HERNÁNDEZ-FLORES, María Juana, NIEVES-ALEGRE, Eduardo, ESTRADA-CHAVIRA, María Eugenia and SÁNCHEZ-MUÑOZ, Maximino

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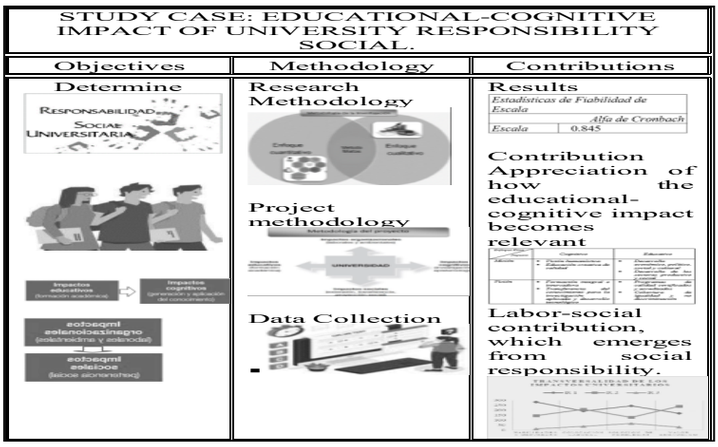
Abstract

Education currently requires a transversal approach, so determining the impact that cognitive and educational approaches have on university students, as part of university social responsibility, is of utmost importance to reinforce professional training. As part of the research methodology, a mixed approach is used on a case study; while the project's methodology handles the 2030 agenda and the guide on the types of university impacts. Thus, an appreciation of Reliability Statistics in Cronbach's Alpha Scale is achieved with a 0.845, focused on the educational-cognitive impact, which becomes relevant through significant learning, this through the social-labor contribution, which emerges from university social responsibility.



Educational, Responsibility, Ethical

Integrating sustainability into teaching and research practice at a higher education institution: A holistic approach

Integración de la sustentabilidad en la práctica docente y de investigación en una institución de educación superior: Un enfoque holístico

HERNÁNDEZ-AYÓN, Francisco Javier, FIGUEROA-VERDE, Brenda, ARVIZU-NARVÁEZ, Ana Carolina and NAVARRETE-MÉNDEZ, Adrián

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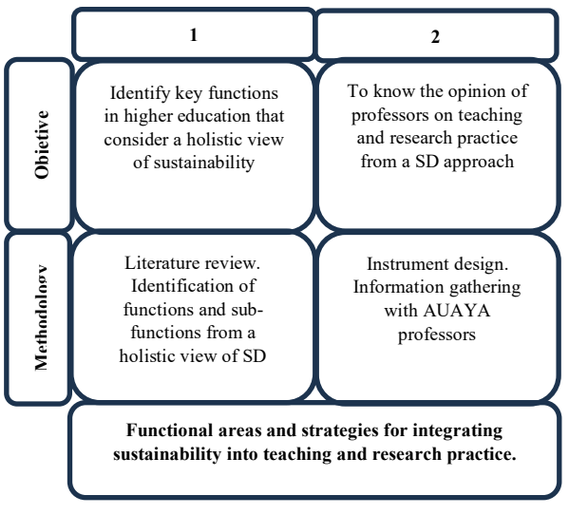
Abstract

Higher education institutions play a fundamental role in training for sustainable development, recognized as key actors since 1990. Higher education institutions can contribute to the Sustainable Development Goals through teaching, research, outreach and institutional management, but face challenges for a holistic integration, requiring a systemic approach. This research sought to identify areas and strategies for the integration of sustainability in the teaching and research practice of a higher education institution. Using a field methodology and quantitative approach, first key functional areas and sub-functions were defined, assessing their coherence with sustainability. Then, the opinion of professors was gathered, who pointed out main problems in teaching, especially in curriculum development and evaluation, evidencing the need for a comprehensive approach.



Institutions, Sustainability, Holistic

Food Bank Management

Gestión del Banco de Alimentos

DE LA PEÑA- MARTÍNEZ, Ruth, RUIZ-AYALA, Jose Dolores, FLORES-GARCÍA, Francisco Gerardo and AGUIRRE-MEJÌA, Elena Tzetzángary

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Abstract

This study examines the operations of the Food Bank in Torreón, Coahuila, a Non-Governmental Organization (NGO) dedicated to voluntarily assisting the most vulnerable populations with food support. Despite its non-profit status, the Food Bank is subject to regulations for food assistance targeting at-risk groups, as outlined in the Official Mexican Standard NOM-014-SSA3-2013, which encompasses essential requirements at local, national, and international levels. The Strategic Business Analysis methodology was employed, utilizing specific techniques for job analysis, organizational climate assessment, quality control, security, and automation, all within the framework of concurrent triangulation to gather both quantitative and qualitative data simultaneously. Based on the findings, a series of operational, administrative, and organizational changes were implemented. In the initial phase, these changes led to a significant improvement in the work environment, a reduction in food waste, and an increase in the monthly volume of products handled.

Modernization of the Organization and Operation of a Food Bank (BA) in the Lagunera Region		
Objectives	Methodology	Contributions
General: In-depth review of the structure and organizational climate of the BA. Specific: Design and implement strategies that improve the efficiency of processes, administration, and agile compliance with both internal and external information needs.	Strategic business analysis, job analysis, organizational climate, matrix technique, Deming cycle, Ishikawa, five'S, security, systematization with the development of custom software.	More effective administration, improvement in operation and organizational climate, better business practices. Development of a software application for the administrative management of processes and covering information needs.

Organizational Development, Continuous Improvement, Systematization

Diagnostic assessment of knowledge in basic sciences and its relation to the teaching-learning process in the university environment

Evaluación diagnóstica del conocimiento en ciencias básicas y su relación con el proceso de enseñanza-aprendizaje en el entorno universitario

GONZÁLEZ-QUEZADA, Esperanza, SOLTERO-SÁNCHEZ, Alma Luz Angélica, HUERTA-CHÁVEZ, Irma Alicia and FIGUEROA-OCHOA, Edgar Benjamín

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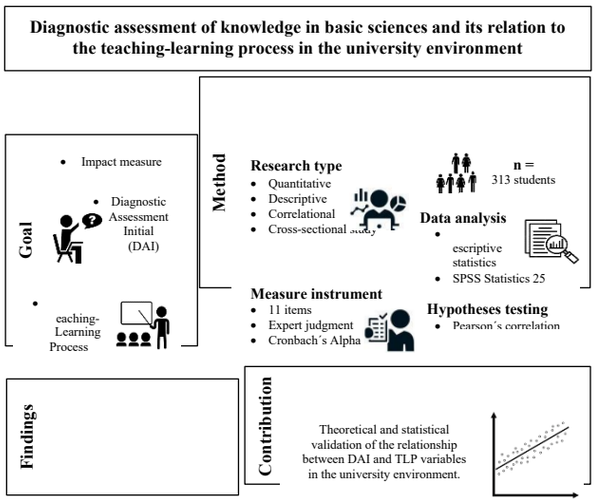
Abstract

Identifying the deficiencies in the learning acquired in undergraduate students allows the design of new methodological strategies in the teaching-learning process. The objective of this research is to measure the implementation of the initial diagnostic assessment of knowledge in basic sciences and differential and integral calculus as part of the Physicochemistry learning unit, and its impact on the implementation of the teaching-learning process. This research is quantitative, descriptive, correlational, and cross-sectional, with convenience sampling of 313 students. The instrument used consisted of 11 items, with validation by expert judgment and Cronbach's Alpha. Data analysis was performed with descriptive statistics and hypothesis testing with Pearson's correlation. The findings corroborate that diagnostic assessment implementation of prior knowledge has an impact on the teaching-learning process in a university environment.



Correlational Study, Deficiencies in Knowledge, Implementation Teaching-Learning Process

Analysis of the economic impact, as a contribution of university students in the municipality of Ocosingo, Chiapas

Análisis del impacto económico, como contribución de los estudiantes universitarios en el municipio de Ocosingo, Chiapas

PEREZ-DE LA CRUZ, José Francisco, ZEPEDA-TRUJILLO, Elizabeth Guadalupe and AGUILAR-FLORES, Miguel Angel

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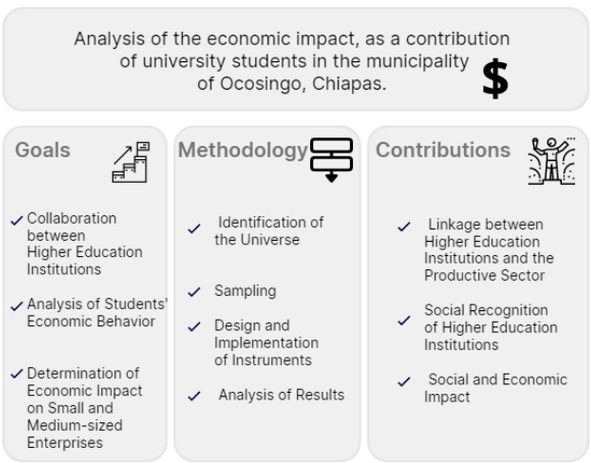
Abstract

Authors must provide an original image that clearly represents the article described in the article. Graphical abstracts should be submitted as a separate file. Please note that, as well as each article must be unique. File type: the file types are MS Office files.No additional text, outline or synopsis should be included. Any text or captions must be part of the image file. Do not use unnecessary white space or a "graphic abstract" header within the image file.



Instituciones, Economía, Vinculación, Impacto Social, Sector Productivo

Facing the Gap: Digital Villages for Life Transformation Small and Medium Enterprises in Morelos

Enfrentando la brecha: Aldeas Digitales para la Transformación de Pequeñas y Medianas Empresas en Morelos

JUÁREZ-SALOMO, Norma Angélica, SILVEYRA-ROSALES, Mariana Teresa, CUEVAS-OLASCOAGA, Miguel Ángel and GAMA-HERNANDEZ, Gerardo

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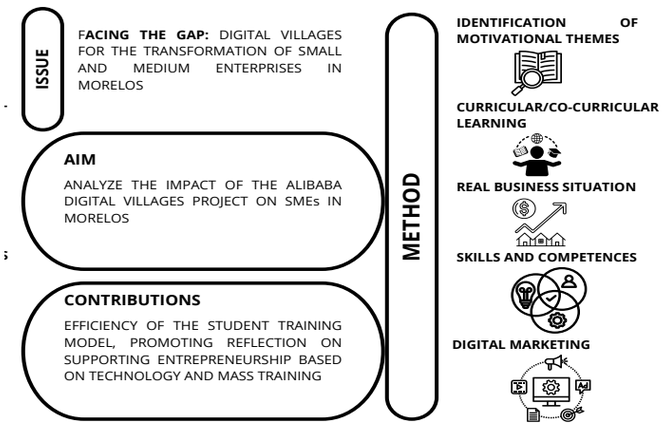
Abstract

Digital Villages project of Alibaba´s Group, carried out in the state of Morelos, due to its transformative effects on Small and Medium Enterprises, was an extraordinary strategy to empower participants through collaboration initiatives between teachers, students, and entrepreneurs, using digital resources to improve the prospects of visibility and commercial development of each project, contributing to the reduction of poverty gaps and job creation. The general methodology adopted by each team, was Project-Based Learning (PBL), which allowed participants to identify motivating topics and learn curricular or co-curricular content, testing their skills and competencies. The challenge of each project was to find out critical situations, considering the reality or environment of each small business, arousing their interest and reinforce concepts and procedures required to learn within marketing and digital resources. The analysis of the small and medium-sized companies that took part of the project led to identify the theoretical and practical characteristics of the Digital Villages project in the state of Morelos and revealed the importance of the Alibaba Business School methodology at the various levels of training. The added value was being able to appreciate the efficiency of the Student Training Model through Agile Methodologies; and promote reflection on the importance and efficiency of supporting small and medium-sized businesses in entrepreneurship, under a model like that of China, based on technology training and mass training.



Pedaogical Innovation, Technology, Methodology

Analysis of professional interests in high school institutions of the Colegio de Bachilleres System in the Sierra Gorda de Querétaro

Análisis de los intereses profesionales en las instituciones de educación media superior del Sistema Colegio de Bachilleres de la Sierra Gorda de Querétaro

MORADO-HUERTA, Ma Guadalupe, SOTO-SEVILLA, Sergio, LÓPEZ-HERNÁNDEZ, Edgardo and IBARRA-PÉREZ, Juan

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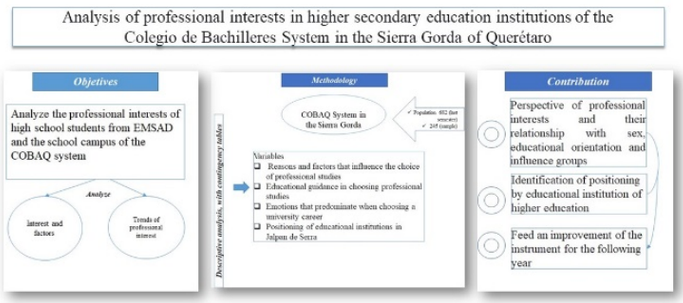
Abstract

The analysis of professional interests is a phenomenon that is analyzed in a multifactorial way in order to obtain a complete scenario that allows us to identify the dependent and independent factors. In this case we can find an outline of the experience in identifying the motives that drive the choice of a career, as well as the state of mind of a young person in the process of professional placement, which is first-hand material to identify the reinforcement of professional orientation strategies. On the other hand, it allows the regional identification of trends in educational aspirations, which reflects the intention to continue studying, and it also provides a background of the results to visualize future studies aimed at improving the interpretation of the variables.



Professional Interests, Motives, Factor

Ecosystem of a Spin-off for the generation of MSMEs at the higher education level

Ecosistema de un Spin-off para la generación de MiPymes en el nivel superior

MÉNDEZ-MENDOZA, José Nemorio, CANO-CORONA, Ariana, VARELA-LOYOLA, José Antonio and HERNÁNDEZ-ZEMPOALTECATL, Rodrigo

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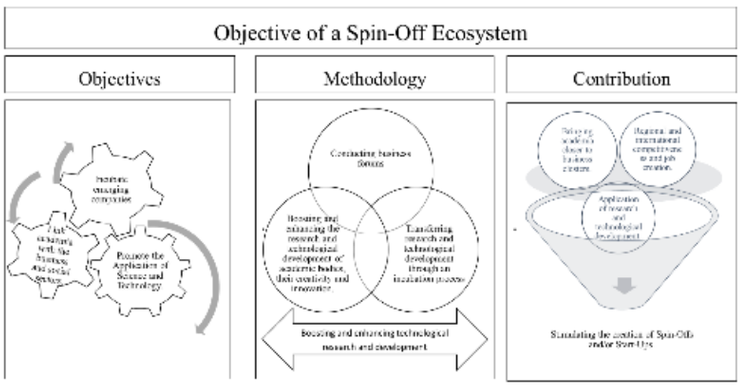
Abstract

The ecosystem converges within the academy, which offers programs of excellence, holistically integrating science and technology; the state, institutions, and research centers, technological parks, the private sector, and the link with the community, fostering an entrepreneurial identity among students and/or interest groups. Technology transfer manages knowledge and technology directed at providing solutions to manufacturing or control processes required by companies to be competitive and sustainable in a globalized market, promoting innovation and economic development. Business success lies in innovative business proposals that involve the transfer of science and technology required by productive or service companies, fostering the generation of spin-offs and startups. Currently, the University, through Nodess, links the social and private sectors, promoting social and solidarity economy in the southern region of the state of Tlaxcala, Mexico.



Spin Off, Technological Transfer, Research Line

Diagnostic of Job Satisfaction in a Municipal Council of the State of Mexico.

Diagnóstico de la Satisfacción Laboral en un Ayuntamiento Municipal del Estado de México

ORDOÑEZ-HERNÁNDEZ, Lucía, ZENTENO-BONOLA, Ana Luisa, AGUIRRE-BRITO, Dorian and GARCÍA-PALLARES, Paola Ayleen

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Abstract

In human capital management, a required factor in the integration process is the measurement of job satisfaction. Which was the objective of this article. A method with a quantitative approach was used with a type of descriptive study using the descriptive transectional design. The instrument that was applied was the one designed by Warr, Cook and Wall (1979) which is composed of intrinsic and extrinsic factors with a scale that includes totally dissatisfied, dissatisfied, indifferent, satisfied and totally satisfied. The application was virtual and anonymous. The sample was made up of 303 people, with a confidence level of 95%. The trend of the results in general satisfaction in 85% of men and 79% of women leaned towards very satisfied or satisfied. Improvement strategies were proposed for each factor evaluated.

Diagnostic of Job Satisfaction in a Municipal Council of the State of Mexico		
Objectives	**Methodology**	**Contribution**
Evaluate the Job Satisfaction of the workers of a Municipal Council of the State of Mexico.	The research type is basic and descriptive level, using the Warr, Cook and Wall (1979) satisfaction survey.	A diagnostic of job satisfaction was obtained and improvement strategies were proposed.

Diagnostic, Job Satisfaction, Municipal Council

Measuring service quality of the science education workshop using the SERVPERF model

Medición de la calidad del servicio del taller educativo en ciencias usando el modelo SERVPERF

SOLTERO-SÁNCHEZ, Alma Luz Angélica, GONZÁLEZ-QUEZADA, Esperanza, SOLTERO-SÁNCHEZ, Jazmín del Rocío and HUERTA-CHÁVEZ, Irma Alicia

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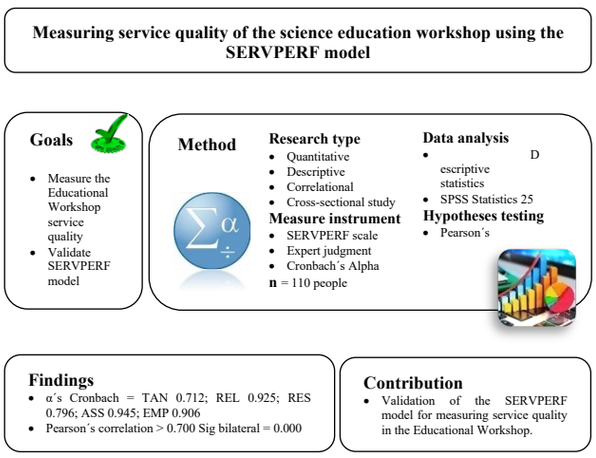
Abstract

Bringing science closer to the general public is a constant task that academics and researchers have the social commitment to perform with quality. This research evaluated the quality of the service provided by teachers during the “Educational Workshop Magic of Chemistry” at the Institute of Astronomy and Meteorology of the University of Guadalajara, using the SERVPERF model. The research had a quantitative, cross-sectional, descriptive and non-experimental approach. The sampling was non-probabilistic by convenience with 110 people, with a ratio of 5 questionnaires in relation to the 22 items of the instrument (Hair et al., 1999). The measurement instrument was validated with values above 0.700 of Cronbach's Alpha (Nunnally, 1978) and descriptive statistics were used to corroborate the normality of the data, the correlation between items and the five variables measured with the SERVPERF model.



Approach Quantitative, Science Dissemination, Service Performance Measurement

Gray TEU repositioning a sustainable circular economy commitment

Reposicionamiento de TEU grises un compromiso de economía circular sustentable

FLORES-CRUZ, Luis Antonio, CRUZ-GÓMEZ, Marco Antonio, LARA-ANDRADE, María Verónica Altagracia and VÁZQUEZ-JUÁREZ, Patricia

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Abstract

The imbalance between imports and exports in global trade generates, consequently, the relocation of gray TEUs on the Transpacific and Transatlantic routes. Moreover, the objective of this research was to analyze the relocation of empty TEUs on the Transpacific and Transatlantic routes. for the purposes of commitment to a sustainable circular economy. On the other hand, the fluidity of global trade depends on the containerization available for export. However, ports that do not have assets will consequently face shortages and will have to be relocated. A mixed analysis was carried out on the relocation of gray TEUs on the Transpacific and Transatlantic routes; based on the quantification and estimation of statistical control variables, decision making, modernization and information and communication technologies. The characterization of data obtained from the relocation of gray TEUs is the basis of the commitment to circular economy and sustainability. The identification of manufacturing processes for recycled TEU will be the subject of future work.

Gray TEU repositioning a sustainable circular economy commitment		
Objectives	Methodology	Contribution
Analyze the relocation of empty TEUs on the Transpacific and Transatlantic routes. for the purposes of commitment to a sustainable circular economy.	This research had a mixed approach, applying both quantitative and qualitative technologies, using systematic processes, as well as records and estimated data.	The characterization of data obtained from the relocation of gray TEUs is the basis of the commitment to circular economy and sustainability.

Relocation Empty TEU, Repositioning Empty TEU, Global Empty Container Movements

Fluidity index for smart farms supply chain

Indice de fluidez en cadenas agroalimentarias

BUENO-SOLANO, Alfredo, HERNÁNDEZ-VALDEZ, Lizeth Danyra, VEGA-TELLES, Ernesto Alonso and ACOSTA-QUINTANA, María Paz Guadalupe

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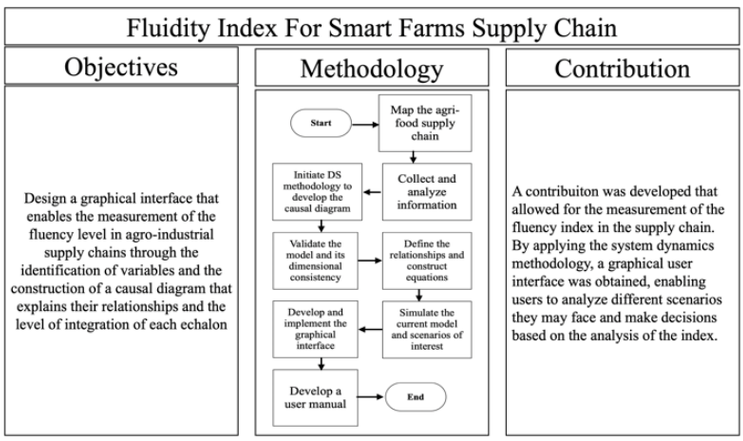
Abstract

This research provides a comprehensive perspective on the supply chain of the agri-food sector in Sonora, Mexico, with a specific focus on tomatoes, one of the most prominent products in both the regional and national economy. The analysis emphasizes the importance of supply chain integration and its impact on the fluency index, utilizing system dynamics methodology to simulate and evaluate this influence.



Smart Farms, Logistics, Fluidity Index

Perspective of Leadership in Higher Education: A Systematic Literature Review

Perspectiva del Liderazgo en la Educación de nivel Superior: Una Revisión Sistemática de la Literatura

HERNÁNDEZ-CRUZ, Luz María, LLANES-CHIQUINI, Charlotte Monserrat de Jesús, MEX-ÁLVAREZ, Diana Concepción and CARBACHE-MORA, César

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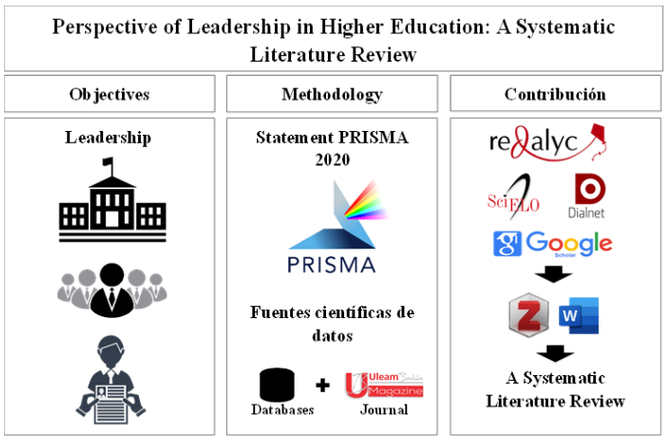
Abstract

The objective of this paper is to compile information from recent studies in the line of research of Leadership as a skill or soft competence in Higher Education as a determining factor in the insertion of professionals in the labor. The methodology implemented to carry out the systematic literature review study is the PRISMA 2020 statement. Perceive the importance of Leadership in Higher Education. Providing new areas for research that can be aimed at quality professional education, which allows graduates to be competitive in the workplace or start their own sources of income.



Professionals, Leadership, Literature

Technological solution: graphical interface with users in a gas station with system dynamics

Solución tecnológica: interfaz gráfica con usuarios en una estación de gasolina con dímamica de sistemas

ACOSTA-HERNÁNDEZ, Vianey Andrea, LAGARDA-LEYVA, Ernesto Alonso, VEGA-TELLES, Ernesto Alonso and PORTUGAL-VÁSQUEZ, Javier

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Abstract

Gas stations measure their efficiency by customer acceptance in the long term. This research focused on the analysis of fuel dispensing capacity at a gas station, using system dynamics methodology to generate an integrated technological solution to evaluate different scenarios. The main objective was to improve operational efficiency by simulating different scenarios, evaluating fuel availability and sales patterns in normal, optimistic and pessimistic situations, allowing the identification of areas for improvement such as low use of service islands and pumps. The results indicate that, although fuel sales and availability are generally stable, there is significant potential to optimize capacity, thereby improving efficiency and customer experience. The conclusions establish the importance of implementing simulation-based solutions and policies to maximize business profitability.

System Dynamics, Graphical User Interface, Scenarios

Infrastructure maintenance management system in a Higher Education Institution: Library, School Registry and Teaching Advice Center (CAD)

Sistema de administración de mantenimiento a la infraestructura en una Institución de Educación Superior: Biblioteca, Registro Escolar y Centro de Asesorías Docentes (CAD)

FORNÉS-RIVERA, René Daniel, CANO-CARRASCO, Adolfo, CONANT-PABLOS, Marco Antonio and ALMADA-LÓPEZ, Andrea

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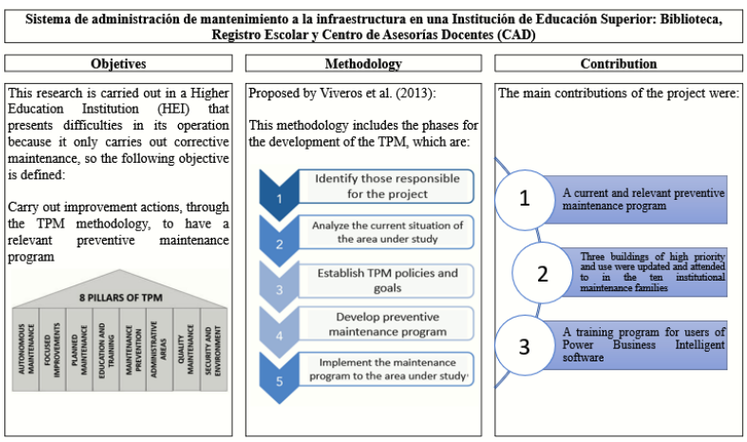
Abstract

This research is carried out in a Higher Education Institution (IES) and addresses the need to develop a Total Productive Maintenance Program (TPM), in the library buildings, school registry and Teaching Advisory Center (CDA), presenting difficulties in its operation managed by the Department of General Services and Maintenance (DSGyM), carrying out only corrective maintenance. The objective was: to carry out improvement actions, through the TPM methodology, to have a relevant maintenance program.

The procedure was: identify those responsible for the project, analyze the current situation of the area under study, establish policies and goals, develop the preventive maintenance program and implement the maintenance program to the areas under study; obtaining a preventive maintenance program, made up of families such as: refrigeration, lighting, hydraulic-sanitary, electrical system, building conservation, painting, roads, miscellaneous, locksmith and waterproofing. Achieving preventive maintenance and training programs.



Program, Administration, Maintenance

Graphic interface design as support for decision-making in the salt production process

Diseño de interfaz gráfica como apoyo para la toma de decisiones en el proceso de producción de sal

VEGA-TELLES, Ernesto Alonso, BUENO-SOLANO, Alfredo, ACOSTA-QUINTANA, María Paz Guadalupe and SUASTEGUI-RAMOS, Francisco

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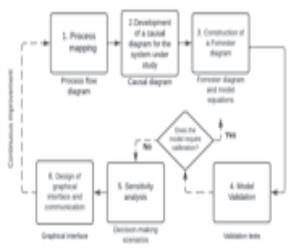
Abstract

The development of this project focuses on designing a graphical interface as a tool for information management in decision making during the salt production process at a company in the agribusiness sector in the southern region of Sonora, Mexico. This is made possible through the application of systems dynamics methodology to evaluate the relationships and interactions of the elements present in the system under study, thereby determining the sensitive variables and parameters involved in the production and commercialization of human consumption salt

Graphic interface design as support for decision-making in the salt production process		
Objetive	**Methodology**	**Contribution**
Develop a technological solution that allows for the analysis of the salt production process from the Sea of Cortez, generating quantitative data to support decision-making.		Development of a graphical interface as a tool for information management in decision making during the salt production process at a company in the agribusiness sector.

Smart Farms, Dynamical Systems, Graphic interface

Analysis of responsible consumption in relation to gender in students of a higher education institution

Análisis del consumo responsable en relación al género en estudiantes de una institución de educación superior

GALAVIZ–ZAMORA, Marisol, MURILLO-FÉLIX, Cecilia Aurora and GALVAN- CORRAL, Alberto

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Abstract

To address the effects of the accelerated consumption of goods and services, there is a global push to promote a culture of more responsible and environmentally and socially empathetic consumption. The objective of this study is to identify whether there is a significant relationship between the dimensions of responsible consumption practiced by students from a university in southern Sonora and the gender variable. To evaluate attitudes toward responsible consumption, three dimensions of a measurement instrument were analyzed: individual responsibility, recycling behavior, and ecological behavior. The most significant findings revealed that, in the dimension of individual responsibility, women exhibit high levels of responsibility, while men show a médium level. This pattern aligns with existing literature, which suggests that women tend to adopt more responsible behaviors compared to men.

Analysis of responsible consumption in relation to gender in students of a higher education institution		
Objectives	Methodology	Contribution
Identify responsible consumption in students of a higher education institution, with the purpose of establishing recommendations for improvement. Identify if there is a significant relationship between the	The type of research is quantitative, descriptive and correlational, three dimensions of a measurement instrument were analyzed, the dimensions are:	The most relevant findings reveal that, in the dimension of individual responsibility, women present high levels of responsibility, while men show a medium level.

Behavior, Recycling, Responsible Consumption

Content and scope of the human right to water. The water crisis in Mexico

Contenido y alcances del derecho humano al agua. La crisis hídrica en México

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Universidad Autónoma de Chihuahua

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Abstract

The water crisis in Mexico is worsening day by day and the solutions seem distant in the face of the government's constant efforts to alleviate the effects of its shortage on the population, particularly in the most pressing needs of the vital liquid in its domestic use, its accessibility , insufficiency, lack of infrastructure and poor quality; as well as the causes that give rise to the emergency situation such as climate change, waste and contamination of aquifers. In the face of this problem, the full exercise of the human right to water seems unattainable. This work examines the content and scope of the right, considering its scarce legislative regulation and what are the impacts that the aforementioned crisis causes in its exercise. This is a dogmatic investigation, which is based on the hypothesis of the current impossibility of guaranteeing the human right to water in Mexico. Its objective focuses on highlighting the problems that afflict the law that is the subject of the study in the face of the problems that the water situation in Mexico reveals. The methods used in the research are historical, legal epistemology, comparative and legal hermeneutics. The main techniques are the review of literature, legislation and jurisprudence that allow us to verify the hypothesis.

Water Crisis, Human Rights, Mexico

The Challenge of Entrepreneurs facing Corporate Social Responsibility in the Southern Zone of Tamaulipas

El reto de los emprendedores ante la responsabilidad social empresarial en la zona sur de Tamaulipas

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Abstract

We have heard of the word entrepreneur; it is usually understood to be a creator or founder of something new related to a novel product acting individually or with a group of friends or also called partners. Normally the entrepreneur occupies positions in business projects in which he is responsible for directing and organizing their birth and subsequently their operation. In this way, risks are assumed, mostly in the financial or economic aspect. One of the many challenges of the entrepreneur is corporate social responsibility since in these times it becomes more important. In this research that has been carried out in the South Zone of Tamaulipas on entrepreneurs we realize that the majority of them face the problem on the preparation of products with reference to the requirements that must be met to avoid causing damage to the environment in the preparation or presentation of said product and thus contribute to or have social responsibility before the final consumer.

Entrepreneur, Social Responsibility, Product

Strategic management in the development of MSMEs in the municipality of Progreso from Obregón, Hidalgo

La gestión estratégica en el desarrollo de las Mipymes del municipio de Progreso desde Obregón, Hidalgo

TREJO-ENCARNACIÓN, Patricia, HERNÁNDEZ-GÓMEZ, Diana, AGUILAR-REYNA, Verónica and BARTOLO-DE LA CRUZ, Marisol

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Abstract

Decision making in Micro, Small and Medium Enterprises is generally based on the experience of the business owner, therefore, the objective of the research is to analyze strategic management in the development of MSMEs in the municipality of Progreso de Obregón, Hidalgo. The methodology is a mixed approach, with a descriptive design, to analyze what a phenomenon and its components are like and how they manifest. A representative sample of 297 MSMEs in Progreso de Obregón was determined. The main results obtained are that: 63% of the municipality's businesses are informal, likewise 71.4% report having strategic management that helps face the challenges of the environment and be able to adapt to changes; On the other hand, 70.3% do not have process diagrams, it is also observed that 69.3% of the company's administration falls entirely on the owner, 25.7% on a family member and 5% on third parties. It is concluded that there is a window of opportunity to improve the strategic management of the business units since the majority have basic and upper secondary education, so it is inferred that by increasing their level of financial education they can enhance their strategic management, which contributes to the achievement of organizational objectives.

Financing sources, Strategic Management, MSMEs, Progreso de Obregón

Validation, reliability and application of a survey to identify the accommodation needs of small and médium miscellaneous

Validez, confiabilidad y aplicación de una encuesta para identificar las necesidades de acomodo de las pequeñas y medianas misceláneas

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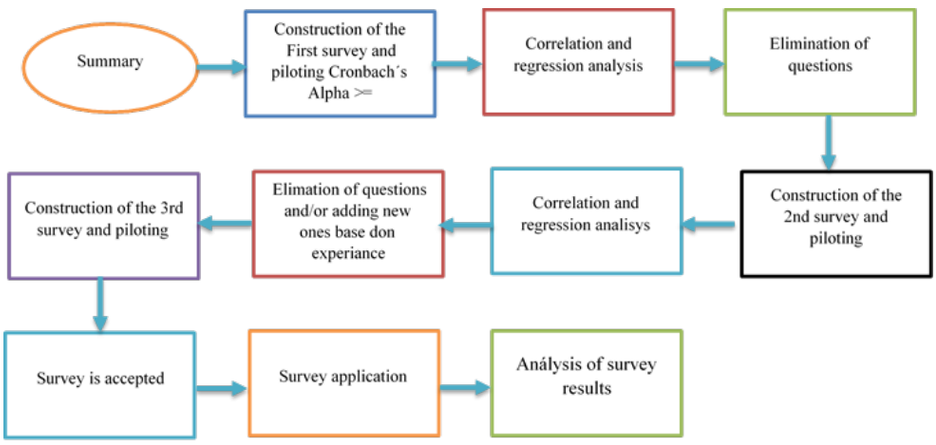
Abstract

Small and médium-sized miscellaneous are a competitve industry. Efficient shelving allocation is critical to gaining a competitive advantage. They can increase their profits and reduce costs with a proper space management and product display. Information on the economically active society preferences at Celaya city, Guanajuato, was obtained through a survey, where a confirmatory factor analysis was carried out, internal consistency values were measured using Cronbach's Alpha. The relationship between variables was confirmed with correlation analysis and determination. The survey designe on a five-level Likert scale showed an adequate fit of the data based on a maximun likelihood test. The overall internal consistency was 0.973. The survey to measure shelving needs showed internal consistency and its five-correlated factor model was validated among respondents.



Validity, Reliability, Application

Cluster composition and regional resilience: The case of the U.S. in the Great Recession

Composición de clusters y resiliencia regional: el caso de Estados Unidos en la Gran Recesión

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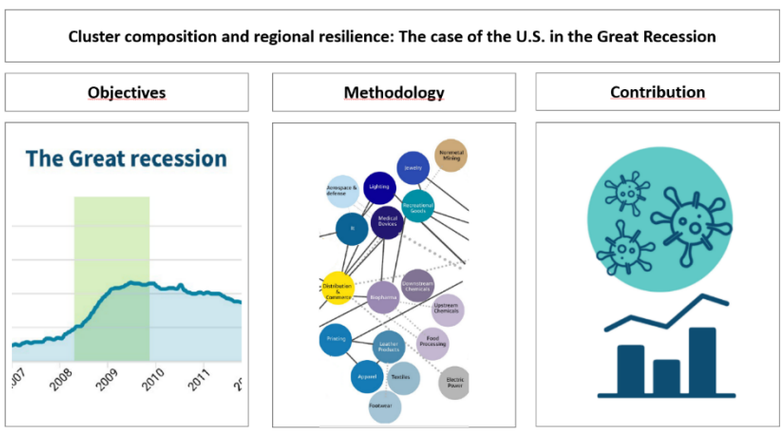
Abstract

This paper contributes to the discussion of industrial composition as a determinant of resilience by analyzing cluster composition. A cluster is a geographically proximate group of interconnected companies, suppliers, service providers, and associated institutions in a particular field, linked by externalities of various types. We describe the cluster composition via cluster specialization, a measure of cluster strength in the region, and cluster diversity, a measure of how diversified the presence of clusters is within the region. We find that the U.S. regions characterized by strong clusters and high innovation before the Great Recession present less vulnerability than the rest of the country in the years of this downturn. The common technological base makes it easier for the reallocation of skills, technology, and workers from one industry to the other, allowing the economy to adjust to the new conditions in the short run.



Resilience, Composition, Clusters

Agricultural Sciences and Biotechnology

Evaluation of the effects of the use of silver nanoparticles as growth promoters of corn (*Zea mays*) and barley (*Hodeum vulgare*)

Evaluación de los efectos del uso de nanoparticulas de plata como promotoras del crecimiento de maíz (*Zea mays)* y cebada (*Hodeum vulgare)*

VARGAS-SOLANO, Zaira, GRANADOS-OLVERA, Jorge Alberto, RANGEL-RUIZ, Karelia Liliana and PEREZ-GUTIERREZ, Edith

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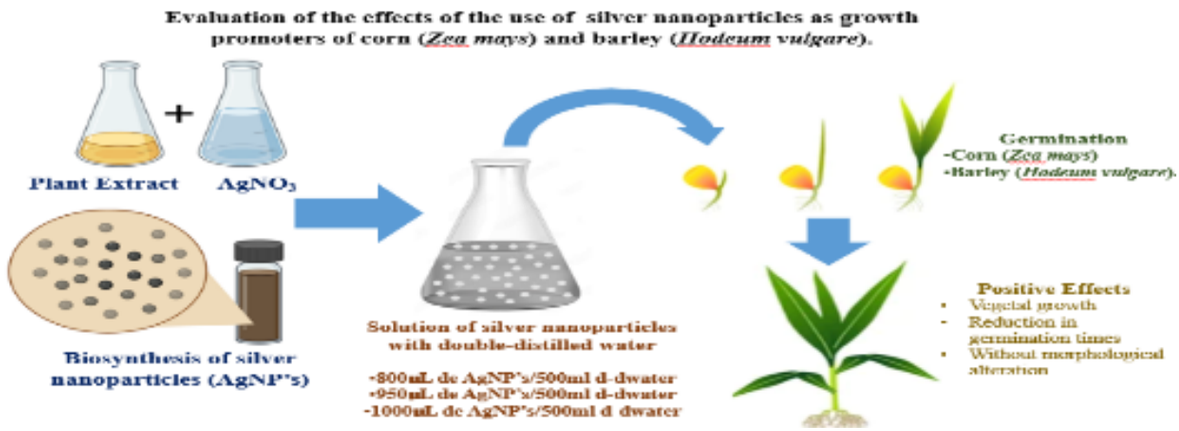
Abstract

The use of AgNp's as germination and growth promoters of corn (*Zea mayz*) and barley (*Hordeum vulgare*) maximize germination times and provide a better yield in terms of obtaining the harvest of the aforementioned seeds. Within the results of this study, it was observed that there is a better germination with respect to the plants that do not contain the silver nanoparticle solution, reflected in a greater emergence and uniformity observed in the final germination, mainly due to the penetration of nanomaterials in the seed that allow increasing the imbibition of water. The doses administered did not damage the cells and in some cases the amount of leaf area damaged was much lower in seedlings treated with nanoparticles than in untreated seedlings.



Germination, Nanoparticles, Growth

Cenotes, dams, estuaries, lagoons and phytoplankton biodiversity

Cenotes, presas, estuaries, lagunas y biodiversidad del fitoplancton

VIZCAÍNO-RODRÍGUEZ, Luz Adriana, CARO-BECERRA, Juan Luis, GARCÍA-DE JESÚS, Sandra and MICHEL-PARRA, J. Guadalupe

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Abstract

According to the literature, latitude determines biodiversity on the planet, so with latitude of 19 to 20 º, 9 natural wetlands (lagoons, estuaries, cenotes) and artificial wetlands (dams) with different characteristics and exposure to anthropogenic factors were analyzed. Limnological monitoring was carried out and samples were collected for identification. The objective was to compare phytoplankton biodiversity between the different wetlands. The Jacquard diversity index and principal component analysis were determined. The greatest similarity was observed between the Lakes of Zapotlán and Cajititlán. The greatest dissimilarity was observed with cavern-type cenotes. Finally, greater similarity was observed between watery cenotes and the estuary. Regarding the species with the highest presence, *Microcystis aureginosa*, *Chlorella* and *Aulacoseira granulata* were identified. It is important to know and conserve the biodiversity of phytoplankton species that carry genes with benefits in the ecosystem and potential biotechnological applications.

Title

Objetives	Methodology	Contribution
To compare phytoplankton biodiversity in lakes, dams, cenotes and estuaries located at latitudes of 19 and 20°.	Limnological monitoring of wetlands with multiparametric probe and collection of phytoplankton samples by dragging. Identification and morphological classification of cyanobacteria and algae. Analysis of results.	The species with the highest presence were *Microcystis aureginosa* for cyanobacteria, *Chlorella* in chlorophytes and *Aulacoseira granulata* for diatoms.

Biodivesity, Phytoplankton, Wetlands

Bioremediation through the use of composting

Biorremediación mediante el uso del compostaje

CALVILLO-BELTRÁN, Sofía Valentina, HERNANDEZ-ROCHA, Zaira Michel, PALACIOS-HERNÁNDEZ, Gabriela Elizabeth and ARROYO-ORDOÑEZ, Ivan

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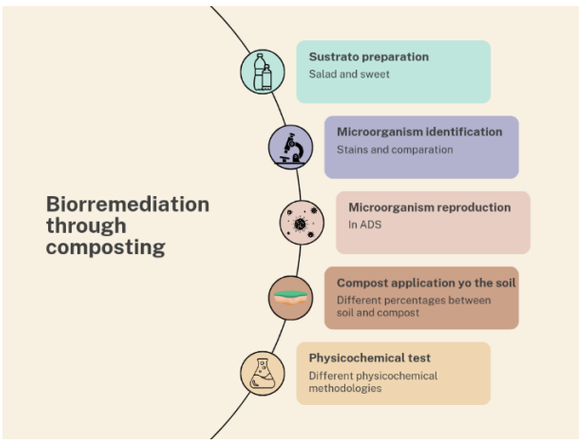
Abstract

Bioremediation through Takakura composting is a method focused on the rapid and efficient decomposition of organic waste. This method uses a combination of microorganisms and natural materials to accelerate the decomposition process, producing a nutrient-rich compost to eliminate or reduce pollutants in the environment, such as soil or water. This compost can degrade or transform pollutants into less harmful or inert substances. In addition, it provides macro and micronutrients that provide optimal conditions for the development of various types of plants and the restoration of soil fertility. To evaluate the conditions of the soil before and after the use of compost, biological, physical and chemical tests were carried out with the compost in different proportions. The results of these tests were compared with the soil parameters established by FAO, giving guidelines to adjust or maintain the parameters.



Bioremediation, Composting, Testing

In vitro fertilization in small ruminants: a review

Fecundación in vitro en pequeños rumiantes: una revisión

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Abstract

In vitro fertilization is a biotechnology that helps to increase animal genetic improvement by producing embryos from donors with superior production characteristics. It also shortens the generation interval by favouring the obtaining of oocytes from prepubertal animals. In addition, it is a technique that can be used to activate reproductive function in animals that do not respond to superovulation treatments, sick animals and those that are sent to slaughterhouse, but that have great genetic potential. To perform this procedure, the oocytes can be obtained from the living animal by laparoscopic ovum pick-up (LOPU) or collected either post-mortem from slaughtered females. Subsequently, the oocytes that will continue the *in vitro* maturation process are selected, the *in vitro* fertilization itself and finally the *in vitro* culture of the zygotes obtained.

***In vitro* fertilization in small ruminants: a review**		
Objectives	**Methodology**	**Contribution**
To describe the procedures required for *in vitro* production of embryos in small ruminants.	A literature search was conducted on the procedures for *in vitro* embryo production, from the recovery of oocyte directly from the follicles to zygote culture and the factors that influence the success of *in vitro* fertilization (IVF).	This review provides the necessary information to perform IVF in sheep and goats. It is a document that can serve as a guide to implement this reproductive biotechnology in animal reproduction laboratories.

Oocytes, Embryos, Reproduction

Engineering

Supply model in academic workshop of coffee bean roasting

Modelo de suministro en taller académico de tostado del grano de café

RAMÍREZ-ROMÁN, Adolfo, RODRÍGUEZ-RODRÍGUEZ, Luis Alberto, SUÁREZ-ALVAREZ, Ángel and CHABAT-URANGA, Jacqueline

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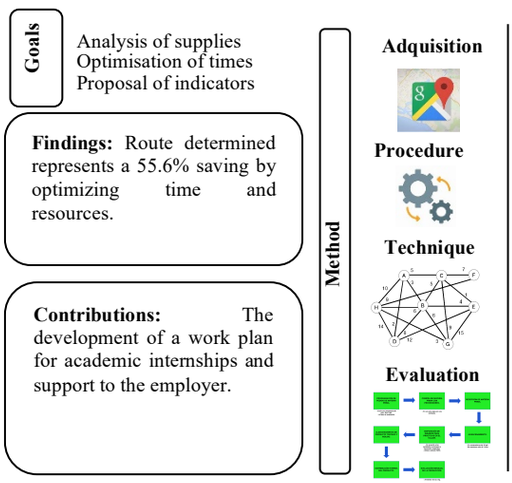
Abstract

In the international market, companies encourage the generation of ideas to enter the environment and gain competitive advantage. Consequently, supply models are the combination of technology and good business practices from the industrial sector, including the information systems required to check activities. The aim of this study is to analyze the supply of operations in the production process of a coffee roasting workshop. Indicators and operations strengthen the development and execution of supply chain planning, organization and management. With field work in coffee farms, profits and companies found in the main producing regions of central Veracruz: Coatepec, Ixhuatlan del Coffee, Huatusco and Cordoba.



Supply Chain, Coffee Bean, Process Optimization

State Estimation of Discrete Event Systems Using Fuzzy Timed Petri Nets

Estimación del estado de sistemas de eventos discretos utilizando redes de Petri temporizadas difusas

GONZÁLEZ-CASTOLO, Juan Carlos, LÓPEZ-MELLADO, Ernesto, RAMOS-CABRAL, Silvia and ZATARAÍN-DURÁN, Omar Alí

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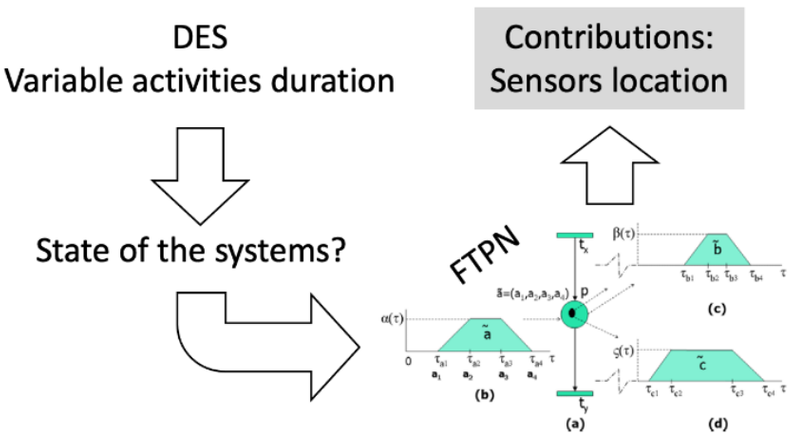
Abstract

In this work, an extension is made to the inference of the state of discrete event systems using knowledge about the duration of activities. The mentioned systems are characterized by the absence of sensors and where the activities have a variable duration. This causes the uncertainty about the state of the system to increase. The problem is addressed by calculating the fuzzy marking of the *Fuzzy timed Petri Net* (FTPN). In this formalism, fuzzy sets are associated with the places, which have information about the variation of the end of the activities. To keep this uncertainty limited, the location of a minimum set of sensors is studied and rules are established for their placement in order to keep limited the uncertainty in the approximation of the marking in Marked Graph structures and State Machines. In this situation, the estimation device obtains and updates a belief that approximates the condition of the system.



State Estimation, Timed Fuzzy Petri Nets, Fuzzy Marking Equation

Analysis and Control of a three-phase motor using a neural network

Control y análisis de un motor Trifásico usando una red neuronal

HERNÁNDEZ-EPIGMENIO, Miguel Ángel, MARTÍNEZ-CARRILLO, Irma, JUÁREZ-TOLEDO, Carlos and CAMACHO- ALTAMIRANO, Ulices

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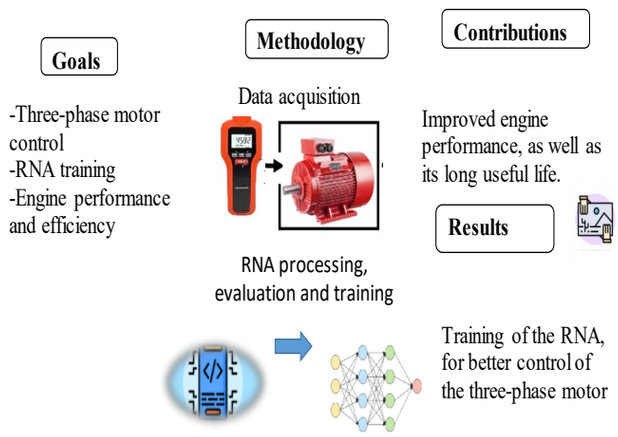
Abstract

Actually the electrical power systems analyzed in automatic control we find the systems: dynamic, linear, triphasic induction motors, their operation can be validated, through their mathematical model, and thus represent their parameters for a real physical motor. This has a high degree of feasibility of being controlled because a more precise approximation of its dynamics can be known. Guarantee optimal energy consumption and performance of a three-phase motor, large companies have bet on artificial intelligence and the quality of proper operation in their new electric motors. This work has the purpose of carrying out an analysis on the operation of a three-phase electric motor for commercial use, is of vital im-portance to know the parameters of the real three-phase motor so that they allow an efficient use of energy and in addition to designing efficient and robust control schemes. Additionally the analyzed operation and manipulation and the training of a neural network (RNA) utilize MATLAB. Main contribution of this document is to experimentally validate the training of the RNA, taking real parameters on the manipulation of a triphasic motor. Training, the results can be used to improve engine performance as well as engine life.



Analysis, Manipulation, Neural, Validate, Consumption

Physicochemical Characterization of the Material Used in the Manufacture of Brick in an Artisanal Way

Caracterización Fisicoquímica del Material empleado en la Fabricación de Tabique en Forma Artesanal

SALAZAR- PERALTA, Araceli, BERNAL-MARTÍNEZ, Lina Agustina, PICHARDO-SALAZAR, José Alfredo and PICHARDO-SALAZAR, Ulises

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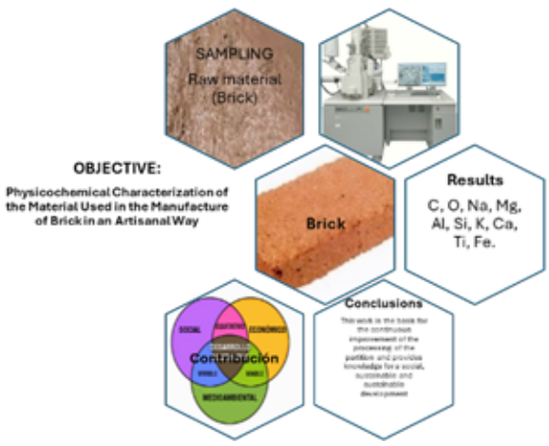
Abstract

The manufacture of Brick in an artisanal way is a traditional activity carried out by the knowledge and experience transmitted from person to person, due to this there are no work instructions, nor data on the chemical composition of the raw material used, nor control of the process of manufacturing. The objective of this study was to physicochemically characterize the raw material for the manufacture of Brick. The elemental chemical composition found was the following. C, O, Na, Mg, Al, Si, K, Ca, Ti, Fe. Elements to which the mechanical properties of the Brick are attributed. The compressive strength of the Brick without heat treatment was 12 to 15 kg/cm^2, after heat treatment it was 24 to 45 kg/cm^2. Regarding morphology, particles from 4 to 301 µm were observed in the raw material. And in the Brick from 18 to 257 µm. It is concluded that the homogenization of the raw material, as well as the temperature control in the thermal treatment of the Brick allowed to obtain greater resistance to compression, since the Peruvian Standard ITINTEC 331.017. And Standard NMX-C-404-1997 establishes 60N/cm^2. and 24kg/cm^2 minimum respectively.



Artisanal Brick, Raw material, Compression Resistance

Design and manufacture of a vise

Diseño y manufactura de una prensa de banco

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Abstract

In this project, the design and manufacturing of a clamping vise is carried out, applying the knowledge acquired in key areas such as machine design, machine elements, and manufacturing processes. The objective is to meet the functional requirements of a drill press vise, ensuring its efficiency and durability. This work describes in detail the parameters and calculations used for the fabrication of the vise, which will be made from A36 steel. This material was selected due to its excellent mechanical properties, which provide significant improvements to the final design. Additionally, this material was chosen because part of the available supplies, which were donated for the project, are composed of the same type of steel. Various manufacturing and assembly processes were employed for the fabrication of the different parts of the vise, such as turning, milling, drilling, threading with a tap, and electric arc welding. These processes not only allowed for the proper assembly of the vise but also provided the opportunity to gain a deeper understanding of the working parameters that depend on the specific characteristics of the material. Based on the calculations and technical parameters identified during the project, the production cost of the prototype was estimated. The final design of the vise consists of seven main parts: movable jaw, fixed jaw, spindle, guide cylinder, body, and base.

Movable jaw, Fixed jaw, and Press base

Reconstruction of motor voltage control signal in industrial applications using IoT

Reconstrucción de la señal del control de voltaje de un motor en aplicaciones industriales mediante IoT

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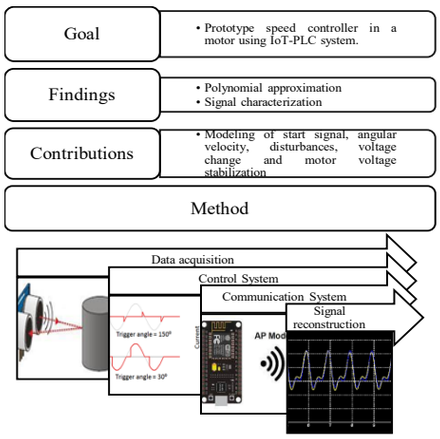
Abstract

The IIoT allows to have an efficient automation system that monitors specific parts of a system in real time. This paper implements a prototype of speed control and monitoring in a motor belonging to an industrial process with PLC, where the current regulation is related to the data acquisition system and the proposed control algorithm in an IIoT architecture. Finally, the characterization of the starting signal is modeled by means of the angular velocity, the disturbances present in the voltage change and stabilization will be processed using the numerical integration theory and the Matlab tool, to obtain a polynomial approximation of order n.



IIoT, Numerical Integration, Polynomial Approximation

Implementation of a system ANDON for the utilities department in a plastic injection plant

Desarrollo de un sistema ANDON para el área de servicios en planta de inyección de plástico

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Abstract

ANDON systems have been very useful in different industrial processes, since through visual management they alert in real time about present problems, reducing response time, downtime and increasing efficiency. These systems are generally manual and depend on the manipulation of operators; their operation is desired to be automatic; this can be achieved using elements that capture process variables and programmable controllers and display elements. This work presents an application in a plastic injection company to solve a problem of monitoring pressure and temperature services that caused downtime in production lines. The use of sensors is proposed for the acquisition of variables and screens to present information through visualization tools available in PLC for remote monitoring, acquisition and presentation of data so that solutions can be applied immediately, reducing downtime. and saving costs.

Implementation of a system ANDON for the utilities department in a plastic injection plant.

Objectives	Methodology	Contribution
Develop a variable monitoring system ANDON. Automatically present process information for preventive maintenance application	The controller receives the process variables through sensors, processes and compares the values, presenting results on screens through a field network.	Automate the monitoring of remote variables. Prevent downtime. Improve plant performance. Reduce expenses.

Monitoring, PLC, System

Experimental investigation of FFF process parameters using carbon fiber reinforced PETG material by Taguchi analysis

Investigación experimental de los parámetros del proceso FFF aplicando el material PETG reforzado con fibra de carbono mediante el análisis Taguchi

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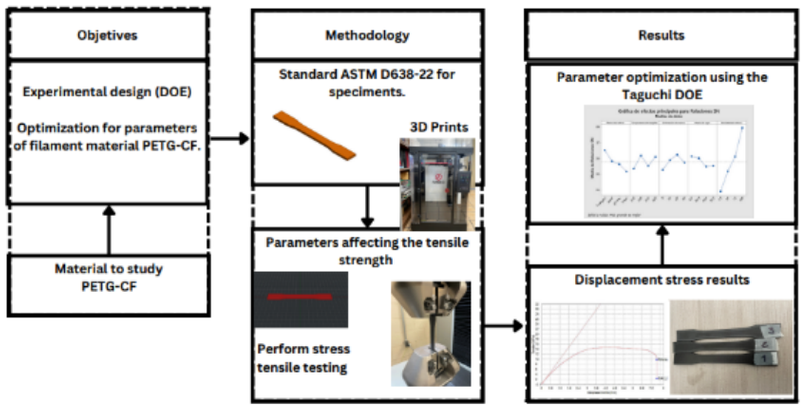
Abstract

Fused filament fabrication (FFF) is a popular additive manufacturing technique with the ability to produce products in industries such as automotive, aerospace, and medical due to the potential for material waste and the manufacturing of complex geometries with different materials. For high-strength parts, it is crucial to investigate and optimize printing parameters to make the printed parts as strong as possible. This work will focus on the experimental investigation of parameter optimization for the strength of carbon fiber reinforced PET-G (PETG+CF), which is carried out using Taguchi's method and the samples were produced according to the orthogonal matrix L16 and to study if influence by ANOVA (analysis of variance). It was possible to conclude that the best parameters for the tensile strength of PETG+CF with temperature of 250° C, part orientation at 60°, layer height of 0.30mm, 100% fill density and with triangle fill pattern.



Fused filament fabrication, PETG-CF, Taguchi, ANOVA Analysis of variance

Design and development of universal leg prostheses with size adjustment using polylactic acid (PLA)

Diseñó y desarrollo de prótesis de pierna universal con ajuste en tamaños utilizando ácido poliláctico (PLA)

MURILLO-RENDÓN, Pablo Antonio, CUATE-GÓMEZ, Diego Hernán, GARZÓN-ROMÁN, Abel and LUGO-QUINTAL, Jesús Manuel

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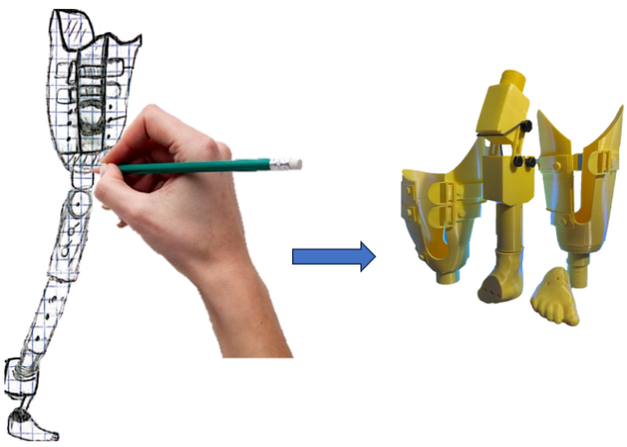
Abstract

The history of leg prosthetics is a journey of continuous innovation and progress. In Mexico, according to INEGI (2015), there are 780,000 people with amputations; of the 75,000 amputees, only 10% have a prosthesis, and 7% do not know how to use it. The leading cause is Type 2 diabetes. Current prosthetics vary in cost and technology, ranging from hundreds to hundreds of thousands of dollars. Losing a limb affects mobility and psychological, social, and physical well-being. Unlike the rudimentary ones of the past, modern prosthetics are more advanced and functional. This study, with 50 participants, analyzes various anthropometric measurements to design an adjustable universal prosthesis, improving the quality of life for amputees through an interdisciplinary approach combining biomechanical analysis, material evaluation, and types of prosthetics. The results highlight the importance of considering gender for an optimal fit.



Analysis, Biomechanical, Functional, Participants

Environmental impact of energy consumption in academic buildings: Case study of the faculty of agricultural sciences at UAEM, Life Cycle Analysis approach

Impacto ambiental del consumo energético en edificaciones académicas: Caso de la Facultad de Ciencias Agropecuarias de la UAEM, un enfoque de Análisis de Ciclo de Vida

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Abstract

The evaluation of building energy needs during their operational phase is crucial for understanding their energy requirements. This study focuses on analyzing the energy demand of buildings within the Faculty of Agricultural Sciences at the Autonomous University of the State of Morelos during its operational phase. The methodology employed includes Life Cycle Assessment (LCA) to assess electricity consumption and associated greenhouse gas (GHG) emissions. The results revealed a significant increase in energy demand between 2022 and 2023, with significant environmental implications in terms of resource depletion and GHG emissions. These results underscore the urgency of implementing energy efficiency measures and adopting more sustainable practices in academic environments to mitigate environmental impacts and contribute to the fight against climate change.

Energy, Life Cycle Assessment (LCA), building

Exploring the Food Quality System (SQF) in Plastic Cap Manufacturing: A Scientific and Practical Approach

Exploración del Sistema de Calidad de Alimentos (SQF) en la fabricación de tapas plásticas: enfoque científico y práctico

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Abstract

The Food Safety Quality System. (SQF) is a critical tool for ensuring the safety and quality of food products. However, its application goes beyond the food industry. The Food Quality System (SQF) is a necessary tool to ensure the safety and quality of food products. Therefore, this study focuses on the investigation of SQF in the specific context of plastic cap manufacturing. The unique challenges faced by this sector in terms of food safety, product quality, and regulatory compliance are examined, and a practical framework for implementing SQF in plastic cap manufacturing operations is proposed, with the goal of improving product safety and customer satisfaction. It is concluded that the Food Quality System (SQF) is essential to guarantee food safety and quality in the manufacture of plastic lids, helping to mitigate contamination risks, improve processes and meet consumer expectations. However, there is variability in SQF compliance among companies, with some showing high compliance and others requiring improvements, a clear correlation between SQF compliance and product quality indicates that rigorous standards result in higher quality products and customer satisfaction; The choice of rigorous, standardized criteria to assess compliance and quality is essential. Despite the good performance in implementing the SQF, there are always opportunities for continuous improvement through the identification of critical areas and the adoption of corrective actions.

Objectives	**Methodology**	**Conclusions**
To implement the SQF in plastic caps manufacturing operations, with the aim of improving product safety and customer satisfaction. 	Variables play a key role in understanding and evaluating the implementation of such a system. 	Companies that implement SQF standards more rigorously tend to produce higher quality plastic closures, which translates into higher customer satisfaction. 

Quality, Food, Application

Impementation of an IoT-based crop irrigation system for adverse conditions

Implementación de un sistema de riego de cultivos basado en IoT para condiciones adversas

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Abstract

In the face of global challenges such as climate change, water scarcity, and the need for increased agricultural productivity, the adoption of advanced technologies in farming has never been more crucial. One such technological innovation that holds immense promise is the irrigation system, which leverages the Internet of Things (IoT) to optimize water usage and enhance crop growth. The proposed system consist of a measuring temperature, relative humidity (RH) and soil moisture. This data is used to to know how much water will be supplied to the plant. With this, the waste of water will be reduced and the farmer will know if the crop has been estressed trhoughout its life. It also has an alert system to send the user a notification if the crop is being exposed to extreme weather conditions, or if there was a flood due to a possible accident in the plantation.

Implementation on an IoT-based crop irrigation system for adverse conditions		
Objetives	**Methodology**	**Contribution**
The objetive is used temperature, relative humidity and soil moisture throughout the life of a plant to has de advantage of providing information about the stress that the crop has suffered. Besides, provides of a system thas alerts the farmer by cell phone if the plantation has a leak or there is an extreme temperatura condition wich can compromise the production.	The methodology for the design and implementation of an IoT-based integration system, includes stages of research, development of a mobile application, power stage and implementation of all these components in a real plant. In addition to testing the device under adverse temperature conditions.	The presented irrigation system based on IoT shows data of great interest both for farmers and for people who want to develop their crops for personal consumption or ornamental plants. This helps to know if a plant has been stressed and how much. The above, provides information than helps predict the future production of a crop.

Iot, Agricultural, Measuring

Thermodynamic Analysis of Nuclear Plants: A Virtual Perspective

Análisis termodinámico de plantas nucleares: Una perspectiva virtual

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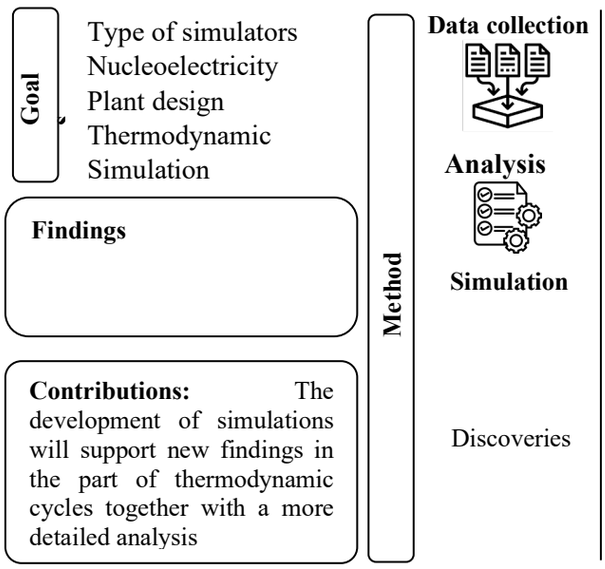
Abstract

This article aims to study the generation of electricity through nuclear energy, to do so, it goes through the other ways to obtaining energy, until reaching nuclear energy, where the research is deepened, emphasizing nuclear reactions and operation. of nuclear power plants. Once the theory was understood, simulation projects were carried out in software, previously explained, the simulations were matched and complemented for a greater understanding of the theory. This article allows the understanding for a particular case, applicable to different projects promoted by Thermoflex, since there are no guides or tutorials in Spanish and those that exist in other languages, they are not very varied.



Thermodynamics, Simulation, Thermoflex

Sustainable design of dynamic elbow orthoses for adult rehabilitation treatment

Diseño sustentable de órtesis dinámica de codo con fines de rehabilitación en adultos

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Abstract

The elbow joint is prone to degenerative diseases, injuries from work, sports, or accidents. Rehabilitation often requires surgery and mechanical rehabilitation by health professionals. This research aimed to design a dynamic elbow orthosis using the finite element method for sustainable adult rehabilitation. Elbow orthoses can reduce treatment time effectively, but their high cost and importation limit accessibility. The study involved a mixed analysis of orthosis design and optimization, considering variables like anthropometric measurements, mobility ranges, biomechanical parameters, and mechanical design. Technical data from human anatomy were used to create biomechanical models, optimizing the orthosis design for sustainable systems. Future work will focus on further rehabilitation optimization by health professionals.

Sustainable design of dynamic elbow orthoses for adult rehabilitation treatment		
Objetives	Methodology	Contribution
This research aimed to design a dynamic elbow orthosis using the finite element method for sustainable adult rehabilitation.	The study involved a mixed analysis of orthosis design and optimization, considering variables like anthropometric measurements, mobility ranges, biomechanical parameters, and mechanical design.	Technical data from human anatomy were used to create biomechanical models, optimizing the orthosis design for sustainable systems.

Elbow Orthosis, Biomechanics, Finite Element

Desktop Forklift Simulator -DFS

Simulador de Montacargas de Escritorio -SME

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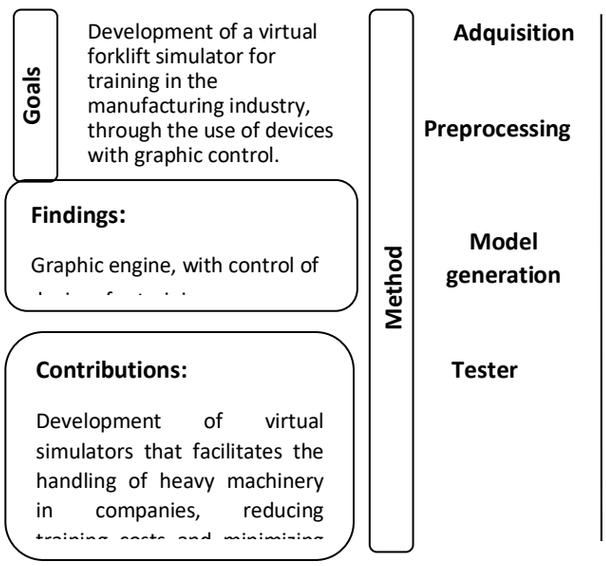
Abstract

This article presents the design and development of a technological tool that has the function of a forklift simulator, which is an interactive desktop application, and the objective is to train personnel in the use of a forklift car, to prevent accidents and major injuries. reliability in the mobility process when driving in real time: the methodology used is scrum to generate a software product with compliance with the industry requirements, which is carried out through a product backlog, and sprints to carry out the deliverables of the simulator modules, the result obtained was a graphic engine of Unreal Engine 5 and Blender for modeling, where the connection of devices is made, the control with steering wheel, pedals and gear lever is generated



Forklift, Simulator, Training, Unreal Engine, Control

Simultaneous electricity and biogas generation of vinasses and cattle manure

Producción simultanea de electricidad y biogás a partir de vinazas y estiercol de vaca

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Abstract

A new design for the simultaneous generation of electricity and biogas was constructed. The voltage production in a microbial fuel cell and the biogas generation through anaerobic digestion were tested at different concentrations of mezcal vinasses and cattle manure. When comparting the control test with the concentrations using vinasses, these resulted in inhibition of voltage output. On the contrary, if no vinasses were used, no biogas production took place, revealing that the inoculum did not have activity itself. The concentration with the lowest organic matter content showed the poorest AD efficiency and lowest voltage output. By increasing the organic matter, power density increased until a certain limit. Contrary to the effect of organic matter content on the voltage production, biogas yield and methane content increased with increased organic matter. These results show that the combination of these technologies is not suitable for the simultaneous voltage production and biogas generation.

Bioenergy, Efficiency, Microbial

Speed Control of 3 Phase Induction Motor using an RC Circuit as a Start Signal

Control de Velocidad de un Motor Trifásico de Inducción usando un Circuito RC como Señal de Arranque

JUÁREZ-TOLEDO, Carlos, MARTÍNEZ-CARRILLO, Irma, HERNÁNDEZ-EPIGMENIO, Miguel Ángel and CAMACHO- ALTAMIRANO, Ulices

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Abstract

Overcoming Resistance of the initial condition in three-phase electric motors is essential in applications where it's had high initial consumption demand, such as HVAC Systems, pumps or compressors, higher torque ensures reliable operation even under varying conditions of load. These motors can provide efficient operation for heavy loads or when starting under load conditions. In this work an RC circuit is used for starting signal of a 3-phase induction motor, advantages of using an RC circuit against a conventional variable frequency controller are shown in the article.

Goal

Relationship between RPM and torque

RC auxiliary signal

Controller of VFD Measurement

$$V_C = K_v\left(1 - e^{\left(\frac{-t}{\tau}\right)}\right)$$

Contributions: The design process of an auxiliary signal controller for a VFD.

Torque, Circuit, Applications

Reconditioning of a Satec 60WHVL universal machine for educational purposes

Reacondicionamiento de una máquina universal Satec 60WHVL con propósitos de enseñanza

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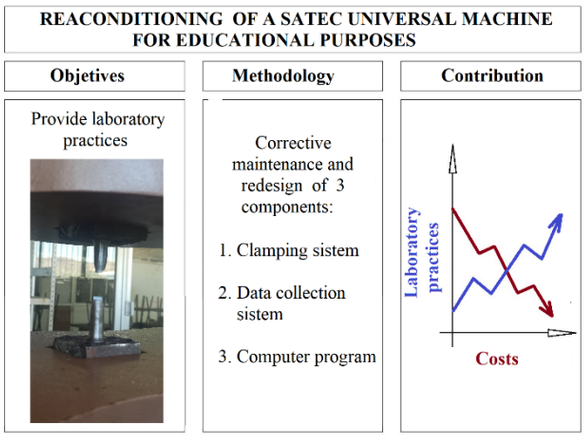
Abstract

An Instron universal testing machine (UTM) was made operational for educational proposes on a low budge, at the Mazatlán campus of the National Institute of Technology of Mexico (TecNM). The machine was inactive for 27 years due to the lack of funds for repairs and calibration. This UTM is needed to undertake essential practices in engineering careers offered by the institution. In addition to its repair its reconditioning represented the redesign of three components: 1) the clamping system, 2) the general data collection system, and 3) the computer program. It is noted that redesigns 2 and 3 were carried out with the objective of enabling the staff at the institute to perform repairs and calibration on the data acquisition system as well as providing maintenance to the electromechanical system. This significantly reduce costs both for its current commissioning and future maintenance, since the original components, supplier assistance, and calibration services are difficult for the institution to afford. The machine is currently operational for experimental tests undertaken in the modules of Mechanics of Materials and Mechanical Design, which are being taught to more than 150 students per semester.



UTM, Reconditioning, Engineering education

Virtual Reality Forklift Simulator -VRFS Forklift Simulator in Virtual Reality – SMRV

Realidad Virtual Simulador de Carretillas Elevadoras –VRFS en Realidad Virtual- SMRV

CORTES-GARCIA, Alicia, VALENCIA-GARCIA, Alejandro Cesar, RODRIGUEZ-MIRANDA, Gregorio and MENDOZA-HERNANDEZ, Guillermo

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Abstract

This paper presents the development of a virtual reality (VR) forklift simulator by a team at the Universidad Tecnológica de San Juan del Río. Using Eric Ries' Lean Startup methodology, a forklift model was designed based on a pre-existing template and adapted to meet customer needs. The simulator allows users to control all forklift functions, manipulate loads with the forks, and explore a virtual warehouse environment. Functional tests were conducted with the collaboration of teachers and students, demonstrating the effectiveness and realism of the simulator. This innovative approach to training offers a safe and practical environment for pre-practice learning in reality, promoting the development of forklift handling skills. With the use of cutting- edge technology such as Unreal Engine, this simulator represents a valuable tool for training in various industrial sectors.

Virtual Reality, Forklift simulator, UnrealEngine, Blueprint

Development of new standardized methods for calculating fuel poverty index: a study in the coast of Cabo Corrientes Jalisco

Desarrollo de una nueva metodología estandarizada para el cálculo del índice de pobreza energética: Estudio de caso en la Región Costera de Cabo Corrientes, Jalisco

CERDA-CARRILLO, Nely, VEGA-GÓMEZ, Carlos Jesahel, SANDOVAL-HERNÁNDEZ, Erika and ROJAS-RAMÍREZ, José Juan Pablo

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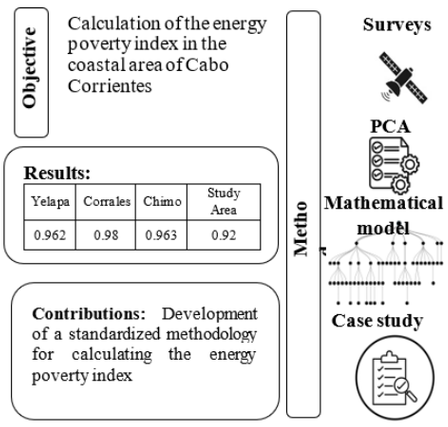
Abstract

Fuel poverty poses a significant challenge to communities worldwide, particularly in vulnerable regions. Within this context, energy poverty is understood as the inability of households to access basic energy services, representing a barrier to sustainable development and social welfare. This article addresses the need for the development of standardized methodologies for measuring and analyzing energy poverty. In response to the absence of unified approaches for comparative analysis of energy poverty across different geographical contexts, this paper proposes a new methodology, based on data collected from coastal localities in the State of Jalisco. A principal component analysis was conducted, generating a normalized multivariate matrix, and through clustering analysis, similar criteria were grouped into different analytical categories. By applying this method, an adaptation of the Gini Index and Lorenz curves was achieved to precisely calculate an Energy Poverty Index, specifically in the coastal region of Cabo Corrientes, Jalisco.



Energy, Poverty, Indicators

Implementation of an Inventory System through FIFO

Implementación de un Sistema de inventario por medio de PEPS

ACOSTA-GONZÁLEZ, Yanid, DELGADO-GÓMEZ, Gilberto, GARCÍA-RUÍZ, Cecilia Edith and ARCOS-FERNÁNDEZ, Ashley Naomi

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Abstract

An inventory system was implemented through the use of an Excel program format, which allows you to monitor and manage your stock effectively, and also provides an easy-to-use interface to track inventory levels, monitor replenishment needs. and forecast demand accurately.

Objetives	**Metodology**	**Contribution**
Reducción del 15% de Mermas	PDCA(Plan, check, check, act) FIFO	Control de inventarios Redución de desperdicio Reducción de mermas

First in, firs out, Control de inventarios, PDCA

Thermal-structural numerical analysis of the brake and disc system of a Formula SAE 2024 type vehicle

Análisis numérico térmico-estructural del sistema de frenos y disco de un Formula SAE 2024

LÓPEZ-FLORES, Jennifer-Guadalupe, CORDERO-GURIDI, José de Jesús, OVANDO-CUEVAS, Enrique Romeo and YESCAS-ÁVILA, Eber Alonso

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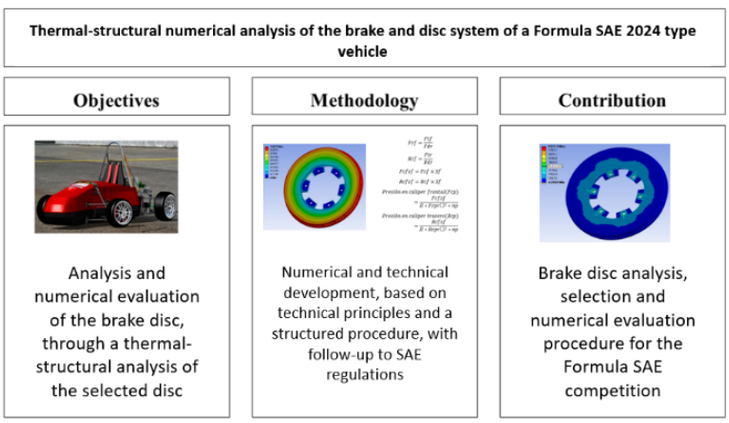
Abstract

The results of the numerical evaluation process of the brake and disc system of a Formula SAE type vehicle in its 2024 version are presented. Through the process of evaluating fundamental equations for the brake system, the type of disc and its properties are selected. physical. Using finite element analysis based on a thermal-structural evaluation, disc operating parameters are evaluated, which in comparison with those presented by other competitors in the Formula SAE competition, show similar numbers in the performance expected by the brake system and in particular of the disc considered in the design of the vehicle.



Formula SAE, Thermal-structural analysis, Brake disc

Analysis of thermal loads using BIM methodology to reduce the energy consumption of buildings in Morelos, Mexico

Análisis de cargas térmicas mediante la metodología BIM para disminuir el consumo energético de edificaciones de Morelos, México

VÁZQUEZ-FUENTES, Erick E, MONTIEL-GONZÁLEZ, Moisés, ALVARADO-JUÁREZ, Roberto and MORALES-GÓMEZ, Laura

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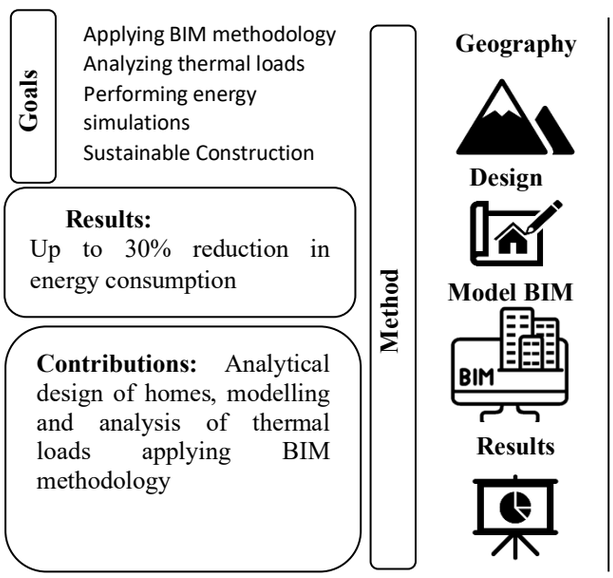
Abstract

A Net Zero Energy Building (NZEB) is a building with a highly reduced operational energy consumption where energy efficiency measures have been implemented that allow the energy demand to be supplied by renewable sources. To this end, this paper describes the adaptation and implementation of a methodology to transform an existing residential building into a net zero energy building and thus achieve a self-sustainable building, considering as a case study a warm sub-humid climate in the state of Morelos, since this climate predominates in 85% of the total area of the state. The types of feasible and affordable eco-technologies to be implemented in Morelos are analysed and discussed. The energy efficiency of the building is analysed considering the combination of construction techniques, suitable materials for the envelope, thermal loads, and electrical energy consumption, with the aim of reducing the high dependence on fossil fuels in the construction sector.



Net zero energy, BIM methodology, Ecotechnologies, Thermal loads, Thermal comfort

Biogas production using cheese whey in a bioreactor controlled by an Arduino-based system

Producción de biogas utilizando suero de queso en un biorreactor controlado por un sistema basado en Arduino

NAVA-SALDAÑA, Alberto, ROJAS-ESCOBAR, Silvino, GONZÁLEZ-CONTRERAS, Brian Manuel and GUEVARA-GARCÍA, José Antonio

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Abstract

Implementation of a bioreactor with control and data capture to produce biogas from cheese whey in a dark fermentation process is presented. Sensors MQ8 for hydrogen and MQ4 for methane (to determine composition), ultrasound (for biogas volume), pressure, temperature and pH, were integrated into a single Arduino card, plus two peristaltic pumps for pH control and feeding. A single block programming allows data capture and pH control, while Excel interface allows a single screen visualization of response graphs in real time. For start-up and testing, granular activated sludge was used as inoculum, under anaerobic conditions, at pH 5.5 and 35 °C. 240 h batch operation gave a production of 73 L H_2 Kg^{-1} $COD_{lactose}$. In later stages, the H_2 production kinetics will be carried out with the aim of optimizing, as well as the use of IoT for remote monitoring of the system.

Biohydrogen, Cheese whey, Arduino, Bioreactor

Electricity Consumption Measurement Device for the Design of an Energy Management System.

Dispositivo de medición de consumo eléctrico para el diseño de un Sistema de Gestión de la Energía

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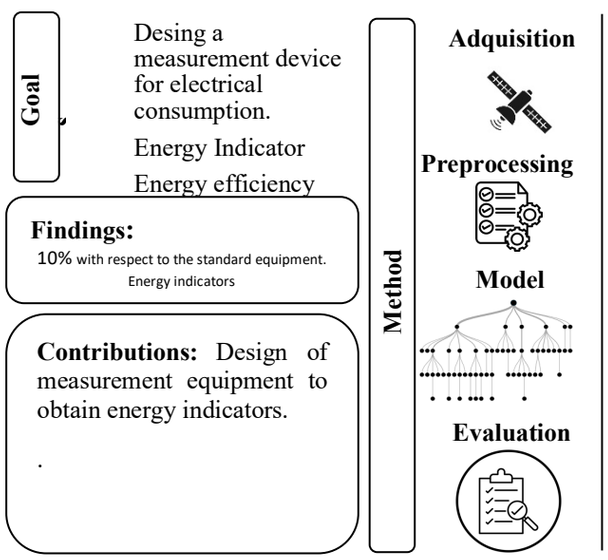
Abstract

As the industry prioritizes energy efficiency, the implementation of Energy Management Systems has become a strategic necessity. One of the basic aspects for this type of system is the evaluation of energy performance that requires the collection of energy data as an essential input, so this project has as objective design a measurement device focused on the acquisition of voltage, current, power, power factor and electrical consumption through an iterative and progressive approach with elements adapted from a cascade model for determining the significant uses of energy and energy indicators of the production area of a bottling plant. The results of the measuring equipment has a difference of 10% with respect to the standard equipment so the significant uses of energy and the energy performance indicators by production line were determined.



Energy, Efficiency, SGEN

Thermoeconomic analysis in solar collector fields: a focus on constant flowrate and variable flowrate models

Análisis termoeconómico en campos de colectores solares: un enfoque en los modelos de flujo constante y flujo variable

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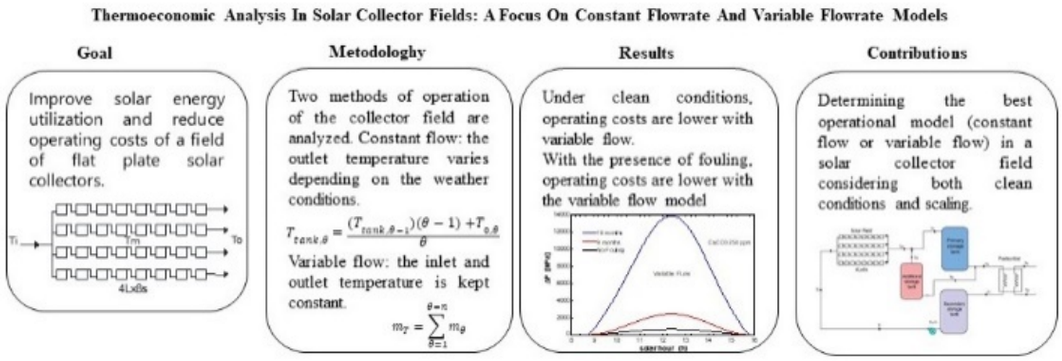
Abstract

In this study, the operation models with constant flowrate and variable flowrate of a flat-plate solar collector field are analysed. The model that achieves greater energy utilization and lower operating costs was determined under two conditions: when scaling fouling occurs in the collector tubes and when a clean operation (without fouling) is considered. The case study involves a pasteurization plant operating at temperatures above 85°C. The operational scenarios are as follows: 1) Variable flowrate: the flowrate is adjusted based on environmental conditions to maintain a constant outlet temperature, and 2) Constant flowrate: the flowrate remains constant, resulting in varying collector outlet temperatures depending on weather conditions. The results show that under clean conditions, operating with variable flowrate yields a lower cost per kWh of captured energy ($0.048/kWh). In the presence of fouling, the cost of operating with variable flowrate significantly increases to $0.15/kWh, while constant flowrate results in the lowest cost ($0.077/kWh).



Collectors, Networks, Scaling

Global port supply chain management

Gestión de la cadena de suministro global portuaria

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Abstract

90% of trade obeys port route logistics that involve the five global communication channels. The aim of this research was to analyze the evolution of global logistics and management of the global port supply chain with the aim of transforming it into a single window. On the other hand, global port success depends on geopolitics, infrastructure, adhesion to clusters, continuous investment, services, quality, costs and time. However, ports that do not have these parameters will be trunks or failures. A mixed analysis was carried out on the management of the global port supply chain based on the quantification and estimation of statistical control variables, decision making, geopolitics and modernization. The characterization of data obtained from port logistics determined transportation systems of sustainable, sustainable and circular development. The identification of critical routes for the conversion of a port to a single window will be the future work subject.

Global port supply chain management		
Objectives	Methodology	Contribution
The aim of this research was to analyze the evolution of global logistics and management of the global port supply chain with the aim of transforming it into a single window.	A mixed analysis was carried out on the management of the global port supply chain based on the quantification and estimation of statistical control variables, decision making, geopolitics and modernization.	The characterization of data obtained from port logistics determined transportation systems of sustainable, sustainable and circular development.

Port Logistics, Supply Chain Management, Maritime Routes

Construction and Development of an Ultrasonic Spray Pyrolysis System for Semiconductor Thin Films Deposition to Photovoltaic Applications

Construcción y Desarrollo de un Sistema de Rocío Pirolítico Ultrasónico para el Depósito de Semiconductores en Películas Delgadas para Aplicaciones Fotovoltaicas

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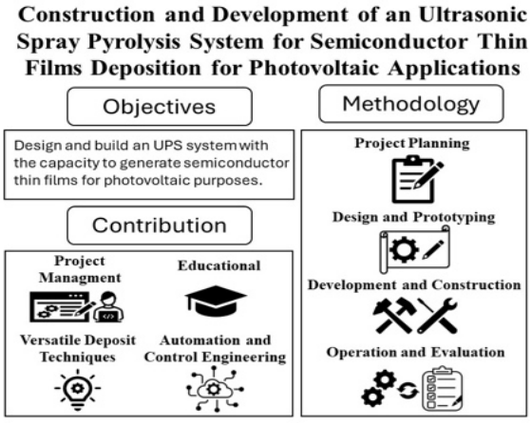
Abstract

The ultrasonic spray pyrolysis (USP) technique is an efficient method for depositing high-quality thin films, offering advantages over traditional methods. This paper presents the construction and development of a USP system designed for semiconductor thin films used in photovoltaic applications. It provides an overview of the technique, including the setup, material preparation, and process control. The results demonstrate the system's ability to produce uniform, high-quality films, underscoring its potential to advance semiconductor research and inspire new applications in photovoltaics.



Deposition Thecniques, Spray Pyrolysis, Thin Films

Domotic control by codification of electromyographic signals and network sockets

Control domótico vía codificación de señales electromiograficas y socket de red

GONZÁLEZ-SILVA, Marco Antonio and HERNÁNDEZ-PÉREZ, Faride

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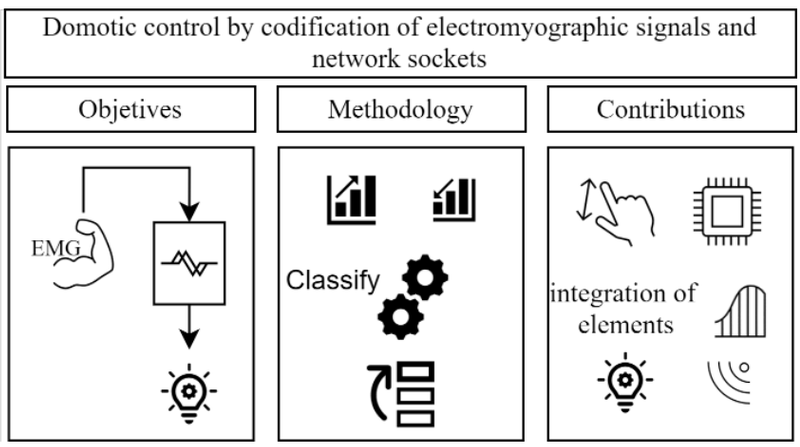
Abstract

This article presents a system where signals generated by an electromyographic sensor on a person are sent through a client-server network topology. The purpose of these signals is to manipulate home automation devices only with certain arm movements, thus creating a gadget that does not require a keyboard or a touch screen. So that the signal can be interpreted as a control instruction, different patterns of EMG signals were defined that are possible to identify by means of a coefficient evaluation between signals. The use of sockets allows devices to be manipulated on local networks or over the Internet.



Domotic-Control, Electromiography, Socket-Network

Thermodynamic study for the recovery of lithium and cobalt from waste batteries

Estudio termodinámico para la recuperación de litio y cobalto a partir baterías de desecho

FARIAS-GONZALEZ, Miguel Angel, FARIAS-GONZALEZ, Francisco Javier and PEREZ-CASTRO, Laura Luzc

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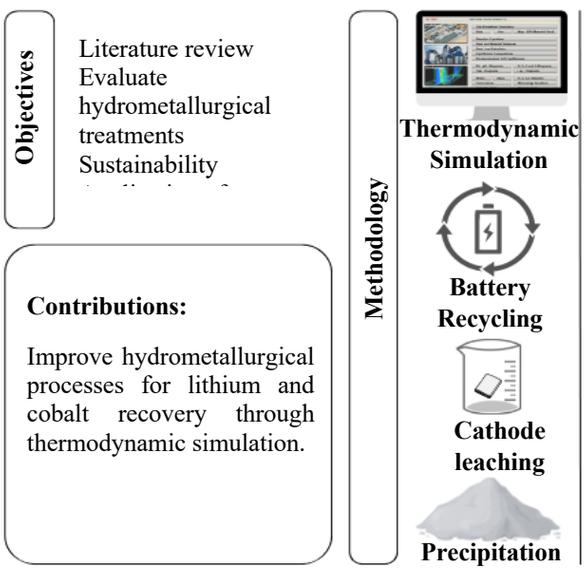
Abstract

Lithium and cobalt are a fundamental raw material for the manufacture of portable batteries, widely used in mobile phones, laptops, electric cars, etc., due to their properties in the accumulation of electrical energy. While it takes approximately 250,000 kg of lithium ore or 750,000 kg of brine to extract 1,000 kg of lithium, it takes only 28,000 kg of discarded lithium-ion batteries to obtain the same amount of metal. For this reason, this project seeks to improve and optimize the recycling process through the selective precipitation of lithium (Li) and cobalt (Co) from ammonium oxalate $(NH_4)_2C_2O_4$ and sodium carbonate Na_2CO_3, through a detailed study of variables such as reagent concentration, pH and temperature. This will be achieved through thermodynamic simulations, with the aim of maximizing the recovery of lithium and cobalt from discarded batteries.



Thermodynamic Simulation, Batteries, Lithium

Feasibility of dry canals in the Americas

Factibilidad de canales secos en el continente Americano

CASTILLO-AGUIRRE, Alfredo Humberto, CRUZ-GOMEZ, Marco Antonio, MEJIA-PEREZ, José Alfredo and ESPINOSA-CARRASCO, María del Rosario

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Abstract

The future of global maritime trade is being guided by the Triad generating uncontrollable infrastructure expansion. The objective of this research was to analyze the feasibility of dry canals in the American continent as sustainable development projects with fine relief from the Panama Canal. On the other hand, the success of a dry port depends on the preferences for use as a port route over its competitors. However, dry ports that are not competitive will be locally supplied. A mixed analysis was carried out to identify the feasibility criteria for dry canals, based on the quantification and estimation of statistical control variables, decision making, geopolitics and modernization. The characterization of data obtained from requirements so that a dry port can act as a detonator of sustainable and sustainable development in a cutting-edge environment. The identification of parameters of island-type port systems will be the subject of future work.

Feasibility of dry canals in the Americas		
Objetives	Methodology	Contribution
The objective of this research was to analyze the feasibility of dry canals in the American continent as sustainable development projects with fine relief from the Panama Canal..	A mixed analysis was carried out to identify the feasibility criteria for dry canals, based on the quantification and estimation of statistical control variables, decision making, geopolitics and modernization.	The characterization of data obtained from requirements so that a dry port can act as a detonator of sustainable and sustainable development in a cutting-edge environment.

Dry Port, Inner Port, Trunk Port

Proposal for standardization in the warping process in textile manufacturing

Propuesta de normalización en el proceso de urdido en la fabricación de textiles

BAHENA-MEDINA, Lilia Araceli, GÓMEZ-VICARIO, Miguel Ángel, REYES-VELÁZQUEZ, Alejandro and HERNÁNDEZ-JASSO, Ana María

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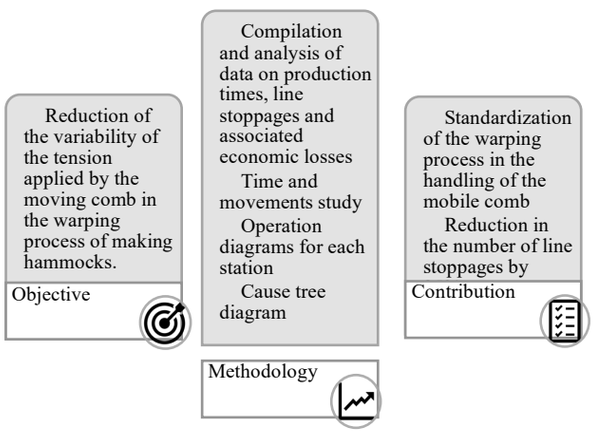
Abstract

In a textile company focused on producing hammocks, the Warping Process presented line stoppages in its weavers related to the variability of the tension applied by the moving comb. This variability was identified as the main cause of reel defects, which account for 84% of line stoppages. It was found that 72% were caused by differences in the voltage with which they were made. To address the problem raised, a detailed analysis of line stoppages caused by defects in the reels and their impact on production was carried out. The methodology included the collection and analysis of data on production times, line stoppages and associated economic losses. Time and motion study techniques were implemented to identify the warping stations with the highest number of defects and operations diagrams were developed for each station.



Warping, Standardization, Textile process

Structural analysis of a lifting platform for autonomous vertical vehicular parking

Análisis estructural de una plataforma de elevación para estacionamiento vehicular vertical autónomo

BETANZOS-CASTILLO, Francisco, FUENTES-CASTAÑEDA, Pilar and CORTEZ-SOLIS, Reynaldo

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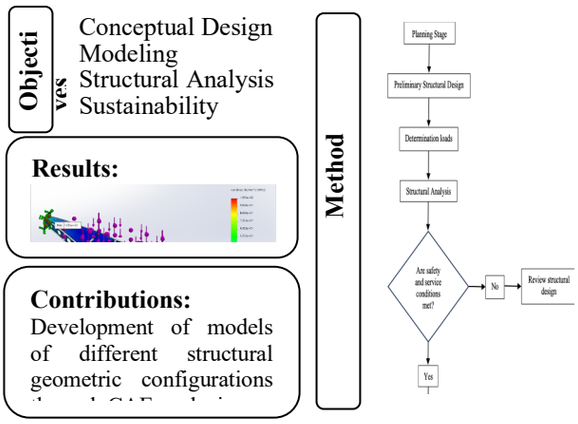
Abstract

A problem that has become latent in urban areas, cities, shopping malls, among others, is the space available for parking cars, coupled with the increase of the vehicle fleet and few spaces established to operate as parking lots. As an alternative solution, the conceptual design of a vertical autonomous parking with a vision oriented to the I4.0 industry was developed. The design, modeling and structural analysis was carried out using computer aided engineering (CAE) of a central platform where vehicles are accommodated upon arrival, this will be raised and finally transferred on a structure divided into different levels, making comparisons according to the configurations and design parameters. Finally, simulations were obtained by means of Finite Element Analysis (FEA), which allowed the realization of different configurations through the use of software to verify if the use of the proposed material is viable for future works in a real way.



FEA, Simulation, Vertical Parking

Development of a prototype spoiler for effective braking of a racing motorcycle, utilizing active aerodynamics

Desarrollo de un prototipo de spoiler para el frenado efectivo de una motocicleta de competición, utilizando aerodinámica activa

CRUZ-OLVERA, Leonardo, CUATE-GOMEZ, Diego-Hernan, GARZÓN-ROMÁN, Abel and LUGO-QUINTAL, Jesús Manuel

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Abstract

High-level competition motorcycles have incorporated "wings," regulated by the rules of the championships in which they are used. This article highlights the importance of these aerodynamic modifications to improve performance during braking and direction changes, crucial aspects in motorcycle competitions. Previous studies have evaluated how the wings in MotoGP increase drag and lift force according to the lean angle, fundamental to understanding their impact on the aerodynamics of competition motorcycles. Despite existing research, more study is needed on static wings, motivating this work to explore the effects of active wings, similar to those in high-end cars and F1 single seaters, through 3D modeling and computational fluid dynamics (CFD) simulations. The goal is to design wings that generate variable downforce on the sides and rear, optimizing aerodynamics and dynamics in extreme corners, improving performance and safety.

Winglets, Motorcycle Racing, 3D Design

Using latent heat from a water purification system to improve the performance of an absorption heat transformer

Uso del calor latente de un sistema de purificación de agua para mejorar el desempeño de un transformador térmico por absorción

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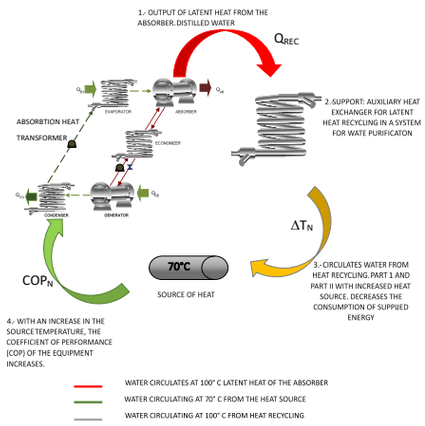
Abstract

Absorption heat transformer for water purification (AHTWPs) are an option for utilizing energy from industrial or natural sources. Previous studies have demonstrated the feasibility of recycling the heat produced by the distillation of impure water, increasing the coefficient of performance (COP) values and reducing the energy requirements in the AHTWP. The present work presents a heat recovery proposal consisting in combining two cases: with source temperature increase (Case I) and without source temperature increase (Case II). The new configuration allows the fractionation of the available amount of heat (□ηQAB) between the two heat recovery cases. A simulation was carried out for different absorber operating conditions, using H2O-LiBr as the working mixture at different concentrations. The results show that it is possible to increase the initial COP values up to 74%.



Absorption, Purification, Combining Configuration

Engine cooling system analysis of a low displacement motorcycle using thermography

Análisis del sistema de refrigeración del motor de una motocicleta de baja cilindrada mediante termografías

CRUZ-RAMIREZ, Christian, CRUZ-GOMEZ, Marco Antonio, ESPINOSA-CARRASCO, María del Rosario and MEJIA-PEREZ, José Alfredo

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Abstract

The cooling system of a motorcycle uses air and a coolant fluid as working fluids to reduce the temperatures generated by combustion. The aim of this research was to identify a mapping of motorcycle heating using thermography as a tool to optimize lifespan. On the other hand, motorcycles with efficient cooling systems increase their lifespan. However, motorcycles lacking this compromise their lifespan, requiring frequent repairs. A mixed analysis was employed for the optimization of the radiator, where quantification and estimation of control variables such as component temperatures, heat transfer, bodies, and surroundings were applied. The technical data characterization of the radiator and its thermographies were used to optimize its thermal performance. It is anticipated that the radiator characterization will be applicable to future work on motorcycles with similar characteristics to those used in this study.

Engine cooling system analysis of a low displacement motorcycle using thermography		
Objectives	Methodology	Contribution
The aim of this research was to identify a mapping of motorcycle heating using thermography as a tool to optimize lifespan.	A mixed analysis was employed for the optimization of the radiator, where quantification and estimation of control variables such as component temperatures, heat transfer, bodies, and surroundings were applied.	The technical data characterization of the radiator and its thermographies were used to optimize its thermal performance.

Heat Transfer, Thermography, Motorcycle Cooling System

Obtaining the transfer function using Matlab's System Identification and PID controller for a temperature plant of an USP-type reactor

Obtención de la función de transferencia usando System Identification de Matlab y control PID para una planta de temperatura de un reactor tipo RPU

GRIJALVA-CEDILLO, Samuel, GARCIA-HERNÁNDEZ, Ramon, ALVAREZ-MACIAS, Carlos and MARTINEZ-LOPEZ, Ricardo

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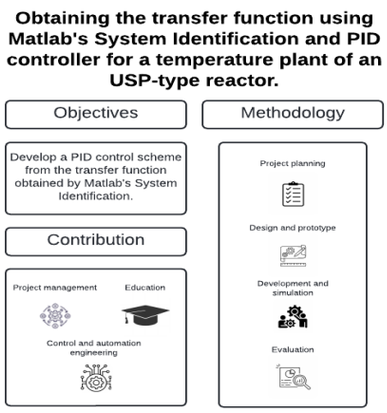
Abstract

The Matlab System Identification Toolbox optimizes experimental developments and accurately models physical systems using experimental data. Valued for their simplicity and robustness, PID controllers are crucial in industries such as food, pharmaceutical, and chemical. USP reactors are key in the synthesis of nanomaterials and coating of substrates with thin films, as well as in ultrasonic spraying and atomization. In this process, the substrate temperature is critical to ensure material quality.



Identification, Control, Spray pyrolysis

Performance comparison in optimization algorithms for heart disease detection model

Comparación de rendimiento en algoritmos de optimización para el modelo de detección de enfermedades cardiovasculares

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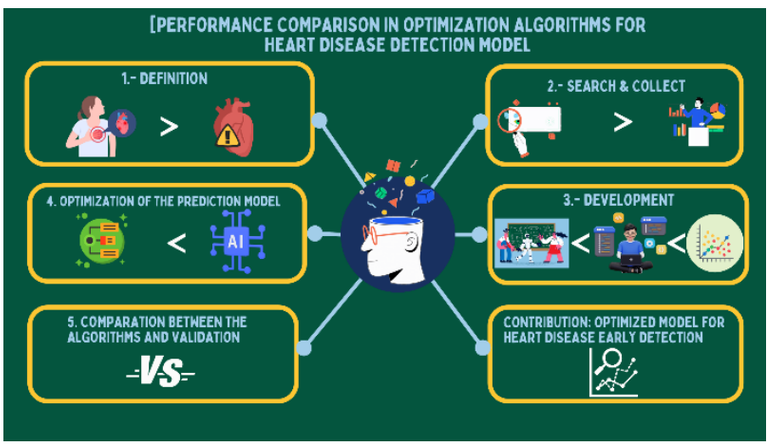
Abstract

Cardiovascular diseases are the leading cause of mortality worldwide, necessitating robust predictive models for early diagnosis. This study evaluates and compares the performance of support vector machine (SVM) models optimized using genetic algorithm (GA) and particle swarm optimization (PSO) techniques. A publicly available dataset with health-related features was used, involving preprocessing steps like handling missing values, encoding categorical variables, and feature scaling. The models were assessed based on cross-validation accuracy, test accuracy, and F1 score. Convergence plots were generated to visualize the optimization process. Results highlight the effectiveness of GA and PSO optimizations in enhancing SVM model performance for predicting cardiovascular health outcomes. The comparison provides insights into the relative strengths of each optimization method, guiding the development of advanced predictive models for heart diseases diagnosis and management.



Cardiovascular Disease, SVM, Optimization Algorithm

Diagnostic, analysis and management of the routes of a Distribution Center of a dairy producer in the State of Mexico

Diagnóstico, análisis y gestión de las rutas de un Centro de Distribución de una productora de lácteos en el Estado de México

ZENTENO-BONOLA, Ana Luisa, CALDERÓN-RÍOS, Norma Otilia, PALOMAR-FUENTES, María del Pilar and BENITEZ-VALLEJO, Juan Carlos

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Abstract

Distribution Centers are an important part of an organization, since the goal of this area is to ensure that products reach their destination in a timely manner. In the case of the dairy producing company, one of its distribution programs was diagnosed, analyzed and managed due to the decrease in efficiency. The status of the project was diagnosed as a priority, and the strengths and areas of opportunity were identified. Subsequently, an analysis of the first ten critical paths with the lowest indicator was carried out. The implementation of quality tools and methodologies continued to identify the main causes and the root cause of low effectiveness. Likewise, efforts were made to increase the indicator and reach its minimum standard. In addition to a final evaluation of the results obtained after the implementation of the pre-established countermeasure plan.

Diagnosis analysis and management of the routes of a Distribution Center of a dairy producer in the State of Mexico		
Objectives	**Methodology**	**Contribution**
Increase the degree of effectiveness of the distribution route project to 90%	The research type is basic and explanatory level.	The degree of effectiveness increased by 4.1%, achieving 90.3%, on average; applying quality techniques.

Distribution Center Management, Quality, Effectiveness

Determination of the Solar Fraction for Optimized Parabolic Concentrator Solar Collector Networks

Determinación de la Fracción Solar para Redes Termosolares Optimizadas Conformadas por la Tecnología de Colectores Tipo Canal Parabólico

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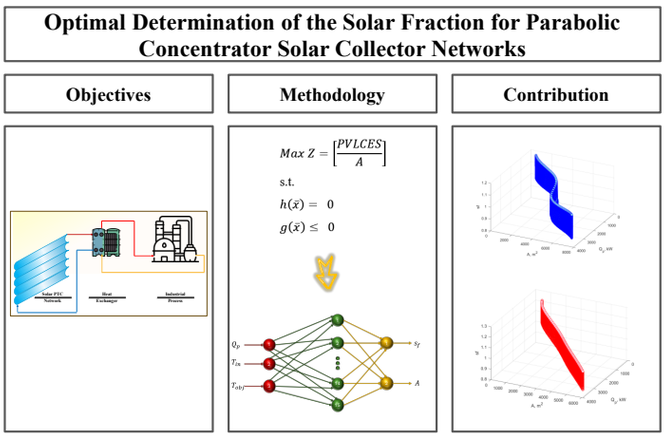
Abstract

Studies show that the solar fraction of most solar thermal plants that supply heat to industrial processes ranges from 5-60%. The main limiting factor for increasing this value to 100% is the installation area. This work presents a study of the solar fraction parameter in optimized designs of systems using parabolic trough collector technology. An optimization process using Mixed-Integer Nonlinear Programming with 9 decision variables is proposed, employing the heuristic technique of Particle Swarm Optimization coupled with a transient thermohydraulic-economic model. The inlet temperature of the heat transfer fluid was varied from low to high, as well as the temperature and load required by the industrial process to obtain networks with optimized area, structure, and operating conditions. For predicting the solar fraction parameter and optimized network area, a regression using artificial neural networks was performed. It was found that it is possible to obtain flexible optimized networks capable of operating with average sf values of 1.05 throughout the year, and with a minimum area that supports changes in the operating conditions of temperature and thermal load of the process in the range of 70-400°C and 0.4-4 MW, respectively.



Solar, Fraction, Optimization, Heat, Industrial, Processes

Ships decarbonization is an urgent technology and responsibility challenge that impacts global warming

Descarbonización de barcos es un reto de urgencia tecnológica y responsabilidad que impactan en el calentamiento global

FLORES-CRUZ, Luis Antonio, CRUZ-GÓMEZ, Marco Antonio, CORREA-NIETO, Marco Antonio and MEJÍA-PÉREZ, José Alfredo

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Abstract

Maritime transport generates 3% of global CO_2 emissions according to the GHG (Greenhouse Gases) report. The aim of this research was to analyze the decarbonization of ships through the technological migration from conventional fuels to alternative types for zero-emission purposes. On the other hand, shipping companies that modernize their fleets to zero emissions will have priority in the provision of services. However, those that do not have these assets will be penalized. A mixed analysis was carried out on the migration of technologies in zero-emission ships based on the quantification and estimation of statistical control variables, decision-making, modernization stages and technologies. The characterization of data obtained from each ship will determine the feasibility of applicable technologies to achieve zero emissions. The optimization of technology applied to each ship according to its use will be the subject of future work.

Ships decarbonization is an urgent technology and responsibility challenge that impacts global warming.		
Objectives	Methodology	Contribution
Analyze the decarbonization of ships through the technological migration from conventional fuels to alternative types for zero-emission purposes.	This research had a mixed approach, applying both quantitative and qualitative technologies, using systematic processes, as well as records and estimated data.	The characterization of data obtained from each ship will determine the feasibility of applicable technologies to achieve zero emissions.

Shipping Industry Carbon Footprint, Ships Decarbonization, Zero Emissions Ships

Optimization of production processes through the Kaizen philosophy to reduce time

Optimización de procesos productivos mediante la filosofía Kaizen para la reducción de tiempos

HERNÁNDEZ-ANAYA, Luisa Fernanda, LÓPEZ-GARZA, Esmeralda, GARZA-MORENO, Jesús Cruz and ESPÍNDOLA-ÁLVAREZ, Jorge Antonio

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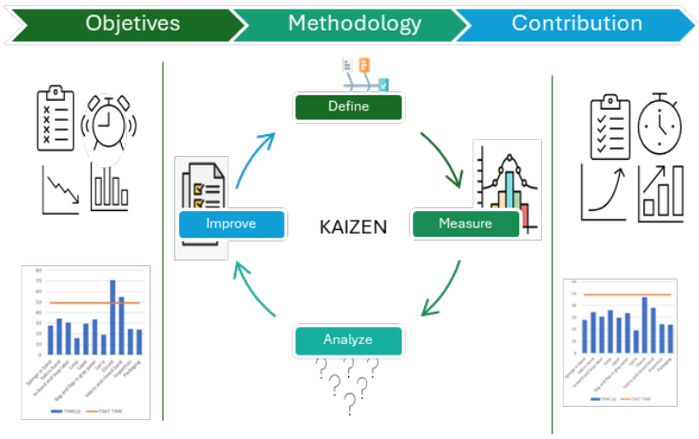
Abstract

This work presents the results obtained from the design and implementation of the Kaizen philosophy in a maquiladora company, where downtime in the production line, machine failures and low production levels have been detected. The philosophy was implemented where the production line was analyzed through the implementation of continuous improvement tools that managed to eliminate downtime and thereby improve the company's productivity.



Kaizen, Continuous Improvement, Productivity

Evaluation of the grinding performance at the Saucito I Plant and optimization of the Knelson QS30 Gravimetric Concentrator

Evaluación del desempeño de molienda en la Planta Saucito I y optimización del Concentrador Gravimétrico Knelson QS30

CONTRERAS-PIMENTEL, Luís Ángel, NÁJERA-LÓPEZ, Aimeé Nataly, VILLEGAS-MARTÍNEZ, Rodrigo Cervando and GARCÍA-GONZÁLEZ, Juan Manuel

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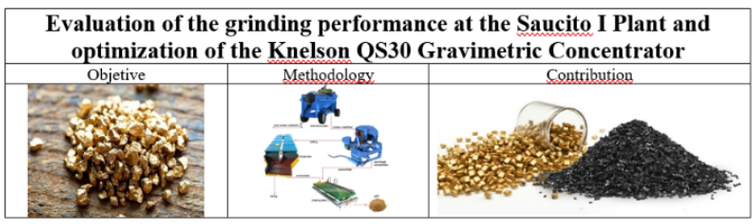
Abstract

Gravimetric concentration of minerals is a solid-solid separation process used to increase the percentage of the desired mineral. The objective of this work is to evaluate the performance and efficiency of grinding in a Knelson QS30 Gravimetric Concentrator, through the granulometric distributions of the process streams, the efficiency of screens and circulating loads, for its optimization in the extraction of Au and Ag in the Saucito I Plant. The experimentation was carried out at the plant located in the El Saucito del Poleo Ejido in Fresnillo, Zac. To achieve the objective, a sampling of the grinding area was carried out, some variables were kept constant, the concentration time was modified at the same fluidization flow of the concentrator. The results showed the need to optimize the concentration time. In conclusion, by optimizing the fluidization flow and concentration cycle time, the concentration of gold is increased



Recovery, Knelson, Gravimetric Concentrator

Optimization of the corn snack manufacturing process to reduce production costs

Optimización del proceso de elaboración de botana de maíz para reducir costos de producción

BAHENA-MEDINA, Lilia Araceli, GÓMEZ-VICARIO, Miguel Angel, REYES-VELÁZQUEZ, Alejandro and LANDA-MENDOZA, Jatziri

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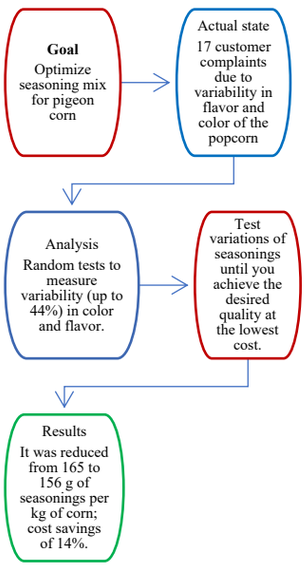
Abstract

This work was developed in an SME that is responsible for the production and distribution of fried foods made of flour, wheat, corn and soy, through a semi-artisanal process. The company received 17 complaints during a month, of which 8 (47.06%) pertain to the variation in the color and flavor of the pigeon.20 samples were obtained and the difference in the variation of the seasoning was approximately 44.01%; From there, 18 tests were carried out and finally the one that maintained the quality of the product and considered the best corn-seasoning relationship was chosen. Initially, an average of 165 g of seasoning was used for each kilogram of corn, this was reduced to 156 g. With the help of the test, the company's savings increased, resulting in a 14.03% reduction in what it cost to make said snack ($9,000 per month).



Preparation Of Snacks, Optimization, Popcorn

Blockchain: A Disruptive Technology and Its Initiatives in the State of Hidalgo, Mexico

Blockchain: Una Tecnología Disruptiva y sus Iniciativas en el Estado de Hidalgo, México

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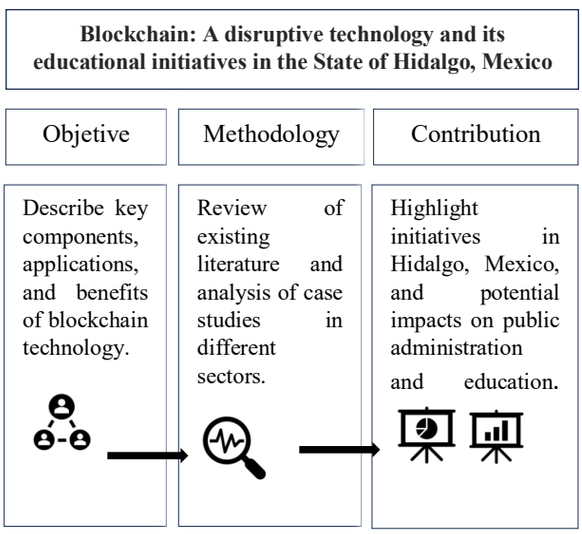
Abstract

This paper examines blockchain technology, its disruptive impact, and its applications in the educational sector in the state of Hidalgo, Mexico. Statistical data on blockchain adoption, its benefits in education, and finally, local initiatives are presented, exemplifying its potential to transform record management and transparency in educational institutions.



Blockchain, Education, Digital Credentials

Portable equipment and interface to train in CPR based on monitoring the applied force

Equipo portátil e interfaz para el entrenamiento en RCP basado en la monitorización de la fuerza aplicada

SESEÑA, Hiram, ZUÑIGA, Mariana, NÁPOLES, Elías and MARTÍNEZ, Moisés

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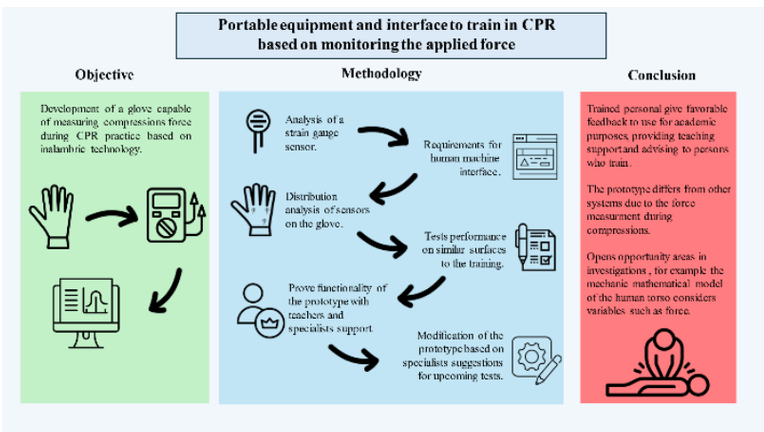
Abstract

A percentage of sudden cardiac arrests that occurred outside the hospital, there were no present people to assist in, so it is necessary that people need to be easily trained with equipment capable to feedback concisely to their performance, due to apply a quality CPR may increase survival to persons who suffers cardiac arrests. This article shows the development of training CPR equipment, based on measuring the force during compressions. For the prototype, two strain gauges were used to measure force, also having an embedded system to recollect data to subsequently send them to a graphic interface to be interpretated by persons who are training. The force variation from each sensor is due to their position, therefore, an average of measurements was made, resulting in a variation range between 220 N and 340 N for the applied force during compressions. This equipment can be useful as base for data acquisition.



Cardiopulmonary Resuscitation, Data acquisition, Training

Non-Invasive Analysis for Detecting Gear Fractures in Automotive Transmissions

Análisis no invasivo para detección de fracturas en engranes de transmisiones automotrices

ZUÑIGA, Mariana, ROJAS, Rafael, NÁPOLES, Elías and MARTÍNEZ, Moisés

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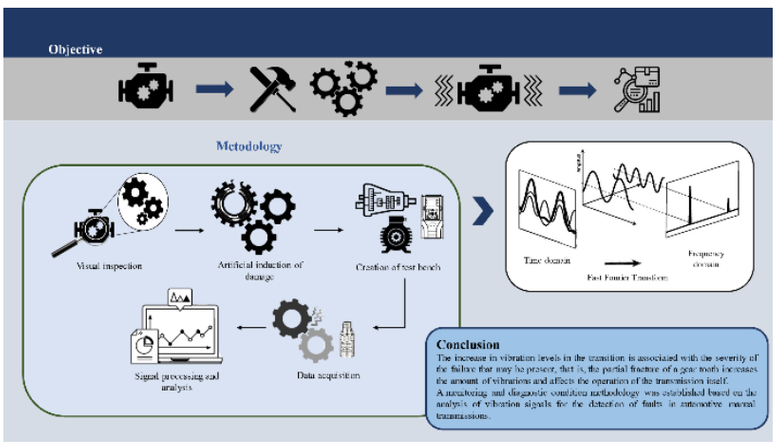
Abstract

Vibration analysis has proven to be effective for detecting failures in rotating elements. The objective of this study is to identify different failure conditions in a gear within an automotive gearbox by inducing failures in the gear and subsequently processing the vibration signals in the frequency domain using the Fast Fourier Transform. Two accelerometers were used to acquire data from the automotive transmission under different operating frequencies, to identify patterns indicative of failure in the damaged gear. The results show that the method can help identify the failure in the gear according to the amplitude value, differentiating between failure due to fracture and eccentricity. The increase in vibration levels is directly related to the severity of the failure present in the gear.



Identification of Failures, Vibrations, Gears, Analysis

Development and Desing for a Vehicular Care Based on a Embedded System to Prevent Car Heist

Diseño y desarrollo de una alarma vehicular con base en un sistema embebido para prevención de robos vehiculares

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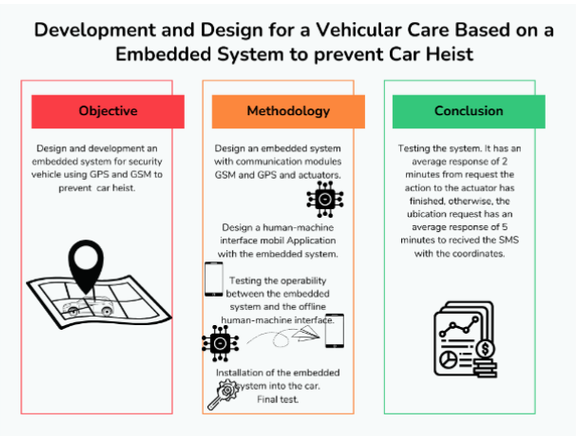
Abstract

Globally, a common trouble is the inefficiency of security systems in cars, several vehicles are stolen for this reason every year. The purpose on this paper is to make an embedded system for vehicular security. This system has direct communication with a smartphone, adding some control systems manipulated by user. It has an electronic card, as embedded system, that makes communication work, control, data process and voltage source. The system has microcontrollers and satellite communication modules to improve its communication characteristics, making high efficiency. This way, we look to do a social work in the local area to prevent and recover vehicles with this trouble.



Global Positioning System (GPS), Global System for mobile communications (GSM), App mobile

Dynamic evaluation of composite roofs: Thermal optimization with PCM under extreme climate conditions

Evaluación dinámica de techos compuestos: Optimización térmica mediante PCM en condiciones climáticas extremas

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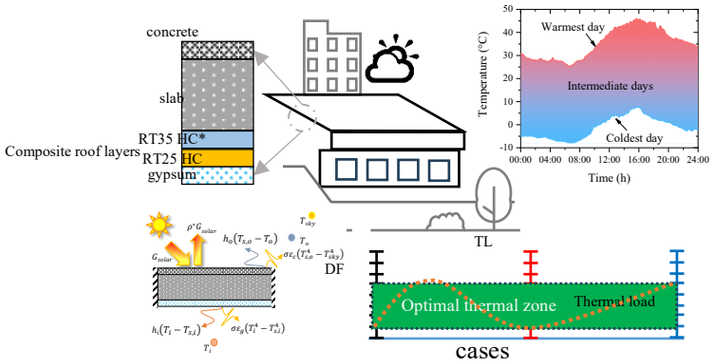
Abstract

The thermal performance of different roof configurations was analyzed, comparing the integration of phase change materials (PCM) with polystyrene insulation under extreme climatic conditions. The decrement factor (DF), time lag (TL), and thermal load were examined. The results indicated that configuration with PCM, either in double layers or with increased thickness, showed the best thermal performance. The optimal configuration, C45, which includes a double layer of PCM with RT25 HC on the bottom layer and RT35 HC* at the top layer, achieved a DF of less than 0.2, a TL between 2 and 10 hours, and a thermal load of 2.5 kWhm^{-2}. This study confirms that adding a PCM layer is the most effective strategy, followed by the increase of the thickness, as well as the addition of insulation, and finally, an additional layer.



Composite Roofs, Thermal Insulation, Heat Management

Implementation of a big data ecosystem for interdisciplinary analysis in academic projects: collaboration between engineering and communication in the study of the 2024 Mexican elections

Implementación de un ecosistema de big data para el análisis interdisciplinario en proyectos académicos: colaboración entre ingeniería y comunicación en el estudio de las elecciones en México 2024

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Abstract

This article presents the development and application of a Big Data ecosystem at FES Aragón, UNAM, framed within a PAPIIT Project. It details the collaboration with the Electoral Observatory of the Communication program at the same Faculty for analyzing political communication on social networks during the 2024 election campaigns in Mexico. Through massive data processing methodologies, which included comparisons between conventional tools like Python and distributed platforms on a Hadoop cluster and the use of Spark, large volumes of data were structured and cleaned. This methodology allowed for processing information for subsequent comprehensive qualitative and quantitative analysis from the perspectives of ethos, pathos, and logos in the discourse of the candidates participating in the electoral process. The results revealed that, while Python is useful for small datasets, Hadoop and Spark offer superior efficiency in large-scale data processing, highlighting the importance of choosing the appropriate infrastructure for each task. The findings demonstrate the value of the intersection between computer engineering and communication in social and political research, setting a precedent for future interdisciplinary collaborations.

Big Data, Political Communication, Data Analysis, Interdisciplinary, Ethos, Collaboration, Electoral, Political, Conventional, Methodology, Qualitative, Quantitative, Analysis, Datasets, Efficiency, Highlighting, Infrastructure, Findings

Wind speed forecasting one step ahead using different input vectors in a neural network

Pronóstico de velocidad de viento un paso adelante, utilizando diferentes vectores de entrada en una red neuronal

CADENAS, Erasmo, MÉNDEZ, Alma-Rosa, ARREOLA, Sixtos-Antonio and CAMPOS, Rafael

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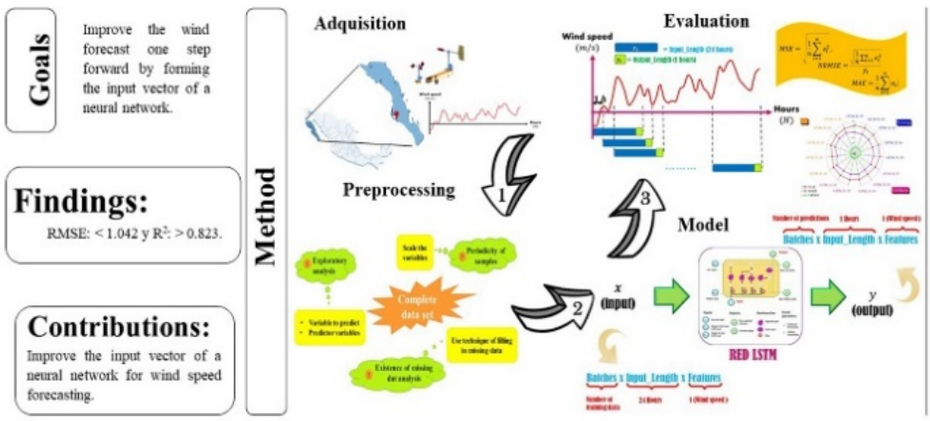
Abstract

This study introduces a method for predicting wind speed in Baja California Sur, Mexico, using long-short-term memory (LSTM) neural networks applied to hourly time series data. Measurements from January 2016, provided by Mexico's Federal Electricity Commission (CFE), were analyzed to optimize the model inputs and reduce forecast errors. The data was statistically described to identify relevant patterns and then normalized to improve model training. Several LSTM network configurations were tested and compared based on error metrics. Initial models with six variables in input vectors were unsatisfactory. However, three additional models with five, three, and two inputs were developed. The model with five inputs and one output (5I, 1O) achieved the lowest error metrics: Mean Absolute Error (MAE) of 0.72, Root Mean Square Error (RMSE) of 0.923, and Normalized Root Mean Square Error (NRMSE) of 0.161, indicating the best performance among the tested models.



Wind Speed, Forescating and LSTM Neural Networks

Mobile Application With Augmented Reality And Geolocation To Promote Tourist Attractions Of Santa Cruz Zenzontepec, Sola De Vega, Oaxaca, Phase 3, 4 And 5: Coding, Test And Launch

Aplicación móvil con realidad aumentada y geolocalización para promover atractivos turísticos de Santa Cruz Zenzontepec, Sola De Vega, Oaxaca, fase 3, 4 y 5: codificación, prueba y lanzamiento

ROJAS-NANDO, Julio Cesar, REYES-LUNA, Nayely, MARTINEZ-PARRA, Eloy and BAUTISTA-ORTIZ, Adriana Ruvicel

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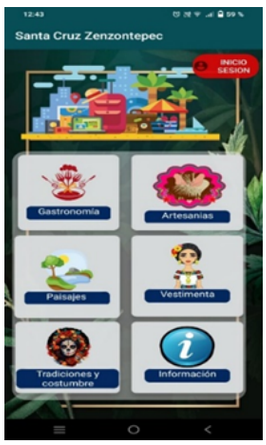
Abstract

The article highlights a mobile application that combines augmented reality and geolocation to preserve the Chatino culture in Santa Cruz Zenzontepec, Oaxaca. The application offers virtual reconstructions of historical events, audios and writings in Chatino and Spanish, connecting the user with the past and revitalizing culture. Its objective is to show the tourist places of the municipality, guiding visitors with geolocation. Developed with various technological tools and an agile methodology, it seeks to provide an immersive experience that not only preserves the Chatino culture, but also invites you to explore tourist places. In summary, this application represents a valuable tool to counteract the loss of cultural identity, offering an educational and exciting experience that connects the user with the history and beauty of Santa Cruz Zenzontepec.



Mobile application, Chatino culture, Augmented reality

Standardized tool for the identification and control of risks associated with tasks in the work environment

Herramienta estandarizada para la identificación y control de riesgos asociados con las tareas en el ambiente de trabajo

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Abstract

Performing a risk analysis by activity allows you to identify and control the risks associated with tasks in the work environment, reduce workplace hazards associated with the risks, as well as prevent or reduce injuries and illnesses in the worker. This article presents a standardized tool to perform a risk analysis by activity, each of the proposed stages is detailed, such as the description of the activity, identification of the risks present, description of the risks, identification of damage or potential effect, risk control hierarchy, identification of current controls, risk assessment and implementation of actions. Each of the stages takes you by the hand to systematically carry out a risk analysis by activity. Finally, the effectiveness of the tool implemented in carrying out a risk analysis is shown.

Risk analysis by activity, Hierarchy of Risk Control, safety and higiene

Synthesis and characterization of carbon-based quantum dots for use in Biotechnology

Síntesis y Caracterización de puntos cuánticos a base carbono para su uso en la Biotecnología

GRANADOS-OLVERA, Jorge Alberto, CALVILLO-BELTRÁN, Sofía Valentina, ARROYO-ORDOÑEZ, Ivan and RANGEL-RUÍZ, Karelia Liliana

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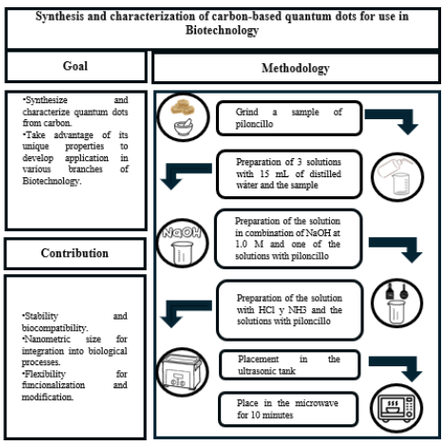
Abstract

Carbon quantum dots (CQDs) are spherical nanoparticles (CNPs) with a size between 2-10 nm and a crystalline structure. They have unique properties, such as high biocompatibility and luminescence produced by their absorbance and emission of light. This shows optical properties that are not seen in larger scale materials. Due to their low toxicity, CQDs offer a versatile platform for various applications, including medical diagnosis, bioimaging, substance detection, controlled drug release, photodynamic therapy and biomarking techniques. They can be synthesized by methods such as ultrasound and microwaves, pyrolysis, hydrothermal synthesis, or exfoliation of carbon materials. Their study and development is an active area of research in biotechnology, nanotechnology and materials science. This work focuses on the properties that this type of nanoparticle has, the synthesis used for its manufacture and the possible uses as a tool in different biotechnological processes.



Synthesize, Characterization, Quantum Dots

Web framework for the Operational Planning management system

Framework web para sistema de gestión de la Planeación Operativa

ESCORZA-SÁNCHEZ, Yolanda Marysol, MENDOZA-ESPINOZA, Héctor Eduardo and HERNÁNDEZ-GRACIA, Tirso Javier

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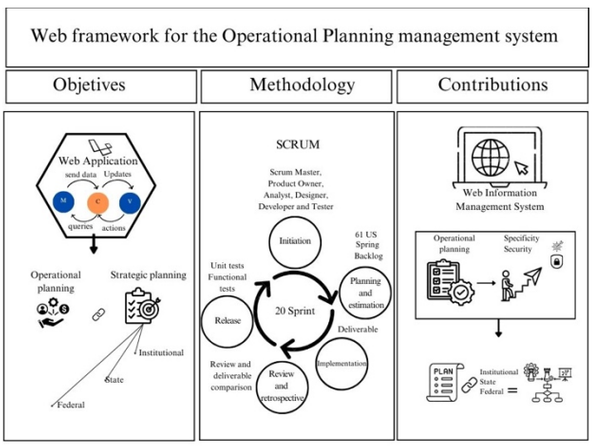
Abstract

In a previous research work, the authors designed an information management model for short-term planning for the Hidalgo Technological Universities; This article presents the implementation of these model in the form of a Web application based on the Controller View Model pattern that allows linking the allocation of resources for operational planning with the objectives of strategic planning at the institutional, state and federal level. The Scrum methodology was used for the development of the application in which 61 user stories and 20 Sprints were established, the application was subjected to unit and functionality testing. The framework used was Laravel. The contribution is an information management system that meets the needs in terms of Operational Planning at a higher level of specificity and security; capable of linking institutional, state and federal planning, allowing compliance with strategic planning.



Information Management System, Model View Controller, Operating Planning

Innovative Approaches in Teaching Modal Analysis: Utilizing Additive Manufacturing for Structural Engineering Education

Enfoques Innovadores en la Enseñanza del Análisis Modal: Utilización de la Manufactura Aditiva en la Educación de Ingeniería Estructural

CENTENO-MORENO, Alan Ibrahim, TORRES-CEDILLO, Sergio Guillermo, CORTES-PÉREZ, Jacinto and REYES-SOLÍS, Alberto

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Abstract

Teaching modal parameters in civil engineering, particularly structural engineering, is essential for understanding structural behavior under mechanical vibrations. As projects grow more complex, the need for rigorous testing increases, making theoretical and practical education crucial. Tools like Matlab, SAP2000, ETABS, and ANSYS are widely used for modal analysis, while practical methods include shake table tests and data collection with accelerometers. Recently, additive manufacturing has gained traction as a cost-effective alternative for creating educational platforms, replacing traditional steel elements with thermoplastics. This innovative approach reduces costs and enhances the practicality of teaching, allowing for visual demonstrations of vibration effects. The article discusses the design of an academic platform using additive manufacturing to teach modal parameters in structural systems, with experimental tests conducted to determine the structure's modal parameters through free vibration analysis.

Objetive

New Alternatives for Teaching Modal Testing Analysis Using Additive Manufacturing

estructural

Contributions:
Utilizing Emerging Technologies for Engineering Education

Metodology

Teaching techniques, Modal analysis, 3D printing

Autotronic system for vehicle and pedestrian detection using Artificial Intelligence

Sistema autotrónico de control para detección de vehículos y peatones mediante inteligencia artificial

SÁMANO-FLORES, Yosafat Jetsemani, SERRÁNO-RAMÍREZ, Tomás, VARGAS-TORRES, Antonio and CAMPOS-HERNÁNDEZ, Juan Salud

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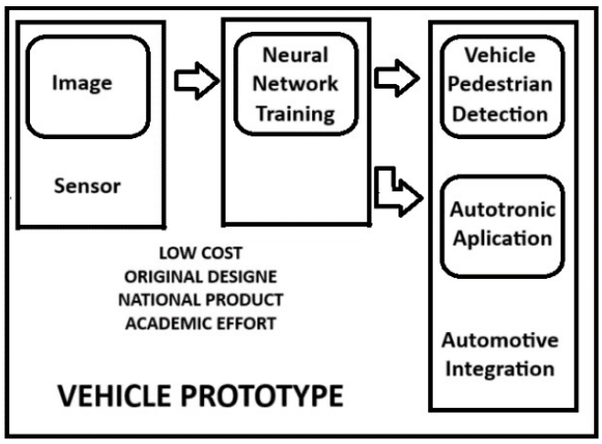
Abstract

The project is based on artificial intelligence which is focused on the detection of pedestrians and vehicles by means of a camera installed in the user's vehicle. Currently, the technological trend is mostly focused on autonomous vehicles, which seek to generate greater convenience and comfort for the driver. Due to the fact that drivers are usually very distracted and are not aware of the road and what is happening around their vehicle, thus causing road accidents. Road culture is not very present in most places where motor vehicles circulate, in addition to the various forms of distraction that currently exist. For that reason, a way to avoid as much as possible these automobile accidents were developed, thus opting for the new available technologies such as Artificial Intelligence and development boards dedicated to image processing.



Autonomous, Detection, Generate, Technologies, Development, Processing, Pedestrians

Design of a High Performance Hybrid Tricycle (THAR) to assist People with Motor Disabilities

Diseño de un Triciclo Híbrido de Alto Rendimiento (THAR) de asistencia para Personas con Discapacidad Motora

MENDOZA-DERRAMADERO, José De La Cruz, MANDUJANO-NAVA, Arturo, CHIHUAQUE-ALCANTAR, Jesús and PAZ-CABRERA, Mauro

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Abstract

In Mexico, there is a delay in the mobility process of people with motor disabilities. At the same time, in our country there are nearly 3 million people with motor disabilities according to what INEGI reports in its 2020 census. Therefore, a virtual prototype is being proposed as a result of the first stage of its own methodology for the design of a hybrid tricycle to transport people with motor disabilities, which offers versatility in terms of transport configurations in the facilities of the Polytechnic University of Guanajuato (UPG). In a second stage, it is proposed to build a scale prototype using additive manufacturing to identify areas of opportunity before building the final prototype and carrying out its real physical tests in order to obtain sufficient data to implement a commercial model that can be reproduced. reliable way.

Goals	Method	Contribution
* Conceptual design of a hybrid tricycle. * Comply with the required technical conditions. * Meet economic requirements.	* Needs detection. * Development and selection of the conceptual solution proposal. * Virtual prototypes in CAD	* Development of a hybrid assistance vehicle for people with motor disabilities.

People With Motor Disabilities, Hybrid Tricycle, Design Methodology

Viability of an earth/air heat exchanger applied in the Mérida city, Yucatan, México through the internet of things

Viabilidad de un intercambiador de calor tierra/aire aplicado en la cd. de Mérida, Yucatán México mediante internet de las cosas

CHAN-GONZALEZ, Jorge J., GALLEGOS-SÁNCHEZ, Selene, ANDRADE-DURÁN, Juan Edgar and LEZAMA-ZÁRRAGA, Francisco

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Abstract

In this paper, an analysis of the feasibility of installing a surface-to-air heat exchanger (ICTA)(Geotérmica, n.d.) (Sakhri et al., 2020) under the meteorological conditions of Mérida, Yucatán, Mexico is presented. This was achieved through the implementation of a low-cost Internet of Things (IoT) system, which enabled real-time monitoring. By leveraging the thermal inertia of the subsoil, we aimed to minimise the use of fossil fuels and promote environmental conservation. The study identified the energy potential and analysed the thermal properties of the environment and subsoil, including ambient and subsoil temperatures, subsurface thermal conductivity, relative humidity of the air and subsoil, types of subsurface materials, thermophysical properties of PVC pipes, direction and predominance of the air, thermophysical properties of ambient air, and solar radiation in the Yucatán Peninsula. Measurements of these variables were conducted in real-time and stored for subsequent analysis. The system also featured an interface that allowed real-time visualization of its behavior through a web page, as well as the areas being measured, ensuring that the sensors could be adjusted or corrected as necessary. Additionally, an on-site climate study was conducted with the assistance of a weather station. The analysis focused particularly on a residential house in Mérida, Yucatán, Mexico. Concurrently, a study of the soil's thermophysical properties (Çengel, 2011) was carried out with the support of the Centre for Research in Advanced Materials (CIMAV), Durango sub-headquarters. The results yielded thermal conductivities of 0.1355 W/mK and 0.2105 W/mK. The estimation was performed in triplicate at an average temperature of 24 °C, with hot and cold plate temperatures of 16.5 °C and 31.5 °C, respectively.

Earth-Air Heat Exchanger, Canadian Wells, Internet Of Things, Iot

Evaluation of operational efficiency in a company dedicated to the manufacture and sale of coolers

Evaluación de la eficiencia operacional en una empresa dedicada a la fabricación y venta de coolers

CANO-CARRASCO, Adolfo, GONZÁLEZ-MENDIVIL, Manuel Antonio, FORNÉS-RIVERA, René Daniel and NORIEGA-OLIVAS, Israel

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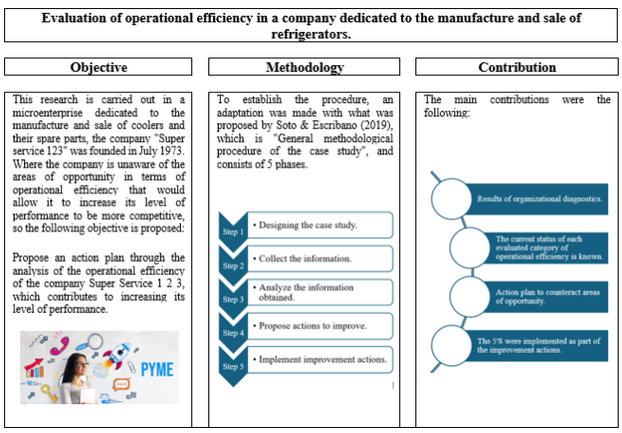
Abstract

The study at Súper Servicio 123, dedicated to the sale and manufacture of coolers, identified the need to improve its operational efficiency. The objective was to propose an action plan based on the analysis of its efficiency to increase its performance. The procedure included five phases: study design, collection and analysis of information, proposal and implementation of improvements. A self-assessment was applied that showed an efficiency of 75%, while an audit revealed 45%, highlighting deficiencies in Marketing and Sales, Operations and Human Resources. The 5S methodology was implemented with the expectation of significantly improving efficiency. The objective of the project was met and it is recommended to use the instrument developed to evaluate efficiency after applying the 5S methodology and the recommended actions to improve organizational performance.



Operational efficiency, Improvement and SMEs

Biofilm of potato starch and silver nanoparticles

Biopelícula de almidón de papa y nanopartículas de plata

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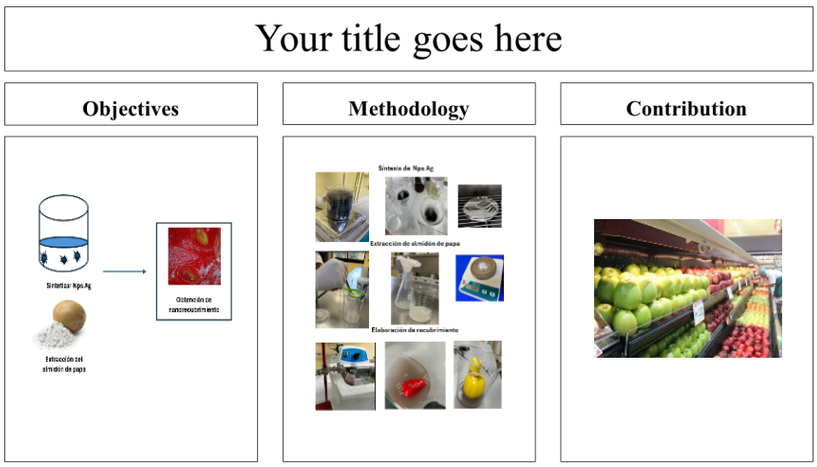
Abstract

The biofilm and covering have been used to promote the change and improve the natural peel of diverse fruits, to prevent the loss of humidity, to allow the interchange of gases, to provide sterility and conservation. Therefore, in recent years a growing interest in the organic films has emerged, this organic films are very diverse, highlighting the potato starch based biofilms. In this investigation some silver nanoparticles were synthesized by the chemical reduction process and were used as covering in fruits to avoid the growing of bacteria in strawberry and apples in conditions of room temperature to maximize the lifetime in shelf of this perishable fruits.



Synthesis, Silver Nanoparticles, Nanocoating

Automatic return system for hot water recovery in the shower

Sistema automatico de retorno para la recuperación de agua caliente en la regadera

MEDINA-MENDOZA, Manuel, DORANTES-RODRÍGUEZ, Rubén José, NICOLÁS-BERMÚDEZ, Jesús and FUENTES-ROMERO, María Teresa

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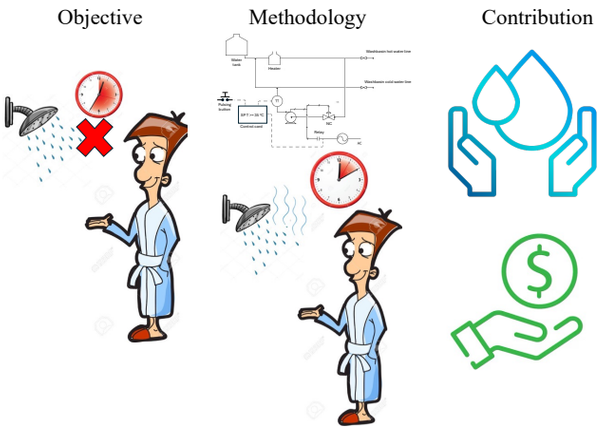
Abstract

The objective of this work was to design, build and install a device to recover the water wasted in low-cost showers, while waiting for the liquid to reach a comfortable temperature. The novelty of this work is that anybody with basic knowledge of Arduino®, or other open-source microcontrollers can build the system, recovering water and at the same time reducing costs. The system can be installed in any home using the existing water pipelines. In addition, it has a functional, compact and adaptable structure, which does not require modifications in the hydraulic installation nor affect the aesthetics of the place where it will be installed, thus facilitating its implementation in any residential home without the need of complex or expensive renovations.



Sustainability, Water Saving, Arduino

Rapid optimization of decapod crustacean digestion for efficient microplastic extraction (MPs)

Optimización rápida de la digestión de crustáceos decápodos para la extracción eficiente de Microplásticos (MPs)

PÉREZ-GÓMEZ, E.O., GARCÍA-ROSALES, G., LONGORIA-GÁNDARA, L.C.

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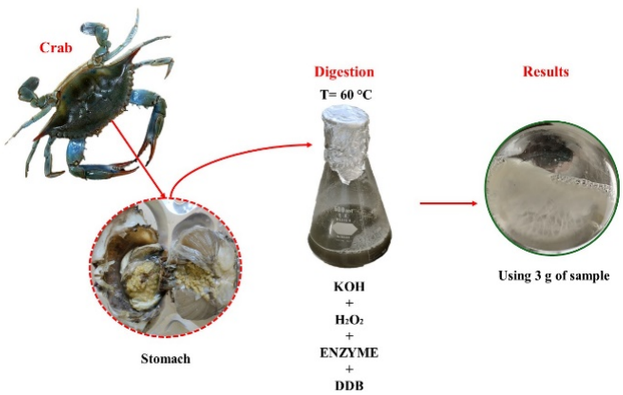
Abstract

The objective of this study was to develop and apply a rapid digestion protocol for extracting microplastics (MPs) from commercial crab samples using four different digestion methods. The methods employed included thermo alkaline digestion with potassium hydroxide (KOH), oxidative digestion with hydrogen peroxide (H_2O_2), enzymatic digestion with protease, and digestion using the surfactant dodecyl dimethyl betaine (DDB). Among these, protocols 2 and 4 (P2 and P4) achieved efficient digestion rates of 93% and 96%, respectively. These protocols were validated based on recovery percentage, repeatability, color assessment, and the chemical integrity of the MPs. The MPs extracted were analyzed using optical microscopy, revealing their presence in the forms of fibers, films, and fragments. Additionally, MPs were characterized by Fourier transform infrared spectroscopy in attenuated total reflectance mode (FTIR-ATR), with spectral quality indices (Q) ranging from 0.80 to 0.90.



Microplastics, Validated, Enzymatic

Technology transfer in the integrative projects of the new educational model at the Technological University of Jalisco, campus Digital Creative City

La transferencia tecnológica en los proyectos integradores del nuevo modelo educativo en la Universidad Tecnológica de Jalisco sede Ciudad Creativa Digital

GONZALEZ-DEL CASTILLO, Edgardo Emmanuel, ROMO-GONZALEZ, Ana Eugenia, LÓPEZ-LAGUNA, Ana Bertha and PEÑA-MONTES DE OCA, Adriana Isela

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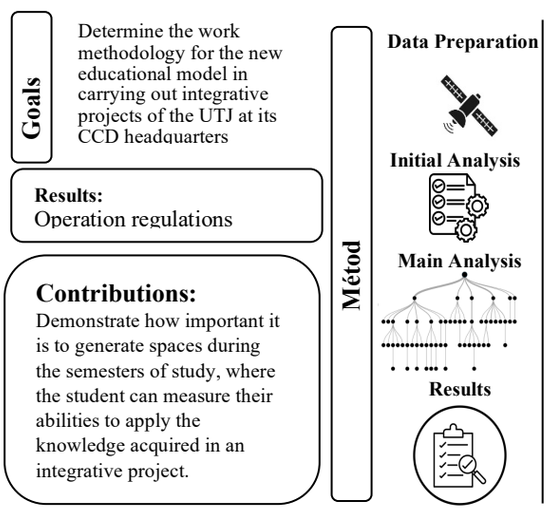
Abstract

An Integrative Project is a work that is prepared in a specific area of knowledge, through which the student highlights the knowledge acquired throughout a specific period of studies, promoting the understanding, analysis and transformation of the problems of the context, is a collaborative work that aims to develop and integrate the acquired skills. This article shows the process of technological transfer in the integrative projects of the new model of the Technological University of Jalisco campus Digital Creative City, which are presented in a plenary exhibition at the end of each training cycle, through which scientific and technological knowledge is delivered. to develop new applications. The sources of knowledge and development of the technologies to be transferred are of diverse origin and belong to or have some link with the University.



Transformation, Integrative, Technologies

Experimental proposal of a 'HALO'-type security device in a FORMULA SAE 2024 type vehicle

Propuesta experimental de dispositivo de seguridad tipo 'HALO' en un vehículo de tipo FORMULA SAE 2024

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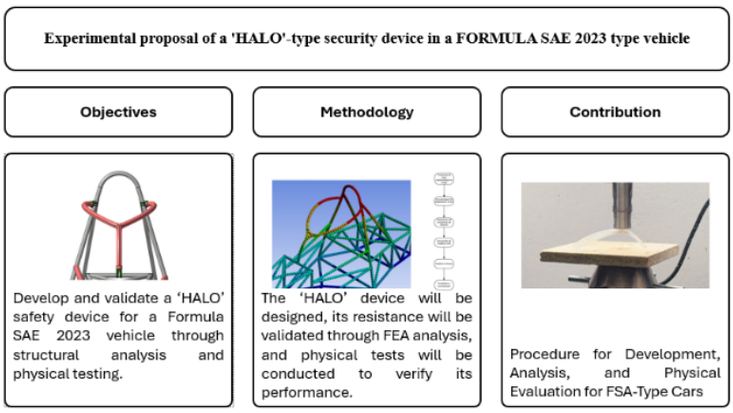
Abstract

This study conducts a numerical and experimental analysis of the use of a "Halo" device, inspired by Formula 1, within the Formula SAE competition. Several alternatives were developed to meet the regulatory requirements of Formula SAE, and the selected proposal was modeled in CATIA V5 using both surface and solid modeling techniques. The model underwent a structural analysis similar to the "Quasi-static Test 1" used for the Formula 1 "Halo," utilizing ANSYS Workbench 2023 R2 for finite element analysis (FEA). Additionally, physical tests were carried out to validate and compare the virtual results, with the aim of assessing the relevance and benefits of this safety device.



Formula Sae, Ansys, Catia, Fea, Safety Device, Halo

Effect of the Angle of Solar Irradiance on the Photo Generation of a Photovoltaic Module

Efecto del Ángulo de Incidencia Solar en la Foto Generación de un Módulo Fotovoltaico

CASTILLO-CAMPOS, Nohemí Alejandra, PALACIO-SIFUENTES, David Isaac, ESCOBEDO-MÁRQUEZ, Diana Laura and ÁLVAREZ-MACÍAS, Carlos

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Abstract

The correct installation of a photovoltaic system is vital to obtain the expected generation when sizing the energy that will be needed, since photovoltaic technology is constantly exposed to factors that can reduce its efficiency. In this work, the effect of the angle of solar incidence on the surface of a module was analyzed, through the comparison of the power generated at different angles of inclination from 10 to 45°, and giving the module different angles of orientation from east to west passing through the south (90° to -90° in the azimuth). The behavior of irradiance over time was also analyzed. Derived from this study, it was found that, for the city of Torreon, Coahuila, photovoltaic modules should be installed facing south and with an inclination of 25°, in addition, the region has an average HSP of 6 hours that occur around noon

Effect of the angle of solar incidence on the photo generation of a photovoltaic module		
Objectives	**Metodology**	**Contribution**
• Analyze the photogeneration of a photovoltaic module according to its inclination and orientation • Check the correct installation parameters for a photovoltaic module in the city of Torreón, Coahuila.	• Evaluation of irradiance reception according to the peak solar hours of the region. • Obtaining efficiency of the module by positioning it with the correct orientation, but varying the inclination. • Analysis of the power loss factor according to the variation of the orientation of the module in the azimuth plane.	The study graphically and mathematically demonstrates the relationship between the orientation and inclination of a photovoltaic module with the energy generation obtained from it, this specifically for the region in which the analysis was carried out.

Photovoltaic Energy, Angle Incidence, Efficiency

Implementation of DMAIC Methodology in a production line of the brewing industry

Implementación de Metodología DMAIC en una línea de producción de la industria cervecera

COLORADO-ISSA, Cinthia Judith, LÓPEZ-ACOSTA, Mauricio, CHACARA-MONTES, Allán and GARCÍA-VILCHES, Susana

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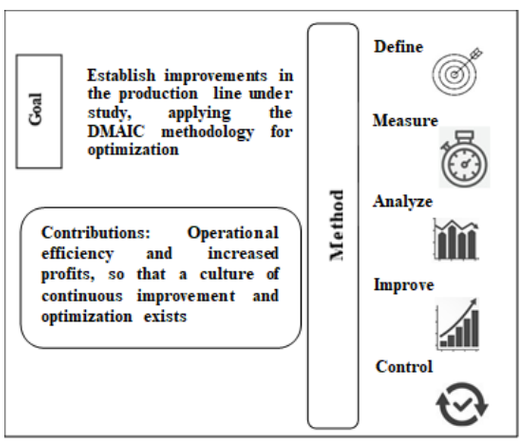
Abstract

This proposal was made in a company dedicated to producing beer. The study focuses on the MEGB production line, which lacks continuous flow, presents line stoppages, operators' leisure time and unnecessary routes. The situation was analyzed using the DMAIC methodology on the line in order to determine adequate balancing at each workstation and achieve a continuous flow free of waiting times. Applying the DMAIC methodology is a benefit for companies by reducing process variation. The statistical method was used to calculate the necessary samples with a confidence level of 95%. Likewise, some of the tools used are PQ analysis, spaghetti diagram, operations graph, operator load graph, line balancing and finally a control plan was made.



Continuous improvement, DMAIC methodology, lean six sigma

Hardware and software system for simulation, control, and communication between industrial automation programs and PLC control used in educational institutions

Sistema de hardware y software para simulación, control y comunicación entre programas de automatización industrial y control PLC utilizados en instituciones educativas

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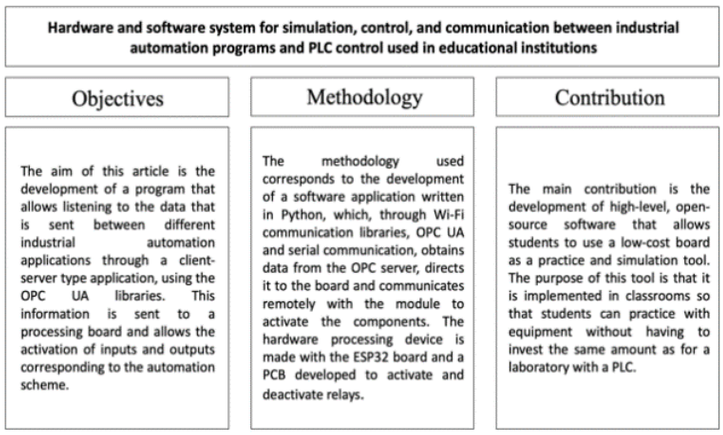
Abstract

This work presents the design and implementation of a system for studying industrial automation in the classroom, enabling students to conduct automation practices using Siemens, Festo, and RealGames software. It complements their learning with physical digital devices connected to a computer to activate and deactivate both analog and digital inputs and outputs, as well as sensors and actuators connected through communication networks and bus-type protocols. This system allows for save cost in the classroom. With minimal investment, each student can have their own “PLC”; using an ESP32 microprocessor-based device. They can couple power components onto baseboards for the device and run the developed server, enabling the device to communicate and activate the specified outputs in the control system, with minimal programming required. The client-server communication libraries were developed using Python, and the ESP32 programming was done using microPython. The maximum number of applications that can be interconnected is up to 127 devices. The maximum response speed or latency is 500ms, and the approximate cost per complete simulation unit is one thousand Mexican pesos. Compared to the cost of a traditional laboratory of this type, it is less than 10% of the cost of a laboratory equipped with PLCs from recognized brands.



Industrial Automation, OPC Server, Client-Server, Education

Design of a single-seater chassis for a BAJA SAE vehicle

Diseño de un chasis monoplaza para un vehículo BAJA SAE

LOZANO-DÍAZ, Alberto, ALFARO-MÉNDEZ, Jonathan, SERRANO-RAMÍREZ, Tomás and PEÑA-AGUIRRE, Julio C.

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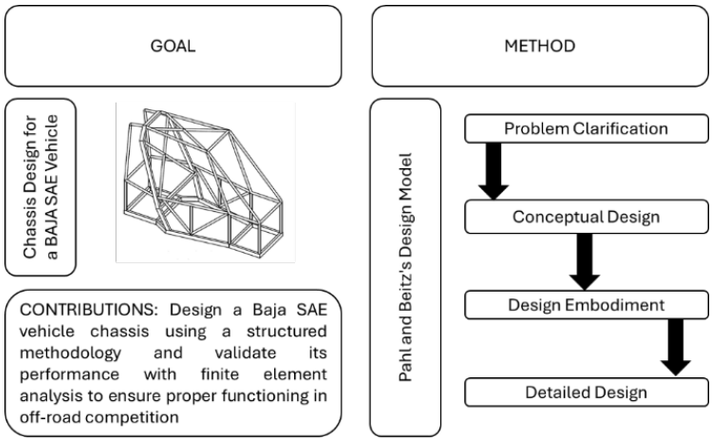
Abstract

This work presents the conceptual design of a single-seater chassis for a BAJA SAE off-road vehicle, using the Pahl and Beitz design methodology, with the objective of developing an efficient, safe prototype capable of withstanding the demands of off-road competitions. The weighted index method was applied to evaluate and select the components that best meet the requirements established in the official BAJA SAE regulations, ensuring an optimal balance between weight, strength, and cost. To ensure the structural integrity of the chassis, frontal and lateral impact analyses were conducted using finite element simulation, where the chassis's ability to withstand 4G loads at different critical points of the structure was evaluated. The results revealed that the stresses generated in the frontal impact are significantly higher compared to other analyses, suggesting the need to reinforce this part of the chassis in future development stages.



Design, Methodology, Weighted Indices

Development of an Inventory Management System for a Company Specializing in Refrigeration

Desarrollo de un sistema de gestión de inventarios para una empresa dedicada a servicios especializados de refrigeración y aire acondicionado

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Abstract

Development of an Inventory Management System for a Company Specializing in Refrigeration

Objectives	Methodology	Contribution
Develop an inventory management system using technology to improve the customer service level of a company specializing in refrigeration and air conditioning services.	1. Diagnosis of the area. 2. Classify tools according to their importance (ABC). 3. Tool coding. 4. Design toolstore database. 5. Evaluate performance indicators.	The main contribution of the project is the company's ability to meet customer requirements, strengthens customer relationships and positions the company as a reliable and competitive supplier in the market.

Inventory, Warehouse, Inventory Management

Estimation of Lithium-Ion Battery State of Health Using an Ensemble Model Integrated with Random Forest and Linear Regression Techniques

Estimación del Estado de Salud de Baterías de Iones de Litio Utilizando un Modelo de Ensamble Integrado por Técnicas de Random Forest y Regresión Lineal

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Abstract

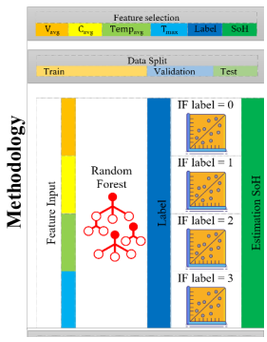
The demand for efficient battery management systems, especially lithium-ion batteries in electric vehicles, has increased with the transition to renewable energy. This study presents an ensemble model that combines Random Forest and linear regression to accurately estimate the state of health (SoH) of batteries. Using NASA data, divided into training, validation, and test sets, the model showed an error margin below 1%. An outlier in battery B0007 suggests potential future improvements in the model's generalization and applicability.

Goal

To develop a predictive model to estimate the state of health (SoH) of batteries.
To analyze the performance of different machine learning algorithms in SoH estimation.

Contribución

Proposal of a new ensemble model approach for accurate SoH prediction.



Machine Learning, Ensemble Models, State of Health

5's diagnosis in the substation department of the western transmission area

Diagnostico de 5’s en el departamento de subestaciones de la zona de transmisión poniente

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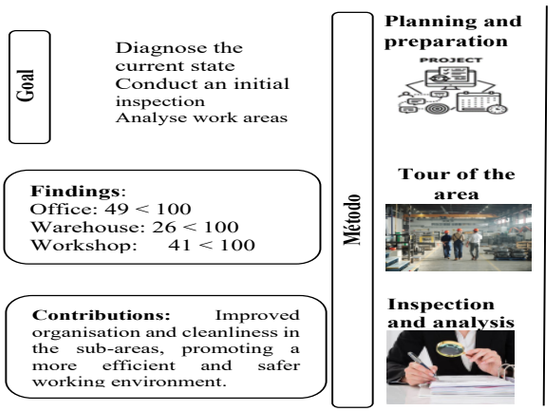
Abstract

In the Western Transmission Zone, the current state of the 5S methodology was assessed in the substation department, covering offices, workshop and warehouse, due to delays caused by inefficient search for tools and documents. The level of 5S implementation was diagnosed, resulting in low scores: Offices 49/100, Warehouse 26/100 and Workshop 41/100, which showed poor organisation. It is recommended to apply the 5S methodology to improve efficiency and safety by eliminating unnecessary objects, maintaining cleanliness and encouraging this habit to increase productivity and competitiveness without additional costs.



Implementation, 5S Methodology, Efficiency

Proposed drinking water treatment system implementing activated carbon and calcium hypochlorite composition filters to prevent health problems of the inhabitants of irregular periurban areas

Propuesta de un sistema de tratamiento agua potable implementando filtros de composición de carbón activado e hipoclorito de calcio para prevenir problemas de la salud de los habitantes de las zonas irregulares periurbanas

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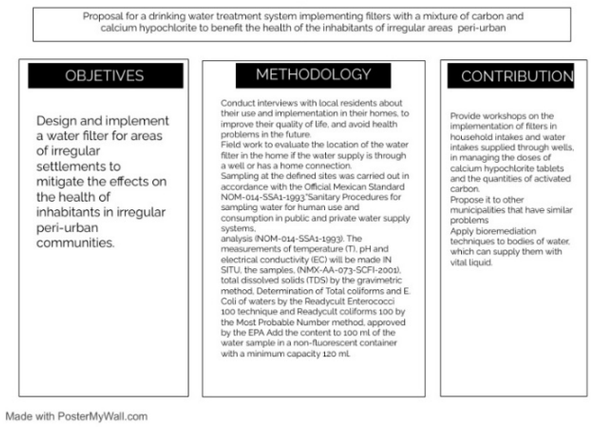
Abstract

The consequence of the growth of irregular settlements, the poor disposal of their domestic gray water and solid waste damages the bodies of water, resulting in damage to the health of the inhabitants. Objective to design a filter for the inhabitants of marginalized areas that do not have the basic services of drinking water and drainage, to reduce the pollutants present in the water and organic matter present that damage h The filter will prevent the water extracted from the well and from the drinking water intake, which supplies about 100 families, from affecting their health. The irregular settlements do not have basic services so the purpose is to improve the quality of life of the inhabitants, not only to focus on a single settlement, but to replicate it in other municipalities so that the inhabitants will no longer suffer injuries or illnesses from contaminated water. Methodology we use the following NOM-014-SSA1-1993, evaluating physical and microbiological parameters with the technique Readycult Enterococos-100 and Readycult E.Coli 100. Training to give workshops on the implementation of filters in household intakes and water intakes supplied by wells, on the handling of calcium hypochlorite tablets and the quantities of activated carbon.



Water pollution, Activated carbon filter, Irregular settlements

Power system restoration protocol for planned events in a real time simulator

Protocolo de restauración de un sistema eléctrico para eventos planeados en un simulador en tiempo real

GALVÁN-SÁNCHEZ, Veronica Adriana, GUTIÉRREZ-ROBLES, José Alberto, ORTIZ-MURO, Víctor Hugo and LOPEZ-DE ALBA, Carlos Alberto

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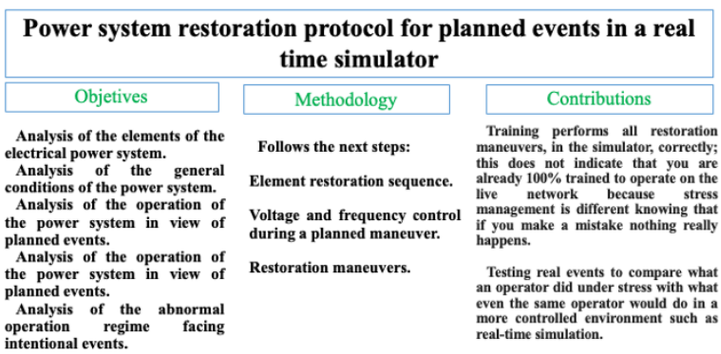
Abstract

This work presents the analysis of planned events in an electrical power network to establish the optimal system restoration protocol for recovering an electrical system. First, a technical description of each maneuver is provided, along with the operational protocol that is followed to decide whether or not it is feasible to carry it out. Once the decision is made to proceed, the preparation of the electrical network is demonstrated. To ensure that all those involved in the technical operational aspect follow a standard reconnection procedure, each event is simulated in the simulator, and the restoration sequence chosen by the person being evaluated is analyzed to determine whether the sequence followed is appropriate or if any specific steps could have been avoided and/or modified. Finally, an assessment is made to determine whether the person being evaluated is ready to operate the network live or if they need more training hours on the simulator. In this way, the simulator becomes an additional tool to the one-on-one teaching that is passed from an operator to their assistant until the latter is capable of operating the network on their own.



Real Time Simulator, Power System Restoration, Connecting and Disconnecting Protocol

Simulation of power grids using multirate methods

Simulación de redes eléctricas mediante métodos multitasa

GALVÁN-SÁNCHEZ, Verónica Adriana, GUTIÉRREZ-ROBLES, José Alberto, BAÑUELOS-CABRAL, Eduardo Salvador and LÓPEZ-DE ALBA, Carlos Alberto

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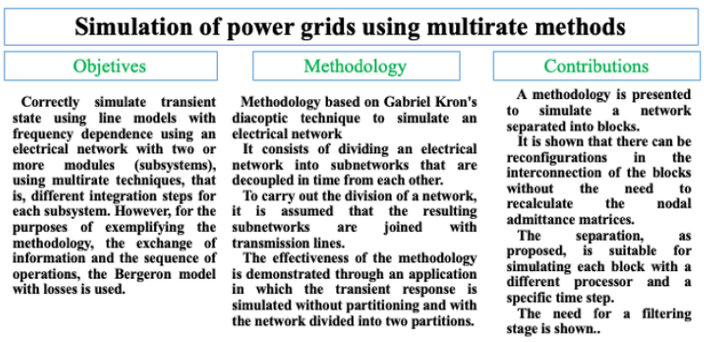
Abstract

This article describes a methodology based on Gabriel Kron's diakoptics technique for efficiently simulating an electrical network. The methodology involves dividing a large electrical network into subnetworks that are decoupled in time from each other. For the purpose of network division, it is assumed that the resulting subnetworks are interconnected by transmission lines. The effectiveness of the proposed methodology is demonstrated through an application example in which the transient response of a network is first simulated without partitions, using the high resolution required by the transient phenomenon. Then, the same simulation is performed, but this time with the network divided into two partitions, using the same integration step for both subnetworks. Finally, the two subnetworks are simulated with different integration steps, according to the dynamics of each. The comparison of results and computation times from these three simulations confirms that transient simulations in large networks can be accelerated without compromising the accuracy of the results.



Bergeron, EMTP, Multirate

Genomic instability in a former high-performance athlete

Inestabilidad genómica en un exatleta de alto rendimiento

CASTAÑEDA-AGUIRRE, Víctor Elías, RANGEL-COLMENERO, Blanca Rocío, GARCÍA-VIELMA, Catalina and CORTES-GUTIÉRREZ, Elva Irene

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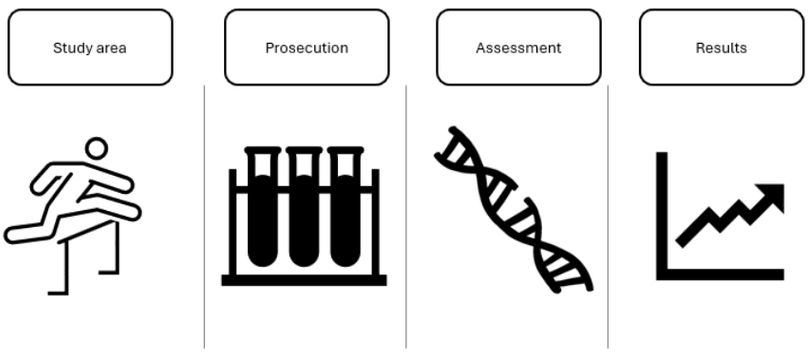
Abstract

This study investigated the impact of high-intensity exercise on DNA damage. A former high-performance athlete was compared with individuals who performed moderate exercise, evaluating genetic damage using the comet single-cell gel electrophoresis assay in blood samples. The results indicated greater DNA damage in the former athlete, suggesting a possible relationship between exercise intensity and genetic damage. However, due to the limited sample size, larger studies are required to confirm these findings and determine whether factors such as type of sport or other variables could influence the results.



Quality of life, Sports, Health

Backend configuration for a teacher evaluation web application

Configuración de backend para una aplicación web de evaluacion docente

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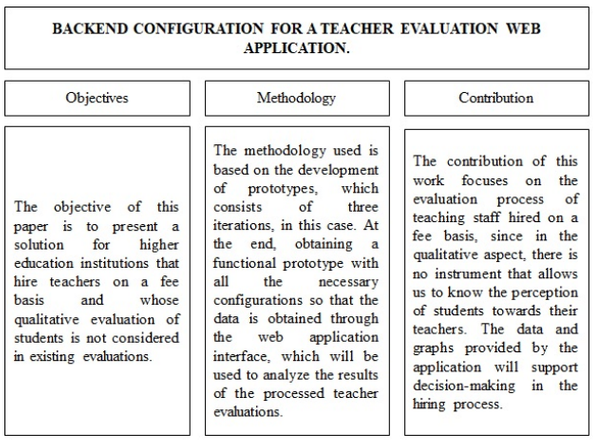
Abstract

The objective of this paper is to present a solution for higher education institutions that hire teachers on a fee basis and whose qualitative evaluation of students is not considered in existing evaluations. The methodology used is based on the development of prototypes, which consists of three iterations, in this case. At the end, obtaining a functional prototype with all the necessary configurations so that the data is obtained through the web application interface, which will be used to analyze the results of the processed teacher evaluations. The contribution of this work focuses on the evaluation process of teaching staff hired on a fee basis, since in the qualitative aspect, there is no instrument that allows us to know the perception of students towards their teachers. The data and graphs provided by the application will support decision-making in the hiring process.



Institutions, Qualitative, Evaluation

Automatic irrigation of hydroponic lettuce cultivation with IoT

Riego automático del cultivo hidropónico de lechuga con LoT

COTA-LUNA, Xóchitl Yadira, CASAS-GÓMEZ, Víctor Manuel, HIDALGO-BAEZA, María del Carmen and MARTÍNEZ-ROMÁN, Alejandro

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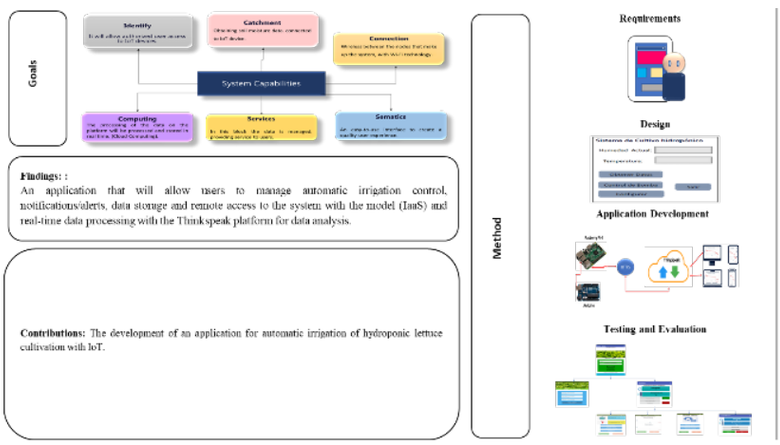
Abstract

The use of water in irrigation systems, especially in agriculture, is a major challenge due to water scarcity, which makes it necessary to grow vegetables more efficiently. The purpose of this research is to design a mobile application that allows greater Optimization in the use of water in the hydroponic cultivation of lettuce at the Fidel Velázquez Technological University (UTFV). The application will have an interface that will allow continuous monitoring of soil humidity, automation of irrigation according to the needs of the crop, customizable programming of irrigation schedules, integration of IoT technology for communication and control of alerts and notifications in case of problems or abnormal conditions. . Data processing is in real time on the ThinkSpeak Cloud Computing platform, where data analysis will be enhanced to evaluate the efficiency of the irrigation system and make adjustments. The beneficiaries are teachers, students and society.



Mobile application, Automatic irrigation, IoT

Web application for learning Zapotec Diidxazá

Aplicación web para el aprendizaje del Zapoteco Diidxazá

RAFAEL-PÉREZ, Eva, PINEDA-NIVÓN, Aimée Jahdaí, DÍAZ-SARMIENTO, Bibiana and VILLALOBOS-GARCÍA, Julio César

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Abstract

Web applications have become a fundamental tool for learning today. The goal of the "Web Application for Learning Zapotec Diidxazá" is to facilitate flexible learning, starting from the user's interest in an interactive and playful way. The incremental methodology was used, whose philosophy is to build by gradually increasing the program's functionalities. This model focuses on delivering an operational product with each increment (Mills, 1999), from the communication, planning, modeling, construction, and deployment phases. The results are: A trilingual dictionary with audio, a multilingual bidirectional translator, an object detector, and a real-time image translator using artificial intelligence, along with learning sessions, assessments, and playful games. The web application is a platform that helps facilitate and promote the learning of Zapotec and, in the future, preserve the linguistic and cultural heritage of the Diidxazá variant.

Aplicación web para el aprendizaje del zapoteco diidxazá		
Objective	**Methodology**	**Contribution**
- Facilitate learning in a flexible way, starting from the user's interest in an interactive and playful manner	- Incremental Pha**ses:** - Communication - Planning - Modeling - Construction - Deployment	- Facilitate and promote the learning of Zapotec. - Preserve the linguistic and cultural heritage of the Diidxazá variant

Web Application, Zapoteco Diidxazá, Learning

Mobile application: learning zapotec diidxazá

Aplicación móvil: aprendiendo zapoteco diidxazá

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Abstract

"Learning Zapotec Diidxazá" is a mobile application that combines various innovative technologies and artificial intelligence. Its goal is to facilitate and promote the learning of Zapotec Diidxazá. An Incremental methodology was used, which allows the application to be built progressively, integrating new functionalities in each phase of communication, planning, modeling, construction, and deployment. This approach facilitates continuous feedback and adaptability to possible changes (Mills, 1993). The results include various functional modules such as: a trilingual dictionary with audio recordings by native speakers, a multilingual bidirectional translator, an object detector, a real-time image translator, learning sessions, assessments, and educational games based on the pedagogical model of Critical Theory by projects. The application has not only succeeded in offering an interactive and accessible educational resource but also has the potential to become a driving force for cultural revitalization in the future, by strengthening the appreciation and preservation of this ancestral language.

Mobile Application: Learning Zapotec Diidxazá		
Objective	**Methodology**	**Contribution**
Facilitate and promote the learning of Zapotec Diidxazá.	- Incremental Phases: - Communication - Planning - Modeling - Construction - Deployment	- To offer an interactive and accessible educational resource - To become a driving force for cultural revitalization by strengthening the appreciation and preservation of this ancestral language.

Application Mobile, Zapotec Diidxazá, Language

Web Application for Attendance Management with QR Technology in a Public Elementary School

Aplicación Web para la gestión de asistencia con Tecnología QR en una Escuela Primaria Pública

AGUILAR-ORTÍZ, Gabriela, RAMOS-LIRA, Estefania, PÉREZ-CRUZ, Silver Octavio and DIAZ-SARMIENTO, Bibiana

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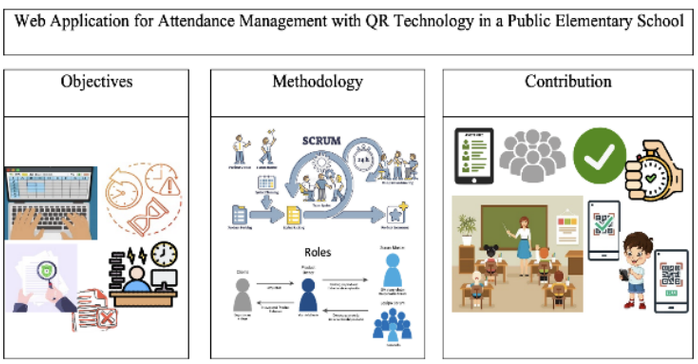
Abstract

Educational institutions must constantly update themselves with technological tools to improve the teaching-learning process. Student attendance is crucial, as their non-attendance affects their academic development. Currently, attendance control in the Public Primary School is carried out manually, being inefficient. Implementing technologies such as the QR Code can streamline this process by enabling faster and more accurate registration, instant access to data, early interventions for students with frequent absences, and error reduction. In addition, it facilitates integration with school management systems, promoting a more proactive and student-centered educational environment. For the development of the web application, the SCRUM methodology was used, which will allow agile and collaborative management, ensuring adaptability and continuous improvement of the system. This solution will not only optimize attendance registration, but will facilitate more accurate tracking of students' academic performance.



SCRUM, Attendance, QR Code

Professional Residency Web System implementing Artificial Intelligence Model

Sistema Web de Residencia Profesional implementando modelo de Inteligencia Artificial

DIAZ-SARMIENTO, Bibiana, ROMÁN-HERNÁNDEZ, Esteban Daniel, MORALES-HERNÁNDEZ, Maricela and SALINAS-HERNÁNDEZ, Fabiola

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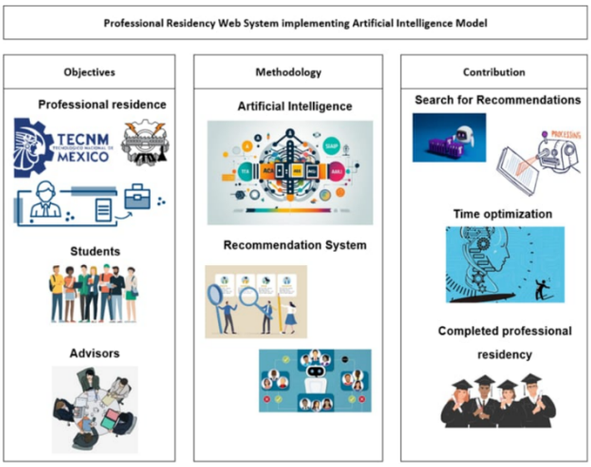
Abstract

Computer Systems Engineering students at the Tecnológico Nacional de México – Instituto Tecnológico de Oaxaca take the Professional Residency subject in semesters nine or ten, which has a value of 10 credits. A project related to their area of study must be developed in a company in 4 to 6 months. To take it, it is necessary to attend different departments and carry out the corresponding process. At the Outreach Projects office, students must submit their Professional Residency preliminary project. A professor from the academy reviews this draft for authorization. Once approved, an Internal Advisor is assigned. Thanks to the Recommendation System based on Artificial Intelligence, a suggestion of teachers who could be assigned as Internal Advisors is provided, thus facilitating the selection process and ensuring better alignment between the project and the consultant's experience.



IA, Professional Residence, System

Study of times and movements in the packing process of the company Flores de María

Estudio De Tiempos Y Movimientos en el proceso de empaque de la empresa Flores de María

OSCOS-FUENTES, Eduardo, LARA-ÁLVAREZ, Daniel Emiliano, CASTAÑEDA-ROMERO, Alberto Fernando and GARCÍA-CASTILLO, Karla Yazmín

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Abstract

The importance of the study of times and movements in the various industries lies in explaining that the work is organised according to the main techniques of work measurement; time study with stopwatch, work sampling and predetermined time standards. Through the application of quality tools, it is determined which areas of work represent a problem in production in order to have a better performance, efficiency, effectiveness and improvement of the operators for the realisation of certain processes. Such is the case of the flower sector in the municipality of Villa Guerrero, Mexico, where demand is seasonal, which means that companies dedicated to the production of roses on a large scale do not have an adequate organisation in various processes, causing inefficiency and a series of delays in production. Therefore, the importance of this research work lies in carrying out a time and motion study to eliminate slack time and eliminate unnecessary elements that could affect productivity, safety and quality of production in the company Flor de María, where it was hypothesised that the time and motion study will help the company Flores de María to improve the working methods of the packaging process in the activities of rehydration, calibration, stem selection, labelling (Kanban) in this area to increase the efficiency of the production process.

Productivity, Time and Motion Study, Efficiency, Floriculture Sector

Turmeric nanoparticles with β-glucan and vitamins C, D3 and zinc

Nanopartículas de cúrcuma con β-glucano y vitaminas C, D3 y zinc

PINALES-MUÑIZ, Karla Lucia, NERY-CEPEDA, Sebastián, CANALES-PRADIS, Braulio and DÍAZ-SILVESTRE, Sergio Enrique

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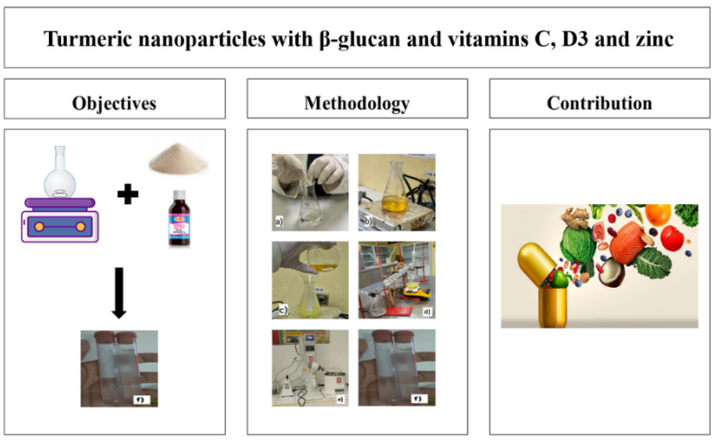
Abstract

Nanotechnology offers extraordinary potential for its application in the food sector, focusing on meeting consumer needs. This technology enables the development of new methods to control and structure foods, enhancing their functionality and nutritional value. This study presents the methodology for synthesizing turmeric nanoparticles loaded with β-glucan and vitamins C, D3, and zinc, with the aim of using them in innovative dietary supplements. The importance of employing various characterization techniques such as UV-VIS, FTIR, and SEM, as well as conducting cytotoxicity tests, is emphasized to evaluate the properties of the nanoparticles and ensure their effectiveness and safety in food applications.



Nanoparticles, Dietary Supplements, Turmeric

Computer device theft detection system

Sistema de detección de robo de dispositivos de computadora

FLORES-CRUZ, Mario Alberto, ARREDONDO-VIDAL, Josuee Francisco, GUTIÉRREZ-AMBROSIO, Martha Nayeli and HIDALGO-BAEZA, Maria del Carmen

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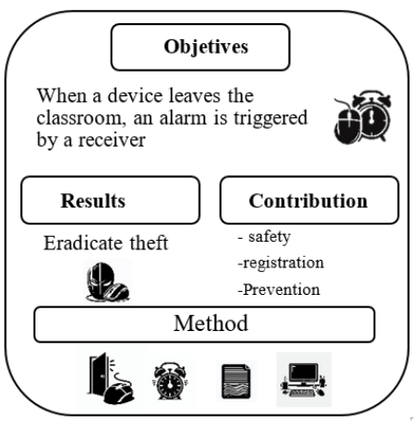
Abstract

The project aims to protect computers, peripherals, and valuable devices in a laboratory using NFC technology. Each device will be tagged with an NFC identifier, which will trigger an alarm and notify the administration for immediate intervention if the device is removed from the room. Additionally, the system will log the time and location of the incident in a database, facilitating detailed tracking and analysis of events. The project also includes a web platform where students can report theft issues, creating an efficient communication channel for security concerns. This comprehensive approach ensures real-time monitoring, effectively deterring thefts and aiding in the quick recovery of stolen devices. By enhancing the security infrastructure of the laboratory and providing a reliable incident management mechanism, the project aims to create a safer environment for both students and equipment, thereby promoting a secure and efficient academic setting.



Security, Detection, Monitored

Access door Pedestrian Access Control System

Puerta de acceso sistema de control de acceso de peatones

SANCHEZ-OCAÑA, Luis Fernando, TORREALBA-MARIÑO, Angelys Gabriela, CISNEROS-BLAS, Ashley Vanessa and MARTÍNEZ-ROMAN, Alejandro

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Abstract

At the Fidel Velázquez Technological University (UTFV), the congestion of students at door 4 pedestrian access has caused delays and inconveniences. This project proposes the installation of a pedestrian access control system that consists of the installation of 3 turnstiles at the three doors of the university integrated with a barcode scanner for the student community's credentials. The main objective is to expedite the entry of students to improve efficiency in the institution.

Access, Automation, Barcod

Viability Evaluation in SCAP through development in different impacts

Evaluación de viabilidad en los SCAP mediante el desarrollo en distintos impactos

HERNÁNDEZ-RAMOS, Katia, HERNÁNDEZ-RAMOS, Alma Yizel, PANECATL-BERNAL, Yesmin and HERNÁNDEZ-CORONA, Sergio

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Abstract

In this time when health has become unprecedentedly relevant, it is very important to be aware of the use and care of both drinking and rainwater. The research was carried out at the Instituto Tecnologico Superior De La Sierra Norte De Puebla, located in Zacatlán, municipality of the State of Puebla, with geographical coordinates 19° 34′ 42″ and 98° 18′ 06″ west longitude with a climate corresponding to being temperate sub-humid and an annual temperature of between 12° and 18°. The general importance of this project is determined based on the implementation of a new irrigation system in projects for use in fields or specifically in the buildings of the institution, since it is considered that rainwater is the basis of a development to innovate in different areas. Taking into account the proper functioning and development of the system within the academy, obtaining a common benefit mentioned above such as projects coming from other careers and the dependency. To mention part of the objective, it is proposed to develop an optimal model of a catchment system to guarantee the water supply and with this make a good ecological management free of contamination in our institution. Having with this a clear alternative in order to meet the needs of the community that we form, previously studied to adapt it in required areas of the institution such as the bathrooms of the institution, some of the buildings such as the practice unit and the building A and E with an effective reduction of expenses in drinking water and apply a new last of use for common benefit and take care of it.

Viability Evaluation in SCAP through development in different impacts.

Objectives	Methodology	Contribution
Evaluate the viability of the Rainwater Collection Systems in the ITSSNP	-Population – Sample -Measuring instrument -Reliability statistics of the measuring instrument -Field work -SCAP management at the institute -SCAP graphic plans	-Social impact -Environmental impact -Economic impact

Capture System

Database design to translate from Nahuatl to Spanish

Diseño de base de datos para traducir del Náhuatl al Español

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Abstract

This paper presents a proposal for the creation of a knowledge base to serve as a starting point for training a real-time translation system between Nahuatl and Spanish using the Entity-Relationship Model (MER) for database design. In this model, entities and relationships are key elements, with mathematically defined attributes corresponding to specific domains. To implement this model, a specific methodology is followed, ranging from the determination of entities to the physical design of the database. Effective database design requires consideration of three essential elements: structure, relationships and integrity rules. These rules ensure that key values in relationships are defined and that attributes in one relationship properly correspond to others in a different relationship.

Database, Creation, Structure, Methodology

Conceptual development of a pulverizer for glass recovery

Desarrollo conceptual de pulverizadora para la recuperación de vidrio

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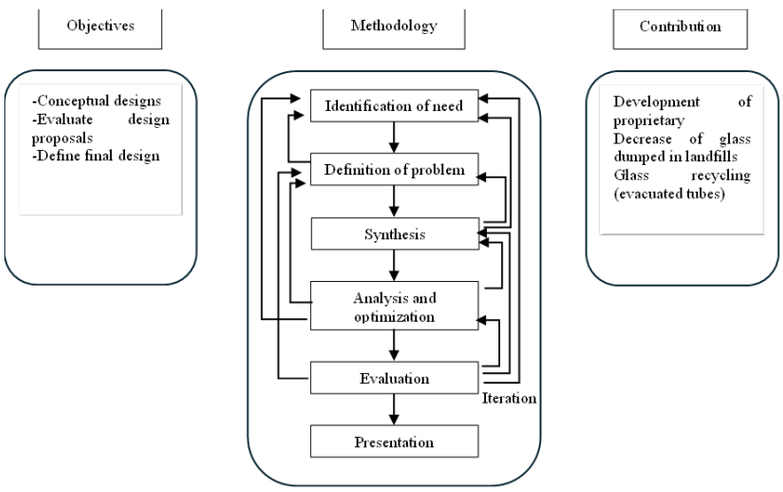
Abstract

This paper describes the procedure for the development of the conceptual design of a spraying machine, which will help in the recycling of glass obtained from evacuated tubes. This design was made under the consideration of generating a proprietary technology, which would allow to obtain in the region the necessary elements for its construction, as well as for the maintenance and improvement of the prototype, because the existing ones are expensive or require maintenance to be provided by the companies that sell them, and spare parts, in some cases, need to be ordered from abroad. The development of the concept was done following the methodology for mechanical engineering design, starting by identifying a problem to be solved, glass deposition in landfills; generating sketches, identifying the elements and components to be used; evaluating the feasibility of obtaining them and generating the final concept for their manufacture.



Conceptual Design, Recycled Glass, Pulverizer

Virtual Learning Objects to promote ethics in the development and use of Artificial Intelligence in higher education

Objetos Virtuales de Aprendizaje para fomentar la ética en el desarrollo y uso de Inteligencia Artificial en la educación superior

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Abstract

There are various artificial intelligence tools that generate texts, videos, audios, images, presentations, mind maps and essays, significantly supporting the educational field. However, it is important to consider the ethical implications of their use and development. Therefore, this chapter proposes the design of virtual learning objects (VLOs) to promote ethics in the use and development of artificial intelligence in higher education. The methodology employed is based on content analysis, focusing on the use of VLOs in the educational context, the ethical challenges associated with artificial intelligence, and the relevant ethical theories. It is concluded that VLOs bring significant benefits to education and can be effective in promoting ethics in artificial intelligence; it is essential to consider in its design the ADDIE methodology, the types of VLOs and ethical theories such as utilitarianism, deontology, the ethics of virtue, justice and care, in addition to principles such as simplicity, coherence, clarity, aesthetics and time.

Graphical abstract

Objetives	Methodology	Contribution
Propose the design of virtual learning objects to promote ethics in the use and development of artificial intelligence in higher education.	The technique of content analysis has been implemented in relation to virtual learning objects, artificial intelligence and ethical theories to develop the proposal of the established objective.	A proposal has been developed for the design of virtual learning objects to promote the ethics of both the use and development of artificial intelligence.

Virtual Learning Objects, Artificial Intelligence and Ethical Theories

Proposal for the design of a mist irrigation system to improve the production and quality of the mushroom fungus (Pleurotus Ostreatus)

Propuesta de diseño de sistema de riego por nebulización para mejorar la producción y calidad del hongo seta (Pleurotus Ostreatus)

SOTO-LEYVA, Yasmin, RUÍZ-DÍAZ, Montserrat, BONES-MARTÍNEZ, Rosalía and MARTÍNEZ-DOMÍNGUEZ, José Antonio

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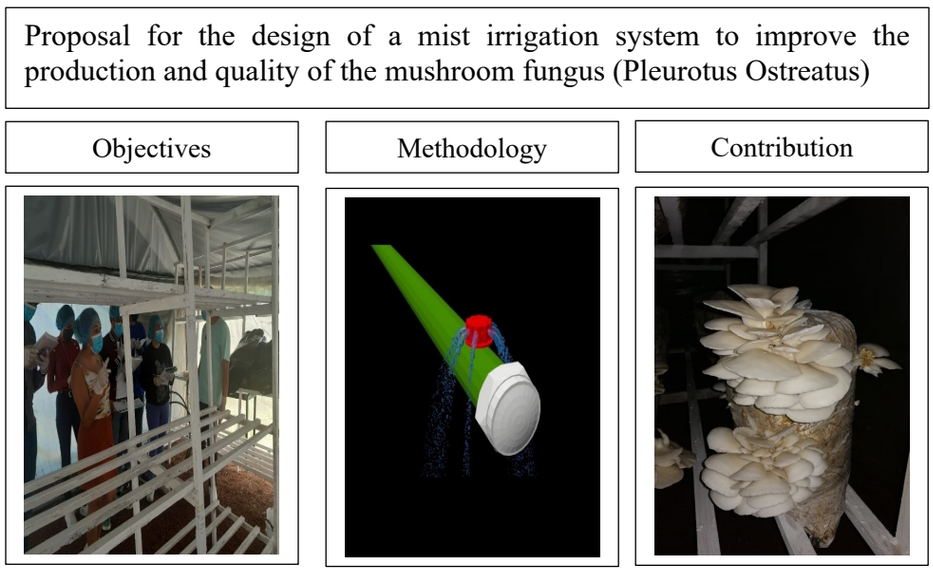
Abstract

Specialized software design of a mist irrigation system to improve the production and quality of the mushroom fungus (Pleurotus Ostreatus), this fungus is known for its nutritional value and to achieve optimal performance, growth, development and quality, it is essential to maintain optimal conditions. proper environmental conditions, such as relative humidity, which plays a crucial role in cultivation. The design of the irrigation system is a viable solution to maintain ideal environmental conditions in mushroom crops. This study is made up of 4 phases: 1) Evaluation of current irrigation systems, 2) Determine the irrigation requirements (H_2O) for the crop, 3) Specialized software design of the mist irrigation system, 4) Economic analysis, the objective is to generate an irrigation system to provide uniform misting that maintains relative humidity in the optimal range (80°-90°). The results obtained demonstrated that the system offers greater efficiency in the use of H_2O. It is important to consider that the Design may vary, according to the conditions and available resources; Therefore, this research represents the basis for developing future research, aimed at obtaining improvements in the production of mushrooms**.**



Mushroom fungus (Pleurotus Ostreatus), Misting, Crop

Soiling of Photovoltaic Modules: Impact on Performance and Mitigation Strategies

Ensuciamiento de Módulos Fotovoltaicos: Consecuencias en el Rendimiento y Estrategias de Mitigación

ESCOBEDO-MÁRQUEZ, Diana Laura, CASTILLO-CAMPOS, Nohemí Alejandra, ESMERALDA-GÓMEZ, Alma Graciela and ÁLVAREZ-MACÍAS, Carlos

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Abstract

Solar energy is a natural resource that is used to generate electricity using photovoltaic technology, based on the photoelectric effect. Although useful, this technology faces challenges such as intermittency, environmental impact, installation costs, and energy storage. A specific problem is the dust that accumulates on the surface of the photovoltaic modules, the particles of which the dust is composed reduce their efficiency by absorbing or reflecting part of the solar radiation needed for the solar cells. To maintain the efficiency of the modules, it is essential to clean them regularly, using dry or wet cleaning methods. This research analyzes the factors that affect the performance of PV modules and compares the advantages and disadvantages of both cleaning methods. The results of the study indicate that wet cleaning is more effective in maintaining the optimal performance of PV modules.

Soiling of photovoltaic modules: impact on performance and mitigation strategies		
Objectives	**Methodology**	**Contribution**
• Analyze the factors that affect the performance of photovoltaic modules. • Compare the cleaning techniques used in the maintenance of photovoltaic modules. • Evaluate Dry Cleaning Versus Wet Cleaning	• Documentary research • Comparison of cleaning techniques for photovoltaic modules • Experimental tests with dry cleaning and wet cleaning	This research shows a compendium of cleaning techniques commonly used for the maintenance of photovoltaic installations. Likewise, the analysis of the most effective type of technique to maintain good performance of the photovoltaic modules is presented.

Photovoltaic Modules, Cleaning Techniques, Solar Energy

Ecological Waterproof Adobe Brick based on Straw and Manure

Adobe Ecológico Impermeable a Base de Paja y Estiércol

BONES-MARTÍNEZ, Rosalía, SOTO-LEYVA, Yasmin, RUÍZ-DÍAZ, Montserrat and SANTOS-OSORIO, Arturo

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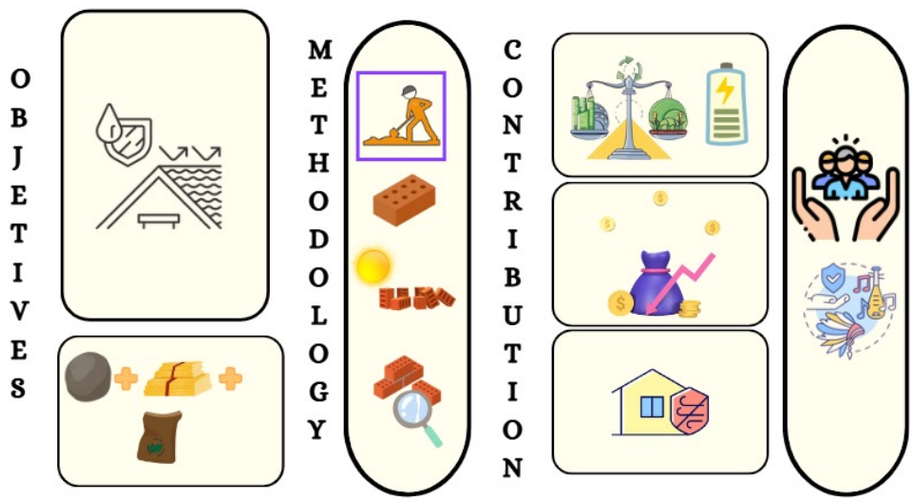
Abstract

Waterproof ecological adobe brick made from straw and dung is one of the oldest building materials used by humanity, it is a sustainable and efficient solution for construction, it is a traditional building material that has been used by man for centuries due to its sustainability and thermal efficiency, especially in areas where conventional building materials are not easily accessible or expensive. Adobe consists of a mixture of soil, water, and often straw or manure, which is molded into blocks and dried in the sun. Combining adobe with materials such as straw and manure can improve its properties, including water resistance, this traditional method uses natural and local materials, providing an ecological and economical alternative. To improve the resistance and durability of the walls that protect them against humidity, thus avoiding problems such as degradation and mold formation, which are the main causes that put people who have their homes at risk. of this material. In this way, a more durable construction is achieved and suitable for different climates.



Ecological, Sustainable, Sustainability, Efficiency, Conventional, Resistance, Formation, Traditional, Properties, Alternative, Adobe, Ecological, Waterproof

Leadership in the professional training of Computer Systems Engineers

El Liderazgo en la formación profesional de Ingenieros en Sistemas Computacionales

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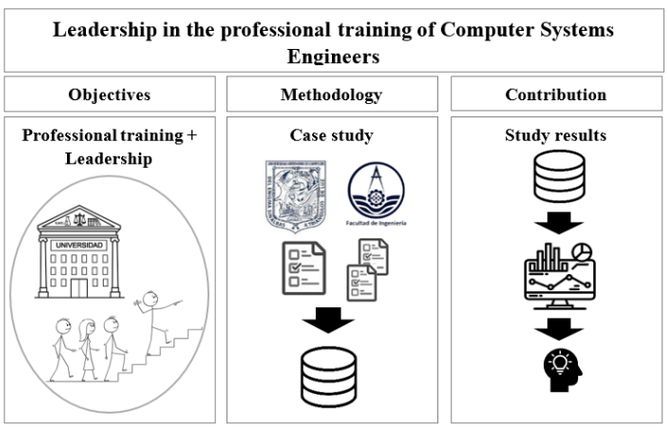
Abstract

This study arises from recognizing Leadership as a fundamental soft skill in Higher Education. The above allows us to propose an exploratory and purposeful field investigation with the objective of exhibiting significant data that shows an intrinsic but compelling panorama in the tireless search for quality professional education, allowing professionals to function successfully in their disciplinary area. The method used is the case study applying the survey technique as a tool for data collection. The development of the field work is carried out at the Faculty of Engineering of the Autonomous University of Campeche (UACAM) with students of the Computer Systems Engineering (CSE). The results presented in this study serve to identify new lines of research and paths to achieve quality professional training in computer sciences.



Leadership, Professionals, Computer Systems Engineers

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Field:
Discipline:
Subdiscipline:

DOI: https://doi.org/
Article History:
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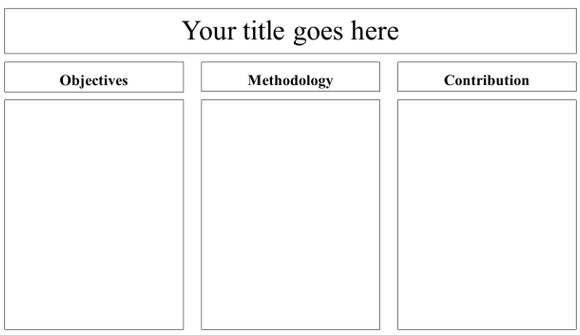

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ISBN 978-607-8948-49-9