Expotecnologia 2019 "Research, Innovation and Development in Engineering"

IOP Conference Series: Materials Science and Engineering
Volume 844

Cartagena, Colombia
30 October - 1 November 2019

ISBN: 978-1-7138-4728-1
ISSN: 1757-8981

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571

Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution 3.0 International Licence.
Licence details: http://creativecommons.org/licenses/by/3.0/.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Expotecnología 2019

Peer review statement

Evaluating a new binder in the self-leveling mortar mixture 1
I Guzman, A F Porto, G Cervantes, R I Porto

Evaluation of triangle´s triple restriction on conventional construction and modular construction-Example: New building of the University of the Coast..... 19
S E de la Puente Molina, J L Espitia Ticora, O A Capera Rodríguez, Z A Palomeque Sánchez

Evaluation of the coughing power of the Opuntia ficus indica for removal of turbidity in waters of the Guatapuri River (Colombian Caribbean)..... 26
C R Vidal-Tovar, E M Moscote-Vides, A J Vides-Redondo, C A Severiche-Sierra

Obtaining a sugar syrup from the use of the extract of the guácimo fruit (Guazuma ulmifolia lam) 35
C R Vidal-Tovar, C A Cadavid-Osorio, G E Angulo-Blanquicet, C A Severiche-Sierra

Mobile application development to promote the sustainable transport of agricultural products 46
I A Vergara, M A Martínez, L F Castañeda

Learning styles for algebra concepts: The case of engineering students at the Universidad de Santander (Valledupar, Colombia)..... 55
C R Vidal-Tovar, H Valle-Fuentes, I C Rios-Dominguez, A F Castro-Alfaro

Scientific reasoning skills and patterns of use of Information and Communication Technologies. The case of the students of the Universidad de Santander (Valledupar, Colombia)..... 62
G E Angulo Blanquicett, G E Angulo Blanquicett, C R Vidal-Tovar, I C Rios-Dominguez

Traffic flow prediction model and probability of congestion..... 69
M Pilamunga Poveda, J M Lavin, M Aldás Sánchez, D Ríos Insua

Identification of critical variables in conventional transformers in distribution networks 81
I.A. Marriaga-Márquez, K.Y. Gómez-Sandoval, J.W. Grimaldo-Guerrero, JR Nuñez-Álvarez

Drivers of Biomass Power Generation Technologies: Adoption in Colombia..... 87
W Reyes-Calle, J.W. Grimaldo-Guerrero

Kinetic Study of Cyanide Degradation from Gold mining wastewater Using Photocatalysis..... 95
R.R. Correa-Turizo, R.M. Mestre-Martinez, I Marrugo-Pautt, I Baldiris-Navarro, Carlos Severiche

Degradation of Cyanide from Gold Mining Wastewater Using Photocatalysis 104
R M Mestre-Martinez, I Marrugo-Pautt, R R Correa-Turizo, C A Severiche Sierra, I Baldiris-Navarro

Risk assessment of PCP lift system using a fishbone diagram and MICMAC method..... 112
J. Osorio-Tovar, J.W. Grimaldo-Guerrero

Prospective towards implementation of electric vehicles in Colombia 119
E. Gómez-Mesino, A.F. García-Quintero, J.W. Grimaldo-Guerrero

Offshore oil exploitation in the Caribbean Sea: Challenges for Colombia 126
J.W. Grimaldo-Guerrero, Y.F. Contreras-Rueda

Communications in Flexible Supervisor for Laboratory Research in Renewable Energy 134
J. R. Nuñez-Alvarez, I.F. Benítez-Pina, Y. Llosas-Albuerne

Design of a Fuzzy Controller for a Hybrid Generation System 144
J. R. Nuñez, J. Mestre, J. J. Cabello, H. Dominguez, J. Fong, L. Peña, I. Benítez, D. De Oliveira

A proposal for updating the Response Spectrum of San Jose de Cucuta, Colombia 163
C. H. Florez, J F Marquez, C F Lozano

Potential Energy savings in compressed air systems in industrialized cities. A case study in Barranquilla and Cartagena 169
Hernan Hernandez Herrera, Jorge Iván Silva-Ortega, Vicente Leonel Martínez Diaz, Aliana Gomez Pons, Zaid García Sanchez

Evaluation of trace-metal concentrations in water consumption of streams near Guajira (Colombia) 179
N. Garzon, E Espinosa, L. A. Sarmiento-Rubiano, R. Manzoli R, R. Canteroand, J. R Castro-Suarez

Use of technological tool for the consolidation of mathematical pre-knowledge in higher education 188
D. Diaz, K. Rueda

Methodology to define an integration process between frameworks SCRUM, Django REST framework y Vue.js, implemented for software development, from quality management approach and agility 195
J G Arévalo, L Viecco, L Arévalo

Design of a library using Matlab software for modeling and simulation of parabolic cylindrical solar collectors (CCP) 205
S A Sanchez, M A Quiroz, LR Sierra, A D Morales, J M Palencia

A review: Comparison of performance metrics of pretrained models for object detection using the TensorFlow framework 222
S A Sanchez, H J Romero, A D Morales

Growth Optimization of Chlorella Vulgaris in Mixotrophic Culture Enriched with Nutrients using Experimental Design 237
Ildefonso Baldiris-Navarro, Jorge Sanchez Aponte

Benefits of the instrumentation, monitoring and control systems (IMC) of bridges in Colombia, from an economic point of view through a case study 246
J D Castro, L Suarez, I C Cerón

Causal Analysis of the Pinion Teeth Failure in a Limestone Reclaimer 256
L M Castellanos, J J Cabello, A Sagastume, V L Martínez, A E Ortiz

Agriculture 4.0 the advance in models and new knowledge to improve production 265
F González-Salazar

Influence of thermal-varying material properties on stress calculation for creep life assessment of seamless medium-carbon steel boiler tubes 273
L M Castellanos-González, H Hernández Herrera, R Goytisolo Espinosa, L M Castellanos Molina, E E Vergara Verbel, J A Alcalá Ballestero

Thermal comfort evaluation in an educational building with air conditioning located in the warm tropical climate of Colombia 279
M Balbis-Morejon, A Noya-Sambrano

Energy performance analysis between two air conditioning systems used in an educational Building in warm-climate 286
M Balbis-Morejón, J I Silva-Ortega, J Castro-Peña

Study of linear strain gauges at micron scale for the reduction of external factors 293
C T Villamizar, W Y Arevalo, C C Castiblanco

Application of Business Intelligence in studies management of Hazard, Vulnerability and Risk in Cuba 303
C Milanés-Batista, H Tamayo-Yero, D de Oliveira, J R Nuñez-Alvarez

Characterization of the current electric energy needs in subsidized residential users 317
S F Umaña-Ibáñez, J I Silva-Ortega, Y Gomez-Charris, K M Berdugo-Sarmiento, S J Carbonell-Navarro

Automatic detection of number-plate and traffic infractions of motorcyclists by Intelligent Transportation Systems 326
J F Valencia, T Ramírez-Guerrero, L F Castañeda, M Toro

Approach to professional practice from simulators and virtual laboratories 336
C J Peña, L Vargas, J C Murcia

Automatic Classification System by Color of Plastic Bottle Caps (SISAC) 348
H. A. Rodriguez-Arias, A. Mendoza-González

Parameter estimation of a second order system via nonlinear identification algorithm 362
Patricio Ordaz, Liliam Rodríguez-Guerrero, Omar Santos, Carlos Cuvas, Hugo Romero, Mario Ordaz-Oliver, Pablo López-Pérez

Evaluation methodology for Speech To Text Services similarity and speed characteristics focused on small size computers 369
J.E. Aguilar-Chacon, D.A. Segura-Torres

Thermal energy capture by pyroelectric effect 376
F Cárdenas, J Rodríguez

NDT Non-Destructive Test for Quality Evaluation of Concrete specimens by Ultrasonic Pulse Velocity measurement 383
L Pedreros, F Cárdenas, N Ramírez, E Forero

Automation of the Conductive Ink Synthesis from Recycled Parts from Metallurgical and Chemical Residues Joined to Polymer Resin and Solvent 392
Jhon Lara, Sergio Cantillo, Karolina Castillo, Jorge Montalvo, Karen Lara

Smart Institution Model 401
M Pilamunga Poveda, J L Santamaría Aguirre, E Viera Alulema

Design of an Information System for optimizing the Programming of Nursing Work Shifts 406
F Osores, G Cabrera, R Linfati, S Umaña-Ibañez, J Coronado-Henández, G Gatica

Information T echnology Governance Model, Based on Risk Management and Information Security for Colombian Public Universities: Case on Study University of La Guajira 415
L R Viecco, J G Arevalo

Technological surveillance as element for the positioning of public universities 433
F O Moya, S L Villero, F P Perez

Analysis of the water quality risk index for human consumption in urban areas of the department of Bolivar 444
Emilia Polo-Carrillo, Geraldine Morales-Simancas, Yudis Cabarcas-Ariza, Jorge Valle Rodríguez

Algorithm for the dynamic compensation of Chromatic Dispersion in XGS-PON network architecture 455
A Trujillo, G Gomez, A Zemanate

Business model for the optimization of energy consumption by VAC equipment in service sector buildings 472
Y Gómez-Charris, S Umaña-Ibáñez, J Silva-Ortega, J Caicedo-Ortiz, G Camargo-Acuña

Impact through digital marketing tools in social networks and web analytics in higher education institutions 483
C J Gómez Sierra

Design and implementation of an intelligent thermal chamber to produce plantain hills 492
J López Hurtado, H A Gallego Becerra

Diagnostic tool for radical improvement in business processes 499
A Sanchez-Comas, L E Vasquez Osorio, M Pérez-Vargas, M Caicedo-García, D Neira-Rodado, A Troncoso-Palacio

Student perception of the use of ICT on learning Morphophysiology 514
A Quintana

Manufacture of hybrid pieces using recycled R-PET, polypropylene PP and cocoa pod husks ash CPHA, by pneumatic injection controlled with LabVIEW Software and Arduino Hardware 522
A D Rincón-Quintero, L A Del Portillo-Valdés, A Meneses-Jacomé, C G Cárdenas-Arias, C L Sandoval-Rodriguez, J G Ascanio-Villabona, B E Tarazona-Romero, J A Sandoval-Baldión, J C Ortiz-Ríos, R A Mantilla-Olejua

Incidence of corrosion in low voltage electrical conductor 534
J G Ascanio-Villabona, A D Rincón-Quintero, C G Cardenas-Arias, C L Sandoval-Rodriguez

Building a prototype for functional analysis of the energy potential of the water flow in pipe ½ “using microturbines applied to Unidades Tecnológicas de Santander 546
J G Ascanio-Villabona, C L Sandoval-Rodriguez, A D Rincón-Quintero, B E Tarazona-Romero, R E Paez-Castro

Characterization of the mechanical vibration signals associated with unbalance and misalignment in rotating machines, using the cepstrum transformation and the principal component analysis 572
C L Sandoval-Rodriguez, J G Ascanio Villabona, C G Cárdenas-Arias, A D Rincon-Quintero, B E Tarazona-Romero

Development of an artificial vision system that allows non-destructive testing on flat concrete slabs for surface crack detection by processing of digital images in MATLAB 579
BE Romero-Tarazona, CL Rodriguez-Sandoval, JG Villabonai-Ascanio, A D Rincón-Quintero

Elasticity modulus variation of the AISI SAE 1045 steel subjected to corrosion process by chloride using tension test destructive 605
C G Cárdenas-Arias, A D Rincón-Quintero, A Santos-Jaimes, C L Sandoval-Rodriguez, D F Rojas-Gomez, S J Ardila-Galvis

Ultrasonic signal acquisition system for TOFD imaging 611
J Casagua, J Rodríguez, D Segura

A Novel Full Boundary Element Formulation for Harmonic Analysis of Elastic Membranes Coupled to Acoustics Fluids..... 618
A J Narváez-Cruz, J F Useche-Vivero, J A Martínez-Trespalacios, J R Castro-Suarez

Business architecture for the management of urban incidents: believes the TI government for the legal office of the Sinu University..... 631
J C Arrieta, M C Bonfante, L A Blanquicett, L F Murillo

Discrete Events Simulation Method for Analyze Cycle Time: A Case Study in the Plastics Industry Sector..... 640
A Troncoso, A Sanchez, J Gonzalez

The Reading Plan: A Strategy to support the Academic Performance of students of Systems Technology at Antonio de Arévalo University Foundation..... 648
N Sánchez-Castro

Exploratory Analysis of the Market Trend of Power Transformers in Mexico for Manufacturing Sector for Exportation 657
M Rivera-Anaya, J R Corona-Armenta, E Oliva-López, F A Domínguez-Pacheco, J V Bernal

Location of Quality Parameters in Small Smart Grid: Off-Grid Case Using Wavelet Transform 672
L. Rojas, C. Rojas, C. Pacheco, E. Caballero, M. Molina

Effects of the implementation of a self-assessment model in the accreditation of programs in Higher Education..... 690
E Delgado-Florez, O Batista-Ayola, Y Blanco-Jimenez

Development of a web system for the management of PQRS in higher education institutions..... 699
Y Blanco-Jimenez, L K Ahumada-Torres, J R Castro-Suarez, M A Chico-Ruiz

Mechanical effort of ceramic particle-reinforced epoxy matrix used as a sealing layer on aluminum coatings by Arco Spray 708
E E Vergara, L M Castellanos, L M Diaz, A R Lucas, B B De Avila

Computational simulation of the temperature distribution of aerogel–based coated and uncoated multi–layer panels for thermal insulation..... 716
A Ángel, G Suárez, J Niño

The challenges of socio-legal research in law schools in Colombia and the use of new information and communication technologies 721
E Ramírez Llerena, M Chico Ruiz, Y Blanco Jiménez, J Luna Marzola, E Delgado Florez, A Calderon Hernandez

Vehicle Lateral Wander Measures Using Ultrasonic Sensors 749
E Oconitrillo-Varela, H Hernández-Vega, J P Aguiar-Moya

A Novel Full Boundary Element Formulation for Transient Analysis of Elastic Membranes Coupled to Acoustics Fluids..... 759
A J Narváez-Cruz, J F Useche-Vivero, J A Martínez-Trespalacios, J R Castro-Suarez

Author Index