## 2015 Workshop on Engineering Applications – International Congress on Engineering (WEA 2015)

Bogota, Colombia 28 – 30 October 2015



**IEEE Catalog Number:** 

CFP1529S-POD 978-1-5090-0229-0

**ISBN:** 

## Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc **All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number: CFP1529S-POD 978-1-5090-0229-0 ISBN (Print-On-Demand):

## Additional Copies of This Publication Are Available From:

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

Phone: (845) 758-0400 (845) 758-2633

Fax: E-mail: curran@proceedings.com www.proceedings.com



## 2015 Workshop on Engineering Applications - International Congress on Engineering (WEA) Table of Contents

Special Session on Computational Intelligence – Session 1 (Computational Intelligence 1)	
ID 6 - Voltage Instability Detector Based on Phasor Measurement Units Using Artificial Neural	Network 1
Said F. Mekhamer, Noha H. El-Amary, Amr M. Ibrahim and Ahmed Kamal	
ID 26 - Prototype Selection Based on Similarity Relations for Classification Problems	7
Mabel Frias, Yumilka Fernandez, Yaima Filiberto, Rafael Bello and Yaile Caballero	
ID 40 - Adaptive Beamforming for Moving Targets Using Genetic Algorithms	13
Diego Fernando Burgos Beltrán, Jonas Kunzler, Rodrigo Lemos and Hugo Silva	
Special Session on Management (Management)	
ID 5 - Methodology for the design and implementation of strategy based on Cybernetics and C	Complexity 18
Science: A Case Study in Rafael Uribe Uribe Hospital Bogotá D.C., Colombia	
Angel M. Fonseca, Angelo Diaz and Catherine V. Quintero	
ID 51 - Public Management of IT: Comparative case study between a developing and a develop	ped country 25
July Díaz, Carlos Cruz, Ruben Candia and Adil Usman	
ID 52 – A model for articulation between planning and management in a public university	33
Jenny Alexandra Triana Casallas and Jose Ignacio Rodriguez Molano	
Special Session on Fuzzy sets and Systems (Fuzzy Systems)	
ID 8 - A model for Goal Programming with Type-2 Fuzzy Uncertainty	37
Krisna Yoel Espinosa Ayala, Juan Sebastian Patiño Callejas and Juan Carlos Figueroa Ga	ırcía
ID 32 - On ordering words using the centroid and Yager index of an Interval Type-2 fuzzy number 10 states and 10 states are stated as a state of the states are stated as a state of the states are stated as a state of the state of the states are stated as a state of the state of	ber 42
Juan Carlos Figueroa García and Diego Fernando Pachon Neira	
${\tt ID~43-Design~and~Implementation~of~a~CBR~Interval~Type-2~Fuzzy~Controller~for~Stabilizing~an}\\$	Inverted 48
Pendulum	
Ángela Duquino, Christian Rojas, José Soriano and Diana Ovalle	
ID 67 - Computational Intelligence, Fuzzy systems, and Machine Learning: academic vs industr	ial learning 54
Roman Neruda and Juan Carlos Figueroa-García	

Special Session on System Dynamics (System Dynamics)	
ID 9 – Optimum phase shifting on inventory-production system to cost reduce in order to still system stable	60
Jose Castellanos and Leonardo Gonzales	
ID 31 - Simulation of Social Problems using System Dynamics	65
German Mendez Giraldo, Lindsay Alvarez Pomar and Eduyn Lopez Santana	
ID 39 - Transport Infrastructure load and the sefety food in the city of Bogota	71
Javier Arturo Orjuela Castro, William A. Casilimas G and Milton Mauricio Herrera R.	
Special Session on Control (Control)	
ID 16 - Path Tracking Control for an Autonomous Underwater Vehicle	78
Vinicius Falchetto, Janito Vaqueiro Ferreira and Ruben Dario Hernandez Beleño	
ID 17 - Estimation of longitudinal and lateral tire forces in a commercial vehicle	83
Carlos Reyes, Olmer Garcia, Pablo Siqueira Meirelles and Janito Vaqueiro Ferreira	
ID 48 - Urban Traffic control in the city of Medellín: A PID control approach	89
Laura Maria Norena, Anna Maria Sarrazola, Andrés Acosta, Alejandro Marquez, Jairo J Espinosa and	
Jorge Espinosa	
Session on Miscellaneous topics (Miscellaneous)	
ID 36 - Navigating through the Linking Open Data cloud datasets: preliminary ideas of a visual search tool	95
based on its defined domains	
David Martín Moncunill, Paulo Alonso Gaona-García and Enayat Rajabi	
ID 64 - Development of a Mobile Application in Augmented Reality to Improve the Communication Field of	102
Autistic Children at the Neurorehabilitar Clinic	
Fabian Steven Garay Rairan, Wilson Rodríguez Arias and Wilmer Pérez Betancourt	
ID 66 - Strategic planning of information from research and volcano monitoring institutions in Latin America	108
Cristhian Lombana Criollo, Adán Beltrán Gómez, Natalie Ortiz, Guerrero, Hugo Delgado Granados	
Special Session on Computational Intelligence – Session 2 (Computational Intelligence 2)	
ID 42 - Analysis of virtualization implementation for the simulation of a multiple-particle-swarms model for	113
expansion of the Coffee Berry Borer	
Nychol Bazurto, Helbert Espitia and Carlos Martínez	
ID 45 - Identification of a Permanent Magnet Synchronous Generator using neuronal networks	117
Helbert Espitia and Guzmán Díaz González	
ID 62 - Some considerations on adaptive stop tables for TransMilenio services	122
Sergio Rojas-Galeano	

Special Session on Optimization (Optimization)	
ID 15- Local and Global Path Generation for Autonomous Vehicles Using Splines	126
Randerson A. Lemos, Olmer Garcia and Janito Vaqueiro Ferreira	
ID 18 - A mixed integer optimization model to desing of selective collection routing for domestic solid waste	132
Yesica Xiomara Daza Cruz, Johana Andrea Patiño Chirva and Eduyn Ramiro Lopez Santana	
ID 30 - A Random Algorithm for Designing the System Matrix in Compressive Spectral Imaging by	137
Homogenizing its Structure	
Camilo Noriega, Yuri Mejía and Henry Arguello	
Special Session on Statistics (Statistics)	
ID 33 - Monitoring aplication profiles for the number of defects in manufacturing bodywork. Case study	143
Pedro Mariño and Alex Zambrano	
ID 46 - Geostatistics applied to study particulate matter PM10 in Mexico City for, January 2014	150
Natalia Ospina and Diana Avellaneda	
ID 61 - Geostatistical Modeling For Temperature Anomaly In Season The El Niño Phenomenon of El Niño in the	156
Department of Boyaca – Colombia	
Camilo Florez and Jennyfer Martinez	
Special Session on Networks (Networks)	
ID 14 - Failure Modeling in a WDM Optical Burst Switched Network	163
Elkin Fabián Aguas Martínez, Juan Sebastian Calderón Ríos and Gustavo Adolfo Puerto Leguizamón	
ID 27 - Communication System for a Soil Monitoring Network at Valle del Cauca	170
Melissa Eugenia Diago Mosquera and Javier Alí Carbonell González	
ID 50 - Next generation networks under the SDN and OpenFlow protocol architecture	175
Roberto Ferro, Yesid Diaz and Carlos Martinez	
ID 58 - Measurement Infrastructure on Microgrids Using Wireless Sensors	182
Fernando Bernal, Natalia Cancino and Elvis Eduardo Gaona García	
Special Session on Simulation (Simulation)	
ID 19 - Conceptual design of multi-agent system for load balancing in queueing networks: a review of concepts	187
and techniques	
Eduyn Ramiro Lopez Santana, Gustavo Florez and Germán Andrés Méndez Giraldo	
ID 29 - Configuration of Propagation Models for Computational Simulation of Different Telecom. Services	194
Trady Alexander Avila Vargas, Javier Enrique Arévalo Peña, Jorge Guillermo Barrera Medina, Juan David	
Zapata Pulido and Martha Liliana Suárez Peñaloza	
ID 41 - Design of a Model of Emerging Joint Actions in Human Social Systems based on the Interaction	200
between Agents	
Luz Esperanza Bohórquez Arevalo and Jorge Eliécer Posada Pinzón	

Session on Electrical Engineering (Electrical Engineering)	
ID 1 - Review of NTC 2050 and NFPA 70 on their section dedicated to equipments for electrical vehicles	206
recharge systems	
Hector Ortega and Javier Rosero	
ID 11 - Instrumentation and control of a DC motor right through the ubidots platform	211
Jackson Steward Rios Sastoque, Cesar Augusto Romero Molano and Diego Esteban Molina Molina	
ID 23 - Three-phase multilevel inverter with Selective Harmonic Elimination.	217
Luis David Pabón Fernández, Jorge Luis Diaz Rodriguez and Marco Alfredo Jaimes Carvajal	
ID 12 - Comparative analysis between definitions of unbalance voltage	223
Alex Rodriguez, Fabian Martinez Fuentes and Adolfo Andres Jaramillo Matta	