2020 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE 2020)

Cuernavaca, Mexico
16 – 21 November 2020

IEEE

IEEE Catalog Number: CFP2090W-POD
ISBN: 978-1-7281-9905-4

Copyright © 2020 by the Institute of Electrical and Electronics 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 is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP2090W-POD
ISBN (Print-On-Demand):	978-1-7281-9905-4
ISBN (Online):	978-1-7281-9904-7
ISSN:	2688-2981

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

2020 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE)

ICMEAE 2020

Table of Contents

Message from the General Chair xi
Organizing Committee xii
Reviewers xiii

Robotics, Computer Vision Applications and Computational Intelligence

Artificial Hydrocarbon Networks for Freezing of Gait Detection in Parkinson's Disease 3
Lourdes Martínez-Villaseñor (Universidad Panamericana), Hiram Ponce (Universidad Panamericana), and José Núñez-Martínez (Universidad Panamericana)

Towards Obstacle Identification by Markovian-Evolutionary Segmentation 9
Angel J. Sanchez-Garcia (Universidad Veracruzana), Homero V. Rios-Figueroa (Universidad Veracruzana), Juan Andres Sanchez Garcia (Universidad Veracruzana), and Juan Carlos Pérez-Arriaga (Universidad Veracruzana)

VPL: A View Planning Library for Automated 3D Reconstruction 13
Juan Irving Vasquez-Gomez (CONACYT)

SVM Classifier and Evaluation of Muscle Power of EMG Signals and Python Implementation 20
José Ricardo Cárdenas-Valdez (ITT), Daniela Valdez-Luis (ITT), Manuel de Jesús García-Ortega (ITT), Angel Humberto Corral-Domínguez (ITT), and Jose Alejandro Galaviz-Aguilar (Tecnologico de Monterrey)

Algorithm Comparison between A* and PRM on Indoor Fire Simulation 23
Arturo G. Roa-Borbolla (Universidad Veracruzana), Yara A. Jimnez-Nieto (Universidad Veracruzana), Gerardo I. Martnez-Espinosa (Universidad Veracruzana), Jorge L. Villa-Paniagua (TecNM. Campus Orizaba), Monica Ruiz-Martinez (TecNM. Campus Orizaba), and Rosa M. Vega-Valera (TecNM. Campus Orizaba)

Visible-Imperceptible Image Watermarking Based on Reversible Data Hiding with Contrast Enhancement 29
Jaime Sarabia-Lopez (Instituto Politecnico Nacional, Mexico), Diana Nuñez-Ramirez (Instituto Politecnico Nacional, Mexico), David Mata-Mendoza (Instituto Politecnico Nacional, Mexico), Eduardo Fragoso-Navarro (Instituto Politecnico Nacional, Mexico), Manuel Cedillo-Hernandez (Instituto Politecnico Nacional, Mexico), and Mariko Nakano-Miyatake (Instituto Politecnico Nacional, Mexico)

An Educational Tool to Teach Blind Children Sexual-Health and Hygiene through Random Forest Regressors and Additive Manufacturing 35
Grace Miranda-Iñiguez (Universidad Politécnica Salesiana), Efrén Lema-Condo (Universidad Politécnica Salesiana), Yaroslava Robles-Bykbaev (Universidad Politécnica Salesiana), and Vladimir Robles-Bykbaev (Universidad Politécnica Salesiana)

Survey on Parking Guidance, Methods and Techniques 41
Luis R. González-Martinez (Instituto Tecnologico Superior de Xalapa), Maria Angélica Cerdan (Instituto Tecnologico Superior de Xalapa), and Angel J. Sánchez Garcia (Universidad Veracruzana)

Machine Learning Algorithms Applied to Genetic Promoter Sequences Recognition 47
Omar Guzman-Ruiz (TecNM/CENIDET), Manuel Mejia-Lavalle (TecNM/CENIDET), Alicia Martinez (TecM/CENIDET), and Yasmin Hernandez (TecNM/CENIDET)

Objective Evaluation of MPEG-7 Visual Descriptors in CBIR Systems 52
K. Salvador Aguilar-Domínguez (Tecnológico Nacional de México / CENIDET, Cuernavaca, Morelos, México), Manuel Mejía-Lavalle (Tecnológico Nacional de México / CENIDET, Cuernavaca, Morelos, México), Gerardo Reyes-Salgado (Tecnológico Nacional de México / CENIDET, Cuernavaca, Morelos, México), and Osslan Osiris Vergara-Villegas (Universidad Autónoma de Ciudad Juárez, Ciudad Juárez, Chihuahua, México)

A* Algorithm for GIS-Based Pipeline Route Selection in Veracruz, Mexico 59
Pedro Moreno-Bernal (Universidad Autónoma del Estado de Morelos, México) and Sergio Nesmachnow (Universidad de la República, Uruguay)

A Flocking Behavior Model with Artificial Potential Fields for the Coordinated Displacement of Robotic Swarms 65
Alejandro Ruiz-Esparza-Rodriguez (National Autonomous University of Mexico), Moises S. Gonzalez-Chavez (National Autonomous University of Mexico), and Victor J. Gonzalez-Villela (National Autonomous University of Mexico)

Representation Learning for Constructive Comments Classification 71
Diego Uribe (TecNM Instituto Tecnológico de La Laguna, Torreon, Coah., México), Enrique Cuan (TecNM Instituto Tecnológico de La Laguna, Torreon, Coah., México), and Elisa Urquizo (TecNM Instituto Tecnológico de La Laguna, Torreon, Coah., México)

Mechatronics, Control Systems and Smart Machines

Modeling and Control of a Two DOF Helicopter with Tail Rotor Disturbances .79
Victor G. Sánchez-Meza (Instituto Politécnico Nacional, México), Yair Lozano-Hernandez (Instituto Politécnico Nacional, México), and Oscar O. Gutiérrez-Frías (Instituto Politécnico Nacional, México)

Two-Layer Saturated PID Controller for the Trajectory Tracking of a Quadrotor UAV .85
Edmundo Javier Ollervides-Vazquez (UANL-FIME-CIIIA, TecNM-ITLaLaguna, México), Erik Gilberto Rojo-Rodriguez (UNAL-FIME-CIIIA), Edgar Ulises Rojo-Rodriguez (UANL-FIME-CIIIA), Luis Enrique Cabriales-Ramirez (UANL-FIME-CIIIA), and Octavio Garcia-Salazar (UANL-FIME-CIIIA)

Control System Based on Reinforcement Learning Applied to a Klatt-Engell Reactor .92
Leighton Leandro Estrada Rayme (Universidad Nacional de Ingeniería, Peru) and Paul Antonio Cardenas Lizana (Universidad de Ingeniería y Tecnología, Peru)

Design and Implementation of an Autonomous Vehicle with LIDAR-Based Navigation .98
Jose Barbosa (USFQ), Christian Hernandez (USFQ), Daniel Paredes (USFQ), and René Játiva E. (USFQ)

Attenuation of Vibrations in a Mechanical Oscillator by Implementing Two Types of Vibration Absorbers: Experimental Results .104
D.A. Flores-Sanchez (Tecnológico Nacional de México/I.T. Pachuca), N. Flores-Morita (Tecnológico Nacional de México/I.T. Pachuca), R.E. Campa-Cocom (Tecnológico Nacional de México/I.T. La Laguna), L.G. Trujillo-Franco (Universidad Politécnica de Pachuca), and H.F. Abundis-Fong (Tecnológico Nacional de México/I.T. Pachuca)

Feedback Rehabilitation System for Children with Problems of Spastic Hemiparesis in the Upper Extremities .110
Jose Luis Gonzalez-Vidal (Universidad Autónoma del Estado de Hidalgo, Mexico), Daniel Hernández Moedano (Universidad Autónoma del Estado de Hidalgo, Mexico), Carmen Betsabet Rodríguez Cisneros (Universidad Autónoma de Estado de Hidalgo, Mexico), José Juan Raygoza Panduro (Universidad de Guadalajara, Mexico), Luz Noé Oliva Moreno (Instituto Politécnico Nacional, Mexico), and Esteban Rueda-Soriano (Universidad Autónoma del Estado de Hidalgo, Mexico)

Design of an Electronic Coupling to Control Speed of Motor on a Conveyor Belt Using IoT .115
Camacho Ulices (Autonomous University of Mexico State, UAEM), Martinez Irma (Autonomous University of Mexico State, UAEM), and Juarez Carlos (Autonomous University of Mexico State, UAEM)

Temperature Analysis of an Aging Chamber Using Mobile Average Filter .122
Hernández Miguel (Autonomous University of Mexico State UAEM, México), Juárez Carlos (Autonomous University of Mexico State UAEM, México), and Martínez Irma (Autonomous University of Mexico State UAEM, México)

Experimental Results from Non-Sub-Wavelength Gold Grating-Coupled Surface Plasmon Resonance using a Monochromatic Signal for Gold/Air Interface as the Base for Biosensors .127
Miguel Angel Ponce-Camacho (CETYS Universidad), Josue Aaron Lopez-Leyva (CETYS Universidad), and Leiva Casemiro-Oliveira (Universidade Federal Rural do Semi-Árido)

Growth Sphere for Optical Measurements in Plants .131
Noel Mijares (Universidad Autónoma de Zacatecas), Efrén González (Universidad Autónoma de Zacatecas), Daniel Alaniz (Universidad Autónoma de Zacatecas), Ernesto Olvera (Instituto Tecnológico Nacional de México Campus Pabellón de Arteaga), Rumen Ivanov (Universidad Autónoma de Zacatecas), and Ismael de la Rosa (Universidad Autónoma de Zacatecas)

Tip-Over Stability Estimation of a Mobile Manipulator using the Mean Normal Ground Reaction Criterion .137
Jose A. Souza-Jimenez (Tecnologico de Monterrey), Eduardo Zavala-Pacheco (Universidad Nacional Autonoma de Mexico), Juan C. Garcia-Hernandez (Universidad Nacional Autonoma de Mexico), and Victor J. Gonzalez-Villela (Universidad Nacional Autonoma de Mexico)

PI Regulation of the Aeromechanical Model of a Direct-Drive Wind Turbine .142
Daniel-Librado Martinez-Vazquez (Universidad Autonoma Metropolitana, Mexico), Jacobo Sandoval-Gutierrez (Universidad Autonoma Metropolitana, Mexico), Eduardo Liceaga-Castro (Instituto Politecnico Nacional, Mexico), and Jesus-Ulises Liceaga-Castro (Universidad Autonoma Metropolitana, Mexico)

Algebraic Identification and Robust GPI Controller in Elevator System .147
Andres Blanco-Ortega (Tecnológico Nacional de México/Centro Nacional de Investigación y Desarrollo Tecnológico), Fabio Abel Gómez-Becerra (Tecnológico Nacional de México/Instituto Tecnológico José Mario Molina Pasquel y Henriquez Campus Puerto Vallarta), Andrea Magadán-Salazar (Tecnológico Nacional de México/Centro Nacional de Investigación y Desarrollo Tecnológico), Cesar Humberto Guzman-Valdivia (Universidad Politécnica de Zacatecas), Rodrigo Oliver Delgado-Árcega (Tecnológico Nacional de México/Instituto Tecnológico José Mario Molina Pasquel y Henriquez Campus Puerto Vallarta), Julio Cesar Robles (Tecnológico Nacional de México/Instituto Tecnológico José Mario Molina Pasquel y Henriquez Campus Puerto Vallarta), and Ma de Jesus Arjona-Ulloa (Tecnológico Nacional de México/Instituto Tecnológico José Mario Molina Pasquel y Henriquez Campus Puerto Vallarta)

Novel Microgripper Based on a Chevron Actuator and a Simple Compliance Arrangement .156
M. Tecpoyotl-Torres (Universidad Autónoma del Estado de Morelos), S. F. Rodriguez-Fuentes (Universidad Autónoma del Estado de Morelos), J. G. Vera-Dimas (Universidad Autónoma del Estado de Morelos), R. Cabello-Ruiz (Universidad Autónoma del Estado de Morelos), and P. Vargas-Chable (Universidad Autónoma del Estado de Morelos)

Evaluation of the Offline Classification Error of Human Locomotion Modes using Virtual Force-Sensing Resistor Data .161
Carlos Manuel Lara-Barrios (Tecnológico Nacional de México / Centro Nacional de Investigación y Desarrollo Tecnológico, Mexico), Paola Catalfamo Formento (National University of Entre Ríos (UNER), Argentina), Eugenia Muñoz Larrosa (National University of Entre Ríos (UNER), Argentina), and Andres Blanco-Ortega (Tecnológico Nacional de México / Centro Nacional de Investigación y Desarrollo Tecnológico, Mexico)

Analysis of the Quality of Electrical Parameters using Low-Cost Programmable Devices .169.....
Martín N. Ocampo-Urióstegui (Universidad Tecnológica Emiliano Zapata del Estado de Morelos), Alberto M. Beltrán-Escobar (Universidad Tecnológica Emiliano Zapata del Estado de Morelos), Jorge S. Valdez-Martínez (Universidad Tecnológica Emiliano Zapata del Estado de Morelos), Jonathan Villanueva-Tavira (Universidad Tecnológica Emiliano Zapata del Estado de Morelos), Luis J. López-Vega (Universidad Tecnológica Emiliano Zapata del Estado de Morelos), Iván Alcalá-Barojas (Universidad Tecnológica Emiliano Zapata del Estado de Morelos), and Enrique Contreras-Calderón (Universidad Tecnológica Emiliano Zapata del Estado de Morelos)

Implementation of Accelerometers with Beams Based on Flexible Arrays Using PLA, at Millimeter Scale .175.....
M. Tecpoyotl-Torres (Universidad Autónoma del Estado de Morelos), J. G. Flores-Castro (Universidad Autónoma del Estado de Morelos), S. I. Valle-Morales (Universidad Autónoma del Estado de Morelos), C. A. Ferrara-Bello (Universidad Autónoma del Estado de Morelos), L. Cisneros-Villalobos (Universidad Autónoma del Estado de Morelos), and P. Vargas-Chable (Universidad Autónoma del Estado de Morelos)

Mechatronics Teaching through Virtual Platforms for Home Confinement due to COVID-19 .180...
Luis David Ruiz Delgado (Universidad Panamericana, Mexico), Santiago del Muro Alvarez (Universidad Panamericana, Mexico), Sebastián Gutiérrez (Universidad Panamericana, Mexico), and Hiram Ponce (Universidad Panamericana, Mexico)

Measurements of Harmonics and Transfer Time in the Electrical Connection of the General Management Department of Construction and Hydraulic Operation of Mexico State .186.....
L. Cisneros-Villalobos (Universidad Autónoma del Estado de Morelos), S. I. Valle-Morales (Universidad Autónoma del Estado de Morelos), and M. Tecpoyotl-Torres (Universidad Autónoma del Estado de Morelos)

Li-ion Battery Two-Region Polynomial Piecewise State-of-Charge Model for a Portable Datalogger Applied to Technosol Studies .192.....
Miguel A. Bañuelos-Saucedo (Universidad Nacional Autónoma de México)

An Novel Power Dispatch Optimization using Linear Programming and Operating Strategy in DC Microgrid .196.....
Jorge Luis Mirez Tarrillo (Universidad Nacional de Ingenieria)

A Review of Experiences in Microgrid Optimization as a Step Towards Dynamic Electrical Topologies .202.....
Jorge Luis Mirez Tarrillo (Universidad Nacional de Ingeniería)

A Comparison of Electrical Parameters and Efficiency Improvement between Perovskite Cells with Carbon and Metal Electrodes .209.....
Estefani Gabriela Mendoza Guerra (Universidad Nacional de Ingenieria) and Jorge Luis Mirez Tarrillo (Universidad Nacional de Ingenieria)

Instrumentation of an Educational Prototype for Vibration and Signal Analysis .215.....
Juan C. Marin-Soriano (Tecnológico Nacional de México/I.T. Pachuca), Luis G. Trujillo-Franco (Universidad Politécnica de Pachuca), and Hugo F. Abundis-Fong (Tecnológico Nacional de México/I.T. Pachuca)

Author Index 221 . . . . . .