

# **2024 IEEE Colombian Conference on Applications of Computational Intelligence (ColCACI 2024)**

**Pamplona, Colombia  
17-19 July 2024**



**IEEE Catalog Number: CFP24O64-POD  
ISBN: 979-8-3315-1691-8**

**Copyright © 2024 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:	CFP24O64-POD
ISBN (Print-On-Demand):	979-8-3315-1691-8
ISBN (Online):	979-8-3315-1690-1
ISSN:	2769-3651

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

On Using Deep Learning for Automatic Classification System of Microseisms at Cotopaxi Volcano .....	1
<i>Román Lara-Cueva, Iván Iglesias, Alejandro Rosero, Diego Benítez, Noel Pérez-Pérez, José Luis Rojo</i>	
Real-Time Monitoring of Solar Photovoltaic Power Plants: A Concentrated Validation Study .....	6
<i>Fabian Alonso Lara Vargas, Jimena De La Ossa Rivera, Santiago Jaramillo Mira, Carlos Vargas Salgado, Jesus Aguila Leon, Evelyn Villabon Lopez</i>	
Performance Tests of LLMs in the Context of Answers on Industry 4.0.....	12
<i>D. Pedro José González, Ailín Orjuela Duarte, William Mauricio Rojas, J. Luz Marina Santos</i>	
Minimizing Energy Losses in Unbalanced Distribution Networks Via the Optimal Integration of PV Sources and D-STATCOMs.....	18
<i>Laura Sofía Avellaneda-Gomez, Brandon Cortés-Caicedo, Oscar Danilo Montoya</i>	
Duolingo Evolution: from Automation to Artificial Intelligence.....	24
<i>Janice Vega, Monica Rodriguez, Erick Check, Halpin Moran, Luis Loo</i>	
Fuzzy Control of a Multilevel Cascade Inverter Using High Frequency Transformers .....	30
<i>Jorge Luis Diaz Rodriguez, Luis David Pabon Fernandez, Laury Katherine Gualdron Godoy</i>	
Applying Fuzzy and Adaptive Control Techniques to a Turbocharger Test Bench .....	36
<i>José Ricardo Bermúdez Santaella, Oscar J. Suarez, Juan José Cabello Eras</i>	
Optimal Sizing and Location of TSCs in Medium-Voltage Distribution Networks Via the Sine-Cosine Algorithm .....	42
<i>Oscar Danilo Montoya, Víctor M. Garrido-Arévalo, Walter Gil-González</i>	
ECO-LÓGICA: A Prototype for Carbon Dioxide Pollution Level Prediction.....	48
<i>Guillermo Augusto Durán Boneth, Rosanna Costaguta, Dewar Rico-Bautista</i>	
Recognizing Overarching Themes and Actors in Peacebuilding: A Longitudinal Analysis of Press Content in Latin America .....	53
<i>Aglaya Batz-Lineiro, Merlin P. Grueso-Hinestroza, Lizeth F. Serrano-Cardenas, David F. D’Croz-Baron, Carlos A. Ojeda-Sanchez</i>	
Selection of Spectral Bands for Estimating Fishmeal Quality Parameters Using ML Models.....	59
<i>Tulio Merino, Antonio Criollo, Gerson La Rosa, Juan Valdiviezo, Juan Soto</i>	
Artificial Intelligence Literacy in Research.....	64
<i>Mauricio Rojas Contreras, Jorge Omar Portilla Jaimes</i>	
Multispectral Characterization of Pesticide Residues in Strawberries .....	70
<i>Diego Alfonso Pelaez, Juan Esteban Arango, Oscar Eduardo Gualdron</i>	
Nonlinear Control Design for a Single-Phase PWM-CSC with an Adaptive Load Estimation.....	76
<i>Angélica Mercedes Nivia-Vargas, Oscar Danilo Montoya, Walter Gil-González</i>	
Commissioning and Testing of an Autonomous Ground Vehicle .....	82
<i>Gabriel Gómez, René Játiva, Gustavo Scaglia</i>	

Finding Biomarkers of Virtual Reality-Induced Avatar Embodiment Priming in EEG Signals Recorded During a Motor Imagery Brain-Computer Interface Training.....	88
<i>Michael S. Ramírez-Campos, Hamed Tadayyoni, Alvaro D. Orjuela-Cañón</i>	
Implementation of Multispectral Satellite Images for the Identification of Productive Areas in a Difficult Access Region.....	94
<i>Jeisson Felipe Maldonado, America Elizabeth Ramirez, Marisol Maestre Delgado</i>	
Transformer Neural Network Architecture for Forecasting of Colombian Solar Irradiance .....	99
<i>Alvaro D. Orjuela-Cañón, Angie L. Blanco-Cañón, Mario F. Jimenez</i>	
Solar-Powered Electric Vehicle Charging Station with Fuzzy MPPT Algorithm.....	104
<i>Jesús A. Medrano-Hermosillo, Abraham E. Rodríguez-Mata, Larbi Djilali, Oscar J. Suarez-Sierra, Victor A. González Huitron</i>	

**Author Index**