



# Applied Computer Sciences in Engineering [ 10th Workshop on Engineering Applications, WEA 2023, Cartagena, Colombia, November 1-3, 2023, Proceedings /

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editor

Monografía

This book constitutes the refereed proceedings of the 10th Workshop on Engineering Applications, WEA 2023, held in Cartagena, Colombia, during November 1-3, 2023. The 37 full papers included in this book were carefully reviewed and selected from 93 submissions. They were organized in topical sections as follows: artificial intelligence; optimization; and simulation

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**Contenido:** Artificial Intelligence -- Algorithmic trading system using auto-machine learning as a filter rule -- An algorithmic trading strategy for the Colombian US dollar inter-bank bulk market SET-FX based on an evolutionary TPOT AutoML predictive model -- Evaluating the incidence of different factors on the level of service at interceptions without traffic lights -- Physically Informed Neural Networks Applied to Financial Derivatives Valuation in Markets with Liquidity Risk -- Application of hierarchical risk parity with Latin ADRs -- Experimental Analysis of a Peregrine Falcon 3D Prototype with oscillating feathers -- Optimal portfolio selection using a Robust-Bayesian model -- Impact of Pruning Distribution in Compressed CNN Models: A Case Study --

Open-loop stability analysis of interval dynamic systems -- Acquisition of motor images of the left and right hand by means of the Emotiv epoc+ headset for their classification using the EEGNet neural network -- Natural Language Contents Evaluation System for Multi-class News Categorization Using Machine Learning and Transformers -- Automatic Assessment of Voice Disorders Using Phase Plots -- Medical Image Compression techniques comparison using open-source libraries -- Implementation of a reinforced learning algorithm in a simulation environment for path planning of a robot manipulator with 3 degrees of freedom -- MACHINE LEARNING FOR RICE (*Oryza sativa* L.) PHENOLOGICAL IDENTIFICATION -- wGMU: A Novel Fusion Strategy to Identify the Important Parts of Sentence for Relation Classification -- Effect of preprocessing in deep learning systems to aid the diagnosis using X-ray pulmonary images -- Topological Data Analysis to characterize fluctuations in the Latin American Integrated Market -- Implementation of the chaotic systems Lorenz, Rossler, and Chen on an 8 bit microcontroller -- Enhancing Impaired Waist-to-Height Ratio Classification Using Neural Networks -- Application of artificial intelligence tools, data processing, and analysis in the forecasting of level and flow variables in wells with little data from the Morroa Aquifer -- Voltage Regulation for Microgrids Based on a Data-Driven Predictor -- Generalized nonlinear rectification function for estimating Mel Cepstral coefficients from Colombian birdsongs -- Optimization -- Global Sensitivity Analysis in Optimization - the Case of Positive Definite Quadratic Forms -- MPC-Based Path Tracking of a Differential-Drive Mobile Robot with Optimization for Improved Control Performance -- A Mixed Integer Linear Programming Model for School Timetable in Cartagena -- Evaluation of a Mixed-Product Production System Performance with Unreliable Machines -- Distributionally Robust Optimization for Networked Microgrids: An Overview -- Pickup and delivery vehicle routing problems in bike sharing systems: a review -- MATHEMATICAL OPTIMIZATION MODELS FOR THE DESIGN AND APPLICATION OF INDUSTRIAL SYMBIOSIS NETWORKS: CHALLENGES AND TRENDS -- Simulation -- Static and Dynamic Electrical Characterization of Flexible Photovoltaic Panels for Optimization of their Performance -- Rural Migration in Colombia -- Investigation of the conductive properties of the electro-polymerized thiophene and pyrrole derivatives: correlation between experimental and theoretical parameters -- Strategies, information technologies and models for knowledge management in software development companies: A systematic review of the literature -- Smart Substation Communication with Virtual Networks -- Development of a farm animal tracking device using LoRaWAN -- In-silico study of the effect of particulate matter from Medellín on virtual ventricular tissue

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