ISSN 2007-9737

Editorial for Thematic Section:

Theory and Applications of Fuzzy Systems, Neural Networks, and Metaheuristics

This thematic section deals with recent developments on fuzzy logic, neural networks and meta-heuristic optimization algorithms, as well as their hybrid combinations, and their application in areas such as, intelligent control and robotics, pattern recognition, medical diagnosis, time series prediction and optimization of complex problems.

The thematic section comprises papers dealing with type-1 and type-2 fuzzy logic, which basically consists of papers that propose new concepts and algorithms based on type-1 and type-2 fuzzy logic and their applications. We also consider papers that present theory and practice of meta-heuristics in different areas of application. Metaheuristics of interest will include genetic algorithms, particle swarm optimization, grey wolf optimization, and other recent nature-inspired optimization algorithms. In addition, special interest is given to papers presenting theory and practice of neural networks in different areas of application, including convolutional and deep learning neural networks.

In the current literature, we can find interesting papers on diverse applications of fuzzy logic, neural networks and hybrid intelligent systems in medical applications.

In addition, we can find papers describing applications of fuzzy logic, neural networks and meta-heuristics in robotics problems, pattern recognition systems, time series prediction and other areas.

This will warrant more and more research attention from the scientific community on these important topics, especially since everyday newer and newer systems are emerging across all the domains of science and engineering, e.g. social networks, big data analytics, cyber security, cyber-physical systems, cloud computing etc.

After the reviewing process, 12 papers were selected for inclusion in the thematic section.

The first paper by Miguel A. García-Morales et al. is presenting a study on the Multi-objective Evolutionary Algorithm Based on Decomposition with Adaptive Adjustment of Control Parameters to Solve the Bi-objective Internet Shopping Optimization Problem. Simulation results show the effectiveness of the proposed approach.

The second paper by Jessica González-San-Martín et al. is presenting an Advancing Cloud Task Scheduling: Recent Developments and Comparative Insights. Experimental results demonstrate the advantages of the proposed method.

The third paper by José Alfredo Brambila-Hernández et al. is presenting a Novel Dynamic Decomposition-Based Multi-objective Evolutionary Algorithm Using Reinforcement Learning Adaptive Operator Selection.

The fourth paper by Lucero Ortiz-Aguilar et al. describes a Design of Routes for Collaborative Robots in the Automobile Painting Process through a Comparison of Perturbative Heuristics for Iterated Local Search.

The fifth paper by Jesus A. Rodríguez-Arellano et al. describes an approach for Prescribed-Time Trajectory Tracking Control of Wheeled Mobile Robots Using Neural Networks and Robust Control Techniques.

The sixth paper by Andres Espinal et al. describes Grammatical Evolution with codons selection order as Intensification process.

In the seventh paper by Rodrigo Cordero-Martínez et al., an Adjustment of Convolutional and Hidden Layers using Type-1 Fuzzy Logic Applied to Diabetic Retinopathy Classification is presented.

The eighth paper by Martha Pulido et al. deals with a Bird Swarm Algorithm and Particle Swarm Optimization in Ensemble Recurrent Neural Networks Optimization for Time Series Prediction.

The ninth paper by Valentin Calzada-Ledesma et al. describes Water Stress Challenges: Mathematical Modeling of Water Resource Management.

The tenth paper by Daniel Ruelas et al. describes the Prediction of Enterprise Financial Health using Machine Learning and Financial Reasons for Taiwan Economic Companies.

The eleventh paper by Hector Martinez et al. describes a Dragonfly Algorithm with fuzzy parameter adaptation for benchmark mathematical function optimization.

Finally, the twelfth paper by Marylu Lagunes et al. describes a Comparative Study of Gorilla Troops Optimizer and Stochastic Fractal Search with fuzzy dynamic parameter adaptation.

We believe that these papers will be an important contribution to the state of the art of fuzzy systems, neural networks and metaheuristics for solving real-world problems.

In addition, there are also contributions on the theoretical side with new concepts and models of fuzzy theory, neural models and new proposed metaheuristic methods.

We envision that the papers of the thematic section will be of great interest to researchers and students of the computational intelligence areas, as well as in medical and healthcare areas.

Guest editor:

Oscar Castillo
(Tijuana Institute of Technology, TecNM, Mexico,
ocastillo@tectijuana.mx)