



Computational Intelligence and Neuroscience

Special Issue on
Metaheuristics for Machine Learning

CALL FOR PAPERS

Metaheuristic optimization algorithms are essentially stochastic in nature and can be applied to any optimization problem, independent of whether the problem is formulated as a monoobjective or as a multiobjective optimization problem. They are called nature inspired algorithms because their origin comes from the observation of natural behavior: the analogies can be drawn from the fields of physics (simulated annealing, microcanonical annealing, etc.), or biology (evolutionary algorithms) or ethology (ant colonies, particle swarms, etc.). Algorithms, techniques, and methods based on metaheuristic paradigm have been successfully applied to a wide range of complex problems. From the perspective of development of science, metaheuristics are an emerging interdisciplinary area combining diverse domains like natural sciences, biology, sociology, and computer science. Their rapid growth is a natural consequence of the rapid development of interdisciplinary research today.

The ability to learn is one of the central features of intelligence, which makes it an important aspect for both cognitive psychology and artificial intelligence. The field of machine learning, which crosses these disciplines, aims at designing algorithms that can learn from models and generate prediction on data. Most methods in machine learning are based on finding parameters that optimize a defined objective function. Then, efficient metaheuristics may allow enhancing the performance of such algorithms. Indeed, metaheuristics can be used within a learning based system at different levels, for instance, feature selection, training algorithm, classification algorithm, and clustering algorithm.

This special issue aims at providing an opportunity, for researchers interested in the advances and applications of metaheuristics devoted to enhance the performance or to design efficient machine learning algorithms, to meet and discuss the advances and latest developments in this area. The special issue will be oriented towards both theoretical and application aspects of metaheuristics to optimize machine learning algorithms. Regarding applications, priority will be given to those works which are related to brain interface computing (BCI) and to the association between metaheuristics and computational neurosciences models to solve biomedical problems.

Potential topics include, but are not limited to:

- ▶ The application and design for machine learning of various metaheuristic techniques, such as tabu search, simulated annealing, iterated local search, variable neighborhood search, memory-based optimization, dynamic local search, evolutionary algorithms, memetic algorithms, ant colony optimization, variable neighborhood search, particle swarm optimization, scatter search, and path relinking
- ▶ The fields of interest in terms of machine learning will include feature selection, training/adaptation algorithms, regression, prediction, clustering, and classification.

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/cin/mml/>.

Lead Guest Editor

Patrick Siarry, Université Paris-Est
Créteil, Vitry sur Seine, France
siarry@u-pec.fr

Guest Editors

Amir Nakib, Université Paris-Est
Créteil, Vitry sur Seine, France
nakib@u-pec.fr

Amitava Chatterjee, Jadavpur
University, Kolkata, India
achatterjee@ee.jdvu.ac.in

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