Symmetric Machine Learning Method Enhanced by Evolutionary Computation and Its Applications in Big Data Analytics

Guest Editors:

Prof. Dr. Lianbo Ma

Dr. Shi Cheng

Prof. Dr. Shangce Gao

Dr. Yu Guo

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Message from the Guest Editors

Machine learning (ML) has been widely applied for big data processing and analytics, where various optimization problems (about model symmetry/asymmetry, model architecture and hyperparameters, data clustering, and data prediction) are frequently encountered. Evolutionary computation (EC) is commonly used in these scenarios where classical numerical methods fail to find good enough solutions. Evolutionary approaches can be used in all the parts of ML: preprocessing (e.g., feature selection and resampling), learning (e.g., parameter setting and network topology), and postprocessing (e.g., decision tree/support vectors pruning and ensemble learning). It is of great interest to investigate the combination of EC and ML in solving large-scale big data analytic problems. The interdisciplinary research of this topic focuses on the progress of machine learning, evolutionary algorithms and their applications for big data, as well as emerging intelligent applications and models in topics of interest, including, but not limited to, industrial control, job-shop scheduling, expert systems, pattern recognition, and computer vision.

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Editor-in-Chief

Prof. Dr. Sergei D. Odintsov
1. Institució Catalana de Recerca i Estudis Avançats (ICREA), Passeig Luis Companys, 23, 08010 Barcelona, Spain
2. Institute of Space Sciences (ICE-CSIC), C. Can Magrans s/n, 08193 Barcelona, Spain

Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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