Title:

Evolutionary Computation for Machine Learning and Data Mining

Abstract:

Evolutionary computation technique has been widely used for addressing various challenging problems due to its powerful global search ability. There are many complex optimization tasks in the fields of machine learning and data mining such as feature selection, neural architecture search, hyper-parameter search etc. This workshop aims to collect original papers that develop new evolutionary computation techniques to address any kind of machine learning and data mining tasks. For all the aforementioned, we kindly invite the scientific community to contribute to this workshop by submitting novel and original research related but not limited to the following topics:

Scope and Topics:

Topics of interest include but are not limited to:

- Numerical optimization/Combination optimization/ Multi-objective optimization
- Genetic algorithm/Genetic programming/Particle swarm optimization/Ant colony optimization/Artificial bee colony/Differential evolution/Fireworks algorithm/Brain storm optimization
- Classification/clustering/regression
- Machine learning/Date mining/Neural network/Deep learning/Support vector machine/Decision tree/Deep neural network/Convolutional neural network/reinforcement learning/Ensemble learning/k-means
- Neural architecture search
- Full-space neural architecture search
- Automatic machine learning
- Feature selection, extraction, and dimensionality reduction on high-dimensional and large-scale data
- Evolutionary feature selection and construction
- Multi-objective feature selection/multi-object classification/ multi-object clustering
- Hybridization of evolutionary computation and neural networks, fuzzy systems
- Hybridization of evolutionary computation and cost-sensitive classification/clustering
- Hybridization of evolutionary computation and class-imbalance

classification/clustering

- Evolutionary neural networks
- Hyper-parameter tuning with evolutionary computation
- Evolutionary transfer learning
- Evolutionary computation for deep neural networks
- Evolutionary computation in deep learning for regression/lustering/classification
- Evolutionary computation for hyper-parameter optimization,
- Evolutionary computation for neural architecture search
- Evolutionary computation for automatic machine learning
- Evolutionary computation for deep neural network
- Real-world applications of evolutionary computation and machine learning, e.g. images and video sequences/analysis, face recognition, gene analysis, biomarker detection, medical data analysis, text mining, intrusion detection systems, vehicle routing, computer vision, natural language processing, speech recognition, etc.

Program Committee Chairs:

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Yu Xue received the Ph. D. degree from School of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics, China, in 2013. He is an associate professor in the School of Computer and Software, Nanjing University of Information Science and Technology. He was a visiting scholar in the School of Engineering and Computer Science, Victoria University of Wellington, New Zealand (2016.8-2017.8). He was a research scholar in the Department of Computer Science and Engineering, Michigan State University, the United States of America (2017.10-2018.11). His research interests include Evolutionary Computation, Machine Learning, and Data mining.

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Bing Xue is currently an Associate Professor and Program Director of Science in School of Engineering and Computer Science at VUW. She has over 200 papers published in fully refereed international journals and conferences and her research focuses mainly on evolutionary computation, machine learning, classification, symbolic regression, feature selection, evolving deep neural networks, image analysis, transfer learning, multi-objective machine learning. Dr Xue is currently the Chair of IEEE Computational Intelligence Society (CIS) Data Mining and Big Data Analytics Technical Committee, and Vice-Chair of IEEE Task Force on Evolutionary Feature Selection and Construction, Vice-Chair of IEEE CIS Task Force on Transfer Learning & Transfer Optimization, and of IEEE CIS Task Force on Evolutionary Deep Learning and Applications. She is also served as associate editor of several international journals, such as IEEE Computational Intelligence Magazine and IEEE

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Yong Zhang received the BSc and PhD degrees in control theory and control engineering from the China University of Mining and Technology in 2006 and 2009, respectively. He is a professor with the School of Information and Electronic Engineering, China University of Mining and Technology. His research interests include intelligence optimization and data mining.

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Adam Slowik was born in Warsaw, Poland, in 1977. He received the Ph.D. degree in electronics with distinction from the Department of Electronics and Computer Science, Koszalin University of Technology, Koszalin, Poland, in 2007, and the Dr. Habil. (D.Sc.) degree in computer science from the Department of Mechanical Engineering and Computer Science, Czestochowa University of Technology, Czestochowa, Poland, in 2013. Since October 2013, he has been an Associate Professor with the Department of Electronics and Computer Science, Koszalin University of Technology. His research interests include soft computing, computational intelligence, machine learning, and bioinspired global optimization algorithms and their applications. He is an Associate Editor for the IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS.