

Special Session

Code: 9a3j8

Title

Learning to Optimize in Intelligent Systems

Proposer / Main Organizer

Provide complete address/affiliation, phone, email and biography.

The main organizer will be the primary contact person to whom all correspondence will be sent.

Zizhen Zhang, Associate Professor (Main Organizer)

School of Computer Science and Engineering, Sun Yat-sen University, Guangzhou, China.

Tel: +8613826411848, zhangzzh7@mail.sysu.edu.cn

***Zizhen Zhang** received the B.S. and M.S. degrees from the Department of Computer Science, Sun Yat-sen University, Guangzhou, China, in 2007 and 2009, respectively, and the Ph.D. degree from the City University of Hong Kong, Hong Kong, in 2014. He is currently an Associate Professor with the School of Computer Science and Engineering, Sun Yat-sen University. His research interests include computational intelligence, reinforcement learning, and various applications in production, transportation and logistics.*

Hu Qin, Professor

School of Management, Huazhong University of Science and Technology, Wuhan, China.

Tel: +8613349921096, tigerqin@hust.edu.cn

***Hu Qin** received the Ph.D. degree from the City University of Hong Kong, in 2011. He is currently a Professor with the School of Management, Huazhong University of Science and Technology. His current research interests include algorithms and artificial intelligence, including various topics in operations research, such as vehicle routing problem, freight allocation problem, container loading problems, and transportation problems.*

Haitao Yuan, Associate Professor

School of Automation Science and Electrical Engineering, Beihang University, Beijing, China.

Tel: +8618813119708, yuan@buaa.edu.cn

***Haitao Yuan** received the Ph.D. degree in Computer Engineering from New Jersey Institute of Technology (NJIT), Newark, NJ, USA in 2020. Before that, he received his Ph.D. degree in Modeling Simulation Theory and Technology from Beihang University, Beijing, China in 2016. He is currently an Associate Professor with the School of Automation Science and Electrical Engineering, Beihang University, Beijing, China. His research interests include cloud computing, edge computing, data centers, big data, machine learning, deep learning and optimization algorithms.*

Xiwang Guo, Associate Professor

College of Computer and Communication Engineering, Liaoning Shihua University, Fushun, China.

Tel: +8615566062235, x.w.guo@163.com

***Xiwang Guo** received his B.S. degree in Computer Science and Technology from Shenyang Institute of Engineering, Shenyang, China, in 2006, M.S. degree in Aeronautics and Astronautics Manufacturing Engineering. from Shenyang Aerospace University, Shenyang, China, in 2009, Ph. D. degree in System Engineering from Northeastern University, Shenyang, China, in 2015. He is currently an associate professor of the College of Computer and Communication Engineering at Liaoning Shihua University. From 2016 to 2018, he was a visiting scholar of Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ, USA. He has authored 90+ technical papers in journals and conference proceedings, including IEEE Transactions on Cybernetics, IEEE Transactions on System, Man and Cybernetics: Systems, IEEE Transactions on Intelligent Transportation Systems, and IEEE/CAA Journal of Automatica Sinica. His current research interests include Petri nets, remanufacturing, recycling and reuse of automotive, intelligent optimization algorithm.*

IEEE Member or SMC Society Member

Zizhen Zhang, IEEE Member

Haitao Yuan, IEEE Senior Member

Xiwang Guo, IEEE Member

Category

Cybernetics

Number of Expected Paper Submissions:

6 or more

Keywords

Deep Learning; Heuristic Algorithms; Hybrid Models of Neural Networks, Fuzzy Systems, and Evolutionary Computing

Brief Description and Justification (200-250 words):

Add a short description (200 to 250 words).

Intelligent system can be defined as the system that incorporates intelligence into applications being handled by machines. Many intelligent systems perform search and optimization along with learning capabilities. The techniques are in general based on biologically inspired and artificial intelligence algorithms for solving problems. In tradition, the design of algorithms is primarily based on expert knowledge or handcrafted heuristics. Recently, Learning-to-Optimize (L2O), as a powerful framework for various optimization and machine learning tasks, becomes one of the most active research areas. The goal of L2O is to make use of data driven ability to improve algorithms' accuracy and efficiency. It provides a new optimization paradigm that uses data to learn a model offline and then makes decisions online. L2O can be widely applied in intelligent systems such as production planning, job scheduling, traffic control, vehicle routing, crew rostering, port operation, supply chain management, etc. Recent studies also suggest that L2O has a great potential to improve the performance of intelligent systems.

This special session provides a platform to exchange research works, technical trends and practical experience related to computer science, transportation research, operation research, applied mathematics and management science. This session is expected to broaden the L2O research community and promote the L2O research in intelligent systems.