



ICONIP 2023

November 20-23, 2023, Changsha, China

Invited Session Proposal for ICONIP2023

Title: New Trends of Swarm Intelligence Optimization Assisted by Machine Learning Techniques

Description: As an appealing optimization methodology, Swarm Intelligence Optimization (SIO) has been shown impressive advantages in dealing with complex real-world optimization problems, including continue problems and combinatorial problems, such as the neural architecture search (NAS) and feature selection for a learning algorithm. In recent years, to pursue higher efficiency and effectiveness, there has been a fair amount of research into the design of SIO using machine learning techniques. For example, the reinforcement learning is embedded into the SIO procedure for selecting search strategies or adjusting hyperparameters in solving robot path planning problem, parameters extraction of photovoltaic models, and sewage treatment control problem. Similar examples can be easily given, such as the SVM-based SIO to solve computationally expensive problems. Due to its attracting performance, this session aims to investigate in both the new theories and methods on SIO assisted by machine learning techniques, and the applications in real-world problems. The submissions on various aspects of algorithm design and applications will be welcomed, such as the assistances from neighborhood learning technique, fitness landscape analysis, data-driven technique, PCA, and reinforcement learning.

Topics include (but are not restricted to):

- Reinforcement learning based SIO
- Dynamic neighborhood learning
- Online fitness landscape analysis technique
- Large scale NAS optimization
- Neuroevolution
- Multi-swarm and self-adaptive approaches
- SIO in dynamic or uncertain environment
- Combinations with local search techniques
- Multi-task optimization
- Multi-objective optimization
- Mixed variable optimization

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