

CALL FOR PAPERS

IEEE Transactions on Emerging Topics in Computational Intelligence

Special Issue on Deep reinforcement learning for optimization: methods and application

I. AIM AND SCOPE

Optimization is an old research topic. It widely exists in many engineering problems. Till now loads of methods have been proposed to handle complex optimization problems, amongst which evolutionary algorithms have attracted a great deal of attentions due to their robustness to the underlying problem characteristics. However, evolutionary algorithms which simulate the evolution of nature is an iterative optimizer, causing high computational effort to approximate the optima. That is, such methods may not applicable on online, real-time optimization.

Deep reinforcement learning (DRL), implementing deep learning architecture with reinforcement learning algorithms, is capable of creating a powerful model that can learn to make decisions and scale to previously unsolvable problems. In recent three years, several new methods emerge on the surface that solve combinatorial optimization problems via DRL techniques. They are significantly faster than traditional solvers, e.g., evolutionary algorithms, and able to generalize either to larger problems or to different unseen problems from the same class of the optimization task. Deep reinforcement learning for optimization is an emerging topic over the recent years and has shown promising results. However, a number of research issues remain to be explored. There is a need to explore novel methods to handle constrained, continuous, complex large-scale and multi/many-objective optimization problems using DRL techniques.

This special issue aims to discuss new strategies needed in deep reinforcement learning for addressing more complex optimization problems. It will present most related and recent advances in theory, algorithm development and applications of deep reinforcement learning developed for complex optimization.

II. TOPICS

The topics relevant to the special issue include (but are not limited to) the following topics:

- Advances strategies in deep reinforcement learning
- New strategies of deep reinforcement learning for combinatorial optimization
- New Strategies of deep reinforcement learning for continuous optimization
- New Strategies of deep reinforcement learning for constrained optimization
- New Strategies of deep reinforcement learning for dynamic/online optimization
- The scalability of deep reinforcement learning for complex large-scale optimization

- Deep reinforcement learning methods for multi/many-objective optimization
- Hybrid DRL and evolutionary algorithms for complex optimization
- Hybrid DRL and swarm intelligence methods for complex optimization
- Real world applications using DRL based optimization

III. SUBMISSIONS

Manuscripts should be prepared according to the “Information for Authors” section of the journal, and submissions should be done through the journal submission website: <https://mc.manuscriptcentral.com/tetci-ieee>, by selecting the Manuscript Type of “Deep reinforcement learning for optimization: methods and application” and clearly marking “Deep reinforcement learning for optimization: methods and application” as comments to the Editor-in-Chief. Submitted papers will be reviewed by at least three different reviewers. Submission of a manuscript implies that it is the authors’ original unpublished work and is not being submitted for possible publication elsewhere.

IV. IMPORTANT DATES

Paper submission deadline: July 31, 2021
Notice of the first round review results : September 30, 2021
Revision Due : November 30, 2021
Final Notice of Acceptance/Reject: January 31, 2022

V. GUEST EDITORS

Rui Wang, National University of Defense Technology, China

Email: ruiwangnudt@gmail.com

Lining Xing, National University of Defense Technology, China

Email: xinglining@gmail.com

Maoguo Gong, Associate Editor of IEEE Transactions on Emerging Topics in Computational Intelligence, Institute of Computational Intelligence (OMEGA), Xidian University, China

Email: gong@ieee.org

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Email: epnsugan@ntu.edu.sg

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Email: hisao@sustech.edu.cn, hisaoi@cs.osakafu-u.ac.jp