

CALL FOR PAPERS

IEEE Transactions on Emerging Topics in Computational Intelligence Special Issue on Data and Knowledge-assisted Evolutionary Computation

I. AIM AND SCOPE

Evolutionary computation techniques have been successfully applied to a wide range of real-world optimization problems such as engineering design and machine learning. However, the complexity of optimization problems has rapidly increased. Consequently, the search space becomes much larger, more objectives are required to be optimized, no explicit objective functions are available, or objective evaluations are highly time-consuming. Thus, efficient and effective optimization algorithms are required for finding a high-quality optimal solution for single-objective problems or a set of Pareto optimal solutions for multi-/many-objective problems, especially when the results are expected to be obtained in a limited time.

For improving the efficiency of evolutionary algorithms, knowledge can be extracted from the historical data or the search results to assist in searching for the optimum/optima of the problem. The knowledge extracted from the historical data is normally about the distribution of the data or the mapping relationship from the decision space to the objective space, which can be used to accelerate the search process, or reduce the required number of quality evaluations in solving computationally expensive optimization problems. The knowledge extracted from the search results of a problem can be transferred to the optimization of other problems, thereby speeding up the search for the optimum/optima of these problems.

This special issue aims to present the most recent advances in knowledge-assisted evolutionary computation, in particular knowledge incorporation in initialization, reproduction, objective evaluations, and environmental selection. This special issue will cover a wide range of topics including new theoretical advancements, innovative techniques, and novel applications. Papers can be theoretical, methodological, or application-oriented.

II. TOPICS

The topics of this special issue include but are not limited to the following topics

- Knowledge transfer for dynamic optimization
- Multifactorial/multitask optimization

- Multiform optimization
- Surrogate-assisted optimization and Bayesian optimization
- Data-driven optimization
- Deep learning based optimization
- Multi-fidelity optimization
- Multi-scenario robust optimization
- Preference-driven multi-objective optimization
- Memetic computation
- Evolutionary neural architecture search
- Real-world applications

III. SUBMISSIONS

The papers should be submitted online through the TETCI manuscript submission system (<https://mc.manuscriptcentral.com/tetci-ieee>) and follow the submission procedure. Include the following instructions in the header of the first page of your manuscript and cover letter: “Please submit the manuscript to the Special Issue on Data and Knowledge-assisted Evolutionary Computation”

IV. IMPORTANT DATES

Submission deadline: July 31, 2023

Notification of first review: October 31, 2023

Submission of revised manuscript: December 31, 2023

Notification of final decision: February 28, 2024

V. GUEST EDITORS

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