

SPECIAL ISSUE ON

KNOWLEDGE TRANSFER IN EVOLUTIONARY OPTIMIZATION

Aims and Scope

Evolutionary Algorithms (EAs) are nature-inspired population-based search methods which work on Darwinian principles of natural selection. Due to their strong search capability and simplicity of implementation, EAs have been successfully applied to solve many complex optimization problems, which cannot be easily solved by traditional mathematical programming approaches, such as linear programming, quadratic programming, and convex optimization.

Despite the great success enjoyed by EAs, it is worth noting that existing EA solvers usually conduct the search process from scratch, regardless how similar the new problem encountered is to those already solved in the past. Therefore, conventional EAs do not learn from previous problems and the search capabilities of the EA solvers do not automatically grow with problem-solving experiences. However, in reality, problems seldom exist in isolation, solving one problem may thus yield useful information for solving other related problems. In the literature, there is a growing interest in conducting research on evolutionary transfer optimization (ETO) in recent years: a paradigm that integrates EA solvers with knowledge learning and transfer across related domains to achieve better optimization efficiency and performance.

Being one of the emerging research areas in computational intelligence, there are many challenges and open research questions in ETO. This special issue aims at promoting the development of advanced ETO frameworks and algorithms towards more efficient and effective evolutionary optimization, to tackle the ever-increasing complexity and interdependency of optimization problems encountered in real-world applications nowadays.

Topics

This special issue is targeted on general readership articles about design and application of CI technologies. Topics of interest include, but are not limited to:

- Evolutionary transfer optimization in uncertain environments, such as dynamic optimization, robust optimization.

- Evolutionary transfer optimization for solving complex optimization problems, such as NP-hard combinatorial optimization, expensive optimization, multi-modal optimization.
- Evolutionary transfer optimization for multi- and many-objective optimization problems.
- Knowledge transfer in distributed evolutionary computation.
- Evolutionary transfer optimization for multi-fidelity optimization.
- Evolutionary transfer optimization for multi-form optimization.
- Evolutionary transfer optimization for multi-task optimization, including both implicit and explicit knowledge transfer.
- Real-world applications of evolutionary transfer optimization.
- Theoretical studies on knowledge transfer in evolutionary optimization.

Submission

The IEEE Computational Intelligence Magazine (CIM) publishes peer-reviewed high-quality articles. All manuscripts must be submitted electronically in PDF format. Manuscripts must be in standard IEEE two-column/single space format and adhere to a length of 10-12 pages (including figures and references) for regular papers. A mandatory page charge is imposed on all papers exceeding 12 pages in length.

More information on manuscript details and submission guidelines can be found at the following websites:

- Special Issue website: <http://www.bdsc.site/websites/KTEO/KTEO.html>
- IEEE CIM website: <https://cis.ieee.org/publications/ci-magazine/cim-information-for-authors>

Important Dates

- Manuscript Due: **1 February, 2021**
- First Notification: 15 April, 2021
- Revision Due: 15 May, 2021
- Final Notification: 1 July, 2021

Guest Editors

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