IEEE Transactions on Evolutionary Computation

Special Issue on

Preference-Based Multiobjective Evolutionary Algorithms

AIMS & SCOPE

Multiobjective optimization deals with finding and evaluating a number of trade-off optimal solutions. Evolutionary multiobjective optimization (EMO), started in early nineties, is now a fast-growing field of research and application in evolutionary computation. Numerous different algorithms have been developed to address computationally complex problems. Many of these algorithms attempt to find an approximation of the efficient frontier. In particular, bi-criteria problems have been exploited extensively. Typically, the size of the efficient frontier increases substantially with the number of objectives and it becomes harder to generate all efficient solutions. This then makes a strong case for using preference-based methodologies within an EMO algorithm to handle a large number of objectives, often encountered in practical problems.

On the other hand, Multiple Criteria Decision Making (MCDM) research has been active for the past 50 years. Incorporating decision makers (DM) preferences into the solution process has played a major role in MCDM research. There are methods that try to fit a value function that represents the DMs preferences. There are many other methods that progressively obtain preference information from the DM to converge towards preferred solutions. These methods have been successfully applied in many multiple criteria decision-making environments.

Unfortunately, there have been relatively few studies that incorporate the DMs preferences into EMO algorithms yet. We believe that such approaches have important benefits. Focusing on the desired parts of the efficient frontier will ease the computational effort and provide meaningful solutions for the DM. It will be possible to get closer to the efficient solutions when the search space is narrowed down by the preference information. Problems having more than two criteria will be more manageable as well. Increase in such studies will further increase the cooperation between researchers from computer science and MCDM, and make it possible to take advantage of developments in both fields over the years. We believe that this special issue will be an important step in this direction and will remain as a well-cited reference for future researchers in both EMO and MCDM fields. This special issue invites papers on all aspects of theory, computation, and application related topics on preference-based multi-objective optimization involving evolutionary algorithms.

THEMES

High quality and original papers incorporating any type of preference information in any multiobjective problem-solving task involving evolutionary algorithms are invited. Papers involving techniques borrowed from two or more broad methodologies with a clear demonstration of advantages of the collaboration efforts are encouraged. Themes of the submitted articles should use preference information in conjunction with evolutionary algorithms in the following (but not limited to) areas:

- Mathematical and numerical multiobjective optimization
- Non-classical multiobjective optimization
- Multiple criteria decision making and analysis
- Interactive multiobjective optimization
- Innovative application studies
- Multiobjective optimization involving permutations, meta-models, uncertainties, multiple levels, and others
- Multiobjective combinatorial optimization
- Problems involving a large number of objectives

SUBMISSIONS

Manuscripts should be prepared according to the Information for authors section of the journal found at `http://ieee-cis.org/pubs/tec/authors/` and submissions should be done through the journal website: `http://mc.manuscriptcentral.com/tevc-ieee/` clearly marking PMO Special Issue Paper as comments to the editor-in-chief.

Submitted papers will be reviewed by at least three different expert reviewers. Submission of a manuscript implies that it is the authors' original unpublished work and is not being submitted for possible publication elsewhere.

IMPORTANT DATES

The tentative schedule is as follows:

September 15, 2009:	Submissions deadline.
November 30, 2009:	Notification of the first review.
January 11, 2010:	Revisions due.
March 12, 2010:	Final notice of acceptance/reject.
April 16, 2010:	Final manuscript.

The expected publication of the special issue is 2010. Please pass this information on to interested colleagues. For further information, contact the following guest editors.

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