

IEEE Transactions on Evolutionary Computation

Special Issue on Advances in Memetic Computation

I. AIM AND SCOPE

Memetic Computation (MC) represents one of the successful computational intelligence methodologies in current use today. Stemming from the fundamentals of both Darwinian principles of natural evolution and Dawkins' notion of a meme, the term "Memetic Algorithm" (MA) is generally viewed as being close to a form of population-based hybrid evolutionary algorithm coupled with a learning procedure capable of performing refinements. The last few decades have witnessed a rapidly growing research interest in MA as demonstrated by the significant increase in the number of research publications on MA in the form of books, monographs, and archival articles. Despite the vast research on memetic algorithms, there remain many open issues and opportunities that are continually emerging as intriguing challenges for the field.

To date it remains debatable in the evolutionary/meta-heuristic community on whether hybrid evolutionary algorithm represents the true realization of memetic computation. Hybrid instantiations of MA although encompass characteristics of cultural evolution in the search cycle, may not qualify fully as a true evolving system according to Universal Darwinism, since the core principles of memetic *transmission*, *variation* and *selection* may be missing. The definition of the word "meme" has remained ambiguous and controversial in the fields of anthropology and memetics. There is the issue on whether memes should materialize as information restricted to the brain or also available in behaviors and artifacts. For example, some researchers have looked upon memes as "ideas & knowledge", "synapses in neural memory networks", "memory items & abstractions", "laterally/hierarchically organized semantic memory", "information/neural patterns that infect human minds" and others. Taking the lead from the diverse definitions and roles of "meme" in computational intelligence, several forms of memetic algorithms have materialized in the last few decades, with a plethora of potentially rich memetic computing frameworks and operational algorithms to be developed in the decades to come.

This special issue aims at bringing researchers from academia and industry together to report and review the latest advances in memetic computation, to explore future directions of research and to publicize the new and emerging concept of memetics in computational intelligence, particularly evolutionary computation, to a wider audience. Specifically, we seek for diverse state-of-the-art concepts, theory, and practice of memetic computation that are close to evolutionary principles.

II. TOPICS COVERED

Authors are invited to submit their original and unpublished work in the following areas:

- Novel concepts of memetic computation and its adaptation into evolutionary framework and algorithms,

- Competitive, collaborative and cooperative agent based memetic computation,
- Cognitive & Brain inspired memetic computation,
- Meme-gene coevolutionary frameworks and multi-inheritance model,
- Formal and Probabilistic Single/Multi-Objective memetic frameworks,
- Analytical/Theoretical advances in memetic framework,
- Memes, memplexes, meta-memes in computing and high-order evolution,
- Memetic frameworks that mimics individual learning, social learning and imitation,
- Partial or full or meta-Lamarckian/Baldwinian, meta-learning, agent based memetic computation.
- Parallel Memetic framework,
- Memetic frameworks for handling computationally expensive problems

III. IMPORTANT DATES

- March 31, 2010, Submission deadline
- August 31, 2010, Notification of the first-round review
- October 31, 2010, Revised submission due
- January 31, 2011, Final notice of acceptance/reject
- February 28, 2011, Final manuscript

The expected publication time of the special issue is 2011.

IV. SUBMISSION

Manuscripts should be prepared according to the instructions of the "Information for Authors" section of the journal available at (<http://iee-cis.org/pubs/tec/authors/>). Submission should be done through the IEEE TEC journal website: <http://mc.manuscriptcentral.com/tevc-ieee> and clearly indicate "Special Issue on Advances in Memetic Computation" in the comments to the Editor-in-Chief. Submission of a manuscript implies that it is the authors' original unpublished work and is not being submitted for possible publication elsewhere. The review process will be handled by the Guest Editors of this special issue and the Editor-in-Chief, Prof. Garrison W. Greenwood.

V. GUEST EDITORS

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