Journal of *Memetic Computing* Call For Papers
Thematic Issue on 'Memetic Computing in the Presence of Uncertainties'

Paper Submission: July 31, 2009
Notification of acceptance/rejection: December 31, 2009
Final Decision: March 31, 2010

In many real-world optimisation problems, a wide range of uncertainties has to be taken into account. Generally, uncertainties in evolutionary optimisation can be categorized into four classes:

1. Noisy fitness function. Noise in fitness evaluations may come from many different sources such as sensory measurement errors or randomised simulations.

2. Approximated fitness function. When the fitness function is very expensive to evaluate, or an analytical fitness function is not available, approximated fitness functions are often used instead.

3. Robustness. Often, when a solution is implemented, the design variables or the environmental parameters are subject to perturbations or changes. Therefore, a common requirement is that a solution should still work satisfyingly either when the design variables change slightly, e.g., due to manufacturing tolerances, or when the environmental parameters vary slightly. This issue is generally known as the search for robust solutions.

4. Dynamic fitness function. In a changing environment, it should be possible to continuously track the moving optimum rather than repeatedly re-start the optimisation process. For evolutionary computation in dynamic environments, learning and adaptation usually play an important role. Multi-objective problems may also involve dynamic environments.
Handling uncertainties in evolutionary computation has received an increasing interest over the past years. A variety of methods for addressing uncertainties have been reported from different application backgrounds.

This thematic issues's objective is to foster interest in the issue of handling uncertainties by proposing solutions which are related Memetic Computing. Papers are solicited addressing any of the aforementioned four areas and/or their combination with optimisation methods inspired by the Dawkinian principles of the Meme theory.
The aim of this thematic issue is to reflect the most recent advances in both the fields, optimisation in the presence of uncertainties and Memetic Algorithms (MAs) and increase the awareness of the computing community at large on the use of MAs for real-world problems. In particular, we endeavor to demonstrate the current state-of-the-art in the theory and practice of MAs and their successful applicability to uncertain environment. Topics of interests include (but are not limited to):

The aim of this thematic issue is to reflect the most recent advances in both fields optimisation in the presence of uncertainties and Memetic Algorithms (MAs), and increase the awareness of the computing community at large on this effective technology. In particular, we endeavor to demonstrate the current state-of-the-art in the theory and practice of MAs and their successful applicability to uncertain environment. Topics of interests include (but are not limited to):

- Novel competitive/cooperative MAs for noise filtering and dynamic tracking of the optima
- Integration of noise filtering into the local search of a MA
- Adaptative MAs for handling features of the fitness landscape including uncertainties
- Analytical and/or theoretical studies that enhance our understanding of algorithmic mechanisms
- Asymptotic global convergence analyses and/or complexity analyses of MAs
- Multi-objective MAs for dynamic and noisy problems
- Surrogate-assisted MAs or MAs using approximation methods
- MAs tailored to specific noise features
- Stochastic approximators of computationally expensive fitness functions
- Knowledge incorporation in MAs
- Real-world/ engineering applications of MAs

Manuscripts should conform to the standard sfrmat of the Memetic Computing journal as indicated in the Information for Authors. All submissions will be peer reviewed subject to the standards of the journal. Manuscripts based on previously published conference papers, e.g., EvoSTOC 2009, must be extended substantially. The best papers presented in EvoSTOC 2009 will be invited to submit an extended version for a publication in the Thematic Issue. Electronic submissions must be in PDF format and should be prepared according to the journal guidelines. The submissions should be performed through the

[journal automatic system](#). Please specify on the first page of the manuscript that the submission is intended for this thematic issue.

All enquiries on this special issue should be sent to Dr. Ferrante Neri at neferran@cc.jyu.fi. Prospective authors are also invited to send an email to Dr. Neri indicating their interest in submitting a paper and the specific topics addressed.

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