Editorial

Meng-Hiot Lim · Steven Gustafson ·
Natalio Krasnogor · Yew-Soon Ong

Published online: 7 June 2011
© Springer-Verlag 2011

When memetic algorithms (MA) was first proposed, it seemed like a very nice and logical approach to deal with optimization, although it must be qualified that the idea of mixing global and local search in a synergistic manner is not new. Goldberg [1] in his classic text on genetic algorithm described it as a hybrid, which in essence is similar to MA. The principle behind such as mix is intuitively rational and logical; and to date it has served as the guiding principle for designing and configuring effective metaheuristics. Indeed many successful applications have been demonstrated based on this guiding principle. It is time we move beyond the boundary of a meme defined in the context of MA as being any auxiliary local search methods within an evolutionary algorithm.

The field of memetic computation has seen significant progress over the last 2 years since the publication of the inaugural issue of Memetic Computing in March 2009. From a computational perspective, memetic computing is viewed as a paradigm that uses the notion of meme(s) as units of information encoded in computational representations for the

purpose of problem-solving [2]. Representations in the form of decision tree, artificial neural works, fuzzy system, graphs, etc., are unconventional examples of the various manifestations of memes encoding. Such flexible and unencumbering perceptions of memes open up a whole new dimension and flexibility on how well-established ideas and methodologies can be synergistically combined to work for the benefits of problem-solving. Articles in the earlier issues of Memetic Computing have to a certain extent demonstrated this aspect effectively.

Among the past issues of Memetic Computing journal, a few have been thematic in nature. To be specific, six of the earlier published issues have been devoted to themes based on areas relevant to the field of memetic computation. The Guest Editors have put in tremendous effort in putting together these Thematic Issues. More importantly, what they have accomplished is to put forth the notion of memetic computing a perception that is wide and enriching. We were deeply encouraged by the strong support and will endeavor to channel our effort to promote more thematic issues. On this positive note, we welcome any suggestions and proposals of thematic issues.

This issue of Memetic Computing is made up of five good articles on the expansive scope and horizon of memetic computation. To begin this issue, the paper by Chia, Goh, Tan and Shim gives an illustration of how data mining technique can be applied to enhance the performance of evolutionary algorithms. The idea of mining rules in each generation to derive what they refer to as knowledge based mutation type of operation is a good demonstration of how problem-oriented memes can be configured during a search. The second paper by Shichel and Sipper shows how game playing controllers can be evolved using genetic programming, to the extent of evolved agents achieving performance comparable to that of hand-crafted controllers. Here, the agents carry the memes

M.-H. Lim (✉) · Y.-S. Ong
Nanyang Technological University,
Singapore, Singapore
e-mail: EMHLIM@ntu.edu.sg

Y.-S. Ong
e-mail: asysong@ntu.edu.sg

S. Gustafson
GE Global Research,
Niskayuna, NY, USA
e-mail: steven.gustafson@research.ge.com

N. Krasnogor
University of Nottingham,
Nottingham, UK
e-mail: nxk@Cs.Nott.AC.UK

in the form of rules that endow them with capability to drive race cars. Mendis and Gedeon in their paper use the Levenberg-Marquardt method as a fast converging local optimization learning algorithm for learning weights and aggregation parameters in Generalized Weighted Relevance Aggregation Operator (WRAO) and Generalized Ordered Weighted Aggregation Operator (GOWA) and apply them to three sets of UCI benchmarks. The paper by Ong and Fukushima addresses the issue of termination criteria in genetic algorithms. Instead of relying on predefined termination criteria, the authors developed genetic algorithm (GA) with automatic termination and acceleration elements which allow the search to end without resorting to predefined conditions. The final article in this issue is by Saha and Bandyopadhyay. In this paper, they present a line symmetry distance based technique for clustering. They propose a new line symmetry based distance to calculate the amount of symmetry of a point with respect to the first principal axis of a data set. The

evolutionary clustering technique that uses this new principal axis based line symmetry distance for assignment of points to different clusters. Readers will find the collection of these five diverse articles useful as reference for their research.

We thank all those who have supported this journal. To reach a 3rd year milestone is a significant achievement for any journals. For this, the contributions of the reviewers and Editors should not be undermined. We are heartened by the strong show of support and will continue to put in our effort to maintain and enhance the quality of this journal.

References

1. Goldberg DE (1989) Genetic algorithms in search, optimization and machine learning. Addison-Wesley, USA
2. Ong YS, Lim MH, Chen X (2010) Memetic computation—past, present and future. *IEEE Comput Intell Mag* 5(2):24–31