Editorial

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Since the first issue of the *Memetic Computing* journal was published, just over 3 years ago, we have seen a steady increase in the number and quality of works published within the field of memetic computing. If 3 years ago one would have done a Google search for “memetic computing”, only a handful of matches would have been returned. The same query today surpasses the two million mark, a clear indication of the growing attention that this field of research has garnered. Memetic computing is mainly about taking a meme-centric approach towards problem-solving. To pin down on a definitive and all-inclusive definition of what constitutes memetic computation may prove futile. However, it is hoped that many of the pertinent issues relevant to this field were appropriately addressed with the timely publication of a recent broad-based survey paper on memetic computing [1]. While debates and discussions may go on, it is nevertheless a healthy and positive sign pointing towards the potentially fertile ground of research that this field has to offer.

In this issue, five articles have been selected for publication. The first paper by Lam and Li highlights a new area of metaheuristics inspired by the nature of chemical reactions. Basically, a chemical reaction can be viewed as a process that involves the transformation of molecular components into other, sometimes more complex, components while in other occasions it may result in simpler elements. Termed simply as chemical reaction optimization (CRO), it builds on the principle that reactive molecules with excessive energy, through a sequence of elementary chemical reactions, are converted into a state of minimum energy. The article offers a good survey of this recently proposed CRO metaheuristic.

It is structured in a relatively easy to read tutorial style content, serving as a good platform to gear up and to establish a reasonable understanding of the subject matter. Illustrations of CRO in solving some common engineering problems are also presented.

The second article selected for this issue gives an enlightening exposition of the mechanics of memes reproduction, in particular that of linguistic memes. The paper by Sutcliffe and Wang provides a broad and inclusive interpretation of memes based on previous work. Their paper starts with Dawkins’ original interpretation of memes as units of information in social and behavioral contexts, and includes more recent work on memes from a computational and simulation perspective. Insights about memes reproduction strategies, particularly as they relate to the choice of interpreting versus memorising strategies as tools for faithful memetic reproduction are reported. The paper also studies the impact of the random-based, frequency-based and similarity-based imitation strategies. This is one of only a few papers that deal directly with memetic reproduction and we hope to see more papers along those lines of research submitted for consideration to publish by our journal.

The third paper deals with the generation of online test papers. The problem formulated is a multi-objective optimization based on a divide-and-conquer memetic approach. To date, dynamic programming, tabu search, genetic algorithm, swarm intelligence approaches, artificial immune systems and differential evolution are some of the techniques used to tackle online test-papers generation. Here, Nguyen, Hui and Fong use an approach based on a memetic algorithm. They successfully tackle the complexity of the problem by dividing the set of constraints into two subsets to be solved by evolutionary computation and local search. The authors reported results that outperformed other test paper generation techniques.

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The fourth paper in this issue pertains to a clustering ensemble algorithms. The objective is to combine multiple partitions generated through various clustering means into a single cluster. A genetic-based clustering ensemble algorithm is used as the clustering ensemble engine. Focusing on the generation of initial partitions which serve as the initial population of a genetic-based clustering approach, Ghaemi and co-authors show that the threshold fuzzy C-means approach enhances the performance of the genetic ensemble clustering. They demonstrated the effectiveness of the fuzzy C-means clustering on real-world datasets and showed that by and large, with the fuzzy C-means to generate the initial population for the genetic clustering ensemble algorithm, the performance is significantly improved. To this end, one may see that the fuzzy C-means serves as an effective meme to filter good quality partitions to direct the search towards good quality solution.

We conclude this issue with a paper on path-planning for mobile robots by Botzheim, Toda and Kubota. Here, the authors describe a bacterial memetic algorithm for minimizing path length and number of turns without collision. The so-called bacterial memetic algorithm relies on a set of “bacterial” operators, as opposed to typical genetically

motivated type of operators like crossover and mutation. The bacterial operators are extensions that enhance the search and representation capability of the algorithm. We believe that this is a promising research direction both from the methodological aspects of bacteria-inspired memetic algorithms as well as from the application viewpoint.

Crossing the 3-year barrier is a significant milestone for the any new journal. The authors, reviewers and the editors who managed the review of papers submitted to Memetic Computing have played a key and defining role that contributed to the success of the journal in general and this issue in particular. Indeed, the five articles in this issue give quite a different perspective of memes, technically consistent with the multi-faceted dimensions of memetic computing. We continue to value suggestions, feedbacks, ideas for thematic issues. We thank all of you who have offered their input already as it has contributed to the success of this journal.

Reference

1. Chen XS, Ong YS, Lim MH, Tan KC (2011) A multi-facet survey on memetic computation. *IEEE Trans Evol Comput* 15(5):591–607