Editorial

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The scope and trend in memetic computing has undergone significant transformation in recent years, as evidenced by the number of papers that directly or indirectly conveying the intrinsic role of memes as evolvable and transferrable units in computational problem-solving. With many young and promising researchers working in the field and publishing their work in this journal, it serves as an implicit acknowledgement of meme-centricity as a new dimension for enhancing the performance of most optimization techniques. For this print issue of the journal, we bring together five articles that cover aspects of memes in practical problem solving, with three of the papers focusing on multi-objective optimization in real-world problems.

The notion of neural networks as units of memetic manifestation has been acknowledged in earlier publications. In recent years, a method of non-iterative training for neural networks referred to as extreme learning machine (ELM) has gained greater attention from researchers in the field of machine learning. We foresee that the idea of ELM as a memetic unit is likely to gain traction with more papers in this domain submitted for publication consideration. We shall therefore expose the domain of ELM in this issue with an article presenting a methodology for building up high-quality classification model from source data based on sparse transfer representation for extreme learning machine. Li et al. refer to this as TFSR-ELM. They show that by incorporating penalty for diversity between consecutive classifiers in the cost function can result in transfer of knowledge. They obtained good results, showing that the TFSR-ELM can effectively improve

the classification by learning free sparse knowledge. It is also effective for different size of training data. They further extend it to a novel transfer free sparse representation kernel extreme learning machine (TFSR-KELM). Experimental results showed the effectiveness of the proposed algorithm.

The second paper by Bui and Huynh describes the issue of designing survivable network for last mile communication. They proposed a formulation of the survivable network design problem based on fault-tolerant multi-objectivity optimization; minimizing network cost and minimizing the number of simultaneous connections. They refer to this as survivable network design problem (SNDP) for last mile communication networks (L-SNDP), which basically involves configuring a set of infrastructure nodes and a set of customers C . There are two customer types, subset C_1 requiring a single connection (type-1) and subset C_2 with requirement for being redundantly connected (type-2). The multi-objective problem involves searching for a sub-graph with the smallest weight whereby all customers are connected to infrastructure nodes and the connections are fault-tolerant. Some comparison results against other multi-objective optimization algorithms are also presented to validate their approach.

In the next paper, Ji, Cao and Tang outline a unified approach for scheduling the landing of aircrafts for air traffic control. For airports, an arriving aircraft can be simply scheduled based on first-come-first-served rule according to the predicted landing time. Although generally perceived as a fair scheduling scheme, it does not optimize the usage of capacity of the airport. Recently, research on aircraft sequencing and scheduling (ASS) has focused on rearranging the assigned landing time subject to the minimum permissible time interval between successive landings, thereby changing the landing sequence in order to reduce airborne delay. Their work described in this paper proposed an approach

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that is applicable to a number of different problem formulations of ASS. The ASS problems that include different objective functions and constraints are first abstracted as a constrained permutation-based problem. The basic idea of their approach consists of two stages; sequence searching using an estimation of distribution algorithm framework in one stage followed by evaluation of sequences in the second stage.

We include a paper on robot path navigation by Kundu and Parhi. They present a dynamically adaptive population based harmony search algorithm for configuring collision free near optimal path for underwater robot in a three-dimensional space. The work described adopts dynamic adaptation of control parameters and perturbation of solution vectors to achieve a balanced exploitation and randomization capability of the search process. The authors compared the underwater navigational performance of their proposed method against

improved version of ant colony optimization and heuristic potential field method in avoiding static obstacles of different shapes and sizes.

The last paper of this issue is by Chong, describing a memetic approach known as the opposition-based self-adaptive hybridized differential evolution algorithm (OSADE) which was compared against other state-of-the-art algorithms for multi-objective optimization. The author presented experimental results based on simulation on standard benchmarks, showing the competitiveness of the approach based on the inverted generational distance (IGD) and the Hausdorff distance performance indicators.

We thank the Editors who managed the review of the papers selected for this issue and gratefully acknowledge the time and effort of the reviewers in scrutinizing the manuscripts.