

**EDITORIAL PREFACE**

# **Wide Applications of Hybrid Models and Hybrid Evolutionary Algorithms**

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Welcome to the second issue of IJAEC in 2012. We are pleased to invite our readers to enjoy all the valuable contributions sent by the members of the Editorial Board for helping us in starting IJAEC.

Along with the rapid advancements in evolutionary computing technology, it is clear that the increased computational capacity with vigorous mathematical models still does not excellently deal with the real-world problems. During the past decades, applications of hybrid evolutionary algorithms and hybrid models, which cover the state-of-the-art evolutionary computation, have successfully solved problems in a wide variety of fields such as forecasting, scheduling, classification, knowledge acquirement, biometrics, medical diagnosis, signal processing, and so on. IJAEC will continue receiving numerous interesting and high quality submissions.

In this issue, each paper has been carefully reviewed, five feature contributions are included in this issue, with addressing wide

applications of hybrid multiple objective evolutionary algorithms and hybrid evolutionary algorithms, such as hybrid multi-objective with improved genetic algorithm in parallel systems reliability optimization, hybrid multi-objective with simulated annealing algorithm in machine scheduling, hybrid discrete PSO in non-convex optimization, and functional link ANN in software cost estimation.

The first article, by Taboada from The University of Texas at El Paso (USA) and Coit from The State University of New Jersey (USA), proposes a new multiple-objective evolutionary algorithm for reliability optimization of series-parallel systems. The proposed algorithm employs a genetic algorithm based on rank selection and elitist reinsertion with a modified constraint handling method. The main difference among the proposed algorithm and other multiple objective evolutionary algorithms is in the crossover operation performance and in the fitness assignment. In the crossover step, several off-springs are created through

multi-parent recombination to ensure that the mating pool contains a great amount of diverse solutions. The experiments conclude that the proposed algorithm has a better performance when solving multiple objective redundant allocation problems.

The second paper, by Deep, Chauhan, and Pant from Indian Institute of Technology, Roorkee (India), proposes a discrete variant of particle swarm optimization, namely HDPSO, to minimize non-convex trim loss problem. Due to highly complex nature of trim loss problem, it is not easy for manufacturers to select an appropriate method that provides global optimal solution. The proposed HDPSO generates binary variables by using sigmoid function with its domain derived from position update equation, then employs embedded a mutation operator, namely power mutation, to help position updating. The computational experiments results indicate the competitiveness of proposed approach has a better performance, based on four examples with different levels of complexity, over other considered methods.

The third article, by Moghaddam, Amodeo, and Yalaoui from University of Technology of Troyes (France), and Karimi from Amirkabir University of Technology (Iran), employs two-phase method (TPM), a general technique to solve bi-objective combinatorial optimization problems, to find all supported and non-supported solutions in the real-world machine scheduling problems with small-size. In addition, authors also develop three different bi-objective simulated annealing algorithms to find a good estimation of Pareto-optimal solutions for large-sized problems. Empirical results obtained reveal that the distribution of solutions found by the proposed algorithms is more uniform than other alternatives, and it could provide a better estimation from exact Pareto-optimal solution set for the single machine scheduling problem.

The last article in this issue, by Rao from Anil Neerukonda Institute of Technology and Sciences (India), Dehuri from Fakir Mohan

University (India), and Mall from Indian Institute of Technology, Kharagpur (India), proposes a faster functional link artificial neural network (FLANN) based software cost estimation in the process of predicting the effort required to develop a software system. As known that software development projects have been found to overrun their planned effort as defined at preliminary design review, hence software cost estimation is important for budgeting, risk analysis, project planning and software improvement analysis. The proposed FLANN mainly employs optimal reduced datasets (ORD), which reduces the whole project base into small subsets that consists of only representative projects, to make the functional link artificial neural network faster. In the empirical testing, the representative projects are given as input to FLANN and exhaustively tested on eight state-of-the-art polynomial expansions. Empirical results show that the proposed approach yields accurate results vis-à-vis conventional FLANN, support vector machine regression (SVR), radial basis function (RBF), classification and regression trees (CART).

I wish that the papers in this issue will receive attentions and opportunities that are continually inspiring new ideas in evolutionary computation fields. In closing, I would like to thank IGI Global, for making IJAEC possible. In addition, since IJAEC is a collaborative effort from all members of the Editorial Board, the composited work reveals the diverse topics in EC, I would like to take this opportunity to thank each member for her/his valuable cooperation. All papers submitted to IJAEC undergo a comprehensive review process under the valuable suggestions from each member of Editorial Board. Each paper receives at least five reviews, based on which the Editorial Board member makes a recommendation. The Editorial Board members ensure all papers receive in-depth reviews before any decision is made. These decisions are reviewed by the Editor-in-chief. I would also like to thank the authors who have chosen IJAEC as a medium to

publish their research results. I hope that readers will find these articles useful, informative, and innovative and I am looking forward to hearing your comments, criticisms and suggestions to continuously enhance it and serve you better. You are also invited to contribute to IJAEC according to your interests and expertise.

Enjoy your reading and do not hesitate to send us your thoughts about these papers as well as your own research paper in the exciting field of evolutionary computation.

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