

2015 IEEE Special Session on Evolutionary Computation in Operations Research, Management Science and Decision Making

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Tolerant Control, Reliability, and Optimization

Organizers:

Wei-Chang Yeh, National Tsing Hua University, Taiwan (yeh@ieee.org)

Yew-Soon Ong, School of Computer Engineering, Director of the Centre for Computational Intelligence, Nanyang Technological University, Singapore (ysong@ieee.org)

Vera Yuk Ying Chung, School of Information Technologies, The University of Sydney, Australia (vchung@it.usyd.edu.au)

Changseok Bae, Electronics and Telecommunications Research Institute (ETRI), Korea (csbae@etri.re.kr)

Aim and Scope

Evolutionary Computation has roots in Darwin's theory of survival of the fittest and Artificial Intelligence respectively. The essential idea of Evolutionary Computation algorithms is to employ many simple agents applying almost no rule which in turn leads to an emergent global behavior. That is, Evolutionary Computation is the emergent collective intelligence of groups of simple agents.

Evolutionary Computation are initialized with a population of random solutions inside the problem space and it then searches for optimal solutions by updating

generations. There are several popular Evolutionary Computation algorithms based on these concepts, including Genetic algorithm (GA), Memetic Algorithm (MA), Ant Colony Optimization (ACO), Particle Swarm Optimization (PSO), Artificial Bee Colony (ABC) algorithms, Simplified Swarm Optimization (SSO), and many other flavors.

Since the early 1990s, Evolutionary Computation has been utilized to obtain optimal or good-quality solutions to difficult optimization problems in fields for which exact and analytical methods do not produce optimal solutions in an acceptable amount of time, especially for these problems are very difficult to solve by conventional approaches. With Evolutionary Computation, the developed algorithms are flexible to internal and external changes, robust when some individuals fail, and decentralized and self-organized.

It is recognized the Evolutionary Computation have been a popular research area that has received significant attention during the past several decades because of Evolutionary Computation's critical importance in various kinds of fields. In recent years, we have seen an increasing interest in Evolutionary Computation in creating stochastic methodologies and optimization techniques with the aims of resembling and simulating the phenomenon of nature for solving larger problems in Operations Research, Management Science and Decision Making including:

- Multi-objective optimization
- Fuzzy optimization problems
- Combinatorial optimization problems
- Scheduling problems
- Green logistic problems
- Advanced transportation problems
- Network design and routing
- Manufacturing cell design
- Reliability design problems

Furthermore, the Evolutionary Computation is the mainstream of data mining analyzing and discovering knowledge from a large complex dataset of heterogeneous quality. The huge datasets exist in modern society so that makes many well-known algorithms and innovative methods impracticable to explore the optimization information by mining data.

Despite a significant amount of research on Evolutionary Computation, there remain many open issues and intriguing challenges in the field. The aims of this special session are to demonstrate the current state-of-the-art concepts of Evolutionary Computation in Operations Research, Management Science and Decision Making, to

reflect on the latest advances in Evolutionary Computation, and to explore the future directions in Evolutionary Computation.

Authors are invited to submit their original and unpublished work in the areas including, but not limited to:

- Evolutionary Computation,
- The studies of Evolutionary Computation in Operations Research, Management Science or Decision Making,
- Novel or Improved frameworks of Evolutionary Computation model,
- Data Mining using Evolutionary Computation,
- Analytical studies that enhance our understanding on the behaviors of Evolutionary Computation,
- The optimization techniques of Evolutionary Computation,
- Knowledge incorporation in Evolutionary Computation,
- Others.

Program Organizers and Chair:

Professor Wei-Chang Yeh, Ph.D.

Department of Industrial Engineering and Engineering Management

National Tsing Hua University, Hsinchu, Taiwan 300

Phone: +886-3-5742443

Fax: +886-3-572-2204

Email: yeh@ieeee.org

URL: <http://integrationandcollaboration.org>

<https://sites.google.com/site/integrationcollaborationlab/>

Wei-Chang Yeh has completed his Ph.D degree in 1992 at the Department of Industrial Engineering, University of Texas at Arlington, USA. He is the Professor of the Department of Industrial Engineering and Engineering Management in the National Tsing Hua University, Taiwan. He has also published more than 108 papers in reputed journals and serves as an editorial board member of repute. His research interest include Network Reliability, Scheduling Problem, Cloud Computing Management, SSO and Soft Computing and Data Mining. Prof. Yeh is an editorial board members of “Reliability Engineering and System Safety (RESS)”, “Soft Computing with Applications (SCA)” and “International Journal of management and Marketing (IJMM)”. He is most honored to be able to serve as the Chair for the IEEE Computational Intelligence Society, and looks forward to the event.

Program Committee of Potential Participants and Reviewers:

Professor Huaguang Zhang, Ph.D.

Professor Ana Maria Madureira, Ph.D.
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