INVITATION TO IEEE DISTINGUISHED LECTURE

IEEE Distinguished Lecture hosted by the School of Science, Computer Science and Information Technology, RMIT University and the IEEE Victorian Section Computational Intelligence Chapter: Research Topics on Evolutionary Many-Objective Optimization presented by Professor Hisao Ishibuchi, Graduate School of Engineering, Osaka Prefecture University, Osaka, Japan

Date: Friday 25 November 2016

Time: 11:30am-12.50pm

Venue: RMIT City Campus, Building 80, Level 9, Room 12

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About the presentation

Recently, evolutionary many-objective optimization has been one of the most active research areas in the field of evolutionary computation. It has been repeatedly pointed out that the main stream research framework in the evolutionary multiobjective optimization (EMO) community does not work well on many-objective problems. When an EMO algorithm is applied to a many-objective problem, almost all individuals in a population become non-dominated in a very early stage of evolutionary (e.g., in 10 generations). In this situation, Pareto dominance-based fitness evaluation cannot generate a strong section pressure to efficiently drive the population toward the Pareto front.

A number of approaches to many-objective optimization have been proposed in the literature. A current trend is the use of a set of well-distributed weight vectors (reference directions, reference points) for many-objective optimization in a similar framework to the decomposition-based EMO algorithm (i.e., MOEA/D). In this presentation, we will discuss some recent research topics in the field of evolutionary multi-objective and many-objective optimization. Emphasis will be placed on the difficulty in performance comparison of evolutionary many-objective algorithms from the following viewpoints: (1) Population size specification for fair comparison, (2) Special characteristic features of frequently used many-objective test problems called DTLZ and WFG, (3) Dependency of the performance of recently-proposed MODE/D-based many-objective algorithms on the shape of the Pareto fronts of those test problems, and (4) Dependency of hypervolume-based performance comparison results on the choice of a reference point for hypervolume calculation.

About the presenter

Hisao Ishibuchi received the BS and MS degrees from Kyoto University in 1985 and 1987, respectively. In 1992, he received the Ph. D. degree from Osaka Prefecture University where he has been a full professor since 1999. He received a Best Paper Award from GECCO 2004, HIS-NCEI 2006, FUZZ-IEEE 2009, WAC 2010, SCIS & ISIS 2010, FUZZ-IEEE 2011 and ACIIDS 2015. He also received a 2007 JSPS Prize. He was the Chair of the IEEE CIS Fuzzy Systems Technical Committee (2008-2009), the IEEE CIS Vice-President for Technical Activities (2010-2013), the General Chair of ICMLA 2011, the Program Chair of IEEE CEC 2010 and IES 2014, and a Program/Technical Co-Chair of FUZZ-IEEE 2006, 2011-2013, 2015 and IEEE CEC 2013-2014.

Currently, he is the Editor-in-Chief of IEEE CI Magazine (2014-2017), an IEEE CIS AdCom member (2014-2016), and an IEEE CIS Distinguished Lecturer (2015-2017). He is also an Associate Editor of IEEE TEVC (2007-2016), IEEE Access (2013-2016) and IEEE TCyb (2013-2016).

He is an IEEE Fellow. His research interests include fuzz rule-based classifier design, evolutionary multi-objective and many-objective optimization, and evolutionary games. According to Google Scholar, the total number of citations of his publications is about 19,000 and his h-index is 60. For further information please visit: http://www.cs.osakafu-u.ac.jp/~hisaoi/.

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