

IEEE Computational Intelligence Society Distinguished Lecturer Program

Speaker: Hisao Ishibuchi, Southern University of Science and Technology, China

Inviting Chapter: IEEE Computational Intelligence Society Western Australia Chapter

Date: 15 June 2022

Time: 1pm (Perth time)

Number of Participants: 66 People

Lecture Title: Fair Performance Comparison of Evolutionary Multi-Objective Optimization Algorithms

Abstract:

In the last three decades, a wide variety of evolutionary multi-objective optimization (EMO) algorithms have been proposed in the literature. In each study, it was demonstrated that the proposed algorithm outperformed other algorithms through computational experiments on test problems. Visual comparison and performance indicator-based comparison (such as hypervolume, IGD and IGD+) are usually used for evaluating EMO algorithms. However, it is very difficult to compare EMO algorithms in a fair manner. This talk explains a number of issues related to fair performance comparison of EMO algorithms. The discussed topics include (i) visual comparison of solution sets of a many-objective problem, (ii) termination condition in computational experiments, (iii) population size specification, (iv) choice of performance indicators, (v) reference point specification for hypervolume calculation, (vi) reference point set specification for IGD and IGD+ calculation, and (vii) choice of test problems. Using experimental results, it is clearly demonstrated that totally different comparison results can be obtained depending on the settings related to these issues.

Bio:

Prof. 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 professor since 1999. From April 2017, he is with the Department of Computer Science and Engineering, SUSTech, Shenzhen, China as a Chair Professor. He received a Best Paper Award from GECCO 2004, HIS-NCEI 2006, FUZZ-IEEE 2009, WAC 2010, SCIS & ISIS 2010, FUZZ-IEEE 2011, ACIIDS 2015 and GECCO 2017. He also received a 2007 JSPS (Japan Society for the Promotion of Science) Prize. He was the IEEE CIS Vice-President for Technical Activities (2010-2013) and an IEEE CIS Distinguished Lecturer (2015-2017). Currently, he is the President of the Japan EC Society (2016- 2018), the Editor-in-Chief of IEEE CI Magazine (2014-2019) and Journal of Japan EC Society (2014-2018), an IEEE CIS AdCom member (2014-2019). He is also an Associate Editor of IEEE TEVC (2007-2018), IEEE Access (2013-2018) and IEEE TCyb (2013-2018). He is an IEEE Fellow.

Website: <https://deeplearningandaiwinterschool.github.io/>

PROGRAM

Tentative program - All times are given in ICT time (UTC+7)

Day 1: Tue 14 Jun

Day 2: Wed 15 Jun

Day 3: Thu 16 Jun

Day 4: Fri 17 Jun

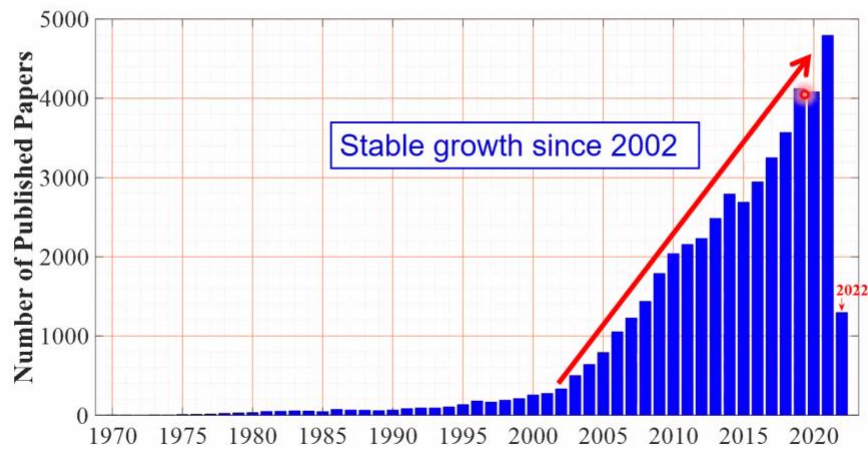
Day 5: Sat 18 Jun

Day 2: Wed 15 Jun 2022 (ICT time UTC+7)

Time	Activity
IEEE-CIS Distinguished Lecturer Talk II	
08.00 - 09.00 am.	Speaker: <i>Jie LU</i> , University of Technology Sydney, Australia Topic: Fuzzy Transfer Learning
Academic Talk	
09.00 - 10.00 am.	Speaker: <i>Guanjin (Brenda) Wang</i> , Murdoch University, Australia Topic: Learning from imbalanced data and case studies in healthcare
Academic Talk	
10.00 - 11.00 am.	Speaker: <i>Jagdish Chand Bansal</i> , South Asian University New Delhi, India Topic: Drone Swarm: Concept, Challenges and Applications
11.00 am. - 12 noon	Lunch Break, Group Photo and Networking
IEEE-CIS Distinguished Lecturer Talk III	
12 noon - 01.00 pm.	Speaker: <i>Hisao Ishibuchi</i> , Southern University of Science and Technology, China Topic: Fair Performance Comparison of Evolutionary Multi-Objective Optimization Algorithms
Academic Talk	
01.00 - 02.00 pm.	Speaker: <i>M. Tanveer</i> , Indian Institute of Technology Indore, India Topic: Large Scale Machine Learning Algorithms and Applications to Alzheimer's Disease (bio)
Academic Talk	
02.00 - 03.00 pm.	Speaker: <i>Qi Sun, Bei Yu</i> , Chinese University of Hong Kong, Hong Kong, China Topic: Fast and Efficient Deep Learning Deployments via Learning-based Methods (Prof. Bei Yu's bio)

Popularity of Multi-Objective Optimization Research

Number of papers published in each year with “Multi-Objective” or “Multiobjective” in the paper title (Scopus Database: **March 29, 2022**)



Optimization Problems

Single-Objective Problems:

Maximize $f(x)$

Multi-Objective Problems:

Maximize $f_1(x), f_2(x)$

Maximize $f_1(x), f_2(x), f_3(x)$

Maximize $f_1(x), f_2(x), f_3(x), f_4(x)$

Maximize $f_1(x), f_2(x), f_3(x), f_4(x), f_5(x), \dots$

