Area: Power and Energy Systems

Host: Professor Dipti Srinivasan

Jointly organized by:
IEEE Computational Intelligence Society, and
Green Energy Management & Smart Grid Research Center (GEMS)

TOPIC	:	**New Framework of Multi-Objective Evolutionary Algorithms with Unbounded Archive**
SPEAKER	:	**Professor Hisao Ishibuchi** **IEEE Fellow, Chair Professor** **Southern University of Science and Technology (SUSTech), China**
DATE	:	**Tuesday, 24 October 2023**
TIME	:	**4.00PM to 5.00PM**
VENUE	:	**Block E3, E3-06-02** **College of Design and Engineering, National University of Singapore**
REGISTRATION		**Registration is required and compulsory. Please register here by 23 October 2023.** **Light refreshments will be provided.** **Contact person: Anupam Trivedi (eleatr@nus.edu.sg)**

ABSTRACT

In the field of evolutionary multi-objective optimization (EMO), early EMO algorithms in the 1990s are called non-elitist algorithms where no solutions in the current population are included in the next population. That is, the next population is the offspring population of the current population. This non-elitist algorithm framework is clearly inefficient since we cannot preserve good solutions during the execution of EMO algorithms. As a result, almost all EMO algorithms in the last two decades are based on the elitist framework where the next population is selected from the current population and its offspring population. In both frameworks, the final population is presented to the decision maker as the final output from EMO algorithms. Recently, some potential difficulties of the elitist framework have been pointed out. One is that the final population is not always the best subset of all the examined solutions. It was demonstrated in the literature that some solutions in the final population are dominated by other solutions generated and deleted in previous generations. It is also difficult to utilize solutions in previous generations to generate new solutions. Offspring are always generated from solutions in the current population. Another difficult is that only a limited number of solutions (i.e., only solutions in the final population) are obtained. A new framework with an unbounded external archive can easily handle these difficulties since the final solution set is selected from all the examined solutions. In this framework, we can select an arbitrary number of solutions as the final output from EMO algorithms. Stored solutions in the external archive can be used to create new solutions and also to select solutions for the next population. In this talk, some interesting research issues in the new EMO algorithm framework are explained.

BIOGRAPHY

Hisao Ishibuchi received the BS and MS degrees from Kyoto University in 1985 and 1987, respectively, and the PhD degree from Osaka Prefecture University in 1992. He is a Chair Professor at Southern University of Science and Technology, China. He was the IEEE Computational Intelligence Society (CIS) Vice-President for Technical Activities in 2010-2013 and the Editor-in-Chief of IEEE Computational Intelligence Magazine in 2014-2019. Currently he is an IEEE CIS Administrative Committee Member (2014-2019, 2021-2023), and an IEEE CIS Distinguished Lecturer (2015-2017, 2021-2023). He is also General Chair of IEEE WCCI 2014 in Yokohama, Japan. He received a Fuzzy Systems Pioneer Award from IEEE CIS in 2019, an Outstanding Paper Award from IEEE Trans. on Evolutionary Computation in 2020, and Best Paper Awards from FUZZ-IEEE 2009, 2011, EMO 2019, and GECCO 2004, 2017, 2018, 2020, 2021. He also received a JSPS prize in 2007. He is an IEEE Fellow.