IEEE Distinguished Lecture
IEEE Computational Intelligence Chapter, IEEE NZ Central Section

Date: 10 June 2019
Time: 10:30-11:30am
Venue: Oceania Inner South, Te Papa
Title: Advances in Evolutionary Dynamic Multi-objective Optimization
Speaker: Kay Chen Tan, IEEE Fellow, IEEE Distinguished Lecturer

Abstract: Multi-objective optimization involves simultaneous optimization of two or more objective functions that are conflicting in nature, which results in a set of trade-off solutions for a given optimization problem. Evolutionary algorithms are capable of finding diverse set of solutions in a single simulation run due to their population-based nature, therefore making them very popular in solving multi-objective optimization problems. However, real-world optimization problems can involve objective functions, decision variables and constraints that may change over time. A dynamic multi-objective optimization problem requires the evolutionary algorithm to be capable of detecting changes in the problem's environment, and robustly tracks the changing optimal solutions to achieve a faster convergence while maintaining the diversity. In this presentation, prediction-based dynamic handling approaches will be discussed and new methods such as Kalman filter and Mixture-of-Experts dynamic handling strategies will be presented. These prediction models can learn the patterns from previous experience and predict future changes. The predictions help to guide the search towards the changed optima, thereby accelerating convergence of the optimization process. Future research directions will also be discussed in the presentation.

Biography:

Kay Chen Tan is a full Professor with the Department of Computer Science, City University of Hong Kong, Hong Kong. He is the Editor-in-Chief of IEEE Transactions on Evolutionary Computation, was the EiC of IEEE Computational Intelligence Magazine (2010-2013), and currently serves on the Editorial Board member of 15+ international journals. He is an elected member of IEEE CIS AdCom (2017-2019) and is an IEEE Distinguished Lecturer (2019-2021). He has published 250+ refereed articles and 6 books. He is a Fellow of IEEE.