IEEE Computational Intelligence Society Distinguished Lecturer Program

Speaker: Gary Yen, Oklahoma State University, USA

Inviting Chapter: IEEE Computational Intelligence Society Thailand Chapter

Date: 10 December 2018

Number of Participants: 50 People

Lecture Titles:

- State-of-the-Art Evolutionary Algorithms for Many Objective Optimization
- Visualization and Performance Metrics in Many-Objective Optimization

Abstract:

Evolutionary computation is the study of biologically motivated computational paradigms which exert novel ideas and inspiration from natural evolution and adaptation. The applications of population-based heuristics in solving multiobjective optimization problems have been receiving a growing attention. To search for a family of Pareto optimal solutions based on nature-inspiring problem solving paradigms, Evolutionary Multiobjective Optimization Algorithms have been successfully exploited to solve optimization problems in which the fitness measures and even constraints are uncertain and changed over time. When encounter optimization problems with many objectives, nearly all designs perform poorly because of loss of selection pressure in fitness evaluation solely based upon Pareto optimality principle. The first talk will survey recently published literature along this line of research-evolutionary algorithm for many-objective optimization and its real-world applications. In addition to various Many-Objective Evolutionary Algorithms proposed in the last few years, the second talk will be devoted to address three issues to complete the real-world applications at hand- visualization, performance metrics and multi-criteria decision-making for the many-objective optimization. Visualization of population in a highdimensional1 objective space throughout the evolution process presents an attractive feature that could be well exploited in designing many-objective evolutionary algorithms. A performance metric tailored specifically for many-objective optimization is also designed, preventing various artefacts of existing performance metrics violating Pareto optimality principle. A minimum Manhattan distance (MMD) approach to multiple criteria decision making in many-objective optimization problems is proposed. This procedure is equivalent to the knee selection described by a divide and conquer approach that involves iterations of pairwise comparisons

Remarks: The lectures are available free to public. The event is co-located with the 2nd Deep Learning and Artificial Intelligence Winter School (DLAI 2), the 10th International Conference on Advances in Information Technology (IAIT2018), and the 9th International Conference on Computational Systems-Biology and Bioinformatics (CSBio 2018).

Website: https://deeplearningandaiwinterschool.github.io

Program:

PROGRAM

Tentative program

Day 1: Monday, 10 December 2018 (KX 10th Floor)

Time	Activity
Opening Ceremony	
08.30 - 09.15 am.	Registration (10th Floor)
09.15 - 09.30 am.	Opening Remarks of DLAI2 – IEEE-CIS Thailand Chapter
IEEE Computational Intelligence Society Distinguished Lecturer Program **	
09.30 - 10.30 am.	**Speaker:** *Gary Yen,* Oklahoma State University, USA **Topic:** State-of-the-Art Evolutionary Algorithms for Many Objective Optimization
10.30 - 10.45 am.	Coffee Break and Group Photo
10.45 - 11.45 am.	**Speaker:** *Gary Yen,* Oklahoma State University, USA **Topic:** Visualization and Performance Metrics in Many-Objective Optimization
11.45 am. - 01.00 pm.	Lunch (9th Floor)
Panel Session I: AI and Brain-like Learning Systems **Moderator: Assoc.Prof.Dr. Jonathan H. Chan** **Co-Moderator: Assoc.Prof.Dr. Phayung Meesad**	
01.00 - 02.15 pm.	*Gary Yen,* Oklahoma State University, USA *Ashish Ghosh,* Indian Statistical Institute, India *Richard Wintle,* Sick Kids Hospital, Canada *Warasinee Chaisangmongkon,* KMUTT, Thailand *Kunihiko Fukushima,* Fuzzy Logic Systems Institute, Japan *Farhad Memarzadeh,* National Institutes of Health, United States
02.15 - 02.30 pm.	Coffee Break and Group Photo
CSBio 2018 Workshop **Chair: Dr.Weerayuth Kittichotirat**	
02.35 - 04.30 pm.	**Speaker:** *Richard Wintle,* Assistant Director, The Centre for Applied Genomics, Sick Kids Hospital, Canada Associate Scientific Director, CP-NET Childhood Cerebral Palsy Integrated Neuroscience Discovery Network **Topic:** Detecting structural variation from whole genome sequence data: application to neurodevelopmental disorders
06.00 - 08.00 pm.	Informal Dinner with Speakers

** The IEEE-CIS Distinguished Lecturer Program session on Monday morning by Prof. Gary Yen is open to the public and free of charge.