

Schedule of the Special Lecture Series 2015
“Research Workshop on Data Analysis & Optimization”
by Assoc. Prof. Dr. FONG Simon James,
Department of Computer and Information Science
Faculty of Science and Technology, University of Macau.
9th and 10th July 2015, 9.00 a.m. - 12.00 a.m.
at Training 1/5, 1st floor, School of Information Technology,
KMUTT, Bangmod, Bangkok.

9th July 2015, 9.00 am. - 12.00 am.

Workshop 1 Title: Analyzing Sensor Data Stream : Challenges and Prospects

10th July 2015, 9.00 am. - 12.00 am.

Workshop 2 Title: Bio-inspired Optimization Algorithms for Improving Data Mining and Other Applications

Details of Research Workshop

09:00 a.m. - 09.10 a.m.	Registration
09:10 a.m. - 10.30 a.m.	Lecture and Workshop
10.30 a.m.. -10.45 a.m.	-- Coffee Break --
10.45 a.m. - 11.50 a.m.	Lecture and Workshop
11.50 a.m. - 12.00 a.m.	Q&A

Abstract Details:

Workshop 1 Title: Analyzing Sensor Data Stream : Challenges and Prospects

By Assoc. Prof. Dr. FONG Simon James

Abstract:

Analyzing real-time sensor data is expected to be a feasible but challenging task even equipped with the latest frontier of information technology. The volume of sensor data is predicted by experts that will vastly surpass from various sources of Big Data, such as wireless sensor network, IOT, CCTV videos, social media over the next decade. Enterprises are eager to discover the true benefits by data mining such sensor data in terms of real-time intelligence. Technically, from the perspective of analytics, a new breed of data mining techniques known as data stream mining seems to be a possible solution though it has a relatively short history of development. With the number of new sensor data sources and issues of Big Data that are emerging, data stream mining massive data sets in real-time has a strong application motivation. In particular, data stream mining which is unlike its predecessor, traditional data mining, is able to process and incrementally induce a prediction model on the fly without the need of loading in the full archive of data. This attractive property makes it a potentially suitable candidate for the next generation real-time sensor data analytics solution. In this workshop, the pros and cons as well as some recommended solutions are discussed on the possibilities of applying data stream mining methods for analyzing sensor data in real-time. Computer simulation demo will be conducted for showing the efficacy of some current data stream mining methods over sensor data.

Workshop 2 Title: Bio-inspired Optimization Algorithms for Improving Data Mining and Other Applications

By Assoc. Prof. Dr. FONG Simon James

Abstract:

Modern Bio-inspired computing and metaheuristics algorithms (BiCam) such as PSO, Fireflies, Ants, Bats and Bees algorithms etc. start to demonstrate their power in dealing with tough optimization problems and even NP-hard problems. The research momentum is picking up recently as optimal solutions for combinatorial optimization are possible to be sought by Metaheuristics. The research introduced in this workshop is about a new BiCam algorithm which can outperform the current ones, as well as modifying from some important existing BiCam algorithms for applying in data mining applications; so as to produce optimal solutions in the most efficient way. The benefits offered by BiCam algorithms complement very well the limitations of data mining because data mining models usually face multidimensional combinatorial problems which are typically NP-hard, with very large search space including about finding global optima and overcoming local optima. Data mining models are well known to be prone to suffer from the curse of dimensionality, which also makes them infeasible for exhaustive search or complex analytical methods. Three case studies will be described in this talk: possible integration of BiCam algorithms into some classical data mining algorithms - namely (1) Data Clustering; (2) Feature Selection in Classification, and (3) Highly Non-linear Regression. At the end of the talk, sample source codes will be provided for free, for fellow researchers to apply the integrated bio-inspired optimization and data mining algorithms to application problems of your own choice.

Short Biography

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Simon Fong graduated from La Trobe University, Australia, with a 1st Class Honours BEng. Computer Systems degree and a PhD. Computer Science degree in 1993 and 1998 respectively. Simon is now working as an Associate Professor at the Computer and Information Science Department of the University of Macau. He is also one of the founding members of the Data Analytics and Collaborative Computing Research Group in the Faculty of Science and Technology. Before joining the University of Macau, he worked as an Assistant Professor in the School of Computer Engineering, Nanyang Technological University, Singapore. Prior to his academic career, Simon took up various managerial and technical posts, such as systems engineer, IT consultant and e-commerce director in Melbourne, Hong Kong and Singapore. Some companies that he worked before include Hong Kong Telecom, Singapore Network Services, AES Pro-Data and United Oversea Bank, Singapore. Dr. Fong has published over 289 international conference and peer-reviewed journal papers, mostly in the areas of E-Commerce technology, Business Intelligence and Data-mining.