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Automatic Control and Systems Engineering

The Department of Automatic Control & Systems Engineering is pleased to announce the following seminar:

Evolutionary Multi-Objective Structural Optimisation

Professor Yaochu Jin
Department of Computing, University of Surrey

Wednesday, 27th November 2013 at 14:00
LT02, Sir Henry Stephenson Building

Abstract
Real-world complex engineering optimisation, such as aerodynamic structural optimisation remains a challenging issue in evolutionary optimisation. This talk discusses the major challenges we face in applying evolutionary algorithms (EAs) to multi-objective aerodynamic structural optimization, including representation, the involvement of time-consuming quality evaluation processes, changing environments, vagueness in formulating criteria formulation, and the involvement of multiple sub-systems. We propose that the successful tackling of all these aspects leads to a systems approach to evolutionary design optimization characterized by considerations at four levels, namely, the system property level, temporal level, spatial level and process level. Finally, a brief discussion of the relationship between data-driven complex engineering optimisation and Big Data science is presented.

Biography
Yaochu Jin received the B.Sc., M.Sc., and Ph.D. degrees from Zhejiang University, China, in 1988, 1991, and 1996, respectively, and the Dr.-Ing. Degree from Ruhr University Bochum, Germany, in 2001.

He is currently a Professor of Computational Intelligence and Head of the Nature Inspired Computing and Engineering (NICE) Group, Department of Computing, University of Surrey, UK. His research interests include understanding evolution, learning and development in biology and bio-inspired approached to solving engineering problems. He is an Associate Editor of BioSystems, the IEEE Transactions on Neural Networks and Learning Systems, the IEEE Transactions on Cybernetics, and the IEEE Computational Intelligence Magazine. He is an Invited Plenary / Keynote Speaker on several international conferences on various topics, including multi-objective machine learning, computational modelling of neural development, morphogenetic robotics and evolutionary aerodynamic design optimization. He is the General Chair of the 2012 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology and Program Chair of 2013 IEEE Congress on Evolutionary Computation.

Dr Jin is Vice President-Elect for Technical Activities, an IEEE Distinguished Lecturer and an AdCom member of the IEEE Computational Intelligence Society. He is Fellow of BCS and Senior Member of IEEE.