Swarm Intelligence

ABSTRACT:

This talk provides an introduction to Swarm Intelligence (SI), a discipline dealing with artificial and natural systems studying the collective behaviors of social insects or animals. SI represents a new concept of Artificial Intelligence and is becoming increasingly popular in recent years. Nature provides many inspirations for the development of SI techniques. These SI techniques have shown remarkable capabilities on solving problems that are often difficult to handle by conventional computational techniques. In an SI system, although there is a lack of centralized control, the system at the swarm level exhibits complex and self-organizing behaviors. This is often the result of local interactions among individuals in the swarm as well as individuals with the environment, based on very simple interaction rules.

This talk first provides an overview on SI and how it complements the traditional definition of Artificial Intelligence. Several biological examples as inspirations for SI techniques will be provided. The application of SI principles to optimization is in particular prevalent among its many application areas. This talk will focus on providing a detailed account on one of the most popular SI techniques, Particle Swarm Optimization (PSO). In particular, the talk will present the canonical PSO and its variants, and provide an illustration of swarm dynamics through a simplified PSO. The talk will also discuss several popular PSO application areas including multiobjective optimization, optimization in dynamic environments, multimodal optimization, and their recent developments.

SPEAKER:

Xiaodong Li received his B.Sc. degree from Xidian University, Xi'an, China, in 1988, and Dip.Com. and Ph.D. degrees in information science from University of Otago, Dunedin, New Zealand, in 1992 and 1998, respectively. Currently, he is with the School of Computer Science and Information Technology, RMIT University, Melbourne, Australia. His research interests include evolutionary computation, neural networks, complex systems, and swarm intelligence. He serves as an Associate Editor of the IEEE Transactions on Evolutionary Computation and International Journal of Swarm Intelligence Research. He is a Member of the IASR Board of Editors for the Journal of Advanced Research in Evolutionary Algorithms. He is a founding member and currently a Vice-chair of IEEE CIS Task Force on Swarm Intelligence. He was the General Chair of the 7th International Conference on Simulated Evolution and Learning (SEAL'08), and a Program Co-Chair of the 22nd Australasian Joint Conference on Artificial Intelligence (AI'09). He is a Program Co-Chair for IEEE Congress on Evolutionary Computation 2012 (CEC 2012), part of 2012 IEEE World Congress on Computational Intelligence (WCCI 2012).

Note: Engineers Australia members are eligible to claim CPD for attending this event.

EVENING LECTURE

Venue: John Connell Auditorium , Engineers Australia Building, 21 Bedford Street, North Melbourne

Time: 6:00pm refreshments for 6:30pm start

Date: Wednesday, 5 September 2012

Register at www.ieeevic.org
There is no admittance fee for IEEE or Engineers Australia members or students.

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Victorian Section