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“Overview of Swarm Intelligence”

by

Prof. Jeng-Shyang PAN

Honorary Director

Shenzhen Graduate School

Harbin Institute of Technology

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Abstract

Swarm intelligence (SI) is based on collective behavior of self-organized systems. Typical swarm intelligence schemes include particle swarm optimization (PSO), ant colony system (ACS), stochastic diffusion search (SDS), bacteria foraging (BF), the bees algorithm, swarm robotics, etc. Besides the applications to conventional optimization problems, SI can be used in controlling robots and unmanned vehicles, predicting social behaviors, enhancing the telecommunication and computer networks, etc. Indeed, the use of swarm optimization can be applied to a variety of fields in engineering and social sciences. This talk reviews some popular algorithms in the field of swarm intelligence for problems of optimization. The overview and experiments of Particle Swarm Optimization (PSO), Ant Colony System (ACS) and Cat Swarm Optimization (CSO) are given. The parallel versions of ACS, PSO and CSO are also introduced. In addition, some comparisons are made between these algorithms.

Biography

Jeng-Shyang Pan received the B. S. degree in Electronic Engineering from the National Taiwan University of Science and Technology in 1986, the M. S. degree in Communication Engineering from the National Chiao Tung University, Taiwan in 1988, and the Ph.D. degree in Electrical Engineering from the University of Edinburgh, U.K. in 1996. Currently, he is the Doctoral advisor in Harbin Institute of Technology and Professor in the Department of Electronic Engineering, National Kaohsiung University of Applied Sciences, Taiwan. He has published more than 400 papers in which 120 papers are indexed by SCI. He is the IET Fellow, UK and the Vice Chair of IEEE Tainan Section. He was Awarded Gold Prize in the International Micro Mechanisms Contest held in Tokyo, Japan in 2010. He was also awarded Gold Medal in the Pittsburgh Invention & New Product Exposition (INPEX) in 2010, Gold Medal in the International Exhibition of Geneva Inventions in 2011 and Gold Medal of the IENA, International “Ideas – Inventions – New products“, Nuremberg, Germany. He was offered Thousand-Elite-Project in China. He is on the editorial board of International Journal of Innovative Computing, Information and Control, LNCS Transactions on Data Hiding and Multimedia Security, Journal of Computers and Journal of Information Hiding and Multimedia Signal Processing. His current research interests include soft computing, robot vision and cloud computing.

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