TUTORIAL
EVOLUTIONARY MULTIOBJECTIVE OPTIMIZATION
AND ITS APPLICATIONS

Summary:

This short course will provide an overview of emerging biologically motivated evolutionary computation paradigms for multiobjective optimization and hand-on working knowledge with specific applications in robotics and automation. Topics include, but not limited to, 1) computational intelligence; 2) simulated annealing; 3) introduction to evolutionary computation; 4) genetic algorithms (search operators, search schemes, niching, constraint handling); 5) ant colony system; 6) particle swarm intelligence; 7) evolutionary multiobjective optimization; 8) multiobjective particles swarm optimization; 9)genetic programming; 10) evolutionary strategy; 11) co-evolution; 12) artificial immune system; 13) social based algorithm; and 14) their applications in robotics and automation.

Speaker:

Gary G. Yen received the Ph.D. degree in electrical and computer engineering from the University of Notre Dame, Notre Dame, Indiana in 1992. He is currently a Professor in the School of Electrical and Computer Engineering, Oklahoma State University. Before he joined OSU in 1997, he was with the Structure Control Division, U.S. Air Force Research Laboratory in Albuquerque, NM. His research is supported by the DoD, DoE, EPA, NASA, NSF, and Process Industry. His research interest includes intelligent control, computational intelligence, evolutionary multiobjective optimization, conditional health monitoring, signal processing and their industrial/defense applications. Dr. Yen was an associate editor of the *IEEE Transactions on Neural Networks*, *IEEE Control Systems Magazine*, *IEEE Transactions on Control Systems Technology*, *IEEE Transactions on Systems, Man and Cybernetics* and IFAC Journal on *Automatica* and *Mechatronics*. He is currently serving as an associate editor for the *IEEE Transactions on Evolutionary Computation*. He served as the General Chair for the *2003 IEEE International Symposium on Intelligent Control* held in Houston, TX and *2006 IEEE World Congress on Computational Intelligence* held in Vancouver, Canada. Dr. Yen served as Vice President for the Technical Activities, IEEE Computational Intelligence Society in 2004-2005 and is the founding editor-in-chief of the *IEEE Computational Intelligence Magazine*, 2006-2009. He is currently serving as President in 2010-2011 of the IEEE Computational Intelligence Society. He is a Fellow of IEEE.