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Network Modeling and Optimization for Engineering Applications:

A Service-oriented EC Architecture

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Abstract

In the past decades, we have devoted our efforts to the research of evolutionary algorithms and its application to optimization problems in the fields of Industrial Engineering (IE) and Operations Research (OR). We summarized our research results in our book entitled *Network Models and Optimization: Multiobjective Genetic Algorithm Approach* by Springer, 2008. We defined an evolutionary computation architecture and developed a software tool for the evolutionary computation researches and real-world applications, called Service-oriented Evolutionary Computation Architecture (SoECA).

In this presentation, we first briefly explain the network modeling and evolutionary optimization for engineering applications. Next we give an introduction of SoECA, and present how to use this software tool for the EC researches and real-world applications. Then we show a network modeling technique to formulate the complex problems, and explain the design of evolutionary algorithms in engineering applications: logistics network models, communication network models, advanced planning and scheduling models, and advanced network models. Finally we discuss future research issues in the design of SoECA for engineering applications.

Biography:

Lin Lin is currently an associate professor at school of software, Dalian University of Technology (DLUT), China; and is a senior researcher at Fuzzy Logic Systems Institute, Japan. He received his M.Sc degree and Ph.D degree in Engineering from Graduate School of Information, Production and Systems, Waseda University in March 2005 and March 2008, respectively. He was a Research Assistant at Information, Production and Systems Research Center (IPSRC), Waseda University from April 2006 to March 2008, and was a Visiting Lecturer at IPSRC, Waseda University, was a Postdoctoral Research Associate supported by the Kitakyushu Foundation for the Advancement of Industry, Science and Technology (FAIS).

He concentrates his academic interests on the application of Evolutionary Algorithms on Network Optimization Design of Communication Network, Logistics Optimization and Manufacturing Scheduling etc. He has authored 29 papers in international journals; has authored 2 books, *Network Models and Optimization: Multiobjective Genetic Algorithms*, Springer (2008), and *Network Model and Multiobjective GA*, Kyoritsu Shuppan (2008); and has authored 2 book chapters, Genetic Algorithms, *Encyclopedia of Computer Science and Engineering*, John Wiley & Sons (2009) and Evolutionary Techniques for Automation, *Handbook of Automation*, Springer (2009).