Meta-synthetic System Modeling to Complex Problems

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Monday 28th May

3.00 - 3.30
Afternoon tea
3.30 - 4.30pm
Presentation

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Abstract

Meta-synthesis system approach (MSA) is proposed to tackle with open complex giant systems problems which cannot be effectively solved by traditional reductionism methods by a Chinese system scientist Qian, Xuesen (Tsien HsueShen, 1911-2009) around early 1990s. The method emphasizes the synthesis of collected information and knowledge of various kinds of experts, and combining quantitative methods with qualitative knowledge.

This talk will introduce some research on transforming the abstract concepts of MSA into practical working steps and building supporting technologies to achieve meta-synthesis result toward complex problem solving. Three types of meta-synthesis, qualitative MS, qualitative -quantitative MS and qualitative-to-quantitative MS will be addressed. An example will be given to show how to model complex problems, such as macro economy growth forecasting problem in HWMSE with versatile resources in information collection, model integration and opinion synthesis, as a demonstration test evaluated at a special session on MSA hosted by International Institute of Applied Systems Analysis (IIASA) in Vienna in 2003.

Moreover, 2 supporting technologies for qualitative meta-synthesis, CorMap and iView, are introduced together with some typical applications, including social risk cognition. Toward the thinking behavior records represented by the textual data, both technologies conduct a series of computing to acquire some exploratory structures of the emerging ideas under different perspectives and the help to get a rough vision from a group divergent thinking process or community opinions toward unstructured problems.

Keywords: meta-synthesis; model integration, creativity support systems, CorMap; iView; mind mining; deliberation mining

Presenter

Dr. Xijin Tang is a full Professor in Academy of Mathematics & Systems Science (AMSS), Chinese Academy of Sciences (CAS), China. She received her BEng (1989) in Computer Science & Engineering from Zhejiang University, MEng (1992) in

Management Science & Engineering from University of Science and Technology of China and PhD (1995) from Institute of Systems Science (ISS), CAS.

She has been working for AMSS-CAS for more than 15 years, and is affiliated with the CAS Key Lab on Management, Decision and Information Systems (MADIS). She had once taken academic visits to Georgia Tech (1998-1999), JAIST (2000-2001) and University of Wollongong (March of 2006). She had developed several DSS for water resources management, weapon system evaluation, e-business evaluation, etc. during her early system research and practice during 1990s. Her recent research interests are meta-synthesis and advanced modeling, opinion dynamics, knowledge creation and creativity support systems. She co-authored and published two influential books on meta-synthesis system approach and an oriental system approach WSR in Chinese. She has given invited plenary talks in several international conferences.

She is the general secretary of International Society for Knowledge and Systems Science and an associate editor for International Journal of Knowledge and Systems Science (IGI-Global). She is also one member of editorial board for Journal of Systems Science and Complexity (Springer-Verlag). She was one of 99 who won the 10th National Award for Youth in Science and Technology in China in 2007.