Discrete Mathematics Seminar

Time: Friday, 11 November 2011, 12:00-1:00 PM
Room: 238 Derrick Hall
Title: Are Two Heads Better Than One?
      Combinatorial Fusion in Computing, Informatics and Analytics
Speaker: Dr. Frank Hsu, Department of Computer and Information Science,
      Fordham University

Abstract:

      Processing information to solve problems, make decisions, or discover knowledge of high complexity in science, technology, society, medicine , health care, education and business often involves fusion (or combination) of data or information from multiple sensors, sources, and systems. Although it is widely known that fusion of information can improve results tremendously, the issue of "why and how" remains a challenging problem in regression, machine learning, data mining, knowledge discovery, and other fields in informatics and analytics.

      Combinatorial Fusion Analysis (CFA), a recently developed information fusion paradigm, uses the method and practice of multiple scoring systems (MSS) - each having a score function, a rank function and a rank-score characteristics (RSC) function. It employs combinatorial methods to model the system space and the rank-score characteristic (RSC) function to measure "Cognitive Diversity" among systems. CFA uses a unique paradigm which integrates computational, mathematical and statistical approaches as well as cognitive neuroscience.

      In this talk, I will first review CFA and then discuss and offer some partial solutions to the fundamental issue of "When is the combination of two systems A and B better than each individual system?" Practical examples are drawn from a variety of application domains including target tracking and computer vision, information retrieval & internet search, virtual screening & drug discovery, protein structure prediction and ChIP-seq analytics, business intelligence and portfolio management, and brain informatics.

Bio:

      Dr. Frank Hsu is the Clavius Distinguished Professor of Science and a professor of computer and information science at Fordham University in New York City. He is Vice Chair of the New York Chapter of the IEEE Computational Intelligence Society. He has been a visiting professor/scholar at the University of Parid-Sud(and CNRS), Taiwan University, Tsing Hua University (Hsin-chu, Taiwan), Keio University(as IBM Endowed Chair Professor), JAIST (as Komatsu Endowed Chair Professor), Boston University and MIT.

      Hsu's research interests include combinatorics and graph theory; network interconnection and communications; and computing, informatics and analytics. Hsu has served as consultant to several government, industry and academic institutions. He has also served on several editorial boards including Journal of Interconnection Networks (as Founding Editor, Editor in Chief and Editor for Special Issues), Pattern Recognition Letter, IEEE Transactions on Computers, Networks, International Journal of Foundation of Computer Science, and the Journal of Ubiquitous Computing and Intelligence.

      Receiving a MS degree from the University of Texas (El Paso) and a Ph.D. degree from the University of Michigan, Hsu is a Fellow of the New York Academy of Sciences, the Institute of Combinatorics and Applications, and the International Society of Intelligent Biological Medicine.