



## Department of Computer and Information Science

### Fall 2017 CIS Faculty Research Talk Series

#### Ranking and Scoring for Big Data Analytics

**Speaker: Prof. D. Frank Hsu, Clavius Distinguished Professor of Science  
Fordham University**

**Date: October 18, 2017**

**Time: 12:00 pm – 1:00 pm**

**Venue: John Mulcahy Hall (JMH) 342**

**Abstract:** Ranking and scoring have been widely used for a period of time in scientific discovery, technology innovation, and social evolution. More recently, ranking, scoring, and combination of multiple scoring systems contribute tremendously to analyzing Big Data in several disciplines such as STEM, social science, data science, and other professional studies in law, business and education. In this talk, I will cover methods and practices for combining multiple scoring systems (MSS). In particular, we explore the issues of “when” and “how” to combine these MSS. Conventional wisdom is that “The combination of two (or more) systems can be better than each individual system only if they are relatively good and they are diverse”. However, measurement of diversity is a challenging issue in Big Data analytics as well as in micro- and macro-informatics. The notion of a Cognitive Diversity (CD) will be introduced. “Cognitive diversity” measures diversity between two information systems as opposed to “statistical correlation”, which measures correlation between two data distributions. CD is useful because it is simple to compute and it is independent of the data items. As such, it is extremely useful in scientific discovery in general and in Big Data analytics in particular. Examples are drawn from a variety of disciplines and use cases in information retrieval, target tracking, joint decision making, virtual screening (and drug discovery), cognitive neuroscience, wireless network selection, market segmentation and portfolio management. We will also discuss the application of combining MSS to various problems in cybersecurity, risk management, and decision support systems.

**Speaker’s Biography:** D. Frank Hsu is the Clavius Distinguished Professor of Science, a professor of Computer and Information Science, and director of the Laboratory of Informatics and Data Mining at Fordham University, New York, NY. He was chair of the department and Associate Dean of the Graduate School of Arts and Sciences. He has held visiting positions at CNRS (and University of Paris-Sud), JAIST (as Komatsu Chair Professor, Kanazawa, Japan), Keio University (as IBM Chair Professor, Tokyo, Japan), MIT (Applied math and Laboratory of Computer Science), National Taiwan University, and National Tsing-Hua University (in Hsin-Chu, Taiwan). He was also chair of the Computer and Information Science section at the New York Academy of Sciences. Hsu’s current research interests include graph theory and combinatorics, Big Data analytics, interconnection networks, machine learning, combinatorial fusion, graph database, and macro-informatics. The Combinatorial Fusion Algorithm he and colleagues proposed in 2005 has been applied to diverse areas such as bioinformatics, finance, target tracking, virtual screening (and drug discovery), decision making, market segmentation and cognitive neuroscience. Hsu received a BA from National Cheng Kung University in Taiwan, an MA from the University of Texas at El Paso, and a PhD from the University of Michigan. He has served on many editorial boards including IEEE Transactions on Computers, IEEE Transactions on Reliability, Networks, Pattern Recognition Letters, International Journal of Foundation of Computer Science, International Journal of Big Data Intelligence, and JOIN (Journal of Interconnection Networks). He has served as co-chairs of many conferences, workshops, PC’s and steering committees including DIMACS Workshops and most recently I-SPAN (14th I-SPAN’ 2017 in Exeter, UK) and ICCS (6th ICCS’ 2016 in New York, USA). Hsu received the Best Paper Award in 2005 at the IEEE-AINA Conference and in 2013 at the Brain and Health Informatics Conference. He received an IBM Faculty Award in 2012. Dr. Hsu is a Fellow of the New York Academy of Sciences and the International Institute of Cognitive Informatics and Cognitive Computing (ICIC). He is a Foundation Fellow of the Institute of Combinatorics and Applications (ICA) and a Senior member of the IEEE.

**Refreshments will be served!**