



Fall 2009 CIS Colloquium Series

# Mining, Modeling and Simulation of the Biomolecular Network

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*11am-12pm, Wednesday, October 14  
4<sup>th</sup> Floor Conference Room (Wachman Hall, CC 447)*

**Abstract:** In this talk, we present a novel method to mine, model and evaluate the regulatory system which executes a cellular function, and can be represented as a biomolecular network. Our method consists of two steps. First, a novel scale-free network clustering approach is applied to the biomolecular network to obtain various sub-networks. Second, a computational model is generated for the sub-network and simulated to predict their behavior in the cellular context. We discuss and evaluate some of the advanced computational models, in particular, state-space model, probabilistic Boolean Network model, fuzzy logic model. The modeling results represent hypotheses that are tested against high-throughput datasets (microarrays and/or genetic screens) for both the natural system and perturbations. Experimental results on time-series gene expression data for the human cell cycle indicate our approach is promising for sub-network mining and simulation from large biomolecular network.

**Bio:** Xiaohua (Tony) Hu is currently an associate professor (early tenured in 2007) and the founding director of the [data mining and bioinformatics lab](#) at the College of Information Science and Technology, one of the best information science schools in USA. Tony is a scientist, teacher and entrepreneur. He joined Drexel University in 2002, founded the [International Journal of Data Mining and Bioinformatics](#) (SCI indexed) in 2006, [International Journal of Granular Computing, Rough Sets and Intelligent Systems](#) in 2008. Earlier, he worked as a research scientist in the world-leading R&D centers such as Nortel Research Center, GTE labs and HP Labs. In 2001, he founded the DMW Software in Silicon Valley, California. He has received prestigious awards including the [2005 National Science Foundation \(NSF\) Career award](#), the [best paper award](#) at the 2007 International Conference on Artificial Intelligence, and the [best paper award](#) at the 2004 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology. Tony received his Ph.D. in Computer Science from [University of Regina](#), Canada 1995, M.Sc. in Computer Science from [Simon Fraser University](#), Canada in 1992, M.Eng. in Computer Engineering from [Institute of Computing Technology, Chinese Academy of Science](#) in 1988 and B.Sc. (Software) from [Wuhan University](#) in 1985.

*Refreshments will be served!*