MARQUETTE UNIVERSITY

HELEN WAY KLINGLER
COLLEGE OF ARTS AND SCIENCES

Department of Mathematics, Statistics and Computer Science

Colloquium Announcement

Biological Networks: Challenges, Solutions, and Opportunities

Dr. Tamer Kahveci
Computer and Information Science and Engineering
University of Florida

3:00 PM, Friday, March 21, 2014

Cudahy Hall, Room 401

Biological networks of an organism show how different bio-chemical entities, such as enzymes or genes, interact with each other to perform vital functions for that organism. Dr. Kahveci's lab is focusing on developing computational methods that will help in understanding the functions of large scale biological networks. In this talk, we will discuss some of the recent research activities at Dr. Kahveci's lab. In the first part of the talk, we will focus on the scalability issues resulting from growing size of biological network databases and describe an indexing method aimed at tackling this problem. In the second part, we will shift the focus on the computational challenges centered on uncertainty in the topology of biological networks. We will discuss our new mathematical model which represents probabilistic networks as collections of polynomials. We show that this is a powerful model that enables solving seemingly very tough computational problems on probabilistic networks efficiently and precisely. We will demonstrate the expressive power of this model on the signal reachability problem, which computes whether an extracellular signal reaches from a membrane receptor to a reporter gene. Finally, we will briefly discuss a set of possible future applications of our polynomial model for probabilistic biological networks and the challenges arising from dynamically evolving network topologies.

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For further information: see http://www.marquette.edu/mscs/resources-colloquium.shtml
or contact Dr. Rong Ge #414-288-6344, Rong.Ge@marquette.edu.

PRE-COLLOQUIUM REFRESHMENTS SERVED IN CUDAHY HALL, ROOM 342 AT 2:30 P.M.