COLLOQUIUM

Department of Computer Science
College of Engineering and Applied Sciences
University at Albany – State University of New York

Title: Parallel Graph Algorithms: Challenges and Approaches

Speaker: Dr. Maleq Khan (Virginia Tech)

Date and Time: Monday, August 10, 2015, 2:30 to 3 PM

Location: Computer Science Conference Room (LI 98)

ABSTRACT

In general, partitioning the data and load balancing are challenging issues in most parallel algorithms. Dealing with these issues is even more challenging for graph algorithms due to the complex dependencies among the computation paths. Emerging massive graphs pose some additional challenges. In this talk, I will discuss some of these challenges and some possible approaches to deal with them. As examples, I will use some specific problems such as generating random networks, counting triangles, subgraph enumeration, etc.

Speaker's Biosketch: Dr. Maleq Khan is a Research Scientist at the Network Dynamics and Simulation Science Laboratory (NDSSL) which is part of the Virginia Bioinformatics Institute (VBI) at Virginia Tech. Dr. Khan received his Ph.D. in Computer Science from Purdue University. Broadly speaking, his research interests are in the areas of design and analysis of algorithms and theoretical computer science. More specifically, he has published papers on distributed algorithms, randomized algorithms, approximation algorithms, wireless networks, complex networks and data mining.

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Title: Using Discrete Dynamical Systems to Explore Stability

Speaker: Dr. Chris Kuhlman (Virginia Tech)

Date and Time: Monday, August 10, 2015, 3 to 3:30 PM

Location: Computer Science Conference Room (LI 98)

ABSTRACT

In this talk, we will define one type of discrete dynamical system (DDS), and will investigate the system state transitions of particular classes. We are primarily concerned with long-term dynamics of Boolean systems. Loosely speaking, stability refers to the behavior of a system when a (long-term) system state has an individual element state "flipped," from 0 to 1, or from 1 to 0. A basic question is: if a vertex state is flipped, will the system return to the original long-term dynamical behavior, or will the long-term behavior change? Previous work shows that these flips tend to drive systems to fixed points, and that there are relatively few of them. We will describe the construction of dynamical systems that are different in two respects:

(a) they have much more complicated long-term structures than fixed points; and

(b) there are many such structures.

Speaker's Biosketch: Dr. Chris Kuhlman is a Research Scientist at the Network Dynamics and Simulation Science Laboratory (NDSSL) which is part of the Virginia Bioinformatics Institute (VBI) at Virginia Tech. Dr. Kuhlman received his Ph.D. in Computer Science from Virginia Tech. Prior to Virginia Tech, Dr. Kuhlman worked at Computer Sciences Corporation, NSWC–Dahlgren and Southwest Research Institute. His interests include discrete dynamical systems, modeling and simulation, distributed and high performance computing and social and network science.