

Computer Science Seminar Series, 2012

National Capital Region

Indemics: An Interactive High Performance, High Productivity Computing Framework for Data Intensive Epidemic Modeling

Speaker: Dr. Jiangzhuo Chen
Virginia Tech

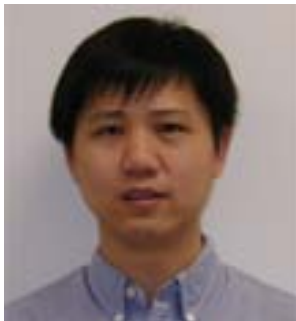
Friday, November 30, 2012
1:00PM- 2:00PM, NVC 325

Abstract

It is important to have a modeling environment which is capable of simulating epidemic propagation, often co-evolving with public health interventions and complex individual level behavior, in a large scale population, and can support real-time pandemic planning, situation assessment, and course-of-action analysis. Such a modeling environment need have: (i) high performance, (ii) high productivity, and (iii) capability to represent complex realistic scenarios. Many existing simulation systems focus on one or two of these requirements. To address all three simultaneously, however, remains a challenging problem. To this end, we have developed Indemics, a database driven interactive modeling environment for epidemic simulations.

In this talk, I will present our recent and ongoing work on Indemics. I will first introduce background information on simulating disease spread over a social contact networks and interventions that can change epidemic dynamics; and provide a formal model for interactive epidemic simulations. After explaining why we use a relational database to compute interventions, I will describe Indemics system architecture and its implementation. Finally I will show experimental results on its performance, productivity, and capabilities.

Biography



Jiangzhuo Chen is a Senior Research Associate in the Network Dynamics and Simulation Science Laboratory of Virginia Bioinformatics Institute at Virginia Tech. He received his Ph.D. in Computer Science from Northeastern University. Jiangzhuo's research interests include computational epidemiology; computational social science; modeling, simulation, and analysis of large-scale socio-technical networks; and approximation algorithms.