NJIT New Jersey's Science & Technology University

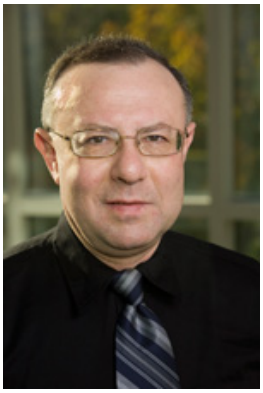
IEEE COMMUNICATIONS SOCIETY North Jersey Chapter

Stochastic Routing for Delay Tolerant Networks

Prof. Zygmunt J. Haas

Cornell University, Ithaca, NY and National Science Foundation, Arlington, VA

Date: November 29, 2010 (Monday)
Time: 2:30 pm (refreshment starts at 2:15 pm)
Place: 202 ECEC, NJIT



About the Speaker

Prof. Zygmunt J. Haas received his Ph.D. in 1988 from Stanford University, at which time he joined the AT&T Bell Laboratories, pursuing research in wireless communications, mobility management, fast protocols, optical networks, and optical switching. In 1995, he joined the faculty of the School of Electrical and Computer Engineering at Cornell University. He heads the Wireless Network Laboratory (wnl.ece.cornell.edu), a research group with extensive contributions in the area of Ad Hoc Networks and Sensor Networks. Recently, he has been serving as an NSF Program Director in the Engineering Directorate.

Dr. Haas is a Fellow of the IEEE and an author of over 200 technical conference and journal papers. He holds eighteen patents in the areas of wireless networks and wireless communications, optical switching, optical networks, and high-speed networking protocols. He has organized numerous workshops, chaired and co-chaired several key conferences in the communications and networking areas, and delivered many tutorials at major IEEE and ACM conferences. His interests include: mobile and wireless communication and networks, modeling and performance evaluation of large and complex systems, and biologically-inspired networks.

About the Talk

In this talk, I will discuss selected research results in the area of Stochastic Routing. Especially, I will concentrate on the use of Stochastic Routing as it applies to Delay/Disruption Tolerant Networks (DTNs). DTNs are useful for applications with lenient requirements on message latency and Stochastic Routing is especially well suited for mobile DTNs. I will compare some of the Stochastic Routing schemes and discuss a number of potential applications.

Gossiping, an example of Stochastic Routing, is a techniques where each node resends the received message with some probability. In fact, flooding is a limiting case of Gossiping, where the retransmission probability equals 1. Numerous variants of Gossiping have been proposed and optimized to implement efficient broadcasting, multicasting, and anycasting.

Epidemic Routing, another example of Stochastic Routing schemes, has been proposed as a routing protocol for DTNs. Unrestricted Epidemic Routing results in shortest packet delivery time and high packet delivery probability at the destination nodes. However, this comes at the cost of excessive number of packet copies in the network, which leads to wasteful energy consumption at the nodes. I will introduce and present the performance of several schemes which, in different ways, restrict the Epidemic Routing in the number of generated packet copies. The schemes are compared in regards to the tradeoff between energy consumption and delivery delay, while maintaining fixed delivery rate.

Another drawback of Epidemic Routing is that the energy consumption is unequal at the different network nodes. Consequently, the system's lifetime is reduced. I will discuss several of our approaches to extend the system lifetime of Epidemic Routing.

Sponsors: **IEEE Communications Society North Jersey Chapter**
NJIT Department of Electrical and Computer Engineering

For more information contact Nirwan Ansari (973)596-3670. Check **http://web.njit.edu/~ieeenj/comm.html** for latest updates. Directions to NJIT can be found at: **http://www.njit.edu/about/visit/gettingtonjit.php**.