



Department of Computer Science and Engineering

Presents

Zygmunt J. Haas, Cornell University

On Networking in the Final Frontier

In the past couple of decades, we have seen many new and exciting emerging networking technologies. In this talk, I will survey three such relatively new technologies: the *Ad Hoc Networks*, the *Sensor Networks*, and the *Delay-Tolerant Networks*. I will discuss how these technologies evolved, how they differ one from the other, and assess their technology-transfer potential. Most of the talk will concentrate on selected theoretical and practical challenges in making these technologies attractive for potential industrial exploitation. In particular, time-permitting, I will discuss the following topics, as they relate to these three technologies: *(stochastic) routing, statistical quality-of-service guarantees, topology control, scalability, security support, transmission scheduling, and mobility modeling*.

As an example of an application, I will introduce our *animal habitat monitoring* project, in which we have applied some of the concepts from *ad-hoc* and *sensor* networking to monitor the behavior of ocean life. Our work is based on the novel concept which we have developed, the *Shared Wireless Infostation Model (SWIM)*. *SWIM* is an example of *Delay-Tolerant Networks*. As opposed to data forwarding over pre-established paths, *SWIM* creates a new *Store-Carry-Forward* networking paradigm, exploiting mobility to enhance connectivity. This new networking paradigm has a broad range of applications; e.g., for telemetry and long-term monitoring, for medical applications of micro-sensors and micro-actuators, or to disseminate traffic advisories or early-warning information in the public emergency system while using the mobility of vehicles.

Bio: After receiving his Ph.D. from Stanford University in 1988, Zygmunt J. Haas joined the *AT&T Bell Laboratories* where he pursued research in wireless communications, mobility management, fast protocols, optical networks, and optical switching. Since 1995, he is a Professor at the School of ECE at *Cornell University*. He heads the *Wireless Network Laboratory*, an internationally recognized research group with extensive contributions in the area of *Ad Hoc Networks and Sensor Networks*.

Dr. Haas is an author of over 200 technical conference and journal papers and holds eighteen patents in the areas of wireless networks, optical switching, and high-speed networking. He has served as editor of numerous journals, among those are: the *IEEE Transactions on Networking*, the *IEEE Transactions on Wireless Communications*, and the *IEEE Communications Magazine*. He is currently the Steering Committee Chair of the *IEEE Pervasive Computing* magazine. His interests comprise: mobile and wireless communication and networks, modeling and performance evaluation of large and complex systems, and biologically-inspired networks. Dr. Haas is a *Fellow of IEEE*. His URL is <http://wnl.ece.cornell.edu> .

Thursday, November 6, 2008
3:30 - 4:30 PM

Student Union Room 330 - University at Buffalo – North Campus

This talk is free and open to the public. Refreshments for attendees after the talk in 224 Bell Hall

For more information, please email cse-dept@cse.buffalo.edu or contact (716) 645-3180