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Spring 2017 Computer Science Distinguished Lecture Series

Challenges of the Internet of Things

Distinguished Speaker: Prof. Zygmunt J. Haas, *IEEE Fellow*
Wireless Networks Lab, Cornell University

Date: April 6, 2017
Time: 12:30 pm – 1:30 pm
Venue: Robinson Technology Center (RTC) 136

Abstract: While Metcalfe's Law states that the value of a network is proportional to the square of the interconnected devices, Internet of Things (IoT) promises to interconnect billions of devices on a global scale in the next few years and to forever change the Information Technology ecosystem. Indeed, instead of working independently or making decisions with limited local information only, the IoT paradigm will enable significant expansion of the systems' capabilities and values, well beyond what the systems' original design would allow. IoT is a natural extension of sensor and ad hoc networks, allowing to harness the benefits of networks through low-granularity information sharing on a global scale. Some of the applications areas of the IoT technology include: medicine and healthcare, home automation, fleet management, smart cities, enhanced safety, and agriculture, to mention just a few.

Because IoT is a technology still in its early stages of evolution, it is characterized by fast rate of innovation, but also by significant market fragmentation. For it to be successful, a convergence path is required, which can be accelerated through appropriate open standardization efforts. But for such efforts to be effective, a number of technical impediments need to be adequately addressed.

The main technical challenges in implementation of the IoT systems stem from a number of their characteristics, such as: the massive number of the devices, the new traffic patterns and their effect on the existing networks, the vast amount of information at various granularity levels generated by the devices, the need to securely share the information possibly on a global scale, the need to preserve privacy of this information, the need for robustness and reliability in the information processing, the need to incorporate "humans in the loop", etc. In particular, many of these characteristics present opposing attributes, such as: security vs. openness and availability, security vs. privacy, creating knowledge vs. privacy, software-based vs. robustness and reliability, local-interest vs. global-coverage, security vs. low-energy, etc. In this talk, we will examine these challenges in details and discuss some potential ways of how to overcome them.

Speaker's Biography: Zygmunt J. Haas received his B.Sc. in 1979, his M.Sc. in 1985, and his Ph.D. in 1988 from Stanford University, all in Electrical and Computer Engineering. In 1988, he joined the AT&T Bell Laboratories in the Network Research Area. There he pursued research in wireless communications, mobility management, fast protocols, optical networks, and optical switching. In August 1995, he joined the faculty of the School of Electrical and Computer Engineering at Cornell University, where he is now a Professor. He heads the Wireless Network Laboratory (wnl.ece.cornell.edu), a research group with extensive contributions and international recognition in the area of Ad Hoc Networks and Sensor Networks. In 2010-2011, Dr. Haas served as an NSF Program Director in the Engineering Directorate.

Dr. Haas is an IEEE Fellow and an author of over 200 technical conference and journal papers and holds eighteen patents in the areas of wireless networks and wireless communications, optical switching and optical networks, and high-speed networking protocols. He won a number of awards and distinctions, including "Best Paper" awards and the 2016 IEEE ComSoc AHSN Recognition Award for "for outstanding contributions to securing ad hoc and sensor networks". Dr. Haas chaired and co-chaired several key conferences in the communications and networking areas, organized many workshops, delivered numerous tutorials at major IEEE and ACM conferences, and served as an IEEE ComSoc Distinguished Lecturer. His interests comprise: mobile and wireless communication and networks, modeling and performance evaluation of large and complex systems, and biologically-inspired networks.

For more information about this Spring 2017 CS Distinguished Lecture Series, please contact Habib M. Ammari at hmammari@nsu.edu