The IEEE Montreal Section and Concordia University are inviting all interested IEEE Montreal members and other engineers and students to a technical seminar on:

Application of Compressive Sensing and Affinity Propagation for Localization of Wireless Terminals

By: Professor Shahrokh Valaee

Department of Electrical and Computer Engineering, University of Toronto

DATE: **Monday December 07, 2009**.

TIME: Refreshments, Registration and Networking: **1:45 p.m.**; **Seminar: 2:00 p.m. – 3:00 p.m.**
PLACE: Concordia University, Electrical & Computer Engineering Department, **Room EV003.309**
ADMISSION: Free.

For info, please contact Dr. Anader Benyamin-Seeyar at anader.benyamin@ieee.org or http://ewh.ieee.org/r7/montreal.

Abstract :

Localization of wireless terminals is a challenging problem, which has received much attention in recent years. Despite much research in this area, localization is still an open problem since in many situations the error in location estimates is considerably high. If wireless terminals can be localized accurately, a host of new applications will emerge, ranging from security and emergency to location-based services and navigation. Recent advances in signal processing have created a new impetus for tackling the localization problem. In particular Compressive Sensing can find an application in localization of wireless nodes since location estimation is an intrinsically sparse problem. We have applied the theory of compressive sensing, combined with Affinity Propagation, for localization of wireless terminals in indoor applications. Our preliminary studies show surprising results. The accuracy of location estimates is very high, making the technique suitable for navigation, such as directing visually impaired individuals to find their way through buildings. We have implemented this algorithm in a HP PDA and have tested in campus buildings and shopping malls. Soon this solution will be field-tested by using it for navigating individuals with reduced vision in a targeted public building. We are now developing an iPhone application for this localizer. This talk will review Compressive Sensing and Affinity Propagation, and combine them to propose a new localization algorithm. The talk will also include a demo of the implemented device and will discuss avenues for further research.

Dr. Shahrokh Valaee's short Bio:

Dr. Shahrokh Valaee received the B.Sc. and M.Sc. degrees from the University of Tehran, and the Ph.D. degree from McGill University all in Electrical Engineering. From 1994 to 1995, he was a Research Associate at INRS Telecom, University of Quebec in Montreal. From 1996 to 2001, he was with the Department of Electrical Engineering, Tarbiat Modares University, and the Department of Electrical Engineering, Sharif University of Technology. Since September 2001, he has been a faculty member of the Department of Electrical and Computer Engineering, University of Toronto, Canada and holds the Nortel Institute Junior Chair of Communication Networks. He is the founder and Director of Wireless and Internet Research Laboratory (WIRLab) at the University of Toronto.

Professor Valaee was the Co-Chair for Wireless Communications Symposium of IEEE GLOBECOM 2006, and is the Co-Chair of IEEE PIMRC 2011. His research is currently focused on vehicular networks, application of network coding in next generation wireless networks, and signal processing.