INVITED SPEAKER SEMINAR

IN ELECTRICAL AND COMPUTER ENGINEERING

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The Department of Electrical and Computer Engineering
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IEEE Control Systems Society, Montréal Chapter
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3:00 p.m.
Room EV003.309

"Cooperative Networking Theory and Hardware Experiments at SARL"

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ABSTRACT

Cooperative transmission (CT) is a virtual array transmission technique in which diversity versions of the same message, transmitted by different radios, are combined in a receiver. CT provides an SNR advantage through diversity and array gains, which can be used to reduce per-node radiated energy, decrease the packet error rate, or extend range and overcome network partitions. The Smart Antenna Research Laboratory (SARL) at Georgia Tech has been studying and prototyping CT links and its use in multi-hop wireless networks since 2007. This talk will overview some of our recent results, which include (i) synchronization, range extension, and routing with concurrent CT (CCT), which is a non-coherent type of CT, implemented in the physical layer, in which the elements of the virtual array transmit at approximately the same time, and (ii) how CT can be used to extend the lifetime of battery-powered wireless sensor networks (WSNs) or increase the efficiency of energy harvesting WSNs.

BIOGRAPHY

Dr. Mary Ann Ingram received the B.E.E. and Ph.D. degrees from the Georgia Institute of Technology (Georgia Tech), Atlanta, in1983 and 1989, respectively. After graduating in 1989, she joined the faculty of the School of Electrical and Computer Engineering at Georgia Tech, where she is currently Professor. Her early research areas were optical communications and radar systems. In 1997, she established the Smart Antenna Research Laboratory (SARL) at Georgia Tech, which emphasizes the application of multiple antennas to wireless communication systems. She has held the Georgia Tech ADVANCE Professorship for the College of Engineering, since 2006. She was a Visiting Professor at Aalborg University, Aalborg, Denmark in the summers of 2006-2008 and at Idaho National Labs in 2010. The SARL performs system analysis and design, channel measurement, and prototyping relating primarily to wireless local area, ad hoc and sensor networks, with focus on the lower three layers of the protocol stack. Dr. Ingram has authored or co-authored over 140 refereed journal and conference papers, including four conference papers that have won "Best Paper" awards. She participated in the development of IEEE 802.11p, which is the standard for vehicular wireless LANs. She served as a Guest Editor for the EURASIP Special Issue on Cross-Layered Design for Physical/MAC/Link layers in Wireless Systems in 2007 and Co-Chair for America for the IEEE Wireless VITAE Conference in 2009. She has been an associate editor for the IEEE Transactions on Mobile Computing since 2009. Prof. Ingram is a Senior Member of the IEEE.

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