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Seminar Dec. 11: Powering the Internet of Things

Thursday, December 7, 2017

WIRELESS SEMINAR SERIES

Date and time: Monday, Dec 11, 3:00-4:00 pm

Location: Carleton University, 4359 ME (Mackenzie Building)

Title: Powering the Internet of Things: Efficient and Reliable Wireless Communications with Unreliable Power Supply

Speaker: Ozgur Ercetin, Professor, Sabanci University, Turkey, Visiting Professor with Carleton University

ABSTRACT: We are surrounded by digital sensors, cameras, and communication devices. Most digital sensors are easy to connect, but those tucked away in hard-to-access spots will need to harvest ambient energy. The harvested energy usually comes in miniscule amounts randomly over time. The unreliable supply of energy brings forth new communications problems to be addressed. In this presentation, we will consider two problems of equal importance: 1) Throughput maximization of an energy harvesting transmitter over a fading channel. The objective is to use the energy as efficiently as possible so that the channel state is sensed rarely to save energy while estimating the channel state by reinforcement learning. 2) Reliable communication to an energy harvesting receiver. The energy harvesting can also be performed at the receiver end, where the only energy source is the information bearing RF signal. Hence, the objective is to use the incoming RF transmissions to both energize the receiver transceiver and decode the information encoded by Hybrid ARQ with smallest time delay. We use Markov Decision Processes to model each problem, and show that their optimal solutions are amenable to simple-to-implement policies.

Speaker Bio: Ozgur Ercetin received the B.S. degree in electrical and electronics engineering from Middle East Technical University, Ankara, Turkey, in 1995, and the M.S. and Ph.D. degrees in electrical engineering from the University of Maryland, College Park, MD, USA, in 1998 and 2002, respectively. Since 2002, he has been with the Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul, Turkey where he is currently a Full Professor. He also held positions as Visiting Researcher with HRL Labs, Malibu, CA, USA, and with Docomo USA Labs, Palo Alto, CA, USA, and Visiting Associate Professor with The Ohio State University, Columbus, OH, USA, and Visiting Professor with Carleton University, Ottawa, Canada, and Universite du Quebec a Montreal, Montreal, Canada. His research interests are in the field of computer and communication networks with emphasis on fundamental mathematical models, architectures and protocols of wireless systems, and stochastic optimization.

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