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SenSIP Graduate Seminar Series

Transmission and coding techniques for two-way relaying

Presenter: Ahmad Salim, PhD

December 4 (Friday), 2015, 11:00 AM / Room: GWC 487

Abstract

The recent proposal of two-way relaying has attracted much attention due to its promising features for many practical scenarios. Hereby, two users communicate simultaneously in both directions to exchange their messages with the help of a relay node. This presentation considers various aspects of two-way relaying. Specifically, the issue of asynchronism, lack of channel knowledge, transmission of correlated sources and multi-way relaying techniques involving multiple users will be discussed. The main focus of the presentation is the proposal of a distributed source coding solution based on Slepian-Wolf coding to compress correlated messages close to the information theoretical limits in the context of multi-way relay (MWR) channels. Specifically, the syndrome approach based on low-density parity-check (LDPC) codes is implemented. A number of relaying strategies are considered for this problem offering a tradeoff between performance and complexity. The proposed solutions have shown significant improvements compared to the existing ones in terms of the achievable compression rates.

Biography:

Ahmad Salim received his B.Sc. degree in Electrical Engineering from the University of Jordan, Amman, Jordan, in 2006. Later, he received his M.Sc. in Telecommunication Engineering from King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, in 2010. He has achieved the eighth place in the University Qualifying Examination held in Jordan in the year 2005/2006 in the field of Electrical Engineering covering all the Jordanian universities. Currently, he is working towards his Ph.D. in Electrical Engineering at Arizona State University, Arizona, United States. His primary research interests lie within the scope of communications and signal processing, including wireless communications, underwater acoustic communications, cooperative communications, MIMO systems, diversity techniques, error control coding and iterative receivers.

Refreshments

Sponsored by the SenSIP Center and NSF I/UCRC
Technical Co-Sponsorship by the IEEE Signal Processing and Communications Chapter, Phoenix Section

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