Abstract

Severe delay and resource (energy, bandwidth) constraints are typical in emerging communications and networking applications within a variety of scientific and engineering disciplines. This is particularly the case in highly constrained sensor networks. Such applications strongly motivate foregoing the convenience of digital communication and revisiting the potential benefits, and even necessity of analog communication, albeit in the modern context of distributed source-channel coding. Major challenges emerge, including the derivation of a theoretical foundation for analog networking from estimation and information theoretic principles, optimal and low complexity algorithm design and the analysis of the fundamental limits. The first part of the talk will outline my research efforts on these lines. In the second part, I will present the applications of the results obtained for the analog networking problem to different disciplines, yielding a novel randomized quantization scheme; a numerical approach to an open decentralized control problem; and networking solutions for neural activity monitoring sensors.

Biography: Emrah Akyol received the B.Sc. degree in 2003 from Bilkent University, the M.Sc. degree in 2005 from Koc University (both in Turkey), and the Ph.D. degree in 2011 in electrical and computer engineering from UC Santa Barbara. From 2005 to 2007, he held positions at Hewlett-Packard Laboratories and NTT Docomo Laboratories, both in Palo Alto, CA, and UC Los Angeles where he worked on several topics in video compression and networking.

Currently, Dr. Akyol is a postdoctoral researcher at UC Santa Barbara. His research focuses on source and source-channel coding, energy efficient communications and computing, and multimedia compression and networking.