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IEEE North Jersey Communications Chapter

Secrecy Capacity of Multi-terminal Networks with Pricing

by Anand Santhanakrishnan, Stevens Institute of Technology

Date: March 3, 2008 (Monday)
Time: 6:15 pm (refreshment starts at 6:00 pm)
Place: 202 ECEC, NJIT

About the Speaker

Anand Santhanakrishnan completed his Bachelor of Engineering (B. E.) degree from College of Engineering Guindy, Anna University, Chennai, India and his Master of Engineering (M. E.) and Ph. D. degrees from the Indian Institute of Science, Bangalore, India. His thesis was on radio resource allocation in cellular networks, with focus on dynamic channel allocation in channelized cellular networks and admission control and power and rate allocation in cellular CDMA. He has also participated in the 3GPP forums on system architecture evolution for UMTS-LTE system with focus on IP mobility. He has also participated in the IEEE 802.20 mobile broadband wireless access (MBWA) forums. He is currently working as a post doctoral researcher in MSyNC lab in the Department of ECE in Stevens Institute of Technology. His current areas of interest include resource allocation, network selection and secrecy capacity in cognitive radio networks. He also particpates in the 1900 A study group activities for dynamic spectrum access.

About the Talk

Secrecy capacity is a measure of the information theoretic capacity of a key-less secure channel. It is the maximum information transfer rate such that the receiver error probability approaches zero while an eavesdropper's error probability goes to 1/2. Most approaches in the literature study secrecy capacity for a single source-destination pair in the presence of a single eavesdropper. In this talk, we present secrecy capacity results for multi-terminal networks considering the multi-access interference due to multiple source-destination pairs. We propose a pricing function to limit the transmit powers of the transmitters. We present mathematical conditions on the pricing parameters that result in optimal power allocation to maximise the secrecy capacities. We further show that the solution to the power allocation problem is independent of the location of the eavesdropper. It is also observed that the pricing model improves the secrecy of the weakest transmit-receive pair.

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