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THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

Network Source Coding: the role of side information and feedback

by

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Date : 6 May, 2009 (Wed.)
Time : 3:30-4:30pm
Venue : Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong

Abstract

Information transfer over networks presents many challenges in addition to those present in point-to-point communication systems. These arise, in part, due to network topology and correlation between information sources observed at nodes in the network. Starting with the remarkable result of Slepian and Wolf (1973), it has been shown that the transmission rate required may be significantly lowered for many source coding systems by exploiting their network aspects. However, the lack of full characterization of the achievable data rates, except for a limited number of networks, points to a need to identify the general principles governing network source coding systems.

In this talk, we focus on two such principles - side information and feedback. We start with an overview of Network Source Coding. We then investigate the network source coding rate region for networks with multiple sources and multicast demands in the presence of side information, generalizing earlier results on multicast rate regions without side information. We show how this result may be used to obtain achievable rates for general networks. Next, we examine networks with unlimited feedback from the sinks to the sources, demonstrating that feedback can not only increase the rate region for network source coding, but also simplify code design in some cases.

Biography

Mayank Bakshi is a PhD student at California Institute of Technology. He is working as a part of the Data Compression Lab with Prof. Michelle Effros. His research interests include (but are not limited to) Network Source Coding, Network Coding, and Information theory in general. Currently, he is at CUHK on a short research visit and is being hosted by Prof Sidharth Jaggi.

**** ALL ARE WELCOME ****

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