



THE CHINESE UNIVERSITY OF HONG KONG
Institute of Network Coding
and
Department of Information Engineering
Seminar



Network-Coded Multiple Access

by

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Date : 17 January 2014 (Friday)
Time : 11:00 am - 12:00 pm
**Venue : Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong**

Abstract

In this talk, I will present the application of physical-layer network coding (PNC) in non-relay networks. Most, if not all, prior studies of PNC focused on its use in relay networks. This is not surprising given that network coding is grounded on the idea of intermediate nodes (i.e., relays) mixing and forwarding information from several sources. Our recent experiments, however, point to a new frontier for PNC. Specifically, we found that PNC could also play a role in non-relay networks.

More concretely, we propose and experimentally demonstrate a first wireless local area network (WLAN) system that jointly exploits physical-layer network coding (PNC) and multiuser decoding (MUD) to boost system throughput. We refer to this multiple access mode as Network-Coded Multiple Access (NCMA). NCMA is the first realized multiple access scheme that establishes the usefulness of PNC in a non-relay setting. Our USRP prototype indicates that NCMA can boost throughput by 100% in the medium-high SNR regime ($> 10\text{dB}$). We believe further throughput enhancement is possible by allowing more than two users to transmit together.

Biography

Dr. Lu Lu received his B.E. and Ph.D. degrees from the University of Science and Technology of China (USTC) and The Chinese University of Hong Kong (CUHK), in 2007 and 2012, respectively. He is currently a postdoctoral fellow at the Institute of Network Coding, CUHK. At CUHK, he received the Outstanding Ph.D. Thesis Award and the Postgraduate Research Output Award both in 2013. His current research interests include wireless communication in 802.11 networks, multi-user detection, physical-layer network coding, and software-defined radios.

**** ALL ARE WELCOME ****

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