



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



## A Serial Joint Channel and Physical Network Decoding

by

**Mr. Pingping CHEN**  
**Xiamen University, China**

**Date : 22 June 2012 (Friday)**

**Time : 2:30 pm - 3:30 pm**

**Venue: Room 833, Ho Sin Hang Engineering Building  
The Chinese University of Hong Kong**

### Abstract

Physical network coding can increase the throughput of a network system over the conventional network coding. Recently, several PNC schemes in conjunction with channel decoding have been proposed for two-way relay systems with two source nodes. These schemes are referred to as the joint channel decoding and physical network coding (JCNC) scheme and are designed mainly for the case that the two sources are encoded with the same iteratively decodable code, which puts a constraint on the overall information transmission rate, while simplifying the decoding complexity. Here, we present a serial joint channel and physical network decoding (S-JCND) scheme for two-way relay communication systems where the two source codes can be either the same or different. We show that in both cases with the same or different source codes, the S-JCND can achieve good performance. In particular, in the cases with the same source codes, it also significantly outperforms the previous proposed JCNC scheme. Secondly, in a PNC-aided relay networks where two end nodes have two transmit-antennas per node, to directly decode network-coded signals from the received signals at the relay, the two nodes can use global channel state information to precode their respective signals after STBC coding. Simulation results illustrate that the proposed STBC-PNC shows symbol error rate (SER) performance no worse than that of the STBC-NC, and outperforms the previous PNC-aided STBC schemes.

### Biography

Pingping CHEN is a PH.D candidate at the Department of Electronic Engineering, Xiamen University, China. Previously, he received a BE degree in Software Engineering from Fuzhou University in 2008. He is working toward PH.D degree since Sept. 2010 in Xiamen University. Now he is a visiting research assistant in Hong Kong Polytechnic University from May. 2012. His research interests include channel coding design and optimization, joint source and channel coding. Currently, he focuses on wireless network coding and communications. He received the XiangYu Group Corporation Endowed Award in 2012.

**\*\*ALL ARE WELCOME \*\***