



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



Characterisation of Network Coding Regions via Entropy Functions

by

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Time : 2:30 - 3:30 pm

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

Abstract

Characterisation of the set of achievable (with vanishing errors)/admissible (with zero errors) rate-capacity tuples for general networks is an extremely difficult problem. It was proved that the characterisation problem is as difficult as determining the set of all information inequalities. In the work by Yan et al. entitled as "The capacity region for multi-source multi-sink network coding", a characterisation was given implicitly via the use of entropy functions. This characterisation was largely based on the outer bound proposed earlier by Yeung.

In this talk, we will show that when sources are collocated, Yeung's outer bound is tight and the sets of admissible and achievable rate-capacity tuples are the same. We also characterise the set of achievable/admissible rate capacity tuples for network subject to linearity constraint, routing constraint and secrecy constraint. We show that for the incremental multicast problem and for single-source secure network coding problem, linear network codes may not be optimal.

Biography

Terence Chan received his Ph.D. degree in Information Engineering in 2001 from The Chinese University of Hong Kong. Upon receiving his degree, he was a visiting assistant professor in the Department of Information Engineering at the same university. From February 2002 to June 2004, he was a Post-doctoral Fellow at the Department of Electrical and Computer Engineering at the University of Toronto. He was an assistant professor at University of Regina between 2004 and 2006. He is now a Senior Research Fellow in Institute for Telecommunications Research at University of South Australia.

His research interests are on information theory and network communications. He received the Croucher Foundation Fellowship and Sir Edward Youde Fellowship in 2002 and 2000 respectively.

****ALL ARE WELCOME ****

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