



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



## Optimal Conflict-avoiding Codes of Odd Length and Weight Three

by

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**Time : 11:00 am -12:00 pm**

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

### Abstract

A conflict-avoiding code (CAC) of length  $n$  and weight  $k$  is a collection of binary vectors of length  $n$  and Hamming weight  $k$ , such that the inner product of any two vectors or their arbitrary cyclic shifts is at most one. In the study of multiple-access collision channel without feedback, CAC is used to guarantee that each transmitting user can send at least one data packet successfully during a fixed period of time  $n$ , provided that at most  $k$  users out of  $M$  potential users are active at the same time. The number of codewords in a CAC determines the number of potential users in the system. A CAC with maximum cardinality is said to be optimal. In this talk, we focus on the case when  $n$  is odd and  $k = 3$ , and how to use Graph Theory and Number Theory to characterize the structure of an Optimal CAC.

### Biography

Yuan-Hsun Lo received his B.S. degree, M.S. degree and Ph.D. degree in Department of Applied Mathematics from National Chiao Tung University (Taiwan) in 2004, 2006 and 2010, respectively. His research interests are in discrete mathematics, particularly in combinatorics, graph theory, combinatorial design, coding theory, algebra and number theory. He is also a new comer in network coding theory. Yuan-Hsun won the excellent thesis award at combinatorics conference in 2006, and was nominated for a fellow of the Phi Tau Phi scholastic honor society. He was an adjunct instructor in 2008-2009, and now is a postdoctoral fellow in NCTU (Taiwan).

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