



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



On Entropy Minimization of Quasi-uniform Arrays

by

Dr. Qi CHEN

**Postdoctoral Fellow, Institute of Network Coding
 The Chinese University of Hong Kong**

Date : 2 Nov 2016 (Wednesday)
Time : 11:00am - 12:00pm
**Venue : Room 1009, William M. W. Mong Engineering Building
 The Chinese University of Hong Kong**

Abstract

Let n be a positive integer and $\mathbf{n} = (n_1, \dots, n_t)$ be a t -partition of n . Let $C = \{c_1, \dots, c_t\}$ be a set of t colors. An $n \times n$ array is called \mathbf{n} -quasi-uniform if the number of the cells in each row and each column colored by c_i is n_i . Two rows of an \mathbf{n} -quasi-uniform array are said to have the same color type if the cells of the two rows in the same column have exactly the same color. Picking a row randomly according to the uniform distribution, we call the entropy of the random variable of the row's color type the *row entropy* of the \mathbf{n} -quasi-uniform array.

In this talk, we study the entropy minimization problem of quasi-uniform arrays, i.e., given \mathbf{n} , computing the minimum row entropy among all \mathbf{n} -quasi-uniform arrays and constructing \mathbf{n} -quasi-uniform arrays that can achieve the minimum row entropy. The solution of the problem partially characterizes the entropy region for three random variables, and also provides a tighter bound on the number of channel uses in error-free perfect-secrecy systems.

Biography

Qi Chen received the B.S. in communication engineering from Nanjing University of Posts & Telecommunications in 2007, M.S. in communication and information system from Shanghai Jiao Tong University in 2010 and Ph.D. degree in information engineering from The Chinese University of Hong Kong in 2014. Since September 2016, he has been a Postdoctoral Fellow at the Institute of Network Coding of The Chinese University of Hong Kong. From September 2015 to January 2016, he was also a Postdoctoral Researcher at the ECE Department of Drexel University. His research interests include information theory and related areas, in particular, the characterization of the entropy region.

**** ALL ARE WELCOME ****