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

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Part 1: Algebraic Soft Decoding of Reed-Solomon Codes Using Module
Part 2: SYSU Faculty Recruitment

Speaker: Prof. Li CHEN, Sun Yat-sen University
Date   : 16 November 2017 (Thursday)
Time   : ~~2:30-3:30pm~~ 3:30 - 4:30pm
Venue   : Room 833, Ho Sin Hang Engineering Building, CUHK

Abstract of Part 1

This talk will introduce two classical algebraic soft decoding algorithms for Reed-Solomon (RS) codes utilizing the concept of module. With Shannon's promised channel capacity, generations of coding theorists endeavor to find good channel codes that can realize the promise, resulting in continuous evolution of wireless communication systems. RS code is the earliest channel code that sheds light on the hope thanks to its maximum distance separable property and strong burst error correction capability. Its applications can be found in modern cellular networks, satellite communications and data storage. However, the current decoding systems fall short of exploiting the code's error-correction potential. The interpolation based algebraic decoding can correct errors beyond half of the code's minimum Hamming distance. But this error-correction advancement is realized with high decoding complexity that so far deters the industrial commitments. This talk will introduce the module minimization (MM) technique for solving the computationally expensive interpolation problem. In particular, we will show how to use the MM technique to solve the interpolation problem in two classical algebraic soft decoding algorithms, the Koetter-Vardy (KV) decoding algorithm and the algebraic Chase decoding (ACD) algorithm. We will also show how to apply the re-encoding transform to further facilitate the decoding. Performance and complexity comparisons between the KV and the ACD algorithms will also be elaborated, sustaining their future applications.

Besides the above research agenda, this talk will also introduce Sun Yat-sen University's recent New Engineering Disciplines Development initiative. The School of Electronics and Communication Engineering is one of the newly founded Engineering Schools to be prospered in the University's Shenzhen campus. We now recruit faculty and research staff in the areas of Information Coding and Transmission, Deep Space and Deep Ocean Communications, Intelligent Communication Networks, Multimedia Signal Processing, Radio Frequency and Integrated Circuits and Emerging Information Technologies. Sun Yat-sen University is where you can enrich yourselves for excellence. Welcome to the talk and know more about our program.

Biography

Li Chen is a Professor and Deputy Dean of the School of Electronics and Communication Engineering, Sun Yat-sen University. He received the BSc degree in applied physics from Jinan University, China, in 2003, and the MSc degree in communications and signal processing and the PhD degree in communications engineering both from Newcastle University, UK, in 2004 and 2008, respectively. From 2007 to 2010, he was a Research Associate with Newcastle University. In 2010, he joined Sun Yat-sen University where he became a full Professor in 2016. From 2011 to 2012, he was an occasional Visiting Scholar with the Institute of Network Coding, the Chinese University of Hong Kong. From Jul. to Sept. 2015, he was a Visitor at the Institute of Communication Engineering, Ulm University, Germany. From Oct. 2015 to Jun. 2016, he was a Visiting Associate Professor with the Department of Electrical Engineering, University of Notre Dame, USA. His primary research interests include information theory, error-correction codes and data communications. He was a recipient of the British Overseas Research Scholarship (ORS) and the 2014 Chinese Young Information Theory Researcher Award. He has been a Principle Investigator for three National Natural Science Foundation of China (NSFC) projects and a Co-Investigator of a National Basic Research Program (973 program) Project. He has also been involved in organizing several international conferences, including the 2018 IEEE Information Theory Workshop in Guangzhou. He likes reading and photography.

**** ALL ARE WELCOME ****

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