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

Coded Wireless Video Broadcast/Multicast- A Framework to Harvest The True Potential of 4G Access Networks

by

Dr. James She

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Date : 28 January 2011 (Friday)
Time : 2:30 - 3:30 pm
Venue : Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong

Abstract

Advancements in video coding and wireless communications, particularly in emerging 4G access networks, can create many exciting wireless video broadcast/multicast applications. Although using shared broadcast radio signals can nicely scale the system capacity regardless of the number of receivers, the rate is limited by the worst-channel receiver for the largest scalability. This prohibits the true potential of any 4G access network to enable high-quality video broadcast, such as for high-definition TV or 3D content. For efficient and robust wireless video broadcast/multicast under fading, this talk presents a novel cross-layer framework that exploits the interplay between applying protections on any successively refinable video source and transmitting through a layered broadcast/multicast channel. It is practically achievable by using multiple descriptions coding on a scalable video source and using superposition coding for layered roadcast/multicast transmission. The results from simulation, empirical, information-theoretical approaches reveal the scenarios that the framework can lead to a lower distortion than a legacy system. Most importantly, this generic framework contributes to the advancements in the related fields by introducing a new design dimension in terms of protections in cross-layer design. It is unique when compared to previous approaches that are often manipulating conventional parameters alone such as power, modulation scheme, coding rate, etc. The impact of this dimension was unapparent in the past, but is now proven as an effective means to enable high-quality, efficient, and robust wireless video broadcast/multicast in any 4G access network.

Biography

James She (http://www.cl.cam.ac.uk/~js864) is currently a Research Fellow in the Computer Laboratory at the University of Cambridge, United Kingdom. He completed his Ph.D. in Electrical and Computer Engineering from the University of Waterloo (UW), Canada, in August 2009. His current research interests include wireless video broadcasting for IPTV/3D systems; wireless/ mobile social media networks, wireless video sensor networks. His Ph.D. thesis on Coded Wireless Video Broadcast/Multicast attracted funding supports from various provincial and national government/research agencies for further research, prototyping and commercialization. During his Ph.D. study, he has generated 5 International, US, Taiwanese patents and authored/co-authored 20 publications. James also received his M.Phil. in Electrical and Computer Engineering from the Hong Kong University of Science and Technology, Hong Kong. Two US and Chinese patents resulted from his Master's thesis were licensed to a startup company - SinoCDN Limited (Hong Kong). The same patents were acuiqred by a US firm in 2008. During 2000-2003, James served as the Chief Technology Officer for SinoCDN Limited.

James She is the recipient of the honor of "Outstanding Achievement of Graduate Studies" awarded by UW and three Canadian national awards in 2009 - NSERC Postdoctoral Fellowship Award, NSERC Innovation Challenge Award, and Canada-UK Millennium Research Award. In 2001, he was the youngest recipient, to-date, to be named one of "Ten Outstanding Young Digi-Persons" by the Innovation and Technology Association and the Information Technology Department, of the Government of Hong Kong. In addition, he received two Hong Kong Industry Awards in 2001 for the networking products using his patented technology.

****ALL ARE WELCOME ****

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