

# **A new communication paradigm for mobile TV over cellular network**

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Electrical and Computer Engineering

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**Abstract:** At the forefront of the explosive growth in wireless data traffic, mobile TV service over cellular network is becoming a natural and intriguing wireless application with tremendous demand. In this work, we fully appreciate the fundamental differences between the cellular network and the traditional terrestrial TV network and propose a new mobile TV communication paradigm that is radically different from existing broadcast/multicast solutions. The talk focuses on multicasting hard deadline constrained prioritized (HDCP) data and the objective is to maximize the average network throughput under some resource constraints. In particular, we will advance two of the most remarkable discoveries in networking and communication theory (i.e., Network Coding and Dirty Paper Coding) in the new mobile TV system design. Despite many existing studies on both techniques, the benefits of these advancements to mobile TV are not yet known. By integrating network layer Network Coding and physical layer Dirty Paper Coding in a cross-layer design, we show that this new perspective opens up room for significant performance improvements, as long as the associated technologies are chosen appropriately.

**Bio:** Dr. Hongxiang Li is currently an assistant professor with the Department of Electrical and Computer Engineering, University of Louisville, Louisville, KY. Prior to that, he was an assistant professor at North Dakota State University from 2008 to 2011. In the summer of 2012 and 2013, he was a summer visiting faculty at the Rome Air Force Research Lab (AFRL) and the NASA Glenn Research Center (GRC), respectively. He received the B.S. degree from Xi'an Jiaotong University, China in 2000, the M.S. degree from Ohio University in 2004, and the Ph.D. degree from University of Washington, Seattle in 2008, all in electrical engineering. Dr. Li's general research area is wireless communications and networks. He has published over 80 journal and conference articles in the field. He won the Best Paper Award in the IEEE International Conference on Electro/Information Technology (EIT) in 2013. His research has been funded by NSF, NASA and AFRL. In the year of 2008, he received the Chinese Government Award for Outstanding Self-Financed Students Abroad, the University of Washington Outstanding Research Assistant Award and was nominated for the YANG Research Award. He is also the recipient of the 2012 Ralph E. Powe Junior Faculty Enhancement Award. Dr. Li is a senior member of IEEE.

**Host:** Prof. Rockey Luo <rokey@engr.colostate.edu>