

Secure Multimedia over Mobile Wireless Networks: Challenges and Solutions

Date: **23 Feb 2011 (Wednesday)**

Time: **3:15 - 4:30 pm**

Venue: **Rm. 1009, William M.W. Mong Engineering Bldg.**

Speaker: **Prof. Chang Wen CHEN**

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Abstract:

It is well known that media data over wireless links is more vulnerable to illegal access and modification due to their open air access operating mode. Wireless links are fundamentally different from the wired communications in several key operation aspects, including limited bandwidth as well as time-varying and error prone channel conditions. As a result, conventional secure data communication schemes cannot be readily applied to secure media over mobile wireless networks. In wireless networks, transmission errors such as packet loss and bit errors are inevitable due to ambient interferences and open air operation mode. Furthermore, media transmission is also fundamentally different from the generic data communication in that media content integrity, rather than the data stream integrity, needs to be preserved during the transmission. For example, when authenticating media for wireless networks, the semantic meaning of the media data, instead of the entirety of the data, needs to be verified.

In this talk, various challenges in secure multimedia over mobile wireless networks beyond reliable transmission will be presented. In particular, examples in multimedia encryption and multimedia authentication over wireless links will be discussed in detail. Some contemporary solutions to these challenges, such as encryption of scalable video and joint source-channel-authentication design, will also be described to illustrate that paradigm shift solutions can be developed to meet these great challenges.

Biography:

Chang Wen Chen is a Professor of Computer Science and Engineering at the State University of New York at Buffalo. Previously, he has been Allen Henry Endow Chair Professor of Electrical and Computer Engineering at the Florida Institute of Technology from 2003 to 2007. He was on the faculty of Electrical Engineering Dept. at the University of Rochester from 1992 to 1996, on the faculty of Electrical and Computer Engineering Dept at the University of Missouri-Columbia from 1996 to 2003. He also served as the Head of Interactive Media Group at David Sarnoff Research Labs in Princeton from 2000 to 2002, managing numerous research projects in video coding standards and wireless video communications.

He served as the Editor-in-Chief for IEEE Trans. Circuits and Systems for Video Technology from 2006 to 2009. He has been an Editor for numerous IEEE Transactions and Journals, including Proceedings of IEEE, IEEE Journal of Selected Areas in Communications, IEEE Trans. Multimedia, and IEEE Multimedia Magazine. He has also served as Conference Chair for several major IEEE and SPIE conferences related to mobile wireless video communications and signal processing. His current research interests include reliable and secure multimedia communications over mobile wireless channels; digital video coding, processing, analysis, and embedded implementation; medical image analysis and biomedical information processing; distributed source coding and digital signal processing for communications; and collaborative signal processing and data aggregation for sensor networks. His research is supported by NSF, DARPA, Air Force, NASA, Whitaker Foundation, Kodak, Intel, and Huawei.

He received his BS from University of Science and Technology of China in 1983, MSEE from University of Southern California in 1986, and Ph.D. from University of Illinois at Urbana-Champaign in 1992. He was elected an IEEE Fellow for his contributions in digital image and video processing, analysis, and communications, and elected an SPIE Fellow for his contributions in electronic imaging and visual communications.

All are welcome