

Department of Computer Science
University of Houston

SEMINAR SPRING 2011

WHEN: MONDAY, MAY 23, 2011

WHERE: PGH 563

TIME: 11:00 AM

SPEAKER: Dr. Qingzhong Liu, Sam Houston State University

Host: Dr. Zhigang Deng

Title: Do You Trust Your Eyes and Ears? --- Introduction to Emerging Multimedia Forensics

Abstract: Being widely facilitated and proliferated by today's digital techniques, multimedia based information hiding and forgery technologies increasingly pose threats to public safety, law enforcement, and U.S. national security. As an emerging research field, multimedia forensics aims to counter the threats. In multimedia forensics, steganalysis and forgery detection have been actively conducted, but still have a lot of gaps to fill. This talk will focus on the author's work in steganalysis.

In image steganalysis, to enhance evaluation of steganalysis performance, a shape parameter of Generalized Gaussian Distribution (GGD) model is utilized to measure image complexity. The relationship among information-hiding ratio, image complexity, and detection performance is demonstrated. Novel methods of feature mining have been explored to improve the detection of LSB matching steganography and several JPEG-based information hiding systems. In audio steganalysis, a derivative-based Mel-cepstrum and Markov approach has been proposed. In comparison to a representative art of audio steganalysis, this novel stream mining gains significant advantage in each category of signal complexity—especially in audio streams with high signal complexity, and thus prominently improves the state of the art.

In addition to steganalysis, a brief introduction to forgery detection will be discussed in the talk.

Brief Bio: Qingzhong Liu is an assistant professor at Sam Houston State University. He was a senior research scientist and adjunct faculty of New Mexico Institute of Mining and Technology, a National Center of Academic Excellence in Information Assurance Education and Research, as designated by the U.S. National Security Agency (NSA)/Department of Homeland Security (DHS), wherein he received his Ph.D. in Computer Science in 2007. His current research is funded by the U.S. National Institute of Justice. His interests include data mining, computational intelligence, bioinformatics, multimedia forensics, and information security.