

IEEE Signal Processing WA Chapter Seminars

Time: Tuesday (June 17, 2014) 10:30am-12noon

Venue: 207:222 (Spatial Sciences boardroom), Curtin University, Bentley Campus

This is a free event, open to both IEEE and non-IEEE members.

Talk by Prof. Hans-Jürgen Zepernick

Title:

Quality of Mobile Multimedia Experience

Abstract:

The rapid evolution of wireless networks is driven by the growth of wireless packet data applications such as interactive mobile multimedia applications, wireless streaming services, and video-on-demand. The largely heterogeneous network structures, severe channel impairments, and complex traffic patterns make the wireless networks much more unpredictable compared to their wired counterparts. One of the major challenges with the roll-out of these services is therefore the design of wireless networks that fulfill the stringent quality of service requirements of mobile multimedia applications. In this presentation, perceptual image and video quality metrics for real-time quality assessment of mobile multimedia experience are discussed. This includes a classification of quality assessment methods, comparison of psychophysical versus engineering approaches, perceptual image and video quality assessment, and some example applications.

Biography:

Hans-Jürgen Zepernick received the Dipl.-Ing. degree from the University of Siegen in 1987 and the Dr.-Ing. degree from the University of Hagen in 1994. From 1987 to 1989, he was with Siemens AG, Munich, Germany. He is currently a Professor of radio communications at the Blekinge Institute of Technology, Karlskrona, Sweden. Prior to this appointment, he held the positions of Professor of wireless communications at Curtin University of Technology; Deputy Director of the Australian Telecommunications Research Institute; and Associate Director of the Australian Telecommunications Cooperative Research Centre. His research interests include cooperative communications, cognitive radio networks, mobile multimedia, and perceptual quality assessment.

Talk by Ms. Thi My Chinh Chu

Title:

Adaptive Modulation and Coding with Queue Awareness in Cognitive Incremental Decode-and-Forward Relay Networks

Abstract:

This paper studies the performance of adaptive modulation and coding in a cognitive incremental decode-and-forward relaying network where a secondary source can directly communicate with a secondary destination or via an intermediate relay. To

maximize transmission efficiency, a policy which flexibly switches between the relaying and direct transmission is proposed. In particular, the transmission, which gives higher average transmission efficiency, will be selected for the communication. Specifically, the direct transmission will be chosen if its instantaneous signal-to-noise ratio (SNR) is higher than one half of that of the relaying transmission. In this case, the appropriate modulation and coding scheme (MCS) of the direct transmission is selected only based on its instantaneous SNR. In the relaying transmission, since the MCS of the transmissions from the source to the relay and from the relay to the destination are implemented independently to each other, buffering of packets at the relay is necessary. To avoid buffer overflow at the relay, the MCS for the relaying transmission is selected by considering both the queue state and the respective instantaneous SNR. Finally, a finite-state Markov chain is modeled to analyze key performance indicators such as outage probability and average transmission efficiency of the cognitive relay network.