

# Perceptual Colour Image Coding with JPEG2000

H.R. Wu

School of Electrical and Computer Engineering

Royal Melbourne Institute of Technology

[henry.wu@rmit.edu.au](mailto:henry.wu@rmit.edu.au)

**Abstract:** Perceptual digital picture coding has become one of the focal points in search of the next generation compression algorithms for high quality/performance digital image, video or image sequence storage, broadcasting and communications. This talk describes a perceptual colour image coder (PCIC) for the  $YCbCr$  component colour space using the JPEG2000 framework. This coder employs a vision model based perceptual distortion metric (PDM) to approximate perceived error for rate-distortion (R-D) optimisation in order to maximise the visual quality of coded images. The vision model employed in the PCIC is structurally based on an existing monochromatic multichannel vision model, which is extended for colour image coding. Subjective tests with 30 viewers show that the PCIC provides superior picture quality at low to intermediate bitrates in comparison with a JPEG2000 compliant coder employing the mean squared error (MSE) and the visual distortion metric (Cvis) as distortion measures, respectively.

**About the speaker:** Hong Ren Wu received his BEng. and MEng. from University of Science and Technology, Beijing, (formerly Beijing University of Iron and Steel Technology), P.R. China, in 1982 and 1985, respectively. He received his Ph.D. degree in electrical and computer engineering from The University of Wollongong, NSW, Australia, in 1990. From 1990 to 2005, Dr Wu worked on academic staff of Faculty of Information Technology, at Monash University, Australia. Dr Wu joined Royal Melbourne Institute of Technology (RMIT University) in February 2005 and is currently a professor of visual communications engineering and discipline head of Computer and Network Engineering, School of Electrical and Computer Engineering. Dr Wu has published extensively in refereed journals and his significant contributions in the area of the proposed tutorial include the no-reference picture blocking metric in 1997, the vision model based video blocking metric in 2002, vision model based perceptual image coding in 2004, and perceptually lossless coding of medical images in 2006. Dr Wu is the co-editor of the book *Digital Video Image Quality and Perceptual Coding*, (Taylor and Francis, 2006). Dr Wu was a guest editor, respectively, for special issue on Multimedia Communication Services, Circuits, Systems and Signal Processing, No. 3, 2001 and for the special issue on Quality Issues on Multimedia Broadcasting of the *IEEE Transactions on Broadcasting*, Vol. 54, No.3, Pt II, September 2008.