Visual Quality Evaluation for Images and Videos

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Abstract

Visual quality assessment of images and videos has become important nowadays with the demand of high-definition and high-quality viewing experience. The standards bodies, i.e., ITU-T VCEG and MPEG, now require subjective tests to be performed on all proposals.

This talk will give an introduction on subjective and objective visual quality assessments, with focus on the latter. For subjective visual quality assessment, a short review will be given on the standard subjective evaluation procedure and the subjective score analysis methods. For objective visual quality assessment, its applications, classifications, and different techniques used in image and video quality metrics will be discussed. The general framework used by the classical HVS-model based image quality metrics (IQMs) will be briefly introduced first, followed by some new methodologies which do not rely on the HVS models, e.g., ones used in SSIM (Structural SIMilarity) and VIF (Visual Information Fidelity) quality measures. For video quality assessment, how temporal information is used to measure the perceptual video quality will be presented.

During the talk, our works on visual quality evaluation will be introduced, including our subjective quality HD video database; just noticeable distortion (JND) models; a practical image quality metric and its usage in image coding; image quality assessment based on decoupling detail losses and additive impairments and its extension to video quality metric; and finally a method to measure video temporal inconsistency.

Brief Biography

King N. Ngan received the Ph.D. degree in Electrical Engineering from the Loughborough University in U.K. He is currently a chair professor at the Department of Electronic Engineering, Chinese University of Hong Kong. He was previously a chair professor at the Nanyang Technological University, Singapore, and the University of Western Australia, Australia. He holds honorary and visiting professorships of numerous universities in China, Australia and South East Asia.

Prof. Ngan served as associate editor of IEEE Transactions on Circuits and Systems for Video Technology, Journal on Visual Communications and Image Representation, EURASIP Journal of Signal Processing: Image Communication, and Journal of Applied Signal Processing. He chaired a number of prestigious international conferences on video signal processing and communications, and served on the advisory and technical committees of numerous professional organizations. Prof. Ngan co-chaired the IEEE

International Conference on Image Processing (ICIP) held in Hong Kong in September 2010. He has published extensively including 3 authored books, 6 edited volumes, over 300 refereed technical papers, and edited 9 special issues in journals. In addition, he holds 10 patents in the areas of image/video coding and communications.

Prof. Ngan is a Fellow of IEEE (U.S.A.), IET (U.K.), and IEAust (Australia), and an IEEE Distinguished Lecturer in 2006-2007.