Perceptual Image Quality and Perception based Modelling

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Abstract:

How to assess signal quality shapes or at least influences many image/video processing algorithms and systems. Without doubt, it is meaningful and beneficial to incorporate a perceptual quality criterion in visual signal (be it naturally captured or computer generated) evaluation and processing processes, since the human visual system (HVS) is the final receiver and appreciator for most processed visual signal. As a result of the evolution, the HVS has developed unique characteristics. Significant research effort has been made towards modelling the relevant HVS’ mechanism, and to apply such a model to various processes.

In this talk, we will first introduce the major considerations associated with perceptual visual signal quality metrics, to be in line with the HVS perception, as well as the new research and development work in this field (e.g., the emerging machine learning based methodology). Then, we will discuss the related perceptual issues in image retargeting, video coding, computer graphics, and so on. The talk will also give our opinions for future research directions and development in the related areas, based upon the substantial recent project experience.

Bio:

Weisi Lin received his Ph.D. from King’s College, London University, U.K. He served as the Lab Head of Visual Processing, Institute for Infocomm Research, Singapore. Currently, he is an Associate Professor in the School of Computer Engineering. His areas of expertise include image processing, perceptual signal modeling, video compression, and multimedia communication, in which he has published 120+ journal papers and 200+ conference papers, filed 7 patents, and authored 2 books. He is an AE for IEEE Trans. on Image Processing, IEEE Signal Processing Letters and Journal of Visual Communication and Image Representation, and a past AE for IEEE Trans. on Multimedia (2011-2013). He has also served as a Guest Editor for 6 special issues in international journals. He has been a Technical Program Chair for IEEE ICME 2013, PCM 2012, and QoMEX 2014. He chaired the IEEE MMTC Special Interest Group on QoE (2012-2014). He has been an invited/panelist/keynote/tutorial speaker in 10+ international conferences, as well as a Distinguished Lecturer of Asia-Pacific Signal and Information Processing Association (APSIPA), 2012-2013.