A Simple Model for Assessing Perceptual Image Quality

Compressing or transmitting images and videos often creates distortions that will eventually be perceived by a human observer. Vice versa, image and video restoration techniques typically aim to enhance the quality of experience of human viewers. Correctly assessing the similarity between an image and an undistorted reference image as subjectively experienced by a human viewer can thus lead to significant improvements in many video and image processing systems.

In this talk, I will introduce the HaarPSI, a simple perceptual similarity index that derives local similarities between two images as well as the relative importance of image areas solely from coefficients obtained from six discrete Haar wavelet filters. In particular, I would like to demonstrate that incorporating functional properties of the early visual system on a very basic level suffices to achieve state of the art correlations with human opinion scores on large benchmarking databases. A main focus of the talk will be the question of to what extent considering such a simple model and human opinion scores as a baseline allows us to derive assumptions about the true mechanisms behind the human perception of image similarity.