A Machine Learning Approach to Visual Information Processing

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Place: Small Report Hall, 1st floor of FIT

Machine learning has a long history, including techniques developed in the context of pattern recognition, neural nets, fuzzy logic, etc. It has blossomed in the last decade. There are two key ingredients for the success of the machine learning approach: 1) a sufficient amount of training data and 2) an efficient learning mechanism. Since this methodology heavily relies on training data, it is also called the data-driven approach. Due to the availability of a large amount of speech corpses and text data, we have witnessed a great progress in speech understanding and text data mining & search based on machine learning in recent years. There are quite a few image and video files available over the Internet nowadays, and they continue to grow in an amazing rate. Will we observe the same success in "data-driven visual information processing" in the coming decade? The future appears to be bright. In this talk, after a brief introduction, I will use two examples to explain the data-driven visual information processing methodology; namely, image retrieval based on relevance feedback and perceptual visual quality assessment. Then, I will point out three major research problems in the near future: 1) information representation, 2) pedagogical development, and 3) context decision.

Biography of Dr. C.-C. Jay Kuo

Dr. C.-C. Jay Kuo received the Ph.D. degree from the Massachusetts Institute of Technology in 1987. He is now with the University of Southern California (USC) as Director of Signal and Image Processing Institute and Professor of EE, CS and Mathematics. His research interests are in the areas of digital media processing, multimedia compression, communication and networking technologies, and embedded multimedia system design. Dr. Kuo is a Fellow of AAAS, IEEE and SPIE. Dr. Kuo has guided about 110 students to their Ph.D. degrees and supervised 23 postdoctoral research fellows. Currently, his research group at USC consists of around 30 Ph.D. students (see website http://viola.usc.edu), which is one of the largest academic research groups in multimedia technologies. He is a co-author of about 190 journal papers, 810 conference papers and 10 books. Dr. Kuo is Editor-in-Chief for the Journal of Visual Communication and Image Representation, and has served as Editor for 10 other journals. Dr. Kuo received the National Science Foundation Young Investigator Award (NYI) and Presidential Faculty Fellow (PFF) Award in 1992 and 1993, respectively. He received the best paper awards from the multimedia communication Technical Committee of the IEEE Communication Society in 2005, from the IEEE Vehicular Technology Fall Conference (VTC-Fall) in 2006, and from IEEE Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP) in 2006. He was an IEEE Signal Processing Society Distinguished Lecturer in 2006, a recipient of the Okawa Foundation Research Award in 2007, the recipient of the Electronic Imaging Scientist of the Year Award in 2010, the holder of the Fulbright-Nokia Distinguished Chair in Information and

Communications Technologies from 2010-2011, and a recipient of the Pan Wen-Yuan Outstanding Research Award in 2011.