

Seminar Announcement

July 1st , Monday, 9:15-10:45am, 光电国家实验室-A302

Can we get more than 1 pixel image/video resolution out of 1 pixel?

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Abstract

Often a high-resolution RGB color image/video needs to be displayed on a low-resolution LCD display. For example, a 10 mega-pixel image is to be displayed on an SVGA monitor, or a 4CIF image is to be displayed on a QCIF mobile phone display. Limited by the low-resolution display, we have to shrink the image from high-resolution to low-resolution. Signal processing theory tells us that optimal decimation requires low-pass filtering with a suitable cut-off frequency followed by down-sampling. In doing so, we need to remove lots of details in the original high-resolution image. An interesting question is – Can we display the image with higher “resolution” than what the low-resolution display has? In other words, can we get more than one pixel “resolution” out of one pixel? The answer is a surprising “yes, but ...”. In this talk, we review some little known results on this interesting topic called subpixel rendering and attempt to explain what happens and why this is even possible. It can provide apparent higher resolution at the price of some, often annoying, color artifacts. This seminar is supported by KC Wong Foundation and is also an APSIPA Distinguished Lecture.

Biography

Professor Oscar C. Au received his B.A.Sc. from Univ. of Toronto in 1986, his M.A. and Ph.D. from Princeton Univ. in 1988 and 1991 respectively. After being a postdoctoral researcher in Princeton Univ. for one year, he joined the Hong Kong University of Science and Technology (HKUST) as an Assistant Professor in 1992. He is/was a Professor of the Dept. of Electronic and Computer Engineering, Director of Multimedia Technology Research Center (MTrec), and Director of the Computer Engineering (CPEG) Program in HKUST.

His main research contributions are on video and image coding and processing, watermarking and light weight encryption, speech and audio processing. Research topics include fast motion estimation for MPEG-1/2/4, H.261/3/4 and AVS, optimal and fast sub-optimal rate control, mode decision, transcoding, denoising, deinterlacing, post-processing, multi-view coding, view interpolation, depth estimation, 3DTV, scalable video coding, distributed video coding, subpixel rendering, JPEG/JPEG2000, HDR imaging, compressive sensing, halftone image data hiding, GPU-processing, software-hardware co-design, etc. He has published 58 technical journal papers, 330+ conference papers, and 70+ contributions to international standards..

Dr. Au is a Fellow of the Institute of Electrical and Electronic Engineering (IEEE) and is a Board Of Governor member of the Asia Pacific Signal and Information Processing Association (APSIPA). He is/was Associate Editors of IEEE Trans. On Circuits and Systems for Video Technology (TCSVT), IEEE Trans. on Image Processing (TIP), and IEEE Trans. on Circuits and Systems, Part 1 (TCAS1). He is on the Editorial Boards of Journal of Visual Communication and Image Representation (JVCIR), Journal of Signal Processing Systems (JSPS), APSIPA Trans. On Signal and Information Processing (TSIP), Journal of Multimedia (JMM), and Journal of Franklin Institute (JFI). He is/was Chair of IEEE CAS Technical Committee on Multimedia Systems and Applications (MSATC), Chair of SP TC on Multimedia Signal Processing (MMSP), and Chair of APSIPA TC on Image, Video and Multimedia (IVM).