THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

Image Interpolation
by Adaptive 2D Autoregressive Modeling

by

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Date	:	**12 Dec., 2006 (Tue.)**
Time	:	**11:00am – 12:00noon**
Venue	:	**Rm 833, Ho Sin Hang Engineering Building**
		The Chinese University of Hong Kong

Abstract

Image interpolation is a technology to generate higher resolution, better quality images from sources of lower resolution and lower quality. It has applications in multimedia communications, consumer electronics (TV, IPTV, DVD players, home theatres, digital cameras, digital projectors, printers, etc.), surveillance/security, medical imaging, and remote sensing. We propose a new approach of image interpolation via adaptive 2D autoregressive modeling (IARM). Since most images are non-stationary signals, we need to fit the model parameters to the statistics of a local window. The challenge is how to estimate the model parameters using a severely incomplete sample set that is the observed low resolution image. The issue on hand is the dilemma of chicken and egg. The interpolation of missing pixels relies on a good model, whereas the model parameters can be reliably estimated only if the missing pixels are known. The new IARM technique combines the two tasks of estimating the model parameters and interpolating the missing pixels with the estimated model, aiming at the maximum possible statistical agreement between estimated model parameters and the interpolated pixels, constrained by known low resolution pixels. This idea is formulated into a non-linear optimization problem. By solving the optimization problem, IARM delivers unprecedented good performance in both subjective and objective image quality measures.

Biography

Xiaolin Wu got his B.Sc. from Wuhan University, China in 1982, and Ph.D. from University of Calgary, Canada in 1988. He is currently a professor at the Department of Electrical & Computer Engineering, McMaster University, Canada, and a research professor of Computer Science, Polytechnic University, New York, USA, and holds the NSERC-DALSA research chair in Digital Cinema. His research interests include multimedia coding and communications, image processing, signal quantization and compression, and joint source-channel coding. He has published over one hundred sixty research papers and holds two patents in these fields. He is the principal inventor of CALIC, the benchmark algorithm for lossless image coding. His awards include 2003 Nokia Research Fellowship, 2000 Monsteds Fellowship, and 1998 UWO Distinguished Research Professorship.

** ALL ARE WELCOME **

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