CSE Seminar

By: Dr. Haomin Zhou
Georgia Institute of Technology
Date: Friday, March 13, 2009
Time: 2:00pm-3:00pm
Location: **Klaus 2447**

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Title

PDE Models and Wavelet Inpainting

Abstract:

In this talk, I will present variational models for the wavelet inpainting problem, which aims to filling in missing or damaged wavelet coefficients in image reconstruction. The problem is motaviated by error concealment in image processing and communications. And it is closely related to the classical image inpainting, with the difference being that the inpainting regions are in the wavelet domain. This brings new challenges to the reconstructions. The new variational models, especially total variation minimization in conjunction with wavelets lead to PDE's, in the wavelet domain and can be solved numerically. The proposed models have effective and automatic control over geometric features of the inpainted images including sharp edges, even in the presence of substantial loss of wavelet coefficients, including in the low frequencies. This work is jointly with Tony Chan (UCLA) and Jackie Shen (Barclays).

Bio:

Dr. Haomin Zhou received his B.S. in pure mathematics from Peking University, China in 1991, his M.S. in computational mathematics from Peking University and M.Phil in applied mathematics from the Chinese University of Hong Kong in 1994 and 1996 respectively, and his Ph.D. in applied mathematics from University of California, Los Angeles in 2000. He had spent 3 years in California Institute of Technology as a postdoctoral scholar and von Karman instructor, before he joined Georgia Institute of Technology as an assistant professor in 2003. His research interests are on numerical analysis and scientific computing, specialized in multi-scale PDE computations, numerical analysis for stochastic differential equations, and wavelet based variational PDE techniques for image and video processing. He is a recipient of the NSF CAREER AWARD in applied and computational mathematics in 2007.

You are cordially invited to attend a reception that will follow the seminar to chat informally with faculty and students. Refreshments will be provided.