PIMS / AMI Seminar

Tuesday, May 27, 2014
3:00 p.m.
CAB 657

"Image Restoration: Wavelet Frame Approach, Total Variation and Beyond"

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Abstract

This talk is about the wavelet frame-based image and video restorations. We start with some of main ideas of wavelet frame based image restorations. Some of applications of wavelet frame based models image analysis and restorations will be shown. Examples of such applications include image and video inpainting, denoising, decomposition, image deblurring and blind deblurring, segmentation, CT image reconstruction, 3D reconstruction in electron microscopy, and etc. In all of these applications, spline wavelet frames derived from the unitary extension principle are used. This allows us to establish connections between wavelet frame base method and various PDE based methods, that include the total variation model, nonlinear diffusion PDE based methods, and model of Mumford-Shah. In fact, we will show that when spline wavelet frames are used, right chosen models of a wavelet frame method can be viewed as a discrete approximation at a given resolution to the corresponding PDE based models. A convergence analysis in terms of objective functionals and their approximate minimizers as image resolution increases will be discussed.

Refreshments will be served in CAB 649 at 2:30 p.m.