



PIMS / AMI Seminar

Friday, November 23, 2012
3:00 p.m.
CAB 657



“Sparse Approximation, Directional Representation Systems, and Mathematical Imaging”

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Abstract

One of the main tasks in modern imaging and applied harmonic analysis is to construct suitable representation systems along with fast implementable algorithms for efficient decomposition and analysis of multidimensional data. It is by now well known that a large class of multidimensional images is governed by anisotropic features which can be modeled as the so-called "cartoon-like" image. In this talk, we shall focus on sparse approximation of cartoon-like images using directional multiscale representation systems, and mathematical imaging using ℓ_1 minimization techniques. We shall discuss about one of the directional multiscale representation systems, namely shearlets, its optimality in N -term approximation of cartoon-like images, and its digitization based on the fast pseudo-polar Fourier transform on pseudo-polar grids. We will also discuss about the application of compressed sensing and ℓ_1 techniques in image inpainting. As an application of the ℓ_1 minimization, we provide a quantitative result for comparison between wavelet inpainting and shearlet inpainting based on an appropriate model for seismic inpainting.

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