

The School of Natural Sciences

Presents

A PDE Approach to Geospatial Image Fusion

Seminar Series – Physics & Applied Mathematics.

Dr. Todd Wittman

Dept. of Mathematics, University of California-Los Angeles

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03:15 pm – 04:30 pm

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ABSTRACT

Earth-observing satellites gather image data in several different formats, with each image modality offering its own advantages and disadvantages. For example, hyperspectral images can be used for material identification but suffer from low spatial resolution. Panchromatic images, on the other hand, have high spatial resolution but lack any spectral information.

An analyst has to piece together information from different sources to get the "big picture". The goal of image fusion is to combine these different images into one dataset. Fusion becomes particularly troublesome when working with high-dimensional datasets, such as hyperspectral images.

I will present a classical linear algebra approach to multispectral image fusion problem, as well as an improvement developed by students in UCLA's REU program. Unfortunately, the classical fusion algorithms do not extend to high-dimensional data. We have recently developed a variational approach incorporating wavelets that successfully combines hyperspectral images with high-resolution photographs. We have also extended this method to geographic density estimation.

This is joint work with Michael Moeller, Andrea Bertozzi, and Stan Osher.

**For more information, contact:
Prof. Harish Bhat, 228-4063, hbhat@ucmerced.edu**