

# SCMS Seminar



## **AUTOLOGISTIC REGRESSION FOR BINARY SEGMENTATION OF HYPERSPECTRAL SATELLITE IMAGES**

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**Time:** 10:00 a.m., Friday, September 26th, 2014

**Venue:** Room 2201, East Guanghai Tower (Main)

**Abstract:** The autologistic model is a relatively simple Markov random field (MRF) model for binary random variables arranged on a graph. If each binary variable also has covariate information available, this information can be included, producing an autologistic regression model. The autologistic regression model is useful for modelling binary responses with spatial association, as might occur in medical, ecological, or image data. The application addressed in this talk is the automatic identification of smoke (as caused by forest fires) in imagery produced by earth-orbiting satellites. These images are "hyperspectral," consisting of 36 image planes. A machine learning approach is taken, where hand-labelled training images are used to develop an autologistic regression classifier for segmenting new images into "smoke" and "nonsmoke" classes. The chosen approach has a desirable level of simplicity, interpretability, and estimation convenience relative to alternative MRF approaches in image processing. Preliminary results on both simulated images and real data will be presented.