

The College of Arts & Sciences  
Department of Mathematical Sciences

Colloquium

# Professor Huiyan Sang

Texas A&M University

Thursday, November 1  
Room 250, 60 West Charlton  
4:00 – 5:00 pm

## *Spatial homogeneity pursuit of regression coefficients for large datasets*

Spatial regression models have been widely used to describe the relationship between a response variable and some explanatory variables over a region of interest, taking into account the spatial dependence of the observations. In many applications, relationships between response variables and covariates are expected to exhibit complex spatial patterns. We propose a new approach, referred to as SCC, to detect spatially clustered patterns in the regression coefficients. It incorporates spatial neighborhood information through a carefully constructed regularization to automatically detect change points in space and to achieve computational scalability. Our numerical studies suggest that SCC works very effectively, capturing not only clustered coefficients, but also smoothly varying coefficients because of its strong local adaptivity. This flexibility allows researchers to explore various spatial structures in regression coefficients. We also establish theoretical properties of SCC and two extensions of SCC. We use SCC to explore the relationship between the temperature and salinity of sea water in the Atlantic basin; this can provide important insights about the evolution of individual water masses and the pathway and strength of meridional overturning circulation in oceanography.

Refreshments will be served 3:15 – 3:45 pm in the Faculty & Graduate  
Student Lounge Room 4118 French Hall West

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