Spatial Regression Model Selection under the Presence of Spatial Confounding

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The spatial random effects model is popular in analyzing spatially referenced data. The model includes spatially observed covariates and unobserved spatial random effects, which if not deal properly with the confounding between the two components, parameter estimation and spatial prediction had been demonstrated to be unreliable. In this talk, we focus on discussing the estimation of regression coefficients and the selection of covariates for spatial regression under the presence of spatial confounding. We first introduce an adjusted estimation method of regression coefficients and the consequent spatial predictor when spatial confounding exists. From a prediction point of view, we then propose a generalized conditional Akaike information criterion to select a subset of covariates, resulting in variable selection and spatial prediction that are satisfactory. Statistical inferences of the proposed methodology are justified theoretically and numerically. This is a joint work with Dr. Chun-Shu Chen and Yung-Huei Chiou.

Keywords: conditional information criterion, mean squared prediction error, restricted spatial regression, spatial prediction, variable selection.