Kate Calder

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Title:

Spatial Confounding and Restricted Spatial Regression Methods

Abstract:

Over the last fifteen years, spatial confounding has emerged as a significant source of concern when interpretable inferences on regression coefficients is a primary goal in a spatial regression analysis.  Numerous approaches to alleviate spatial confounding have been proposed in the literature, many of which have close connections to dimension reduction techniques used for facilitating faster model fitting.  In this presentation, I discuss the issue of spatial confounding in the context of the spatial generalized mixed model for areal data.  In particular, I show how many of the techniques for dealing with spatial confounding in this setting can be viewed as a special case of what we refer to as restricted spatial regression (RSR) models.  Theoretical characterizations of the posterior distribution of regression coefficients under the RSR model demonstrate that inferences on coefficients can defy general expectations in the literature and can produce inferences on regression coefficients that have counterintuitive relationships with their counterparts in non-spatial and non-RSR models.  I will conclude with some general thoughts on restricted spatial regression and alternative approaches for quantifying causal effects in spatial analyses.  This talk is based on joint work with Kori Khan, Assistant Professor of Statistics at Iowa State University.