Spatial and spatio-temporal scan statistics of the regression coefficients

Junho Lee

Department of Statistical Science, Baylor University

Abstract

Spatial or spatio-temporal cluster detection is an important problem in a variety of scientific disciplines such as environmental sciences, epidemiology, and sociology. The scan statistic and its variants have been popular approaches in the last three decades, and most of them are all defined in terms of the responses. However, in regression analysis for spatial or spatio-temporal data, identifying clusters of spatial units in a regression coefficient could provide insight into the unique relationship between a response and covariates in certain subdomains of space and time windows relative to the background in other parts of the domains. Thus, recently, we have addressed the cluster detection problem of regression coefficients for spatial or spatio-temporal data. We introduce our scan statistic approaches from identifying spatial or spatio-temporal clusters in regression models and address challenges in the potential spatial dependence of these statistics.

Keywords: regression; regression coefficient; scan statistic; spatial cluster detection; spatio-temporal cluster detection.