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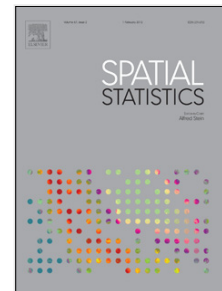
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Spatial generalized linear mixed models with multivariate CAR models for areal data

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Abstract

Disease mapping studies have been widely performed with considering only one disease in the estimated models. Simultaneous modeling of different diseases can also be a valuable tool both from the epidemiological and also from the statistical point of view. In particular, when we have several measurements recorded at each spatial location, we need to consider multivariate models in order to handle the dependence among the multivariate components as well as the spatial dependence between locations. These models can be studied in the class of spatial generalized linear mixed models (SGLMMs). It is well known that the frequentist analysis of SGLMMs is computationally difficult. Recently, there are a few papers which explored multivariate spatial models for areal data adopting the Bayesian framework as the natural inferential approach. We propose to use an approach, which yields to maximum likelihood estimation, to conduct frequentist analysis of SGLMMs with multivariate conditional autoregressive models for areal data. The performance of the proposed approach is evaluated through simulation studies and also

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