Philipps Universität Marburg

RESEARCH SEMINAR

Bayesian overdispersed spatio-temporal count data models proposals

Thursday, June 12th 2025, 4 pm

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Abstract:
Generalized linear models (GLMs) are commonly used for count data, but often face overdispersion—when observed variance exceeds that of the assumed distribution. When data are spatially referenced, accounting for spatial dependence is also critical. This work introduces spatial conditional overdispersion models that address both overdispersion and spatial correlation by incorporating spatial terms and overdispersion parameters into the regression structure. We demonstrate their application to Poisson data through a case study on infant mortality in Colombia, comparing performance with the Besag-York-Mollié (BYM and BYM2) models. We also propose a spatio-temporal extension that includes a spatial lag term for each time point, along with temporally varying spatial lag coefficients. This extension is applied to respiratory hospital admissions in Glasgow and compared to Knorr-Held models. All models are implemented using the Bayesian framework via R-INLA.

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