Contribution ID: **6** Type: **not specified**

Bayesian Spatial Modeling for Misaligned Data Fusion

Monday, 11 September 2023 11:00 (30 minutes)

Spatially misaligned data are becoming increasingly common in fields such as epidemiology, ecology and the environment due to advances in data collection and management. Here, we present a Bayesian geostatistical model for the combination of data obtained at different spatial resolutions. The model assumes that underlying all observations, there is a spatially continuous variable that can be modeled using a Gaussian random field process. The model is fitted using the integrated nested Laplace approximation (INLA) and the stochastic partial differential equation (SPDE) approaches. In order to allow the combination of spatially misaligned data, a new SPDE projection matrix for mapping the Gaussian Markov random field from the observations to the triangulation nodes is proposed. We show the performance of the new approach by means of simulation and an application of air pollution prediction in USA. The approach presented is fast and flexible, can be extended to model spatio-temporal data and different sources of uncertainty, and provides a useful tool in a wide range of situations where information at different spatial scales needs to be combined.

Keywords

Process Monitoring, Spatial Modeling, Mixture Models

Classification

Both methodology and application

Primary author: MORAGA, Paula (King Abdullah University of Science and Technology (KAUST))

Presenter: MORAGA, Paula (King Abdullah University of Science and Technology (KAUST))

Session Classification: INVITED Biostatistics

Track Classification: Other/special session/invited session