

Title: Modelling the presence of Diseases using Bayesian Kriging under uncertainty in the covariates

Author: David Conesa

Affiliation: Department of Statistics and OR, Universitat de València, Spain

Abstract:

Modelling patterns of the spatial incidence of diseases using local environmental factors has been a growing problem in Epidemiology in the last few years. This kind of modelling has been extensively used to address several issues in other contexts like fisheries. Our interest here is twofold. On the one hand, we will discuss a hierarchical Bayesian model we have been using lately to predict these patterns of spatial incidence of diseases by incorporating the environmental and spatio-temporal features of each location. Our approach incorporates the integrated nested Laplace approximation methodology (INLA, see Rue et al., JRSS-B, 2009, for more details) jointly with the SPDE approach (Lindgren et al., JRSS-B, 2011). Some particular examples are presented. But moreover, our interest is also to show what to do in those situations in which we do not have complete coverage for the covariates we incorporate in the model. In other words, what to do in those cases in which there is uncertainty about the covariates. All the discussion is based on a particular data set of presence of parasites on beef cattle in Galicia (Spain).