Andrew Zammit-Mangion
National Institute for Applied Statistics Research Australia (NIASRA)

Causal spatial models

Multivariate geostatistics is based on modelling all covariances between all possible combinations of two or more variables and their locations in a continuously indexed domain. Multivariate spatial covariance models need to be built with some care, since any covariance matrix that is derived from such a model has to be nonnegative-definite. In this presentation I will talk about a specific class of multivariate spatial models that are constructed using conditional dependency arguments: causal spatial models. We show that these models yield flexible, yet valid cross-covariance functions that generalize many of the special cases used to date. The approach will be demonstrated on both simulation and real case studies, one of which applies the model to flux estimation of methane in the United Kingdom and Ireland. This is joint work with Noel Cressie.