Resampling Methods for Spatial Regression Models Under A Class of Stochastic Designs

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Here we consider the problem of bootstrapping a class of spatial regression models when the sampling sites are generated by a (possibly nonuniform) stochastic design and are irregularly spaced. It is shown that the natural extension of the existing block bootstrap methods for grid spatial data does not work for irregularly spaced spatial data under nonuniform stochastic designs. A variant of the blocking mechanism is proposed. It is shown that the proposed block bootstrap method provides a valid approximation to the distribution of a class of M-estimators of the spatial regression parameters. Finite sample properties of the method are investigated through a moderately large simulation study and a real data example from an ecological study is given to illustrate the methodology. This is joint work with S. N. Lahiri.

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