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Estimation of Missing Values in Aggregate Level Spatial Data

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Abstract : Missing data is a common problem in spatial analysis especially at the aggregate level. Missing can either occur in covariate or in response variable or in both in a given location. Many missing data techniques are available to estimate the missing data values but not all of these methods can be applied on spatial data since the data are autocorrelated. Hence there is a need to develop a method that estimates the missing values in both response variable and covariates in spatial data by taking account of the spatial autocorrelation. The present study aims to develop a model to estimate the missing data points at the aggregate level in spatial data by accounting for (a) Spatial autocorrelation of the response variable (b) Spatial autocorrelation of covariates and (c) Correlation between covariates and the response variable. Estimating the missing values of spatial data requires a model that explicitly account for the spatial autocorrelation. The proposed model not only accounts for spatial autocorrelation but also utilizes the correlation that exists between covariates, within covariates and between a response variable and covariates. The precise estimation of the missing data points in spatial data will result in an increased precision of the estimated effects of independent variables on the response variable in spatial regression analysis.

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