

**Title:**

Analyzing Urban Segregation with Variograms: The Case Study of the Federal District in Brazil

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**Short Abstract:**

This paper shows the potential contribution of the variogram analysis, a geostatistical tool that evaluates spatial correlation, to urban segregation studies. The Federal District (Brasilia), Brazil's capital city, was selected as a case study, considering the segregation by income and place of residence. The data source was the 2010 Demographic Census conducted by the Brazilian Institute of Geography and Statistics. The population stratification consisted in eight income groups whose spatial distribution pattern was analyzed. The variogram function, including its shape and parameters, was used to interpret the spatial distribution of each social stratum in terms of urban segregation. Nugget Effect (i.e., the variance at the micro-scale level) shows the degree of uniformity or homogeneity at very short distances. Sill (i.e., the variance's maximum level) reveals the differences or the heterogeneity at longer distances. Range (i.e., the length scale of spatial correlation) indicates how large cluster sizes are. The Relative Nugget Effect (i.e., the ratio between the sill and the nugget effect) exhibits the intensity of spatial continuity or smoothness of the variable distribution. Results showed that all eight social strata have a segregated spatial distribution since none were random (i.e., when the Nugget Effect corresponds to the maximum level of variability in a variogram). Additionally, segregation tends to be higher in the bottom and the top strata of the population, decreasing gradually from the bottom and the top to the middle of social stratification. Further studies are needed to better apply the variogram analysis as a complementary tool for interpreting urban segregation.