

# Handling Dependence of Spatial Clustering on Scale

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Spatial clustering is one of the main tasks of spatial data mining and exploratory spatial analysis. In the last two decades, a large number of spatial clustering algorithms have been developed. In these algorithms, only the spatial autocorrelation characteristic of spatial points is considered, and spatial proximity is the main feature incorporated for spatial clustering. However, another important characteristic of spatial points, i.e. scale dependency, is neglected in the process of spatial clustering. On the other hand, it has been known most spatial patterns under observation vary with scale and the discovered spatial clusters are hard to be interpreted therefore if there is a lack of scale information. On that account, this study aims to investigate the scale dependence of spatial clustering. Specifically, the scale of spatial clustering is defined by two parameters, i.e. cartographic ratio and size of study area, and the scale dependency is quantitatively modeled based on the Natural Principle and a statistical approach. Through experiments, it is proven that by using the constructed dependency relationship, the scale at which spatial clusters are discovered can be specified and the scale in the spatial clustering process also can be controlled. In addition, several trends for clustering results at multiple scales are also discovered.

**Key words:** Spatial clustering; spatial scale; the natural principle