

Chapter 31

Neighborhood Rough–Sets–Based Spatial Data Analytics

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ABSTRACT

Rough set theory partitions a universe using single-layered granulation. The equivalence classes induced by rough sets are based on discretized values. Considering the fact that the spatial data are continuous at large, discretizing them may cause loss of data. Neighborhood approximations can lead to closely related coverings using continuous values. Besides, the spatial attributes also need to be given due consideration and should be handled unlike non-spatial attributes in the process of dimensionality reduction. This chapter analyzes the use of neighborhood rough sets for continuous data and handling spatially correlated attributes using rough sets.

INTRODUCTION

With the huge amount of data generated every day, governments, corporates and scientists look at mining useful information from them. Considering the storage and organization costs of these data, the useful trade-off is to discover useful patterns in them. Transactional, telecommunication, spatial, satellite, remote sensing, medical informatics etc., are some of the domains dealing with *Big Data*. Discovering patterns and inferring predictions are vital to the well-being of man-kind at large. Analysis of spatial data usually includes construction of information system, dimensionality reduction, decision rule extraction based on a computational model and error analysis. This chapter focuses on the construction decision systems, proposes a hybrid method by substantiating the advantages and challenges involved with spatial data.

Spatial Data upholds an important perspective that it can be analysed only with respect to specific spatial reference (or a geographic area). Spatial data include spatial attributes like temperature, rainfall, humidity, slope, land cover etc., These features will be with respect to a spatial reference and encompass spatial auto correlation. Spatial auto correlation is the property of spatial data where the values of a

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