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A RESEARCH ON SPATIAL TOPOLOGICAL ASSOCIATION RULES MINING

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Abstract. Spatial association rules mining is a process of acquiring information and knowledge from large databases. Due to the nature of geographic space and the complexity of spatial objects and relations, the classical association rule mining methods are not suitable for the spatial association rule mining. Classical association rule mining treats all input data as independent, while spatial association rules often show high autocorrelation among nearby objects. The contiguous, adjacent and neighboring relations between spatial objects are important topological relations.

In this paper a new approach based on topological predictions to discover spatial association rules is presented. First, we develop a fast method to get the topological relationship of spatial data with its algebraic structure. Then the interested spatial objects are selected. To find the interested spatial objects, topological relations combining with distance were used. In this step, the frequent topological predications are gained. Next, the attribute datasets of the selected interested spatial objects are mined with Apriori algorithm. Last, get the spatial topological association rules. The presented approach has been implemented and tested by the data of GDP per capita, railroads and roads in China in the year of 2005 at county level. The results of the experiments show that the approach is effective and valid.

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