

Distance-based Clustering of Moving Objects' Trajectories from Spatiotemporal Big Data*

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With the rapid development of smart sensors, smartphones and social media, distributed sensors and tracking systems are generating overwhelming amounts of high velocity spatiotemporal big data. Clustering spatiotemporal data is an important way to mine hidden information behind moving object sampling data, such as understanding trends in movement patterns, gaining high popularity in geographic information and so on. However, the current approaches for clustering trajectory data generally do not apply for excessive costs in both scalability and computing performance for spatiotemporal big data. To find the clusters of moving objects' trajectories, the issue is to find a distance measurement method that respects the geographic distance and the semantic similarity for each trajectory. Therefore, a distance measure to compute the spatial similarity between trajectories based on both geographical features and semantic features of motion is proposed in this research, then a framework for clustering moving objects trajectories is also designed to find out the groups of similar paths from big spatiotemporal data. The cluster quality of the proposed method is validated by means of external and internal validation criteria and is practically evaluated by TDrive datasets which is real trajectory dataset.