Modeling of vehicle trajectory using K-means and fuzzy C-means clustering

ABSTRACT

The implementation of information technology in transportation system is becoming a leading trend nowadays due to alleviating the traffic problems such as traffic congestions and accidents are targeted as primary concerns by the traffic operators. Thus, monitoring the traffic scene serves as basis for the traffic operators especially at traffic intersection. Extracted traffic data from the monitoring system is often massive which requires efforts in searching for significant patterns in it. These patterns describe the vehicle movements are useful for observation of any abnormal behavior that leads to traffic conflicts. However, it will be a tremendous work for traffic operators to observe the vehicle flows manually where thousands of vehicles may travel through an intersection. Hence, the clustering of vehicle trajectory dataset for similar patterns identification is implemented with k-means and fuzzy c-means (FCM) clustering algorithm. As these clustering algorithms require the number of clusters as input parameter of the algorithms, the study of number of clusters for the clustering is served as focus in this paper. The evaluation of clustering performance with different input parameter of number of clusters is discussed in this paper.