

An efficient traffic state estimation model based on fuzzy C-mean clustering and MDL using FCD

ABSTRACT

Monitoring and estimating of large-scale traffic have major role in traffic congestion reduction. Floating Car Data (FCD) is one of the best methods for collecting traffic data due to its versatility and cost efficiency. However, FCD suffers from data sparseness and many researches have been done to improve traffic estimation accuracy with respect to data sparsity. In this paper, a new model based on Fuzzy C-Mean (FCM) clustering and Minimum Description Length (MDL) is proposed to estimate the missing traffic state using FCD. First the Fuzzy clustering is implemented to cluster the road segments based on similarity of their speed at each time slot. Then the MDL principle is applied to estimate the missing traffic state. The experimentation results show that the proposed model can estimate the missing data more accurately than the HMM-based model using the same dataset.

Keyword: Traffic state estimation; Fuzzy c-mean clustering; Pattern mining; Minimum description length; FCD