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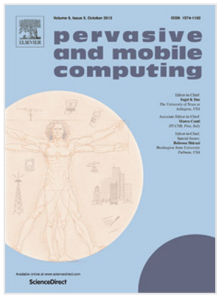

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Exploring Traffic Congestion Correlation from Multiple Data Sources

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Abstract

Traffic congestion is a major concern in many cities around the world. Previous work mainly focuses on the prediction of congestion and analysis of traffic flows, while the congestion correlation between road segments has not been studied yet. In this paper, we propose a three-phase framework to explore the congestion correlation between road segments from multiple real world data. In the first phase, we extract congestion information on each road segment from GPS trajectories of over 10,000 taxis, define congestion correlation and propose a corresponding mining algorithm to find out all the existing correlations. In the second phase, we extract various features on each pair of road segments from road network and POI data. In the last phase, the results of the first two phases are input into several classifiers to predict congestion correlation. We further analyze the important features and evaluate the results of the trained classifiers through experiments. We found some important patterns that lead to a high/low congestion correlation, and they can facilitate building various transportation applications. In addition, we found that traffic congestion correlation has obvious directionality and transmissibility. The proposed techniques in our framework are general, and can be applied to other pairwise correlation analysis.

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