

An Evaluation Model of Traffic Abnormal Probability of Adjacent Freeway Nodes Based on Space-time Constraints

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Abstract—At present, as an important transportation way of citizens and resources, motorway is of great significance to people's life development. However, heavy traffic while increases risks of traffic anomalies while bringing prosperity. In view of the above problems, this paper proposes a method for analyzing the probability of traffic abnormalities based on the space-time constraints, and establishes a probability evaluation model for traffic abnormalities between adjacent nodes of motorway. Firstly, the average arrival time of the traffic flow at adjacent nodes based on the morphological similarity distance is calculated, and then Augment Dickey-Fuller is applied to judge whether the traffic-flow difference sequence between adjacent nodes is stable. For those with unstable difference sequence, the probability of traffic abnormality shall be calculated. If the probability value is greater than the set threshold, it shall be regarded as traffic abnormality. And the feasibility of the proposed method is proved by the experimental results. Therefore, the probability estimation model of traffic anomalies at adjacent nodes of motorways based on space-time constraint can be used to evaluate traffic anomalies of motorways.

Keyword—traffic volume; the risk of abnormal traffic; space-time constraints; morphological similarity distance; Augment Dickey-Fuller;



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