

عنوان مقاله:

Developing a Model of Heterogeneity in Driver's Behavior

محل انتشار:

نشریه بین المللی مهندسی حمل و نقل، دوره 5، شماره 2 (سال: 1396)

تعداد صفحات اصل مقاله: 13

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خلاصه مقاله:

Intelligent Driver Model (IDM) is a well-known microscopic model of traffic flow within the traffic engineering societies. While it is a powerful technique for modeling traffic flows, the Intelligent Driver Model lacks the potential of accommodating the notion of drivers' heterogeneous behavior whenever they are on roads. Concerning the above mentioned, this paper takes the lane to recognize the heterogeneity in drivers' behavior based on Heterogeneity Vector. Heterogeneity vector is an integral part of a new model that holds the potential to provide a method that in turn can accommodate the effect of the above mentioned differentiation in the traffic pattern. The Intelligent Driver Model in combination to Heterogeneous vector results to Intelligent Driver Model Heterogeneous Calibration (IDMHC) which in turn has the capability to improve the accuracy of IDM calibration, and as a result, enhances its performance under real conditions of traffic systems. Following the pre-stated, the study formulates that, the heterogeneity vector, as an output of the computation block, will apply in the simulation of the traffic of vehicles. To validate the performance of the IDMHC model, NGSIM project has been applied. As such, the most notable contributions of this study are, presenting a new method for calibration of microscopic flow model based on individual trajectory data, depicting the differences among drivers based on the newly defined heterogeneity measure, and illustrating the differences among drivers shape, traffic patterns that are causing different distributions of macroscopic variables such as travel time. Based on the study, the results obtained depicts that the difference between the presumed values regarding the IDM parameters has a great difference when compared with the calculated values for each vehicle based on a 50% variance. These results have the likelihood to significantly affect the mode in which microscopic models simulate and predict the traffic situation.

کلمات کلیدی:

Microscopic modeling, heterogeneity, driver behavior, intelligent driver model (IDM), traffic simulation

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