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Abstract

The automatic tollgate at highway entrance and exit needs to categorize vehicle in order to collect highway passing fee especially at night time. This paper proposes a method of vehicle categorization in nighttime traffic using thermal-image processing and statistical analysis. To recognize the vehicular types, statistical relation between thermal features of engine heat, windscreen and others are utilized in this method. Firstly, appropriate threshold values for classifying the thermal features are automatically determined, entire area of the thermal image is then divided into blocks, and thermal features classified in all blocks by the threshold values are finally integrated for vehicle type categorization. To evaluate the performance of proposed method, experiments with 2937 samples of cars, vans and trucks are categorized, and the results approximately reveal 95.51% accuracy.

Keywords: thermal imaging, vehicle category, nighttime traffic, traffic monitoring, ITS.

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