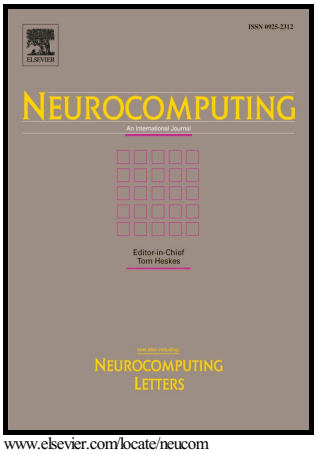

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A Vehicle Classification System Based on Hierarchical Multi-SVMs in Crowded Traffic Scenes

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Abstract

Automatic vehicle classification is very important for video surveillance, especially for intelligent transportation system. Currently, some approaches have been proposed. However, almost all of these methods can not paly well in the practical crowded traffic scenes with heavy occlusions, shadows, and different views, etc. To solve this difficult problem, we propose a new vehicle classification method based on hierarchical multi-SVMs. First, we extract the foreground objects from the surveillance videos. Then, we use the proposed hierarchical multi-SVMs method for vehicle classification. Moreover, we present a voting based correction scheme by tracking the classified vehicles for the final precision. Based on the proposed approach, we have built a practical system for robust vehicle classification in complicated traffic scenes. Extensive experimental results show our solution can achieve convincing results.

Keywords:
Vehicle classification; SVM; Crowded traffic scenes; Occlusions; Video surveillance; Intelligent transportation system

1. Introduction

Robust vehicle classification is one of the most important tasks for video surveillance, especially for intelligent transportation system. It has a wide range of applications for our daily life. For example, the managers can monitor the current traffic flow with different emergency plans according to the recognition vehicle types. For another example, effective vehicle classification