Vehicle Counting without Background Modeling

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Abstract

Abstract. In general, the vision-based methods may face the problems of serious illumination variation, shadows, or swaying trees. Here, we propose a novel vehicle detection method without background modeling to overcome the aforementioned problems. First, a modified block-based frame differential method is
established to quickly detect the moving targets without the influences of rapid illumination variations. Second, the precise targets' regions are extracted with the dual foregrounds fusion method. Third, a texture-based object segmentation method is proposed to segment each vehicle from the merged foreground image
blob and remove the shadows. Fourth, a false foreground filtering method is developed based on the concept of motion entropy to remove the false object regions caused by the swaying trees or moving clouds. Finally, the texturebased target tracking method is proposed to track each detected target and then apply the virtual-loop detector to compute the traffic flow. Experimental results show that our proposed system can work with the computing rate above 20 fps and the average accuracy of vehicle counting can approach 86%.

Keyword：dual foregrounds fusion, texture-based target tracking.