Determination and Identification of Dangerously Lane Changing Vehicles in Traffic by Image Processing Techniques

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Due to increase of vehicle usage all around the world, the importance of safety driving in traffic is increasing. All of the countries around the world are taking actions to increase the safety driving habitats and decrease the number of traffic accidents. One of the applied precautions is to put necessary automatic auditing mechanisms into service for controlling the drivers as they drive since reckless drivers may not obey many traffic rules. In this study, image and video processing based methods are applied to identify the dangerously lane changing vehicles/drivers in the traffic. The proposed method focuses on to detect three different violations in traffic, namely i.) Detecting the vehicles/drivers frequently changing traffic lanes, ii.) Detecting the vehicles/drivers changing lanes when it is forbidden, and iii.) Detecting the vehicles overtaking the other vehicles using the right lanes instead of left one.

The proposed method is based on the image and video processing techniques. It first detects the vehicles in video sequences, then tracks the vehicles in the following frames and determines the lane changes of the vehicles. In the vehicle detection phase an image subtraction method is used. In the vehicle tracking phase, Kalman filtering tracking algorithm is used. After determining the lane changes of the vehicles/drivers, a rule based decision system is used to find out the vehicles/drivers improperly changing lanes and those vehicles are marked on the video. The proposed method is tested on the videos captured from real traffic environments and promising results are obtained.