Vehicle counting method based on Digital image processing Algorithm

Nowadays traffic problems are increasing due to the fast-growing number of vehicles. Traffic flow analysis can be useful for identifying critical flow time periods or determining the influence of large vehicles or pedestrians on vehicular traffic flow, and even documenting the traffic volume trends. Vehicle counting process provides very nice information about traffic flow, vehicle crash occurrences and traffic peak in roadways. This useful information is being used by our group for better traffic management methods, such as changing the timings of traffic lights based on traffic flow. There are several ways to count the number of vehicles passed in a period of time, and therefore estimate the traffic flow, such as using manual counters, portable counters and observers which are mainly hardware dependent or human dependent but the best method or technique to achieve this goal is using digital Image Processing methods on roadway camera video outputs as it is fully automated without any other human or hardware issues or errors. Here we have carried out the process based on a combination of different video-image processing methods including object detection, canny edge detection, frame differentiation and the kalman filter\*. The implementation of proposed technique has been performed by us using c++ programming language and will also be implemented using python programming language at later stage if time permits.

The accuracy or performance of this method or technique in vehicle counts and classification will be also evaluated for proper accuracy of classification and error in vehicle detection targets.

We focus on a software-based novel technique for vehicle detection in roadways and classification od passed vehicles in different specified types. The method which we have implemented detects vehicles in the input video stream, assigns an exclusive identifier for each of them, classifies each vehicle on its distinctive vehicle-type group and finally counts them all. In addition, the method was evaluated and the performance was analyzed using a real condition roadway video feed.

BACKGROUND INFORMATION

A. Video Processing