

Vision-Based Real-Time Vehicle Tracking and Counting in Urban Traffic Scenarios

Aminollah Mahabadi

Department of Electrical Engineering, Shahed University, Tehran, Iran

ABSTRACT

This paper presents a novel fast automatic urban traffic system for a real-time vehicle detection, recognition, tracking and classifying with lane tracking, lane occlusion and forward vehicle detection capabilities using color video cameras by virtual sensor installation. The presented objective robust system automatically extracts background image, adapts and tunes with fast and slow lighting and physical environments variation, and camera position and calibration, especially environmental shadow and vehicle (self and cast) shadow elimination with perturbed wind speed. The experimental results of system on many video color images achieved a high counting performance of 99.8% for vehicle detection with corresponding classification rate of 91%. Better performance with improvement in speed and accuracy has been reported while limitations in the distance of camera, angle of view, illumination conditions are set with low background complexity.

Keywords: Vehicle Detection, Vehicle Classification, Lane Departure Warning (LDW), Urban Traffic, Intelligent Transportation Systems (ITS).