Project name: Traffic regulation using traffic-light-mounted cameras (Second part)

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Abstract

The increasing number of cars (mainly inside cities) causes today's traffic lights systems to be less and less efficient. Most of these systems operate on the basis of constant time intervals (scheduled offline) which often lead to unnecessary traffic jams.

In this project we will develop a computer vision algorithm for estimating the number of waiting cars in front of a traffic light, using videos acquired by traffic-light-mounted cameras (provided by the Haifa traffic-light control center).

The ultimate goal of the project is to provide sufficient statistics for an automatic (adaptive) adjustment of traffic light cycle times, leading in turn to higher average rate of (number of vehicles)/(unit of time) for lanes controlled by traffic lights.

In this project, we used computer vision tools (such as: Optical Flow, Motion Estimation) and Image processing tools (such as: Morphological functions, Edge Detection).
The algorithm developed in this project produces, in confidence of 80%, the number of cars waiting in each lane, and the error, almost surely, does not exceed more than one car per lane.

By using the algorithm, one can make an efficient match between the traffic light periods to the traffic load.
Some results

Car and lane detection