



## Vehicle Count Estimation on Traffic Images

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**Abstract:** Computer Vision has been used as an effective approach to developing cost-efficient traffic surveillance systems. Traffic surveillance systems are now used for vehicle detection, tracking, recognition and counting. However, performing these tasks are not easy especially when challenges in traffic arise such as varying lighting conditions, effect of shadows and occluded vehicles that highly affect the performance of almost all traffic surveillance systems. In this paper, we approach the challenges of varying lighting conditions through a background modelling scheme that updates the background image, a shadow removal scheme to remove shadows among the vehicles in the images, and a segmentation scheme to segment occlusive vehicles. In this paper, background modelling is performed by removing the moving foreground objects and leaving an empty background image. Image noise is removed through a 3x3 median filter. Shadow removal is done by converting the RGB image to its LAB equivalent image – having three channels: L for the lightness and the remaining A and B channels are arbitrary color channels. For shadow detection, if the sum of the means of A and B is less than a threshold (256 in this paper), then the pixels in L that are less than or equal to the difference of its mean and one third of its standard deviation can be classified as shadow pixels. The system was able to count vehicles in a traffic video recorded from DLSU's Archer's Eye having 704x480 resolution. Furthermore, system performance with regards to the detection and counting of vehicles was affected by the presence of non-vehicle entities in the recorded traffic video.

**Key Words:** Vehicle Counting; Vehicle Detection; Background Modelling; Shadow Removal; Noise Removal;