

ABSTRACT

In monitoring the number of vehicles, a system is needed to facilitate counting the number of vehicles on the road. In computer vision, there are YOLO (You Only Look Once), SSD (Single Shot Detection), and Haar Cascade algorithms, all of which can detect vehicles from images or videos. This research compares the impact of changes in video resolution and video brightness on the detection results. Based on the training results, the video resolution used affects the detection results and accuracy. In the YOLO model, video resolution is directly proportional to the detection results and accuracy. Meanwhile, in the SSD and Haar Cascade models, using 720p video resolution yields higher detection results and accuracy. In dark conditions (brightness value = 0.5), the YOLO model produces better detection accuracy compared to normal or bright conditions. On the other hand, the SSD and Haar Cascade models produce better detection accuracy in normal conditions (brightness value = 1). Based on experiments conducted at video resolutions of 1440p, 720p, and 360p, the highest accuracy values were obtained in the YOLO model, which were 81%, 74.33%, and 47.66%. In dark, normal, and bright lighting conditions (brightness values = 0.5, 1, and 1), the highest accuracy values were obtained in the YOLO model, which were 74.33%, 67.66%, and 61%.

Key Words: *Vehicle Detection, Vehicle Counting, YOLO, SSD, Haar Cascade*