

Abstract

A technique used to classify traffic density by counting the number and speed of vehicles in a traffic flow. This study includes several steps done is to detect vehicles, counting passing vehicles in the region of interest, calculate the speed of each vehicle, and classify the type of traffic density occurs at the time.

For detect vehicles use to the three-frame difference method where the result is a black and white image with a white area in the foreground and a black area in the background. Once the vehicle is detected, the vehicle moves calculated and classified according to the size of the area of the vehicle. To calculate the speed of the vehicle used tracking of vehicles that have been obtained based on the detection results using particle filter. Having obtained the number of vehicles and an average speed of passing through the region of interest, then obtained the type of density at the time. Data input to the system is video to detect the flow of traffic on a road and can determine the density of traffic.

Tests conducted with 12 video categories different tests. The first test based on the number of vehicles detected, with 3 hour-long video, the system results in an average accuracy rate of 87.803%. For the second test carried out comparative speed of the system and the real speed, used 3 video at real speed parameters are different. The average level of accuracy in the system amounted to 93.54%. The next test is based on the validity of the classification of the density of traffic on the system and on real cases generate true value for 3 different test video. And the final test is based on the influence of light intensity using the 3 videos that have different light conditions that morning, noon, and evening. Detection of the condition of the number of vehicles are best in this test is in daylight conditions.

Keywords: three-frame difference, particle filters, region of interest, foreground and background areas, video.