ABSTRACT

The increasing volume of traffic over the last decade poses major challenges to traffic research and planning. The causes of congestion include irregular traffic signs and road capacity that is not balanced with community needs. The existence of these problems poses a challenge for researchers to create a system that can calculate and record traffic. Manual calculations can be done but are less efficient. Moreover, the system for detecting, calculating and recording traffic density in real time is still limited.

In this study, a traffic density detection system uses the Haar Cascade method using the python programming language, the author also uses components such as camera modules, raspberry pi, power supply. Raspberry pi component as data processing to process digital images into a calculation of the number of vehicles on the highway. Then the system will determine whether the traffic is smooth, crowded or congested with the parameters that the author has previously determined.

This final project uses the Haar Cascade method with the Haar-Like Feature, Internal Image, Adaboost and Cascade Classifier features, with the results of the object detection test getting the highest accuracy rate of 88,02 % with the RAM usage parameter on the Raspberry pi of 87.9MB from 3827MB The available RAM on the Raspberry pi and the FPS on the system is from 20FPS to 30FPS. In this system, the light intensity greatly affects the performance of the tool when detecting because the color on the car becomes faint when the sun's rays are directly exposed to the car.

Keywords: *Raspberry pi, Haar Cascade, Traffic Light, Image Processing, Computer Vision*