

ABSTRACT

The increasing number of vehicles in recent years is certainly very influential on the traffic density. Traffic light as a tool to manage traffic at this time also not work optimally. Solution of this problem is the traffic light cycle times adjusted to the intersection. So that a high number of delays, long queues and the number of high-traffic light violations can be reduced to a minimum. In this thesis the author will implement a tool for detecting and counting vehicles in miniature roads with obtaining the output be the number of vehicles with input in the form of data from the camera.

Microcontroller receives digital data from the camera so that the required microcontroller with RAM that can accommodate digital image data. Therefore, the system is used ARM Cortex-M3 microcontroller which is a 32-bit microprocessor that has enough SRAM for image signal processing. Next will be done preprocessing the morphological opening to eliminate noise in the image and sobel edge detection to reduce the computation required for subsequent labeling method was applied to find the union of the same labeling process on a set of connected pixels in an image. Labeling has a very important role in image processing to simplify the process of analyzing the shape and pattern recognition at a later stage.

From the results of the tests performed, the vehicle has a high detection accuracy of 73 % with a detection time of about 9 seconds. Results from this study are expected to play an important role in decision-making aimed at traffic light control system based on the number of vehicles using a microcontroller, which can be used to tackle congestion on the terms and conditions of the traffic.

Keywords : Microcontroller, RAM, Preprocessing, and ARM