

ABSTRACT

Traffic lights are a very important part of land transportation facilities, especially in big cities. The increasing number of vehicles currently causes increased density on the highway so that it can cause congestion. Traffic density is usually allocated at certain points on the road, one of which is at the intersection. Currently traffic at crossroads is regulated by traffic lights using a traffic density prediction system. This prediction system will determine how long the green and red lights are active at each intersection.

For this reason, this final project designs a monitoring and control system for automatic traffic lights based on digital image processing. Where this system can detect four or more wheeled vehicles so that it can determine the density on a road segment. Arduino functions as a controller for the duration of traffic lights based on the output from matlab which has detected objects of four or more wheeled vehicles.

In this final project, a system is proposed that can read the number of detected four-wheeled vehicles or more so that they can be displayed on the Arduino serial monitor. Arduino can control traffic lights based on the density of the detected roads. The system is able to work quite well which has an average accuracy value of 80%. The system can be used maximally during sunny conditions such as morning, afternoon and evening at intersections with sparse or congested conditions. The system can read the number of detected four-wheeled vehicles or more so that it can be displayed on the serial monitor on the Arduino.

Keywords: *Traffic Lights, Vehicles, Density, Digital Image Processing, Arduino.*