ABSTRACT

Congestion is a common thing in big cities in Indonesia. Moreover, at a crossroads, there is a buildup of solid vehicles. This situation has hampered the road, especially for emergency vehicles such as ambulances, police cars and fire trucks. So that emergency vehicles that require priority need a traffic light control system in order to reach the destination location on time. This research utilizes the sound of sirens to regulate traffic light control systems.

Sound is processed through signal processing software with the help of a microphone. Voice signal processing uses MFCC (Mel Frequency Cepstrum Coefficient) feature extraction and Euclidean Distance for its classification. If the sound detected is a siren sound, the system manages to prioritize emergency vehicles by giving a green light on the lane being passed. Arduino controls the work of traffic lights and controls the traffic light control system.

This system uses a total of 10 training data and a total of 6 test data using sirens from ambulances, police cars, and fire trucks. Non-siren sound is also used in testing the accuracy of the system. The best parameters obtained using the threshold value for energy is 0.002, the number of frames is 150 data per frame, the MFCC characteristic coefficient is 24, and the threshold value for Euclidean distance is 1.2. The system can detect siren sounds with the best accuracy of 93.33% with an average computing time of 14 seconds. While the time required for each traffic light lane is average for 23 seconds once a period.

Keywords: *traffic lights, siren sounds, control systems, MFCC, Euclidean Distance, Arduino.*