

ABSTRACT

DESIGN AND MODELLING OF ADAPTIVE TRAFFIC LIGHT BY USING GENETIC METHODS

Traffic jam is one of the problems in various regions, especially in big cities in Indonesia, such as Jakarta, Bandung, Surabaya, Makassar and other big cities. This problem is not easily overcome because the growth in the number of vehicles is much faster than infrastructure growth. This is an obstacle in traffic management at road intersections that are prone to congestion, especially during peak hours. Currently most of the existing traffic light settings generally use a constant timer that is fixed (Fixed Time Traffic Light Controller).

This study proposes a road crossing simulation model with an adaptive traffic light regulation system using genetic methods. The M / M / 1 queue model is used as a relevant queuing model. Genetic algorithm designs are obtained based on the best chromosomes of the system being run. The best chromosomes are used to develop patterns that represent the relationship between the amount of vehicle flow and the time of traffic light duration at a crossroads.

The proposed road junction model has been validated and tested against a crossing model with fixed time settings. The proposed model has shown the performance of setting the traffic light time adaptively according to the state of traffic flow in a simulation that can be implemented into a real-time system. This ensures that vehicles that are in heavy traffic flows do not experience drastic delays.

Keywords: *genetic algorithm, traffic lights, traffic jam, adaptive, simulation*