

ABSTRACT

The traffic jam has been happening in various regions, especially in big cities. This problem is not easy to be solved because the vehicle populations are increasing. One of the effects that arising from the growing of vehicle population is the set of traffic light at an intersection becomes sensitive. If traffic light control system is not appropriated with the number of vehicles then traffic jam might be happen. Nowadays, traffic light control system is controlled by Fixed Time settings. Fixed Time duration settings couldn't adapted to traffic jam situation, so the delay in this situation potentially will be long, especially if the proportion of vehicles are not appropriated with traffic light duration. This study was carried out to produce a scheme that better than Fixed Time scheme. In this study, the adaptive control scheme using Fuzzy Inference System (FIS) is developed. FIS produces the green light duration for each way directions. FIS doesn't has the performance parameters for test the ability of schemes, so the system needs to be integrated with Cellular Automata (CA). The movement of vehicles are produced by CA can bring average of delay and average of speed. The main success indicators in calculation are based on average of delay and average of speed on each vehicle in the observation time per time step. In addition, distributions of traffic lights duration in one cycle become an additional factor to analyze the system performances. FIS method produces up to 76.2% average of waiting time at E class and down to 23.8% average of waiting time at F class. Fixed Time scheme method produces 0% average of waiting time at E class and 100% average of waiting time at F class. Therefore, the Fixed Time delay is longer than FIS delay.

Keywords : traffic light, Fixed Time, adaptive, Fuzzy Inference System, Cellular Automata.