

## ***Abstract***

*The traffic jam problem is considered and related with traffic light management. Recent years, traffic light controller system commonly used is Fixed Time Traffic Light Controller. This controller is previously set based on fixed time. Every road intersection is served with the same green light time although the density is not in the same level. This could lead into very heavy traffic jam and road congestion.*

*In this thesis, a simulation system has been developed in order to optimize Fixed Time Traffic Light Controller. A modeling method, Cellular Automata, has been designed to model the road intersection and vehicles. Optimization Algorithm, Artificial Bee Colony, has also been implemented in order to optimize the waiting time of each vehicles in a single road intersection. A better result on waiting time and vehicle queue in each road intersection would reflect the accuracy and performance of this simulation system.*

*This simulation system simulates data in a single road intersection with three parts of road. The testing process shows that this system could reduce vehicle density until 95% , waiting time until 54.7% and queue length until 95% in a comparison with fixed time traffic light controller.*

***Keywords: traffic jam, road intersection, fixed time traffic light controller, cellular automata, artificial bee colony algorithm.***