

Controlling traffic flow in multilane-isolated intersection using ANFIS approach techniques

ABSTRACT

Many controllers have applied the Adaptive Neural-Fuzzy Inference System (ANFIS) concept for optimizing the controller performance. However, there are less traffic signal controllers developed using the ANFIS concept. ANFIS traffic signal controller with its fuzzy rule base and its ability to learn from a set of sample data could improve the performance of Existing traffic signal controlling system to reduce traffic congestions at most of the busy traffic intersections in city such as Kuala Lumpur, Malaysia. The aim of this research is to develop an ANFIS traffic signals controller for multilane-isolated four approaches intersections in order to ease traffic congestions at traffic intersections. The new concept to generate sample data for ANFIS training is introduced in this research. The sample data is generated based on fuzzy rules and can be analysed using tree diagram. This controller is simulated on multilane-isolated traffic intersection model developed using M/M/1 queuing theory and its performance in terms of average waiting time, queue length and delay time are compared with traditional controllers and fuzzy controller. Simulation result shows that the average waiting time, queue length, and delay time of ANFIS traffic signal controller are the lowest as compared to the other three controllers. In conclusion, the efficiency and performance of ANFIS controller are much better than that of fuzzy and traditional controllers in different traffic volumes.

Keyword: ANFIS controller; Green phase module; Next phase module; Multilane- isolated intersection