

E1-224: Development of fuzzy logic based traffic control systems

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In Sri Lanka, due to the rapid increase in the number of vehicles being imported, especially during the recent years, and also due to not having the proper road infrastructure to accommodate these vehicles, vehicular traffic has become a major problem for many commuters. To add to this, most traffic control systems use fixed times that do not accommodate the changes in the traffic patterns. Even the advanced systems developed in the recent years (except for systems based on video cameras) are too rigid since pre-determined data cannot recognise the ever-changing traffic patterns on the road.

A system was built based on an OOPIC micro controller. It was assumed that the sensors are already installed and that they provide data pertaining to vehicular traffic at a junction. A feedback mechanism based on the ratio of vehicles in a lane with those present in other lanes was used as the primary criteria to update the traffic signal timing. The feedback mechanism calls a fuzzy-neural sub-system to make the final decision. The sub system makes decisions with the data it receives and also with data previously obtained, and changes the time allocated to each lane. The sub-system 'learns' continuously the most acceptable time allocation for each lane at any given time.

The pilot tests carried out indicate that the system efficiency improves with time as it continues to learn from experience. The sub system also prevented a total breakdown of the traffic control system which may happen due to a faulty sensor in the feedback system.