A REAL TIME TRAFFIC SIGNAL CONTROL SYSTEM

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by

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DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not being concurrently submitted for any other degree.

UOM Verified Signature

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Abstract

Traffic congestion problem in Colombo city is getting worse since traditional traffic control system could not fulfill the need. Since the existing system is a fixed time fixed cycle control system, it cannot fit with dynamic traffic environment.

In this research, a decentralized control strategy to control a traffic network grid is presented. Single controller is to control traffic signals of all approaches at one intersection and each approach green time is given by its separate Fuzzy Inference System. Vehicle arrival data are to be collected by lane detectors. Inductive Loop Detectors are proposed for this purpose. Herein, a methodology is developed to decide green time of each approach based on the arrival data by the Fuzzy Inference System and the Cycle time. Influence to the particular intersection is identified and is factorized as an input to the Fuzzy Inference System. Later, the green time is decided by the FIS. Results for this mechanism are shown for one intersection on a simulated environment modeled by Matlab.

Calculations have been done based on the real data obtained for fifteen occasions. Results for three sets of data from both existing fixed time system and the intelligent model have been compared based on the calculations done for the total vehicle delay time, expected at the passing the particular intersection. It shows 51.6% of minimized total vehicle seconds delay by the intelligent traffic control model over the fixed time control system.

To my parents

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