

# A REAL TIME TRAFFIC SIGNAL CONTROL SYSTEM

A dissertation submitted to the  
Department of Electrical Engineering, University of Moratuwa  
in partial fulfillment of the requirements for the  
degree of Master of Science

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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.

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We endorse the declaration by the candidate.

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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*

## Acknowledgement

This is to pay my warm gratitude to the Department of Electrical Engineering, University of Moratuwa, Sri Lanka for giving me the opportunity to read for the M.Sc in Industrial Automation and to do this research during the period of October 2005 to January 2008.

I would like to extend my warm thanks with respect to my research supervisors Dr. Lanka Udawatta and Dr. Sisil Kumarawadu, who have given endless support and guidance while I was doing the research and following the program. Their breadth of knowledge and the advices given me at the presentations made me highly impressed to do the research in depth and to develop myself by enriching academic, research oriented and professional maturity. Their countless advices and the guidance were invaluable.

I would also like to thank Professor Ranjith Perera, the Head of the Department. He has given me support and encouragement, and his advice and feedback about my research at presentations have greatly enhanced and strengthened the study. I thank him for all the time and energy he has paid for my work.

I also wish to extend thanks to my friends and colleagues who were invaluable in completing this study, and to the management of Electro-Serv (pvt) ltd who has given me the support by releasing me from the duty to follow this program.

I am indebted to my parents and to my brother Suranga Jayakody for the guidance they have given to me. I recall their constant support, encouragement, love and guidance given me every time.

Finally, I would like to share my research experience with all of you.

Nimanthi Jayakody

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January 2008

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