

Automatic Traffic Control System

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Abstract--- This paper presents an overview of how the major problem of traffic congestion in major cities is solved by using the intelligent system which controls the traffic lights according to the variation in traffic density. This paper also deals with the detection of traffic lights which will help in easy pass out of them through the traffic in case of emergency.

Keywords: IR sensors TSOP1738, WISN, TSN, Multi-agent approach, Microcontroller 89c52, Schmitt trigger CD4093.

I. INTRODUCTION

This document presents an efficient and effective way of solving traffic congestion problem in cities using IR sensors.

Any emergency vehicles having an IR transmitter already installed on it will be detected when the IR receiver detects the signals from that transmitter.

II. PROJECT BACKGROUND

Traffic congestion is a crucial problem in a large city. It is normally caused by improper control of traffic lights which is not corresponding to the current traffic condition around the road junctions. As the number of road users constantly increases, and resources provided by current infrastructures are limited, intelligent control of traffic will become a very important issue in the future. However, some limitations to the usage of intelligent traffic control exist. Avoiding traffic jams for example is thought to be beneficial to both environment and economy, but improved traffic-flow may also lead to an increase in demand.

Different projects regarding this topic have been published. But we are implementing a detection of emergency vehicles using IR sensors only which will be cost effective. Sensors are placed at a short distance from the junction in order to detect cars and count the number of passing cars. When the current green light is going to turn red, but the sensor can detect that some cars have come in that range of distance, the duration of this green light is extended further. This scenario will repeat until no more cars have arrived in that range or the maximum duration for the green light has been reached.

III. METHODOLOGY

We are using the wireless sensors approach to find a solution to this approach. We are using IR sensors which will detect the incoming and outgoing vehicles.

Although the work in this paper adopts the Wireless Sensor Network for traffic control as some previous studies did, it distinguishes itself from these studies in many aspects. *First*, it introduces dynamic signal time manipulation. *Second*, our system includes a GSM module which will detect the emergency vehicles like ambulance,

police vehicles etc. and will create a way for them to pass the traffic without any obstacles.

Our project works on the simple principle of IR sensors that detect the incoming and outgoing vehicles at a junction and which stores this data to a EEPROM. Obstacles is sensed by IR transmitter and IR receiver. RED LED indicated the presence of incoming person and GREEN LED indicated the presence of outgoing person. Incoming and outgoing visitors count is displayed on LCD as well as stored in non-volatile memory. We also calculate the difference between incoming and outgoing persons and display the difference on LCD.

The values are stored in non-volatile memory. Hence even if power failure is there, data is recovered from the EEPROM when system is restarted.

When RESET switch is pressed, both counters become zero and EEPROM is also upgraded to 0 value.

IV. CONCLUSION (FINAL OUTCOME)

We have presented an intelligent traffic light control system, based on a rule-based system, for traffic light control which efficiently manages the traffic according to the current traffic condition. It aims to reduce each car's delayed time at each junction. We can control traffic using IR sensors. IR sensors detect the vehicle's presence and if there is loads of traffic seen then automatically green light stay more time and clear the traffic. It also helps emergency vehicles to pass through the traffic as quickly as possible. The moment emergency vehicles are detected, the system is informed about their presence and system creates a pathway for them.

V. FUTURE EXPANSION

The system we have build can be further expanded and can be implemented using GPS based system which can communicate between different junctions in order to facilitate the road user.

REFERENCES

- [1] "Traffic report study 2007," <http://www.ammancity.gov.jo/arabic/docs/GAM4-2007.pdf>.
- [2] Swedish National Road and Transportation Research Institute, <http://www.vti.se/nordic/1-0mapp/100sv2.html>.
- [3] MikroBasic Documentation Manual, URL: www.mikroelektronika.co.yu. H. Sawant, J. Tan, Q. Yang, and Q. Z. Wang, "Using bluetooth and sensor networks for intelligent transportation systems," in Proceedings of IEEE Intelligent Transportation Systems Conference, 2004, pp. 767-772.
- [4] "A summary of vehicle detection and surveillance technologies used in intelligent transportation systems," Southwest Technology Development

Institute, 2000 I. F. Akyildiz, W. Su, Y. Sankarasubramaniam, and E. Cayirci, "A survey on sensor networks," *IEEE Communications Magazine*, Vol. 40, 2002, pp. 102-114.

