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Intelligent Traffic Light Control System Based On Real Time Traffic Flows

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Abstract: In this project, we are designing a system that utilize and proficiently manages traffic light controllers is to be had. Aim of the system is the instantaneous adaptive to control traffic light. The presented methods for traffic administration and control are not effectively efficient in terms of presentation or performance, cost, support and maintenance. We present a traffic management or controlling system based on new traffic transportation and using new technology for controlling or calculating the traffic sequences. The technique is vigorously adaptive to traffic circumstances on both intersections i.e multiple as well as single. The simulation projected by us shows the competence of the projected scheme in solving traffic jamming in provisions of the typical waiting time and average queue length on the single intersection and thus in turn efficient universal traffic flow be in command of on numerous intersections.
Keywords: Embedded System, Microcontroller, IR sensor, Traffic control, Traffic flow.

I. INTRODUCTION

In late decades travel request in urban region has quickly expanded alongside the development of financial movement and populace, notwithstanding, foundation transportation has gradually extended because of constrained space accessible. Alleviating the movement clog in urban street organize has been a urgent issue for both the examination and commonsense operation. A beneficial and reasonable solution may not obtain always by supplying new infrastructure. Hence, use of existing infrastructure via intelligent or smart traffic management seems to be more feasible and calls for implementation and development of improved traffic signal control techniques and method. A State of serious clog that acquires traffics the system to halt is Gridlock.

Such state emerges when neighbourhood line spills back, thereby limiting activity development on the whole bearings. In any urban transportation arrange the enactment furthermore development of urban gridlock is affected essentially by movement flag setting. Transportation of merchandise, work, modern items and hardware are the keys factors, which impact the modern what's more, natural improvement of any nation.

Movement clog and fumble will brings about long holding up times, loss of fuel and cash. It is hence important to have a quick monetary and effective movement control framework for national improvement.

The observing and control of city activity is turning into a real issue in numerous nations. Activity observing specialist needs to discover new strategies for defeating issues that emerge due to consistently expanding number of vehicles on street. Till now the measures taken are improvement of new streets what's more, flyovers amidst the city; structures of a few rings, for example, inward ring street; centre ring street and external ring street; presenting monorails; confining of expansive vehicle in city amid crest hours and furthermore improvement of advanced movement observing and control framework.

One approach to enhance movement stream situation of current transportation framework is to apply computerization and insightful control techniques to roadside foundation and vehicles.

II. GOALS AND OBJECTIVES

A. Minimized heavy traffic jams.+
B. Minimized traffic, with reduce waiting time.
C. In case of emergency car no stuck in traffic jams.

III.PROBLEM STATEMENT

Today, there is a continuous and vast amount of increase in the jamming level on public roads which leads to traffic jam, especially at rush hours. This is major concern in many countries leading towards a critical situation of congestion. Most of the methods were proposed for solving the illusion of traffic jam. In addition, over the ground sensors like videos, and radars were used. These systems are also high cost and their accuracy depends on surrounding conditions of the environment.

IV. LITERATURE SURVEY

1) Currently, traffic congestions are the most serious issues that most cites are facing. In order to improving the urban traffic orders, as well as to alleviating traffic pressures, this paper presents an urban traffic control system, which is designed based on the real time traffic flow information. The proposed design has combined with traffic control theory, application of single chip computer and ultrasonic technology, design and research of the traffic control system based on traffic. Article control core of the system is the MCS - 51 single chip microcomputer, which achieves real-time monitoring by using ultrasonic sensors for road vehicle. Compared with the traditional control system, the system has the following characteristics: the duration time of traffic signal can be smartly set according to the number of road vehicles; a priority of lane can be assigned according to the actual demand when a vehicle is rarely at night, etc. Therefore, the traffic signal's duration time can be smartly and intelligently adjusted according to the real time road traffic flow information.

2) In this paper, we propose a novel decentralized traffic light control using wireless sensor network. The system architecture is classified into three layers; the wireless sensor network, the localized traffic flow model policy, and the higher level coordination of the traffic lights agents. The wireless sensors are deployed on the lanes going in and out the intersection. These sensors detect vehicles' number, speed, etc. and send their data to the nearest Intersection Control Agent (ICA) which, determines the flow model of the inter-section depending on sensors' data (e.g., number of vehicles approaching a specific intersection). Coping with dynamic changes in the traffic volume is one of the biggest challenges in intelligent transportation system (ITS). Our main contribution is the real-time adaptive control of the traffic lights. Our aim is to maximize the flow of vehicles and reduce the waiting time while maintaining fairness among the other traffic lights. Each traffic light controlled intersection has an intersection control agent that collects information from the sensor nodes. An intersection control agent manages its intersection by controlling its traffic lights. Multiple intersection agents can exchange information among themselves to control a wider area.

3) Traffic coordination in intersections is a very studied and challenging topic. This paper presents an adaptive traffic light system based on wireless communication between vehicles and fixed controller nodes deployed in intersections. We present the integrated simulation environment we have developed in order to study the system. We argue that our system can significantly improve traffic fluency in intersections, and has clear advantages over other architectures regarding both cost and performance.

4) In the densely populated urban area traffic control system is the main mechanism to control the flow of vehicular traffic at the intersection. Conventional traffic control system are not capable of handling dynamic vehicular flow. This dynamic vehicular flow creates traffic jams , congestion at the intersection. Vehicular Ad hoc Network (VANET) is a common part of Intelligent Transport System (ITS) which is directly involved in handling these problems and aims to make journey on road comfortable. The urban traffic flow depends on the driver behavior, and also, it is influenced by traffic control and environmental factor. As the number of vehicles in urban area is increases, the traditional traffic system faces so many problems. This paper describes a working a VANET environment and then a brief study of dynamic traffic system based on radio propagation model. This traffic system uses a clustering algorithm at the intersection. Then we conclude the system working.

5) Vehicular traffic is continuously increasing around the world, especially in large urban areas. The resulting congestion has become a major concern to transportation specialists and decision makers. The existing methods for traffic management, surveillance and control are not adequately efficient in terms of performance, cost, maintenance, and support. In this paper, the design of a system that utilizes and efficiently manages traffic light controllers is presented. In particular, we present an adaptive traffic control system based on a new traffic infrastructure using Wireless Sensor Network (WSN) and using new techniques for controlling the traffic flow sequences. These techniques are dynamically adaptive to traffic conditions on both single and multiple intersections. A WSN is used as a tool to instrument and control traffic signals roadways, while an intelligent traffic controller is developed to control the operation of the traffic infrastructure supported by the WSN. The controller embodies traffic system communication algorithm (TSCA) and the traffic signals time manipulation algorithm (TSTMA). Both algorithms are able to provide the system with adaptive and efficient traffic estimation represented by the dynamic change in the traffic signals' flow sequence and traffic variation. Simulation results show the efficiency of the proposed scheme in solving traffic congestion in terms of the average waiting time and average queue length on the isolated (single) intersection and efficient global traffic flow control on multiple intersections. A test bed was also developed and deployed for real measurements. The paper concludes with some future highlights and useful remarks.
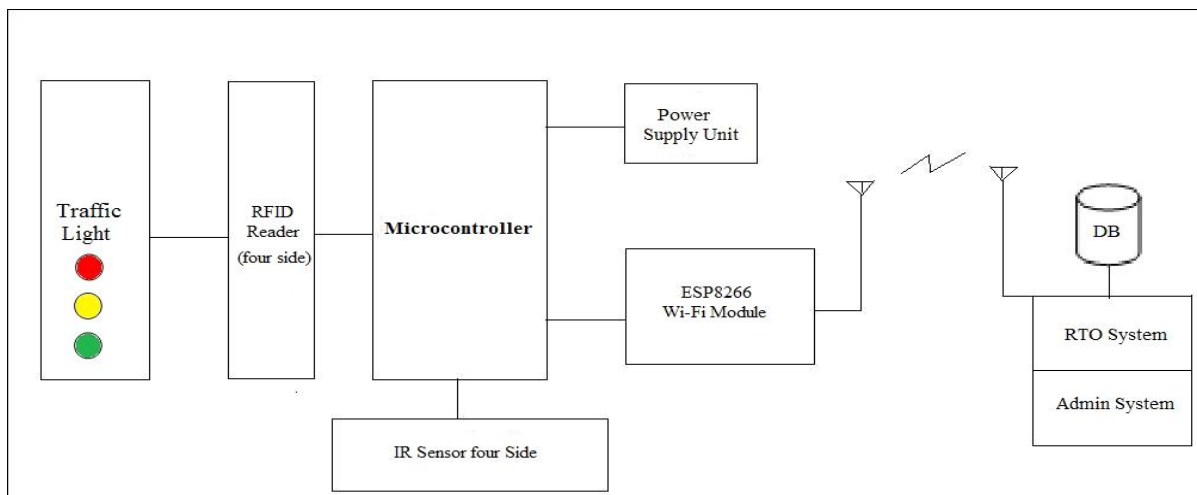
V.SYSTEM ARCHITECTURE

Fig: System Architecture

The Figure consist of power supply, microcontroller, IR sensors. LEDs connected to microcontroller from all four sides. The microcontroller used is Arduino. All the control operations are performed by microcontroller. Power is supplied by power supply circuit(5v dc). When supply is given traffic lights operate normally with green light delay of few seconds. Density is sensed by IR sensors connected on all four sides. Normally output of sensors is high , when obstacle comes in its path output gets low. Microcontroller then automatically increases the delay of green light so that traffic passes.

VI.CONCLUSIONS

The Using Real-Time scenario, the system can:
1) Adjust the current signal duration time smartly.
2) Resolve the problem of traffic congestion.
3) Reduce energy consumption.
4) Protect environment.

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