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Intelligent Traffic Light and Speed Breaker Flatten System

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ABSTRACT
Vehicular travel is increasing throughout the world, but the bedrock capacities of roads and transportation systems have not developed in an equivalent way to efficiently cope with the number of vehicles travelling on them, Due to this, road jamming and traffic correlated pollution have increased with the associated adverse societal and financial effect on different markets, worldwide Wireless Sensor networks (WSNs) are very trendy due to their faster transfer of information, easy installation, less maintenance, compactness and for being less expensive compared to other network options. There has been significant research on Traffic Management Systems using WSNs to avoid congestion, ensure priority for emergency vehicles and cut the Average Waiting Time (AWT) of vehicles at intersections. This paper presents a new method that will reduce the Average Waiting Time (AWT) of vehicles based upon the situation, in this paper we also give the smart idea for the speed breakers.

Keywords: wireless sensor networks, average waiting time.

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I. INTRODUCTION

Over the years vehicle usage has increased exponentially worldwide. Due to this, road traffic conditions have become complicated and chaotic. Traffic control is the big issue in today's era. Therefore the need arises for optimizing traffic control algorithms to better accommodate this increasing demand , Today's traffic control system is able to handle such a situation but not that much effectively because they are static in nature. We need a system which is dynamic in nature so that it can handle traffic smoothly, The management of traffic in India is also a tough job and only manual effor ts can't stop this kind of problem so we need machines. We need a system that can handle such a situation effectively. and such a system called Intelligent Traffic control System**.** In this project we are creating the same dynamic traffic control system which has the ability to control the traffic as well as avoid the congestion of roads . Several traffic control approaches address the problem of reducing traffic jams. A class of them deals with coordination of traffic lights to allow vehicles traveling in a given direction. junction. Here each junction and its traffic lights behave like a social insect. Today's traffic control systems are based on microcontroller and . Transportation research has the goal to optimize transportation flow of people and goods.

In recent decades, researchers have started to monitor real-time traffic using WSNs, RFIDs, ZigBee, VANETs, Bluetooth devices, cameras and infrared signals.Existing urban traffic management schemes for the avoidance of congestion and providing priority to emergency vehicles are considered and set the foundation for further research.

If you observe some techniques like Sarpong Kwadwo Asare and Robert A. Sowah image processing based method[1], Chunyu Yang, Yong Cao, Zaiqing Nie, Jie Zhou, Ji-Rong Wen, "Design Of Intelligent Traffic Light Controller Using Embedded System"[2], Jin Zhou, C.L. Philip Chen, Long Chen, "A Small-scale

Traffic Monitoring System in Urban Wireless Sensor

Networks"[3], they are little bit complex, need the more equipment, skilled man power and those methods will be suitable to high population areas i.e full developed cities, but if we observe the countries like india , the day to day the people was moving from village to near by cities and day to day the vehicles using was increasing.

So the moderate populations cities was increasing day to day for those type of the cities we are proposing a new method to decrease average waiting time in the traffic if we observe the present methods for traffic control systems they are giving the more time to pass the vehicles if the traffic density is high, this type conditions always occur at higher population cities.

Let us consider 4 road junction in higher population cities, almost all roads have higher density, so if we give the more time at 1st road vehicles, obliviously the due to over time 2nd road also have higher density of vehicles, if we give the more time for 2nd road vehicles, then 3rd road also have higher density of vehicles due to over time at the 1st and 2nd road, so if these goes on, the waiting time of the 4th road passenger was increased abnormally.

If we consider the same in the moderate cities, at 4 road junction may be 2 roads have higher density, and remaining 2 roads have may have lesser density, but still we follow the fixed timing for the four roads, and moderate population cities recurring traffic was little bit high compare with the non recurring traffic.

In this paper we are concentrate on averaging waiting time, i.e by taking the chance from the lesser density side and give those chance to higher density side roads.

II. PROPOSED METHOD FOR INTELLIGENT TRAFFIC LIGHT CONTROL SYSTEM

In this proposed methods. mainly we are using wireless sensors to detect the traffic density and small microcontroller circuit to handle the traffic lights.

2.1 Sensor

A sensor is a transducer which transforms the physical nature parameters like light, temperature, velocity, pressure, moisture, etc. to an electronic signal. This electronic signal can be understood by humans or fed into a control system. A traffic monitoring sensor node typically comprises of four main modules as given below:

A sensing module:- This module acquires data.

A processing and storage module:-This module process;- the local data and stores it.

A radio module: - This module is for wireless data communication.

A power module:-This module is for energy supply.

A general sensor node normally includes a radio module for wireless data communication. The transmission range of wireless communication depends on the communication technology, which can be a few meters (Bluetooth, Zig Bee,Wi-Fi, etc.) to thousands of kilometers (Wi-MAX, GSM, etc..).

The wireless communication has numerous technologies and standards, including Zig Bee, Bluetooth, GPRS, GSM,Wi-Fi andWi-MAX highlights the frequency, range, throughput and feature of these wireless communicationtechnologies.

In our method we are using IR LED to collect the information regarding to the density of vehicles, we fixed the IR LED at road side of the low density zone and medium density zone and higher density zone, in normal conditions i.e when there is no vehicle on the road, the IR transmitter transmits light which is received by the photodiode, which starts conducting, as the photodiode conducts, the corresponding transistor also conduct, giving an output of low logic signal to the microcontroller. The same principle works for all other IR sensor-transistor arrangement. The microcontroller makes each led glow for a fixed amount of time.

Now if there is presence of vehicles, the communication between the IR transmitter and the receiver is interrupted, i.e the photodiode receives less or no amount of light from the IR diode and accordingly the base current tot the transistor reduces, eventually making the conductor go to off condition. This causes an output of high logic signal from the transistor to the micro controller, the microcontroller accordingly changes the glow time of the corresponding junction LED.

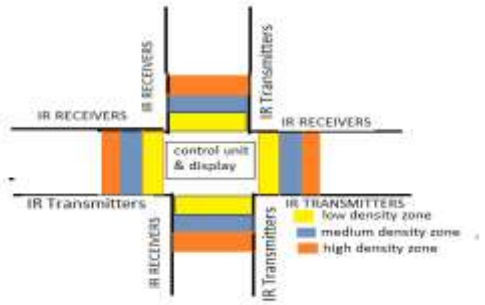


Fig:- IR LED ARRANGEMENT

We may use CFC detectors rather than IR LED, but if you those detectors, we are not able to get the accurate density of vehicles

2.2 Control Unit and Display Unit:-

Control unit consists of transformer, rectifier, regulator and microcontroller; microcontroller receives the IR sensor output and accordingly controls the glowing of LEDs. Display unit consists of 3 LED s – green, red and amber in each side of the junction

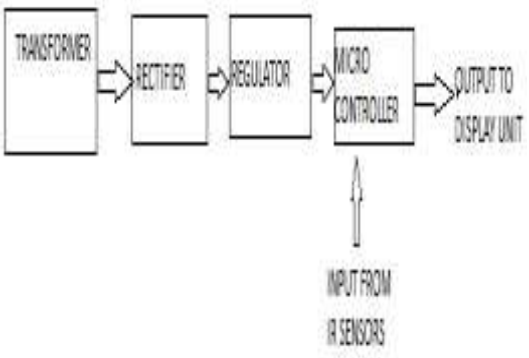


FIG:- CONTROL UNIT

If we look at the working of our network, after ten seconds given the stopping signal by red light, we will collect the traffic density by our sensors, if the sensors indicate the low traffic density, then 30 sec is enough time to clear that traffic, why because the remaining time of stopping signal, the increasing traffic up to medium traffic density only, so 30 sec is enough to clear it.

We will give this 30 seconds time to next road stopping signal, i.e red light of next road.

Suppose our sensors indicate the medium traffic density, then we need the 45 seconds to clear the traffic, we will give this 45 seconds to next road red light.

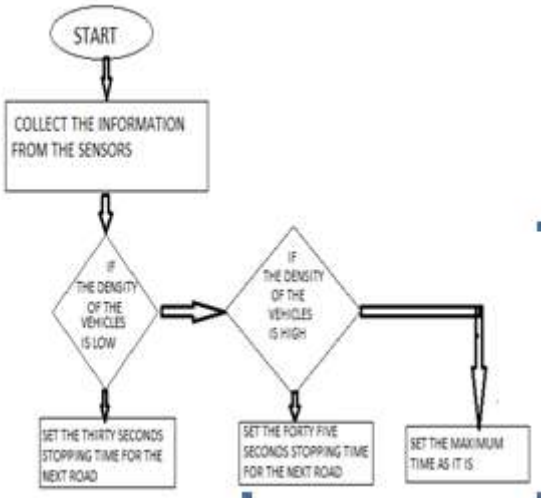


FIG:- Flow chart for the proposed method.

If our sensors shows the traffic was high, then we will put the maximum time as it is, why because if we give increase the time it will increase the waiting time passengers, those who already waiting at the next roads.

This procedure was repeat again and again, due to this method, if any of the road have less density then that much waiting time we are able to decrease.

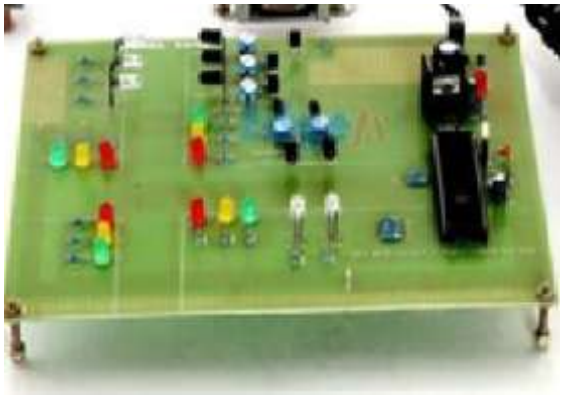


FIG:- Prototype of the proposed method

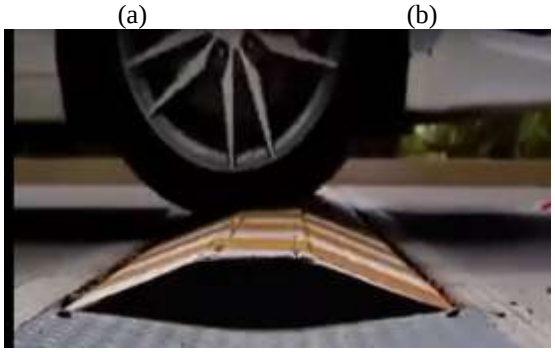
III. INTELLIGENT SPEED BREAKER FLATTEN SYSTEM

Now a days if we observe the roads passed through the villages may have the high chance of accidents, to avoid those accidents we need to reduce the speed of the vehicle for that one are using speed breakers, but due to this the passengers get the difficulty while travelling on these roads, for that one we are giving smart solution for this problem.

The main aim of the speed breakers was reduce the vehicle speed, if the passenger had reduced his vehicle speed there is no need of the speed breaker. So we will use the sensors to monitor the vehicle speed while passenger was arrived to the speed breaker.

(a)

(b)



(c)

FIG:- (a), (b),(c) working of intelligent speed breaker system

To measure the speed of the vehicle we use the wireless sensors 500 meters from the speed breaker, if passenger will not reduce his vehicle speed, we will use some red lights to indicate there is speed breaker ahead of the road, if the passenger already reduced his vehicle speed, the speed breaker automatically reduced height and almost flat to the road, this vertical movements control by the elevation mechanism, this type of activity will create the smooth travelling on the road.

IV. CONCLUSIONS

if we follow the proposed method, it will reduce the average waiting time in small and medium population cities, and we can say it require very less equipment and no need of the skill labour, based on these considerations we can say for moderate population cities it will be one good method to control the traffic lights at the junctions. Intelligent

speed breaker control system also one good idea to give smooth travelling for the passengers.

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