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Density Based Traffic Alert System Using IOT

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ABSTRACT: This paper proposes a density-based traffic control system. Traffic congestion is one of the major problem in the world especially in metropolitan cities. Currently, there are many ways to reduce traffic congestion. But existing methods are not completely solving traffic congestion So, instead of following fixed time basis it's better to shift to manual or automated system. So, we have come up with a new mechanism where the traffic is controlled based on the vehicle's density. By calculating the density of vehicles on road side, timing of the signals will be changed. The main components in the project are IR sensors, Node MCU, LED's. The IR sensors which are present on the sides of the roads will detect the presence of vehicles and information regarding density will be sent to micro controller, where it will decide the glowing time of green and red LED's. This mechanism helps to reduce the traffic way better than previous systems. This project mainly reduces the waiting time and provide efficient traffic.

KEYWORDS*:* Traffic control system, Node MCU, IR sensors, LED's, Blynk app.

I.INTRODUCTION

Nowadays we can see that controlling traffic became the major issue because of rapid increases in auto mobiles and also main reason for traffic is the time delay between the traffic light and vehicle utilization has increased tremendously. We have come know according to latest survey average person sends about four to six mouths of his/her entire life waiting for green light waiting for green to turned on the signal. Whereas number vehicle users constantly increases the facility provide by system is limited and in efficient with respect energy to energy and time consumed. Traffic most people are stuck in the roods and could not go back to home towns. The general traffic system utilizes stable signaling times at intersections and does not provide any important to emergency vehicle such as ambulances, fire-fighters and police cars by there leading to loss of lives damages or destruction of property .and rise in the fuel costs, pollution and congestions.

To rectify this problem we are proposing a mechanisms called as density based traffic alert system. Hence is the proposed of traffic control, we are forces on the signal on the fixed time basis. The main aim to of the proposed by constantly monitor the vehicle density present in all part of the junction. The main components that we use in the system are IR sensor, Node MCU led. But in this node the IR

sensor used to detect the presence of any vehicle in the part of the rood. When detected it sends triggered output of node MCU. were as Node MCU is the heart of the project.

Node MCU analysis the number of such triggered output from the set of sensors to different roods the junction. the triggered different led lights the signal in order to Determine the vehicle movement.

II. LITERATURE SURVEY

Mr. K. Jaya Prakash, B. Sreekanth, K. Charan Teja, R. Venkata Ravi: This paper detects the presence of vehicle. Once the presence of vehicle is detected the time period of signal is adjusted with the help of microcontroller (ATMEGA 328P). The sensor which are grooved inside the road at each lane of junction which will detect the presence of vehicle passing that lane and sends the information to microcontroller. Based on the collected information it will

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decide which lane should get additional time and which lane's time should be deducted. This will happen only once in a single loop.

Shruthi Kr: 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). These techniques are dynamically adaptive to traffic conditions on both single and multiple intersections. An intelligent traffic light controller system with a new method of vehicle detection and dynamic traffic signal time manipulation is used in the project. The project is also designed to control traffic over multiple intersections and follows international standards for traffic light operations. This paper solves the traffic congestion in intelligent manner.

A central monitoring station is designed to monitor all access nodes. In this system traffic density is monitored by wireless sensor network and the road side unit (RUS) beyond the rood and RUS compares the density on all roods and give maximum green time to road priority basis.

Koushik Mandal: Traffic Monitor to monitor and measure the road traffic congestions using probe vehicle. The concept of probe vehicle has come up in recent times for collecting real time traffic data. Our system provides an easy platform to analyze the traffic movement and congestion pattern. Traffic Monitor is a rapidly deployable, cost effective and easily maintainable traffic congestion monitoring measurement system that combines active RFID (based on IEEE 802.15.4 protocol, 2.4 GHz ISM band) and GSM technologies. The congestion detection algorithm is based upon calculation of vehicular speed over a stretch of road and the average waiting time of vehicles at road crossing. It uses one active RFID tag, one wireless router and one wireless coordinator at road side for calculating average trip to cross road.

Amith Kumar Baktha: This is achieved by using PIR (proximity Infrared sensors). Once the density is calculated, the glowing time of green light is assigned by the help of the microcontroller (Arduino). The sensors which are present on sides of the road will detect the presence of the vehicles and sends the information to the microcontroller where it will decide how long a flank will be open or when to change over the signal lights. In subsequent sections, we have elaborated the procedure of this framework.

III.PROPOSED SYSTEM

Block Diagram of Density Based Traffic Alert system:

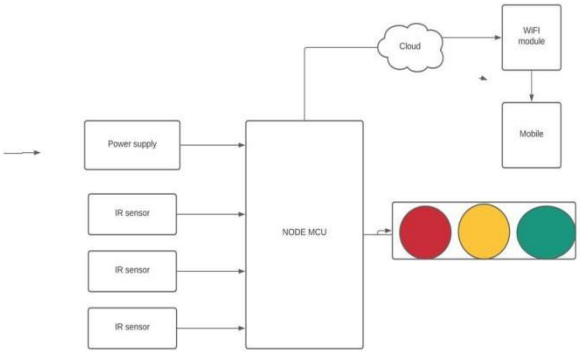

Figure 1: Block Diagram

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The model works on the principle of changing delay of Traffic signals based on the density present at particular lane at the signals using IOT through Blynk app. Density will be visible in Blynk app. Based on that we will decide the signal time. There are three sensors placed at one lane of road side which senses the number of cars passing by the area covered by the sensors. Then Node MCU receive the information about traffic density through IR sensors.

Flow Chart of Density Based Traffic Alert System:

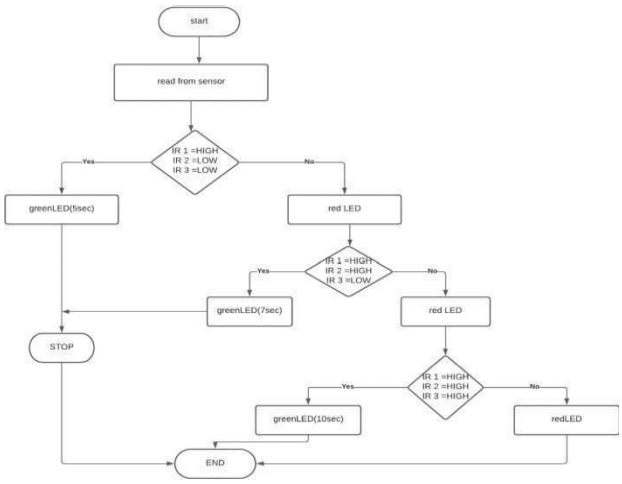

Figure 2: Flow Chart

We consider one side of road among four road junction to measure density of traffic. we are placing three IR sensors at one lane at some distance. we are considering three cases to measure the traffic density.
CASE 1: When first sensor is high and second and third sensor is low then density of traffic is Low, It will be visible in blynk app then green LED will be for 5 seconds for vehicles to pass.
CASE 2: In second case, first and second sensor is high. It means medium density is present at traffic junction then we will allow green LED for 7 seconds for vehicles to pass.
CASE 3: In third case, all three sensors present at road side will be activated. that means high density of traffic is present. we will allow green LED for 10 seconds for vehicles to pass.
Circuit Diagram of Density Based Traffic Alert System:

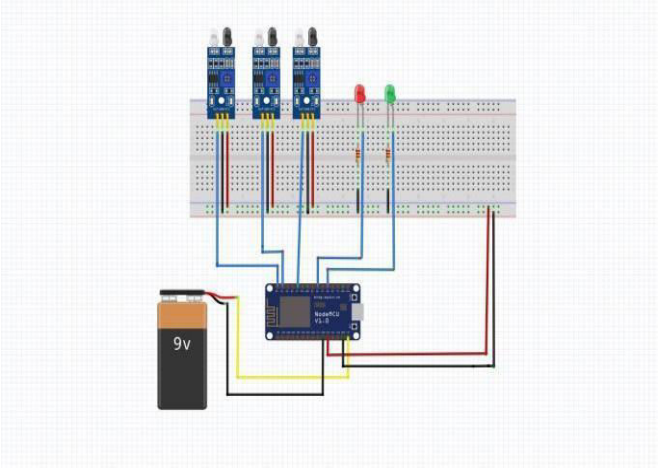

Figure 3: Circuit Diagram

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IV.WORKING PROCESS AND RESULT

After connecting circuit as per the circuit diagram, we give power supply to node MCU using USB cable which is connected to pc.
According to our project, we should check the density of vehicles using IR sensors. Based on density, timing of LED's will be decided.
Download and install Arduino ide as we need to write the code in order to connect sensors and give timing to LED's based on the density cases. Firstly, write the code and verify before uploading it. then dump the code in the Arduino ide and click verify. after verifying, upload the code then it is compiled successfully and uploads.
We are using Blynk app application to see the density in mobile phone. we need to install Blynk app IOT application from play store and log in using username and password created in code.
While performing the kit, connect the mobile with internet and check the vehicles density.

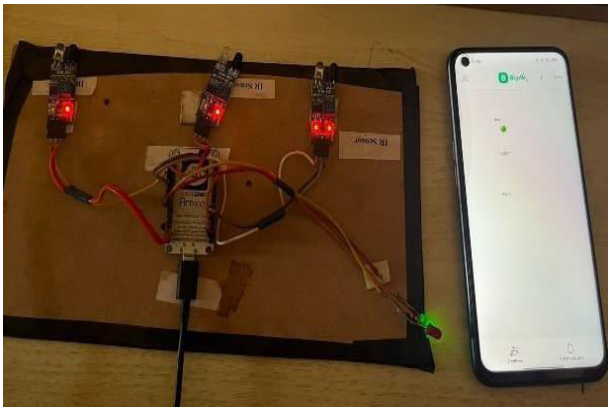

Figure 4: Low density (Green LED ON for 2 seconds)

Green LED will be on for 2 seconds for the vehicle to pass in low density case. After 2 seconds red LED will be on.

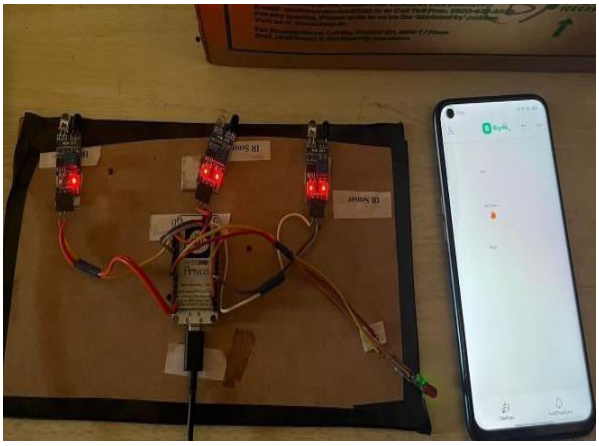

Figure 5: Medium density (Green LED ON for 5 seconds)

Green LED will be on for 5 seconds for the vehicle to pass in Medium density case. After 2 seconds red LED will be on.

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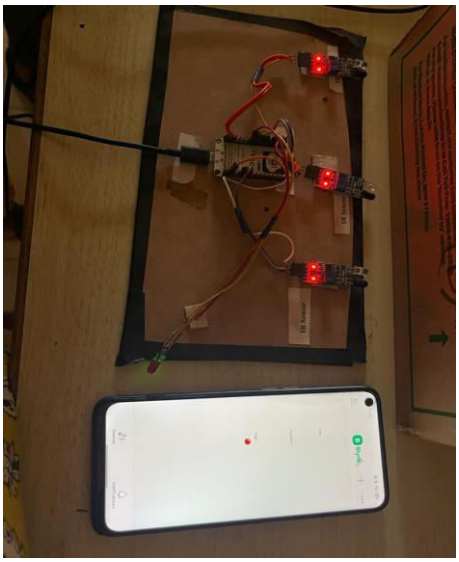

Figure 6: High density (Green LED ON for 7 seconds)

Green LED will be on for 7 seconds for the vehicle to pass in High density case. After 7 seconds, Red LED will be on.

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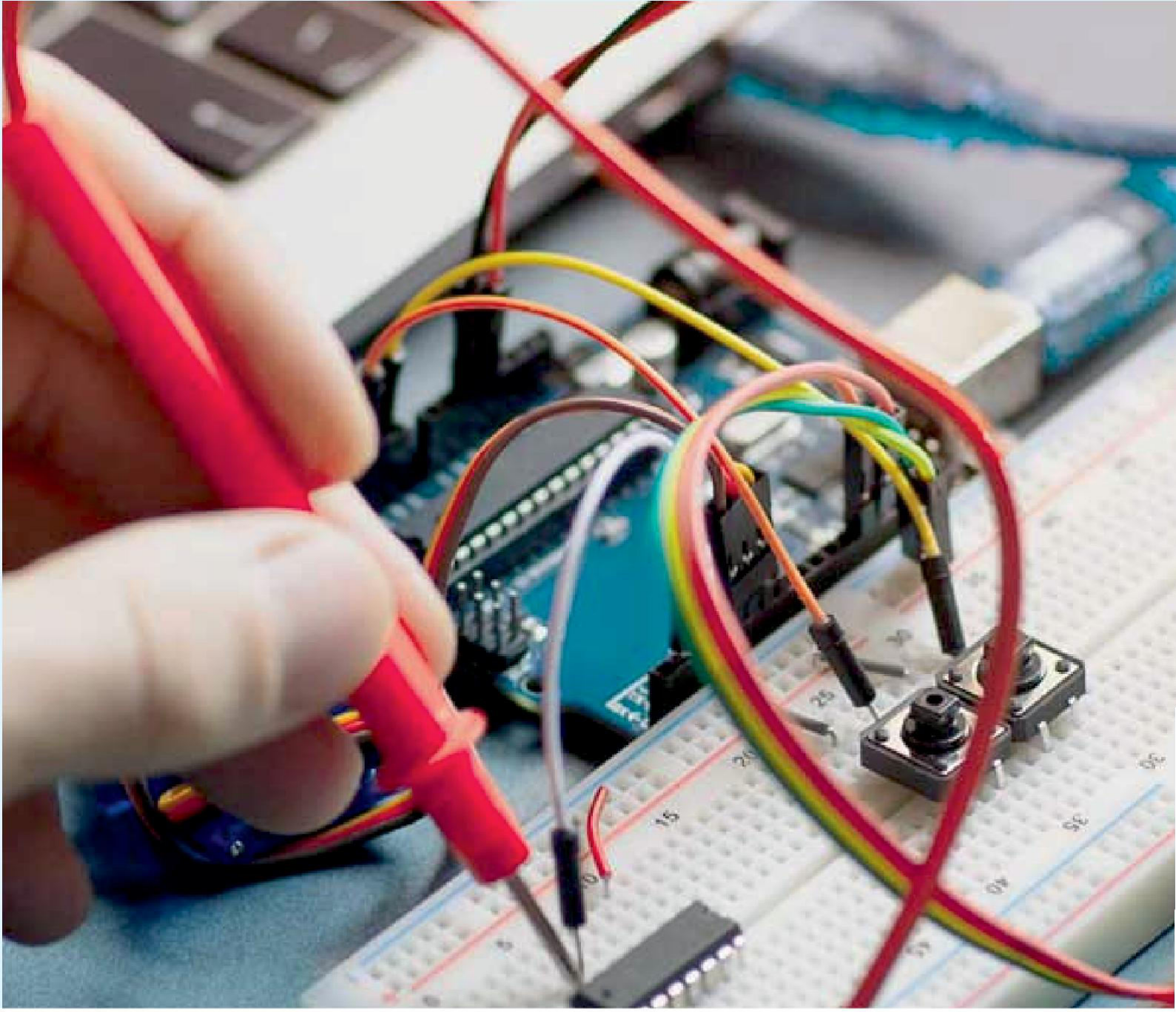

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