A Smart Traffic Congestion Control System

I. INTRODUCTION

The Internet of Things(IoT) is the inter connecting of physical devices which embedded with set of electronics, actuators, software and network connectivity that enable these physical objects to collect the data and exchange the data from one device to another device. IoT allows physical objects to be controlled and sensed remotely across network. IoT is used for direct integration of physical world into computer based system. It yields to improved efficiency, economic benefit and accuracy of physical devices.

Every day thousands of vehicles running through city streets which makes a Traffic congestion. Traffic congestion is a major problem in cities. The main reason for traffic congestion is lack of awareness on the traffic live density on the destination path. The public vehicle purchasing power is increasing and results increasing of private vehicle density. The city doesn’t expand along with an increasingly vehicle density. This problem can be reduced using some technological implementation like mobile applications, and other sensor technologies. Here we introduce a mobile application which helps to decrease some traffic huddles. This Application will work on the theme of updating the cause of traffic jam in a specified circumstance[3]. The Updating can be done by the traffic department belongs to that location or the responsible citizen who is in the same location. This helps the user to know live information about the traffic situation in upcoming junction. This Application is connected to a device which is an Iris camera. This Iris camera is used to detect the sleeping sense of the driver and gives a warning bell to be conscious.

II. CONVENTIONAL TRAFFIC SYSTEM

Conventional traffic system assumes that equal traffic density on each side of a four way junction road. Those days traffic lights are typically pre-programmed for controlling of traffic, but traffic is variable and changed so it is hard to control variable traffic based on static assumption of traffic. In conventional traffic system the vehicles are waiting for some time period irrespective of the load in traffic. We avoid this drawback in smart congestion control system. The main goal of smart congestion control system is to minimize congestion for smooth running of traffic with low cost and high efficiency.

III. PROPOSED SYSTEM

In Conventional traffic system we use green light will on or off in a fashion like west-north-south-east. In my proposed model we have used microcontroller, Infrared sensor, counter flag, display LED[1]. Infrared sensors are used to find its surrounding objects by using infrared radiation. It also capable of measuring the heat being emitted by an object and detecting motion of vehicle and its direction of movement. IR sensor detect the number of vehicles on each side then that count is stored in counter flag variable, which is send back to microcontroller to initialize the traffic signal. The micro controller is programmed to perform the entire task of traffic control based on the data that it has got information from the Infrared sensor.

The Infrared sensor will detect the traffic on the road and indicate that traffic as heavy traffic or normal traffic. The assumption of the traffic by the IR sensor will be taken by the microcontroller and that will be sent to the web page through the GPRS module installed. We develop the communication app for vehicle drivers to update live traffic condition in the destination path. For this communication app the input will come from traffic police each and every point of traffic signal. Those all inputs will integrate with GPS system and communication app will provide alternate route for user destination.

Keywords-GPS, Traffic congestion, Infrared sensor.

REFERENCES

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Abstract: As the use of vehicles is increasing day by day so the problem of traffic is arising is called as traffic congestion. The main objective of this paper is to overcome the problem of traffic congestion so that its negative effects can be avoided. The Infrared sensor is used to detect the density of traffic on the road and it will indicate that traffic as heavy or normal traffic. The density of traffic identified by the IR sensor will be given as input to the microcontroller and that will be sent to the microcontroller or web page through the GPRS module installed. We also develop the communication app for vehicle drivers to update live traffic condition in the destination path. For this communication app the input will come from traffic police each and every point of traffic signal. Those all inputs will integrate with GPS system and communication app will provide alternate route for user destination.

INFORMATION & TECHNOLOGY

1. Global Positioning System (GPS)
   In the late 1990s Global Positioning System was first included in cellphones. It's still the best way to find your location. GPS is shown in Figure 1.

   Fig. 1. Global Positioning System

   Global Positioning System uses a satellites that send location and timing data from space about any object directly to your phone. To know the location of any physical object by using GPS sensor.

2. Inertial Sensor
   If the physical object go into a place where no wireless system works, then inertial sensors can detect your object location based on other inputs like. Most smart phones now use three inertial sensors they are:
1. A compass to determine the object movement direction
2. An accelerometer to report how fast your phone is moving in a particular direction
3. A gyroscope to sense turning motions. Together all these sensors can determine your location but only for a limited time.

EG: If the phone knows your location from the usual sources before you enter using GPS then inertial sensors can then determine where you've gone from the speed and direction you're moving. Even though you don’t exist in a location where wireless sensor works.

C) INFRARED SENSOR
Infrared sensors are used to find its surrounding objects by using infrared radiation. IR sensor also identify the heat released by vehicles and its motion which identify the traffic congestion.

V. WORKING PRINCIPLE
Working principle of A smart traffic congestion control system is shown in figure 2. First by using IR sensor the traffic is analyzed at a particular junction through micro controller that information updated by traffic police in a mobile app. The mobile application consists of Google map, the traffic situation and status in upcoming junction was sent to the user, the task of updating doesn’t take much effort from traffic department this can done in very simple way, the traffic department can just give the numbers as input (1, 2, 3, 4) if he gives input as 1 then information sent to user as heavy traffic if input is given as 2 then it intimates user as accident and traffic jam if he gives input as 3 then information sent to user as light route and if input is 4 then it intimates user as clean route hence traffic department can update their input according to current traffic status in their respective junctions, as application consist of google map the alternate route for your destiny also get highlighted this mobile application. In this communication application driver wakeup alarm function has been incorporated for reducing the accidents this app will work based on signal receiving from irises camera upon steering opposite to the driver eyes.

VI. INSTALLATION PROCEDURE
- An Android Application which is to be created with the features of GPS/Location access.
- User/Driver should have installed the Android Application in his/her mobile.
- The installation of the app should follow three steps
  a) Installing the Application into his/her mobile.
  b) The Application installation should be takes place with the identification by his/her mobile number +91_________
  c) And then the user is required to inform the details like Name, Address, Email etc.
- After finishing the process of installation and filling of details the user is requested for selecting the option that indicates the acceptance to allow the App to access the device location.
- Then the app shows his location on a Google map with the name of the Location.

VII. RESULTS
The following output screens from figure 3 to figure 7 represent the location of vehicle by using IFTTT App.
In this paper by using this smart Traffic Congestion control system we can avoid the traffic jams and we can save the valuable time of many individuals.

IX. REFERENCES
