Smart Traffic System

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Abstract -The Density Based Signal Management in traffic system is to clarify traffic congestion problem which is a big problem in many various modern cities, and many population face this problem. For that, In our project we designed the framework for dynamic traffic light control system, and the automatic traffic light control system, developed the model with codes to help build the system. Generally, each traffic light on Smart Signal System an intersection is assigned set signal time. This is possible to propose dynamically time-based coordination schemes where a green signal time of the traffic lights is assigned base on the present conditions of vehicle density in that traffic.

Keywords –RFID Tag, Sensor, time, Traffic Detector.

I. INTRODUCTION

The Density Based Signal Management in Smart Signal is used in heavy traffic on the roads and the junction which is based on the time. The density of traffic and the time delay will be controlled. Density will control by a program coded and density of traffic is high in particular side more priority will be assigned to that side. The Sensors continuously keeps monitoring density of all sides and the Green color signal is given to the side basis of priority. The side with next priority level observe a first priority level. By using this techniques traffic will be cleared without irregularities and time delay though there is no traffic on the other side will be avoided. High density of traffic will allow traffic with maximum timing assigned low density of traffic will allow traffic with minimum timing assigned.

Objectives:

1. To Reduce the Traffic congestion caused due to uneven traffic.
2. Make the traffic light on and off based on the load of the traffic.
3. To detect the emergency vehicles and make way for them.
4. Provide ease to the people travelling on the highway.

II. LITERATURE SURVEY

Inductive loop detection (ILD): This is an elector-magnetic communication or detection system which is uses a moving magnet to induce electrical current in a nearby wire. ILD are used for send and reception of communication signals, or for detection of metal objects in this metal detectors or vehicle presence indicators. Inductive loop detectors can detect large vehicles passing or arriving at a certain point, for instance approaching a traffic light or in vehicle traffic. The insulated, electrically conducting loop is installed in the pavement. The main drawback of this includes low reliability due to wrong connections.

III. VIDEO ANALYSIS

Video Analysis is used to find out information about moving objects from video. The highest level Video Analysis provides the capability of automatically analyzing video to detect and determine events. It accords of CCTV cameras, other sensors, processors and communication unit. The traffic is continuously monitored with the help of CCTV camera. To implement sense of this data and turn into information logical rules can be created to trigger events based on certain scenarios such as "send an alert and object enters the work area stop there for 2 minutes." Following challenges are [1] when deploying video analysis technology is intrinsic to this way the technology works. [2] this technique is complicated by the environmental issues like rain on the camera lens or windy conditions vibrating in the camera /pole making.

IV. PROPOSED SYSTEM

Sensor monitors vehicle density on a lane. Signal time is dependent on the density of vehicle is high or low.

V. FEASIBILITY STUDY

● Hardware Feasibility :
I. Arduino.
II. Ultrasonic Sensor.
III. Buzzer. IV. RFID tag.
V. RFID reader.
VI. Android Phone

● software Feasibility: I. Arduino IDE.
II. Embedded C

VI. TOOL & TECHNOLOGY

I.LED LIGHTS: A light-emitting diode (LED) is a 2-lead semiconductor light source. It is a p n junction diode, in which provide light when activated.

When a suitable voltage is applied to the leads, electrons are able to combing with electron holes within the device, releasing energy in 1the form of photons, this effect is called electro luminescence and the color of the light corresponding to the energy of the photon) is determined by the energy band in the gap of the semiconductor. LEDs are the typically small and integrated optical components may be used to shape the radiation pattern.
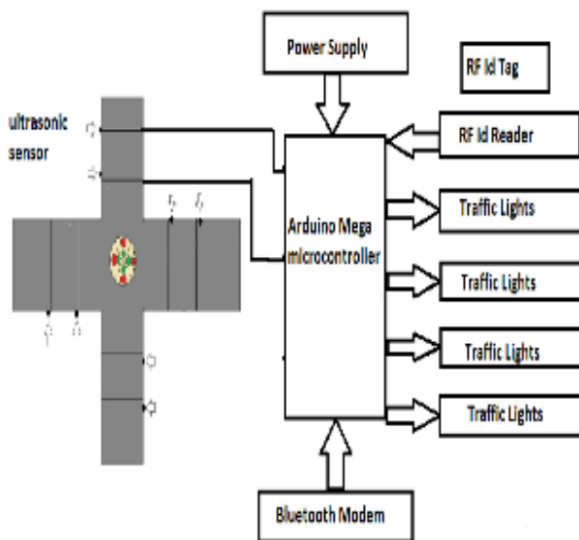
Density of vehicle is higher on lane then controller set max time of signal. An emergency vehicle is detected then controller set time of signal and change light of signal.

II.RFID SCANNER AND CARDS:- RFID is a device that is used to read the contents of certain cards. These RFID cards are of passive types and return a 12 char value. These values are stored and used to detect emergency vehicle.

III.IR SENSOR:-IR sensors are used to detect the density of traffic in all the lanes. These sensors are placed on the sides of road and when they detect the vehicles in front of them they send a signal to the arduino regarding length of density.

IV. BluetoothModule:-Bluetooth is a wireless technology standard for exchanging data between fixed mobile devices over the short distances using short wavelength UHF radio waves in the industrial scientific and in medical radio bands from 2.400 to 2.485 GHz and building personal area networks PAN. It was originally conceived as a wireless alternative to RS-232 data cables.

V. RFID(Radio frequency identification):-
Radio-frequency identification (RFID) [2][3][4] is the wireless non-contact use of radio frequency electromagnetic fields to transfer the data, for purposes of automatically identifying and tracking tags attached to objects

VI. AndroidPhone:

Android is a mobile operating system developed by google It is based on a new modified version of the Linux kernel and the other open source software is designed primarily for touchscreen mobile devices such as a smartphones and tablets. In addition, google has a further developed android tv for televisions, Android Auto for cars, and Wear OS for a wrist watches each with a specialized user interface. Variants of Android are also used on game consoles, digital camera PCs and other electronics.

VII. PROPOSED SYSTEM METHODOLOGY

● In this system, we will us e IR sensors to measure the traffic density.
● We have to arrange two IR sensor for each road; these sensors always sense the traffic on that particular road.
● All these sensors are interfaced to the microcontroller.
● Based on these sensors, controller detects the traffic density and changes the timing of traffic signal as per density of traffic.
● RFID is used in this project to automatically detects emergency vehicle coming on the road. RFID is interfaced to the microcontroller, once the emergency vehicle is detected by RFID microcontroller makes the signal of that road green to facilitate fast transport to emergency vehicle.
● Bluetooth modem is interfaced to the microcontroller. Android device gives signal to the microcontroller using Bluetooth modem to controller traffic signal manually.
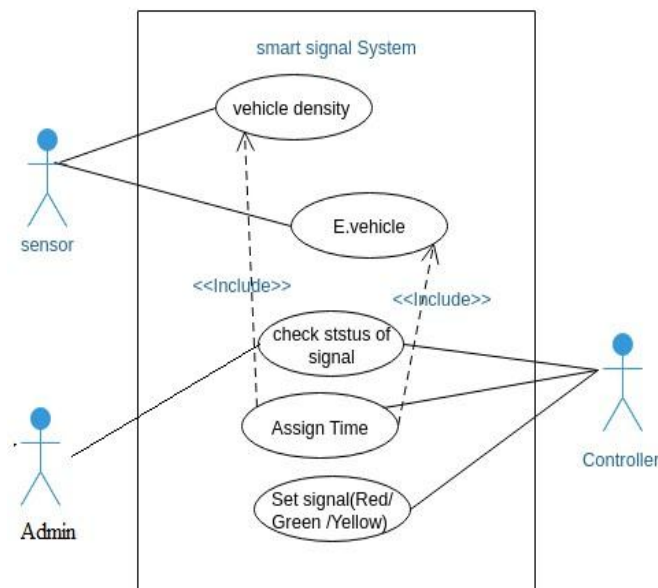
VIII. RESULT
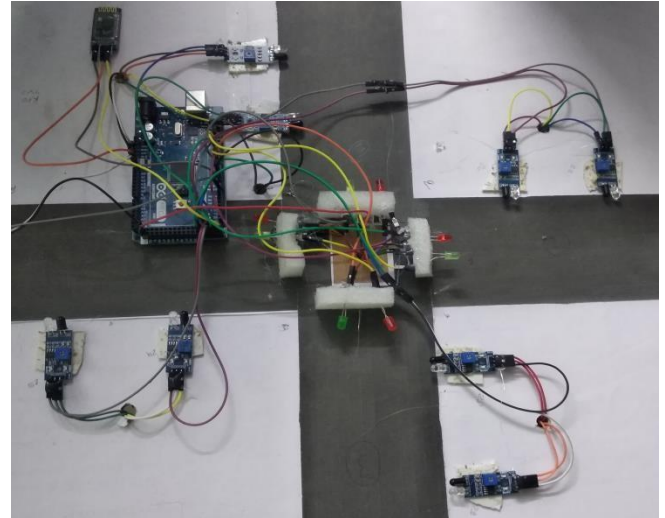
This is a snap of our actual working model. The IR sensors monitor the density and Arduino board is our microcontroller

Future scope:
1. We can use this system to collect the traffic data for traffic research.
2. If all traffic signal in city are synchronized smart city traffic management can be developed.
3. To provide traffic information to drivers using IOT.
4. Also, if emergency is an ambulance, then the nearby hospital will be notified by an alarm through registered

Application:
● Smooth flow of traffic and avoiding severe traffic jams.
● Unlike the traditional system, this will work dynamically rather than working on the time slots allocated.
● Preference will be given to emergency vehicles like ambulance so that it may reach its destination on time, thus saving lives.
● Smart signals will play a key role in the development of cities into smart cities.
● Since this is a dynamic signal, it will help save a lot of time.

IX. CONCLUSION

Smart signal project is beneficial to saving time of people. In this project high density of traffic will allow traffic with long timing assigned low density of traffic will allow traffic with short timing assigned. Sensor detects density of vehicle and Emergency vehicle and set time.

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