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TEAM C-HELIX

Presents

Intelligent Ambulance with Automatic Traffic Control



Proposed by: Akash Verma

Constructed by: Parth Sharma and Raghav Mahant

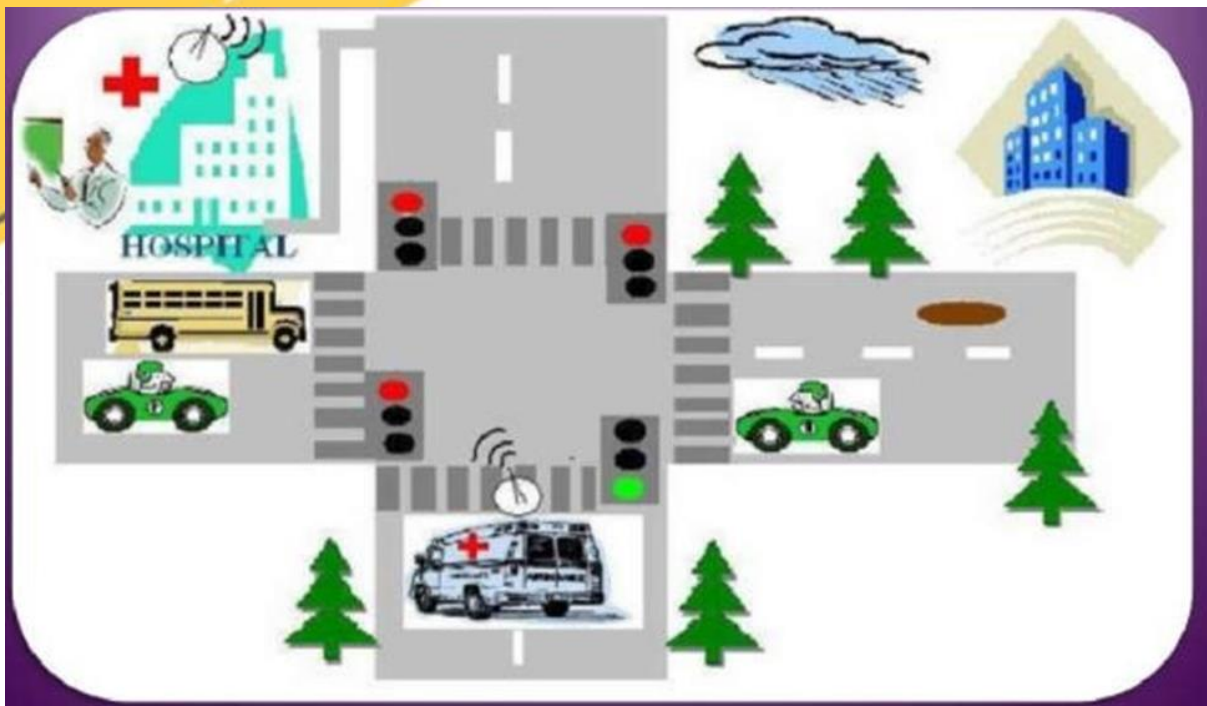


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Objective :

- Autonomous traffic control system: to reach a particular destination without stopping anywhere in order to save the precious lives.
- Ambulance unit to control the traffic signal.
- Hydraulic bollard to stop the vehicles in other lanes during emergency situation.





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Abstract:

With an increasing population and large number of vehicles on road the number of accidents on road accidents keep increasing and during any emergency situation there is a problem of delay in first aid service due to these overcrowded roads.

To overcome this delay in first aid service this paper describes a solution that is **"Intelligent Ambulance with Automatic Traffic Control"** which includes tracking mechanism with automatic traffic light controlling system so that the ambulance can achieve a freeway in order to provide the first aid to patient as fast as possible. An algorithm is used to control the traffic signals automatically based on the key pressed by the driver from keyboard in the ambulance. The information reading the current as well as future location of ambulance is sent from the ambulance itself. This information is used to optimally control the traffic.

We are also using hydraulic bollard on traffic signals so that no one can go when there is red signal.

Potential Applications:

On road due to high traffic people are unable to provide the freeway to the emergency unit which also becomes one of the factors of late first aid to the patient causing fatal consequences.

So, to overcome their negative factors and to provide the first aid to the victim this system - **"Intelligent Ambulance with automatic traffic control"** is proposed.



Present/ Existing Technology:

The vehicles have to face an irregular delay during transit in the urban areas.

At present, the traffic control systems in India lack intelligence and act as a loop control system, with no feedback. So, this variation in technology will help in future by saving lots of lives and precious time during emergency.



Ambulance stuck in traffic during emergency



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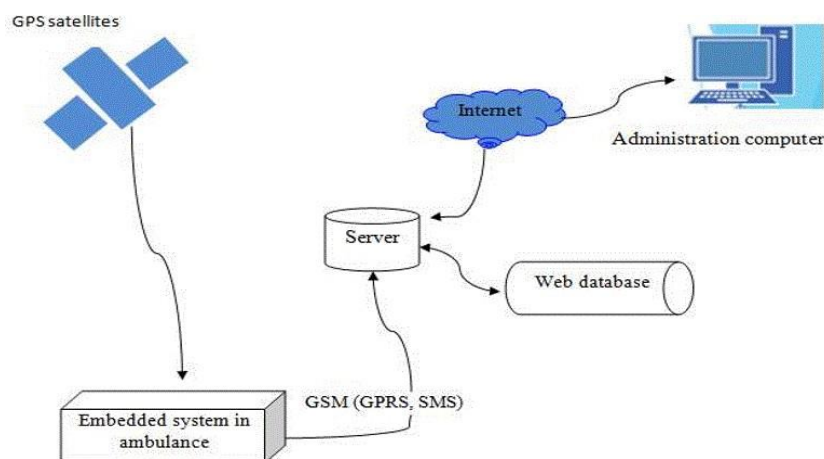


Execution:

Automatic traffic control:

During any emergency ambulance can get stuck in traffic jams on the way to hospital or to the emergency spot. Since we are living in country with massive population and with heavily crowded roads. So, to overcome this problem of traffic jams and to take the patient to hospital as soon as possible this system plays very essential role.

Here as the ambulance reaches any nearby intersection, it informs the traffic lights about its arrival with the help of GPS. The GPS helps in displaying the route to the hospital which the driver can select and signal traffic lights. The Traffic lights with the sensor, convert their light pattern in such a way that the ambulance can get the freeway to reach the hospital and meanwhile all the other lanes turn red to avoid unnecessary traffic on the way. The selected lane remains green until the ambulance passes and all the other lanes with red lights are provided with hydraulic bollard so that no car can cross or break the light.



BLOCK DIAGRAM: Traffic Control System

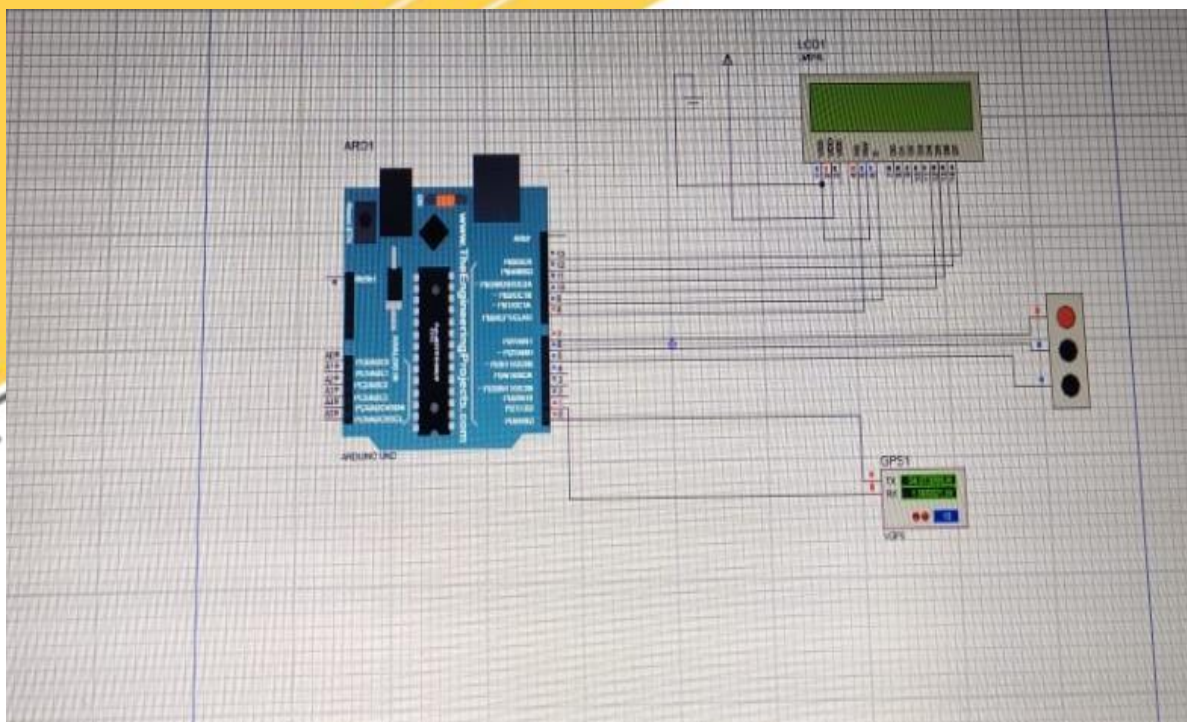


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Execution in Proteus:

In proteus we use Arduino UNO, GPS Module, LCD, and Traffic Lights. Here we have done the interfacing between Arduino UNO, GPS and LCD. The GPS helps us to give perfect location of ambulance and shows the route in LCD. The driver can select the route in nearby intersection, sending signal to the traffic light which turn green in the desired lane and red in all the other lanes.



Interfacing diagram: Proteus



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Proteus coding:

```
sketch_mar14a
#include <TinyGPS.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd( 4, 5, 6, 7, 8, 9 );
// Create an instance of the TinyGPS object
TinyGPS gps;
void getgps(TinyGPS &gps);
void setup()
{
  Serial.begin(4800);
  lcd.begin(16, 2);
}
void getgps(TinyGPS &gps)
// The getgps function will display the required data on the LCD
{
  float latitude, longitude;
```

```
sketch_mar14a
  gps.f_get_position(&latitude, &longitude);
  lcd.setCursor(0,0);
  lcd.print("Lat:");
  lcd.print(latitude,5);
  lcd.print(" ");
  lcd.setCursor(0,1);
  lcd.print("Long:");
  lcd.print(longitude,5);
  lcd.print(" ");
  delay(3000); // wait for 3 seconds
  lcd.clear();
}
void loop()
{
```

```
sketch_mar14a
delay(3000); // wait for 3 seconds
lcd.clear();
}
void loop()
{
  byte a;
  if ( Serial.available() > 0 ) // if there is data coming into the serial line
  {
    a = Serial.read(); // get the byte of data
    if(gps.encode(a)) // if there is valid GPS data...
    {
      getgps(gps); // grab the data and display it on the LCD
    }
  }
}
```



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Hydraulic Bollard:

It only works when there is emergency for ambulance and they will rise when the signal turns red so that no other car can go or break traffic signal. The bollards are given metallic finish and are provided with reflective strips and flashing lights. Furthermore their working is accompanied by a buzzer sound to catch the attention of drivers.



Diagram: Hydraulic bollard



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Social benefits:

1. This model solves the problem of delay in emergency unit due to traffic jams in today's crowded roads.
2. This, if implemented, can drastically decrease the response time of not only ambulances but also other emergency vehicles like fire brigade and V.I.P. vehicles.
3. The precious time saved during any emergency can prevent us from a huge loss of property and lives.

Advantages:

1. Simplicity, user friendly, Easily programmable.
2. This system reduces the overheads on the database server, by deleting the data after every 4 hours automatically.
3. This system is highly responsive that means it gives a quick response to change in traffic.
4. This system reduces the waiting time as traffic signal's light will change according to current traffic density. So, reduce traffic jams.



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Conclusion and future work:

In this project we introduced sensor-based technology for traffic control. We conclude that it provides powerful solution to improve existing system with the new intelligent ambulance with automatic traffic light controller.

This project has two major phases:

1. Blinking of traffic signal light according to the traffic level present on the road.
2. This system manages traffic when any emergency vehicle come.
For example: ambulance, fire brigaded etc.

Proposed system will have wider future scope that user can get traffic information on mobile phone too.