Accident Detection and Ambulance Rescue System using IOT

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Abstract: Road accidents and traffic congestion are the major problems in urban areas. Currently there is no technology for accident detection. Also due to the delay in reaching of the ambulance to the accident location and the traffic congestion in between accident location and hospital increases the chances of the death of victim. There is a need of introducing a system to reduce the loss of life due to accidents and the time taken by the ambulance to reach the hospital. To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident through sensors provided in the vehicle.

A main server unit houses the database of all hospitals in the city. A GPS and Wi-Fi module in the concerned vehicle will send the location of the accident to the main server which will rush an ambulance from a nearest hospital to the accident spot. Along with this there would be control of traffic light signals in the path of the ambulance using RF communication. This will minimize the time of ambulance to reach the hospital. A patient monitoring system in the ambulance will send the vital parameters of the patient to the concerned hospital. This system is fully automated, thus it finds the accident spot and helping to reach the hospital in time.

Keywords: IOT, Ambulance Rescue System, Arduino, GPS, Wi-Fi Module

I. INTRODUCTION

Nowadays Wireless Sensor Networks (WSN) has been applied in various domains like weather monitoring, military, home automation, health care monitoring, security and safety etc. or in a nut shell one can say wireless sensor network can be applied in most of the domains. Currently there is no technology for accident detection. Also due to the delay in reaching of the ambulance to the accident location and the traffic congestion in between accident location and hospital increases the chances of the death of victim. There is a need of introducing a system to reduce the loss of life due to accidents and the time taken by the ambulance to reach the hospital.

To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident through sensors provided in the vehicle. A main server unit houses the database of all hospitals in the city. A GPS and Wi-Fi module in the concerned vehicle will send the location of the accident to the main server which will rush an ambulance from a nearest hospital to the accident spot. Along with this there would be control of traffic light signals in the path of the ambulance using RF communication.

This will minimize the time of ambulance to reach the hospital. A patient monitoring system in the ambulance will send the vital parameters of the patient to the concerned hospital. This system is fully automated, thus it finds the accident spot and helping to reach the hospital in time. These sensors run on both battery power as well as solar energy. They have the capability to draw solar energy so that they can use sunlight for functioning in bright and sunny condition and the battery power for functioning at night or in cloudy or foggy condition.

Sensors used in the Wireless Sensor Network for traffic signal systems are mainly of two types: i) Intrusive type and ii) Non-Intrusive type [i) Intrusive types of sensor are kept under the road and sense the traffic waiting at the signal. This type of sensor has the same working principle as that of a metal detector. ii) Non-Intrusive types of sensor is fitted on the road. The installation of this type of sensor is easy as no cutting of road is needed to be done. Non-intrusive sensor includes acoustic sensors or video image processors to detect the presence of vehicles waiting at the traffic intersection. Although Intrusive sensors are very effective still Nonintrusive sensors are preferred over Intrusive sensors as they are cost-effective, easy to install, immune to natural corrosion and degradation.

II. LITERATURE SURVEY

Pranto Karmokar[1] based accident detection system in which immediately after an accident occurs the information is sent to the web server and an instant SMS is sent to the patients acquaintances and nearby ambulance services.

However, the traffic congestion in between the accident location and the hospital may increase the chances of death of the patients. Karthikeyan M[2] forwarded a system which discusses about the usage of Vibration, Accelerometer and Heart pulse sensor which detects an accident that has occurred. It uses an app which identifies the location where the accident has occurred and sends to signal to the nearby hospitals and ambulance services. It uses Bluetooth module which setup a communication between the driver's mobile and accident detection system. It requires the victim to always connect his phone to the Bluetooth of the accident detection system which may not always be possible. Frahim Wadud Taj[4] proposed a system that detects the accidents and saves the victim's life by alerting the rescue team. When an accident takes place the system forwards a SMS to the nearby rescue team and police station using the GSM module. A rescue team in return trace the location of the accident using GPS to help the victim. This proposed system uses only one vibration sensor due to which there are high chances of occurrance of errors in the detection system. S L V Prasad Gooty[5] proposed a system which deals with the concept of accident detection without any human rescue team. Accident detection is done by using a simple sensor that is embedded in the vehicle. When an accident occurs the sensor sends the accident location to an ambulance. After receiving the location an ambulance is rushed to the accident location.

III. METHODOLOGY

In this project three units called Vehicle Unit, Ambulance Unit and Hospital Unit.

In vehicle unit the vehicle has Tilt sensor according to that tilt senor the main Arduino Controller will operate.

Tilt sensor is used to detect the accident, when the Tilt sensor detects the accident that time the GPS and GSM modules will activated and send a message or call to that nearest hospital or authorized person which is already saved in the program.

GPS module is used to identify the exact location of accident and it will send notification message to that authorized person.

GSM module is used send Notification message and call to that authorized person only when the accident happens.

If an accident occurs, using the GSM module we are sending notification message to authorized person.

Our project is based on four main modules: 1.Sensor. 2. Controller. 3. Hospital 4.Ambulance.

Sensor acts as a trigger that senses the location of the accident place and sends notification to the main controller.

Wi-fi module with a wi-fi is used here because to send message to that authorized person.

GPS module is used to identify the accident location and send notifications to authorized person.

Sensors are used to identify the patient condition and doctors or hospital personnel's can easily monitor the patient.
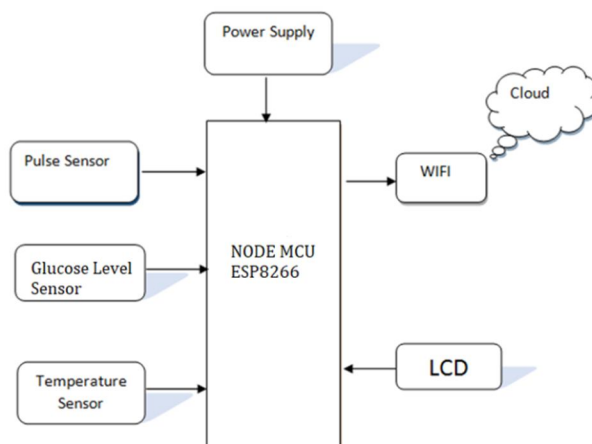
Blynk app is used to monitor the patient condition; Blynk is a open source and free app available in play store. Everyone can download and use it easily.

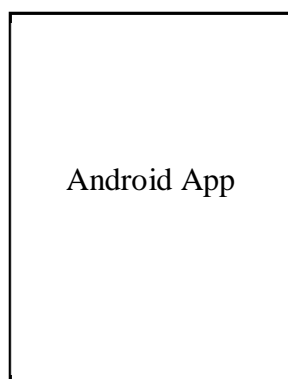We can monitor the patient condition through internet.

A. Vehicle Unit
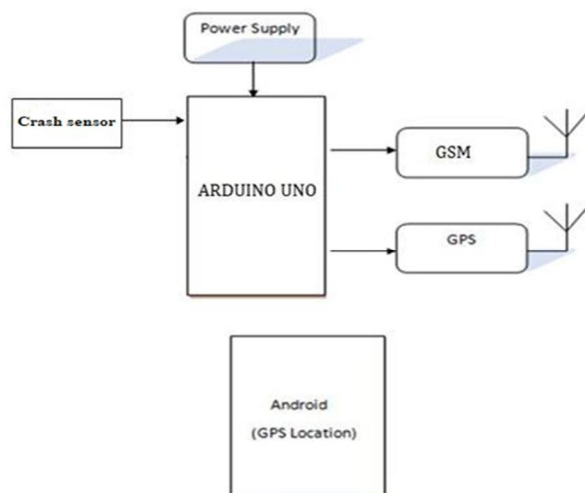
B. Ambulance Unit

C. Hospital Unit

Android App

IV. CONCLUSION

This system can detect the location of accident spot automatically & accurately, and realizing the automation of information transmission. Consequently, it will save the people from wasting their time in searching of location and lives of the victims of accident. The experiment proved that this system can automatically detect accidents and information to the main controller is sent relatively and the traffic unit is also controlled by the ambulance unit in order to reach the accident spot in time and from accident spot to hospital without delay. Such functions can be useful for "help" and "safety", of humans and society.

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