www.ijiarec.com

ISSN:2348-2079

Volume-8 Issue-1

International Journal of Intellectual Advancements and Research in Engineering Computations

Smart ambulance with people identification system using arduino mega

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ABSTRACT

In this fast moving world, nobody is ready to look what's happening around them. When accident occurs, nobody cares about it .So we found out a solution for this problem and we develop a project called "Smart Ambulance System with People Identification System Using Arduino Mega''. It's purpose is to help those people involved in road accident. For such person before giving first aid, there is a need to know their medical database. In this project, an injured person is identified using fingerprint sensor based IOT technology using arduino. The fingerprint of the injured person is scanned and the medical database of that person which is prefetched using arduino mega is displayed in the LCD display and also in the mobile phone app developed using IOT technology within the ambulance. Then message is send to the hospital before ambulance reached the hospital using GSM modem. It also informs the family members and to the nearby police station. The tools used in this project are arduino mega, GPS, GSM modem, LCD, fingerprint scanner, smart phone, PC and IOT technology.

Index Terms: Global Positioning System (GPS), Global System for Mobile communication (GSM), Liquid Crystal Display (LCD), Internet of Things (IOT)

INTRODUCTION

According to the reports released by the Union Road Transport and Highways Ministry, India witnessed 17 deaths and 55 road accidents every hour in 2016, one of the highest rate in the world. Transport Research Wing said that the road accidents killed 150,785 people across India in 2016.Technologist and engineers are introducing new technologies for reducing the accident rate but it is impossible as accidents will happen regularly. At the time of the accident, identification of the accidental person adds difficulty in curing that person quickly and to save his life at the right time. The main objective of this project is to provide medical database of the person who is facing accident. The survey of all the people's medical database is taken by particular hospital. During accident, the fingerprint of the injured person is scanned by fingerprint scanner and the detail which is prefetched in arduino mega is displayed in the mobile app using IOT technology. After identification, these medical databases are send to the hospitals before the ambulance reached the hospital. It also helps the hospitals to get ready for the treatment at the time of emergency. The medical databases like name of the injured person, his mobile number, blood group, age, past health details, location are displayed in the mobile app using IOT technology. The location of the injured person is also send to the family members and nearby police station. It helps to provide the smartest service for the public in the smartest way [1-5].

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LITERATURE SURVEY REVIEW

There are different types of services provided by ambulance. In ancient times, ambulance provided service for taking patients to the hospital but the treatment is delayed as the medical database of the patient is not available at the time which may also result in death of that individual so different techniques were adopted to identity the injured person within the ambulance. Most of the techniques dealt with identifying the place where the accident occurred and send ambulance to that place to take the patients to the hospital. Further this concept was developed using shortest path algorithm to guide the ambulance quickly to the hospital in the shortest path as possible for immediate medication of the patient. In addition to this, the traffic lights were also controlled according to the ambulance arrival. When ambulance arrives at a traffic signal, it turns the traffic light 'green' and after it's departure, the traffic light is turned 'red'. In modern era, a sensor is fixed in a patient's body which diagnoses his health condition. When the health condition of the patient becomes abnormal, hospital is intimated about his condition and ambulance is sent to that location immediately and shortest path algorithm is used to guide the ambulance driver quickly to the hospital. The concept of IOT was also extended to provide guidance to the victims facing natural hazards and call the ambulance to that location quickly [6-10].

EXISTING METHOD

At present, Ambulance provides service to take the unknown injured person to hospital. It also provides service to diagnose the patient's body which delays the time for treating the patients. This delayed treatment may also cause death of the injured person in case of accident. If medical databases of the injured person is available already, immediate medication will be provided to the injured person which reduces the chance for death. In this project, medical database of the injured person is provided inside the ambulance to identify the person who is facing accident or illness. After identification, their details are send to hospital before ambulance reached and to their family members. In case of accident, their details are also send to the nearby police station. In addition to this, medical database of that injured person is displayed in the mobile phone app developed using IOT technology [11-20].

The drawbacks of the existing methods are delayed treatment as the medical database of the injured person is not available at that time, delay in treatment awaiting for the presence of the family members for further treatment. Sometimes, delayed treatment may cause death of the injured person.

PROPOSED METHOD

In this project, an injured person is identified using fingerprint sensor based IOT technology using arduino mega. The fingerprint of the injured person is scanned and the medical database of that person which was prefetched using arduino mega is displayed in the mobile phone app developed using IOT technology within the ambulance. The family members, hospitals and police station are intimated about the accident by a message. Location is also shared to the family members and police station for their quick reach to the hospital for immediate treatment of the injured person to save his life. The tools used in this project are arduino mega, power supply, fingerprint scanner, GPS, GSM modem, LCD display and IOT technology [20-27].

Hardware components

To overcome the disadvantage of delayed treatment due to non-availability of the medical database of the injured person, we have proposed a method to provide the medical database of the injured person using the tools like arduino mega, power supply, fingerprint scanner, GPS, GSM modem, LCD display and IOT technology as shown in Figure 1 within the ambulance.

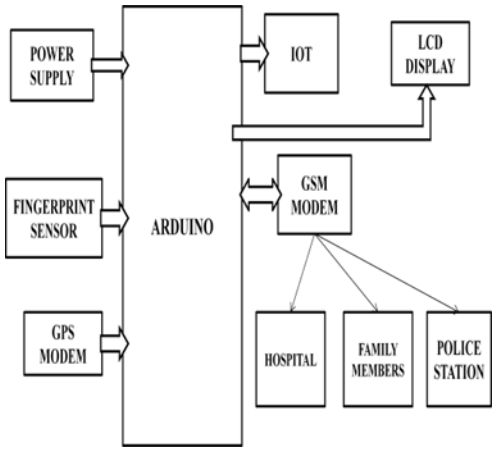

Figure 1 Block Diagram of Proposed Method

ARDUINO MEGA

The medical database of the injured person like name of the patient, age, blood group, location, past health details are fed in the arduino mega as shown in the figure 2. It also controls the GPS, GSM modem, LCD display and fingerprint scanner. It is programmed by arduino mega. The location and medical database of the injured person is send using GSM modem.

Figure 2 Arduino mega

FINGERPRINT SCANNER

The fingerprints of the patients are enrolled using fingerprint scanner as shown in figure 3. Fingerprints can also be deleted, enrolled, identified by using the keypad connected to the fingerprint scanner.

Figure 3 Fingerprint scanner

GPS

The location of the injured person is send to the family members, hospital, police station using GPS as shown in figure 4. The location is also viewed in the mobile app using the IOT technology.

Figure 4 GPS

GSM modem

The messages are sent to the family members, hospital, police station using GSM modem as shown

Figure 5 GSM modem

LCD display

The LCD display as shown in figure 6 is used to display the enrollment of fingerprint, sending messages. The LCD display used in this project is 2x16.

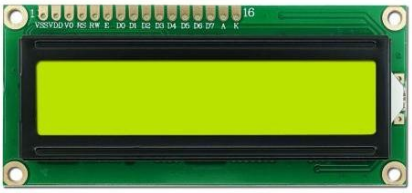

Figure 6 LCD Display

POWER SUPPLY

Initially a power supply of 5V is provided to arduino mega using the bridge rectifier circuit as shown in figure 7. It comprises of four diodes, one capacitor, one transformer, one positive voltage regulator, one resistor and one led. It converts the 230V input AC power into 5V output DC power which is then given as input to the arduino mega.

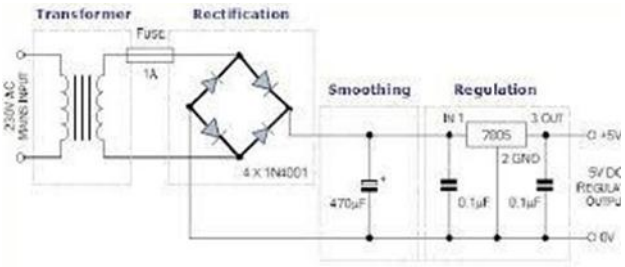

Figure 7 Bridge rectifier circuit diagram

RESULT

The fingerprint of the injured person is scanned and the medical database of that person which is prefetched using arduino mega is displayed in the mobile phone app developed using IOT technology as shown in figure 8 & 9.

Figure 8 Medical database of the injured person in mobile app developed using IOT technology

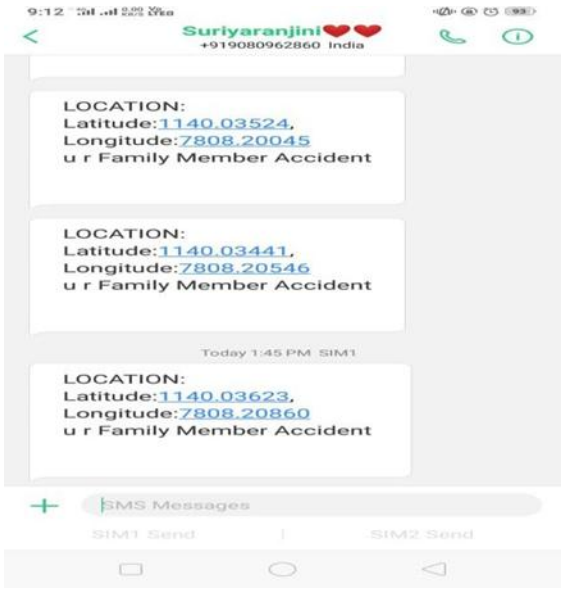

Figure 9 Message send to the parent

The hardware setup of this project consisting of arduino mega, GPS, GSM modem, power supply, LCD display is shown in Figure 10.

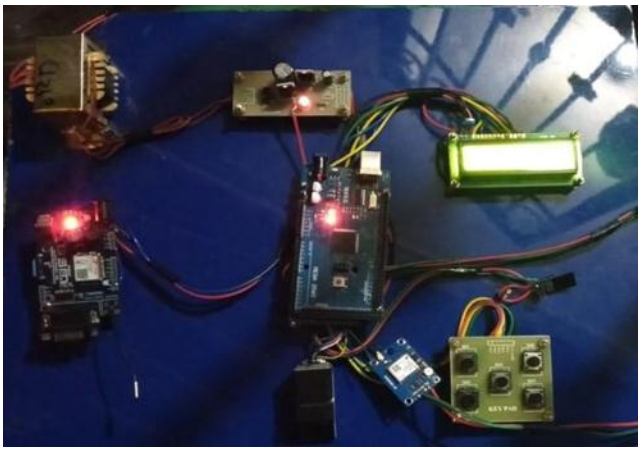

Figure 10 Hardware implementation

CONCLUSION & FUTURE SCOPE

From the above discussion and information of this proposed system, it is clear that this system is highly reliable, effective and economical. It is based on IOT technology to know the medical database of the injured person. In this project, the fingerprint of the injured person is scanned and the medical database of that person which is prefetched using arduino mega is displayed in the mobile phone app developed using IOT technology within the ambulance. This project is implemented in both hardware and in the mobile phone. In future, this project will be implemented purely in mobile phone.

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