

Smart Bio Service

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Abstract – Road accidents and traffic congestion are the major problems in urban areas. People who can be saved through timely treatment die as a result of not getting an ambulatory aid at the proper time. To overcome this drawback, there is a need of an automatic detection of accident spot through sensors which is placed in the vehicle. A main server unit houses the database of all hospitals in the city. A Global Positioning System(GPS) and Global System for Mobile communications(GSM) 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. A patient monitoring system in the ambulance sends the vital parameters of the patient to the concerned hospital through RF communication. This system is fully automated, thus it finds the accident spot and helping to reach the hospital in time.

Keywords: RF communication, GPS, GSM, vibration sensor.

I. INTRODUCTION

Road traffic was getting more and more congested, as a higher population and increased business activities result in greater demand for cars and vehicles for transportation. This increased vehicle density leads to many road accidents[1]. Also due to the delay in reaching of the ambulance to the accident location increases the chances of the death of victim. There is the 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. In this system, the GPS placed in the vehicle tracks the accident spot and the location is sent to the ambulance and family member of the patient through GSM[2]. The patient's physiological parameter like pulse, blood pressure and body temperature is measured and will be transmitted through wireless radio frequency(RF) module to transmit low signal[3][4].

II. OBJECTIVE

The main objective is to minimise the time gap between the occurrence of accident and time required for ambulance to reach at the location of accident for giving treatment to the victim. After accident takes place, a lot of time is wasted for searching the location of the accident, such a circumstance our system work faster and avoid the loss of life due to time delay.

III. LITERATURE SURVEY

A. Traffic accident automatic detection and remote alarm device.

Accidents are common in a daily routine. As vehicles increase in an annual basis the probability of accidents are also increasing. The problem arises when these accidents get unnoticed. People who can be saved through timely treatment die as a result of not getting an ambulatory aid at the proper time.

B. Sensing heartbeat and body temperature digitally using Arduino.

Checking physiological parameters like heart rate and pulse rate are mandatory in any health service. The microcontroller using Arduino programming carries out the analysis of these

parameters. LM35 is used for sensing body temperature which is a major value to diagnose health. The device mainly helps a person to self individually check their mean arterial pressure and heart rate which will be displayed in the android.

IV. DESCRIPTION

Our paper 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. Specialised biosensors are inserted so as to indicate patient's vital signs including temperature, blood pressure and pulse. These are transmitted via through RF module so ambulatory first aid is given to the patient on command provided by nearby hospital. The vibration sensor placed in the vehicle vibrates whenever accident occurs. The location of the vehicle is sent to the ambulance through GPS. As soon as the ambulance reaches the accident spot, the patients' physiological parameters are monitored and transmitted to the nearby hospital through RF communication.

V. SYSTEM OVERVIEW

1. Vehicle Unit

A vibration sensor is placed in the vehicle. Whenever accident takes place, it vibrates vigorously and the GPS gets activated. GPS gives the values of location in terms of Latitude and Longitude [5]. The location of the vehicle is transmitted to the ambulance and a patients' family member through GSM technology. This location is viewed in the android mobile in the ambulance and the patients' family member.

Arduino Uno is a microcontroller board based on the ATmega328P. It has a 16 MHz quartz crystal, a USB connection, a power jack, 14 digital input/output pins, 6 analog inputs and a reset button [6].

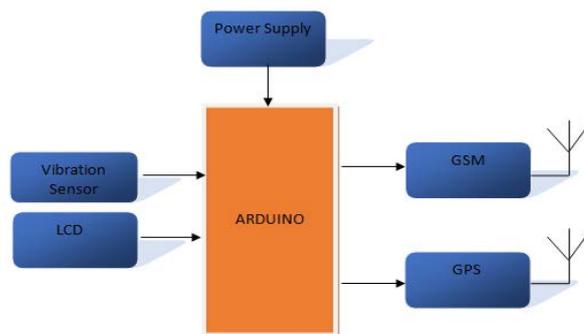


Fig. 5.1: Vehicle Unit

2. Ambulance Unit

As soon as the server in the ambulance receives a message, it reaches the accident spot. With this GPS and GSM technology, the time taken to explain the accident spot to the ambulance driver, and the delay to reach the correct location was greatly reduced.

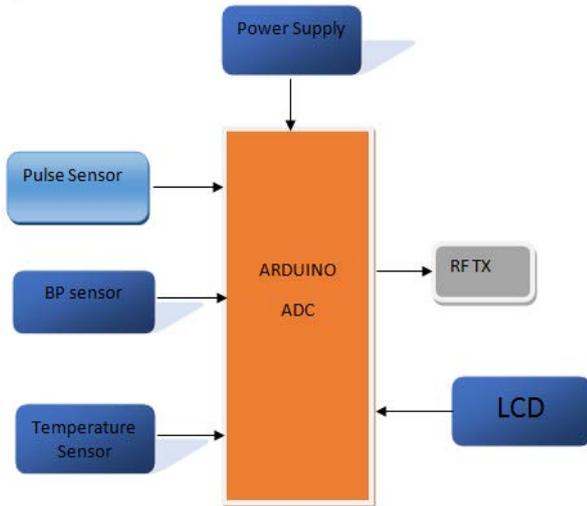


Fig. 5.2: Ambulance Unit

The physiological parameters of the patient like blood pressure, temperature and pulse rate are measured using the sensors available in the ambulance.

Body temperature is a basic parameter for monitoring and diagnosing human health. LM35 is used to sense the body temperature as it is the only sensor used to measure body temperature accurately [7]. These data are transmitted to the nearby hospital through RF communication.

3. Hospital Unit

The patient's data reaches the hospital through the RF receiver before the ambulance arrives. This helps to start the pre treatment procedures so that patient can be treated immediately and it increases the chances of saving the patient's life. The modulation technique used in RF module is amplitude shift keying. It comprises of an RF transmitter and RF receiver pair operates at a frequency of 434 MHz[8].

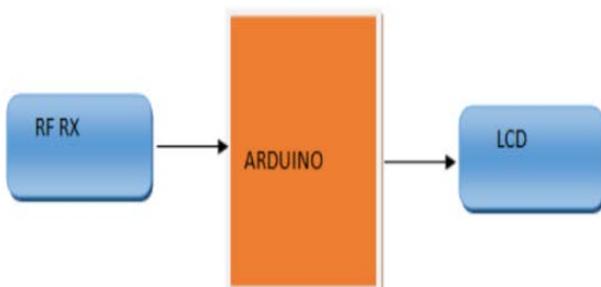


Fig. 5.3: Hospital Unit

VI. EXPECTED OUTCOME

This system automatically detects the accident spot and the information is send to the main controller.It reaches the accident spot in time and from accident spot to hospital without delay. So that it will save the lives of the victims and can be useful for "help" and "safety" of humans and society.

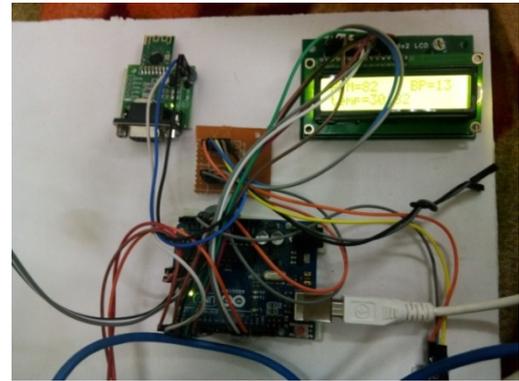


Fig . 6.1: Output

VII. CONCLUSION

This paper constitutes an aspect of timely treatment of humans, Re-establishing various technologies into the model help it to provide an enhanced and efficient service. This service can also be taken forward through generation instilling various parameters and mechanisms relative to the foundation. It can create huge impact in areas where traffic and plateaus is complex and people die just because they could not reach the hospital on time.

VIII. FUTURE SCOPE

The paper mainly prioritises timely treatment of the needy. It found out the vital values before hand, their declining or elevating numbers can help the doctors to evaluate the condition of the patient and start the preparation prior to the arrival of the patient. This idea estimates only few of parameters but in future more of them can be infused according to the appropriateness.

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