SMART BUS TRANSPORTATION WITH AUTOMATIC CARDIAC ARREST DETECTION SYSTEM

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Abstract - *In this world journey is one of the most needed for daily life. Vehicle plays a significant role in transportation. There are many causes of road accidents one such cause is due to heart strokes of the drivers. In the case of a bus, it not only affects the driver but also the passengers on the bus. This problem can be solved by implementing the device after detecting the abnormal heartbeat rate of the driver and taking an immediate action. As there is no such device previously, it becomes the first device that saves the lives of all drivers, most probably the RTC bus drivers from heart stroke during their driving. The device that is placed on the contact parts of drivers such as steering, driver seat senses the heart beat rate, if it becomes abnormal then the device in the vehicle will automatically sends an emergency signal and also the exact location to the nearby hospitals only after having the confirmation of abnormal heart beat rate. It makes a buzzer sound in order to alert the passengers in the vehicle and also the passengers nearby the vehicle. Simultaneously the device which is connected to the vehicle braking system will try to slow down the speed of the vehicle to avoid accidents and to save the passengers, driver and also surrounding people, but if it encounters any obstacle then the vehicle halts immediately. So this is the apt solution to the problem.*

*Key Words***: Heart stroke, abnormal heart beat, emergency signal, buzzer sound, braking system**

1. INTRODUCTION

In this embedded bus transportation system, driver distraction is the leading cause of most vehicle crashes. In traditional accident alert system, when a driver met with an accident can be informed to respective family members through an SMS and GPS location will be sending to the owners but there is no system which monitors the driver conditions and avoid accidents. The driver alert system is used to avoid accident occurrence due to driver abnormal behavior. This device mainly focuses to save the bus driver from getting heartstroke by using alert system.

Fig -1: Death of bus driver due to heart stroke

2. EXISTNG PROBLEM

Journey is most needed in our daily life. Vehicle plays a significant role in transportation. There are many causes of road accidents one such cause is due to heart strokes of the drivers. The prevalence of heart strokes is increased by over 50% in the past 25 years. The common heart stroke symptoms are chest pain, discomfort in the areas of upper body, shortness of breath, sweating. In the case of a bus, it not only affects the driver but also the passengers on the bus.

Refer:
https://www.newindianexpress.com/states/kerala/2018/apr/15/kerala-bus-driver-dies-on-the-wheel-with-cardiac-arrest-passengers-unhurt-1801714.html

Fig -2: Accident due to heart stroke of bus driver

3. PROPOSED SOLUTION

The device that is placed on the contact parts of drivers such as steering, driver seat senses the heart beat rate, if it becomes abnormal then the device in the vehicle will

automatically sends an emergency signal and also the exact location to the nearby hospitals only after having the confirmation of abnormal heart beat rate. It makes a buzzer sound in order to alert the passengers in the vehicle and also the passengers nearby the vehicle. Simultaneously the device which is connected to the vehicle braking system will try to slow down the speed of the vehicle to avoid accidents and to save the passengers, driver and also surrounding people, but if it encounters any obstacle then the vehicle halts immediately.
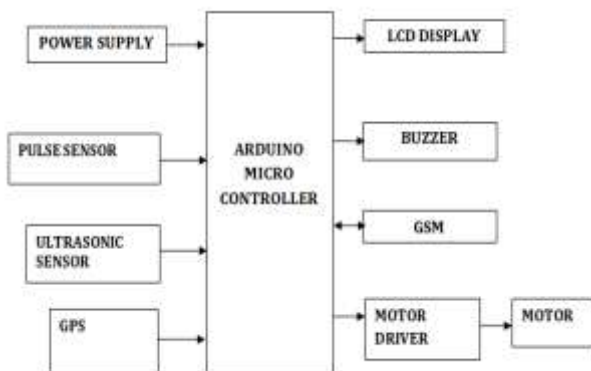
4. BLOCK DIAGRAM

Fig -3: Block Diagram

4.1 Power Supply

This is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the high current to low voltage followed by diodes. AC is rectified to DC using Diodes. The capacitor filter is used to filter the obtained rippled DC. The obtained dc voltage is regulated using a positive voltage regulator.

Fig -4: Stepdown transformer

4.2 Microcontroller

The Arduino is a microcontroller board based on ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a USB connection and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB to get started.

Fig -5: Arduino

4.3 Pulse Sensor

Pulse Sensor is used to sense the heartbeat rate of a person. It is easy to incorporate live heart rate data into the projects. The sensor clips onto a fingertip and plugs right into Arduino with some jumper cables.

Fig -6: Pulse sensor

4.4 Ultrasonic Sensor

An ultrasonic sensor is a sensor that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor sends and receives ultrasonic pulses that relay back information about an object's proximity. This sensor determines the distance to an object by measuring time lapses between the sending and receiving of the ultrasonic waves.

Fig -7: Ultrasonic sensor

4.5 GPS

GPS (Global Positioning System) using which anyone can always obtain the position information anywhere in the world. The GPS module for Arduino allows connecting to your Arduino board to get latitude and longitude information.

Fig -8: GPS

4.6 LCD Display

LCD (Liquid Crystal Display) is an electronic display module used to produce a visible image. The 2x16 LCD display is a very basic module commonly used in circuits. The 2x16 translates a display 16 characters per line in 2 such lines.

Fig -9: LCD Display

4.7 GSM Module

GSM(Global System for Mobile communication). A GSM module is a circuit that is used to establish communication between a mobile device and a GSM system. A SIM is inserted into the GSM through which it sends SMS using Arduino to the mobile number specified inside the program.

Fig -10: GSM Modem

4.8 DC Motor

Microcontroller controls the DC fan using IC L293D motor control. This IC L293D is a motor driver used to control the speed and direction of DC motor. It also offers isolation between microcontroller and the motor. Motor speed can be controlled by the use of pulse width modulation (PWM) technique.

Fig -11: Motor

4.9 DC Motor Driver

Motor driver is a current amplifier that takes lower current control signal and provide higher current signal. This higher current signal is used for driving the motors.

4.10 Buzzer

A buzzer or beeper is an audio signaling device for the purpose of alerting.

Fig -12: Buzzer

5. CONCLUSION

Now days we have an increased risk of heart attacks. This system which helps to detect heart rate of person using heart beat sensor. This system also helps for obstacle monitoring system. This system which helps to measure heartbeat of person. We will make this system so that it can save the passengers, driver and also surrounding people.

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