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Motobike Smart user Protection

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ABSTRACT

Number of incidents increased along with the growth in the use of two-wheel motorbikes. a significant majority of fatal accidents involved people who were not wearing helmets. The risk of a personal tragedy is significant, and drunk driving is one of the leading causes of hospitalization. we suggest a method that can determine whether a helmet is being worn and whether a person has consumed alcohol. To identify any risk to the rider, this system has two components: an alcohol sensor and an ultrasonic sensor .Before starting the motorcycle, it checks to see if the rider has had any alcohol.

KEYWORDS: *Arduino, ultrasonic sensor*

1. INTRODUCTION

In India, the number of traffic accidents has been rising annually. According to the census, every month, between 5 and 10 percent of patients are admitted to hospitals due to bike accidents. According to the report, 18 percent of fatalities in crashes involving geared or gearless cars occurred in 2017, which is double the number of fatalities in 2007. Every five years, the Department of Safety and Health conducts a survey, which reveals that not wearing a helmet increases fatalities. Driving when intoxicated might result in accidents. We require the use of helmets and the avoidance of intoxication in order to reduce fatalities. In order to control these issues, the rider will always wear a helmet while on the bike, ensuring safety. The proposed smart helmet will make certain that the individual.

Accidents and delayed medical assistance are the third major problem. One of the biggest causes of death when a rider has an accident is that he may not receive medical attention right away. By using the internal ultrasonic sensor, the suggested smart helmet will make sure that the wearer is wearing it. If the range exceeds a preset limit, the ultrasonic sensor will alert the receiver installed after the bike's plug system. A Bluetooth module was used to continuously transmit the ultrasonic sensor's readings to the receiver.

The rider's breath will be tested by the alcohol sensor, which will examine the proportions of alcohol present. The receiver will receive the readings that the alcohol sensor has recorded on a constant basis. The receiver is fixed after the plug system controls on and off based on these values obtained using ultrasonic sensors and the alcohol sensor.

2. LITERATURE SURVEY

Smart Helmet with Accident Sensors .When a motorcyclist gets involved in a high-speed accident without a helmet, the consequences can be lethal. A helmet can lessen the shock of a crash and can save a life. Many nations enforce laws requiring motorcycle riders to wear helmets while operating their vehicles; Malaysia is one such nation. This initiative was specifically created to increase the rider's safety on a motorcycle for this reason. When the speed restriction is exceed, motorcycle riders will become concerned. The rider's head and motorbike speed are each detected using a Force Sensing Resistor (FSR) and a BLDC Fan, respectively. A wireless 315 MHz radio frequency module. The system's whole component can be controlled by the microcontroller PIC16F84a. The motorcycle's engine won't start unless the rider fastens his or her helmet and EEG sensors are used in a smart safety helmet for worker fatigue detection. It is well established that certain human behaviors connected to a risk of injury when operating machine tools can be reflected in head gesture and brain activity. The research discussed in this paper aims to raise worker safety by lowering the chance of injury. This research introduces a Smart Safety Helmet (SSH) that tracks the worker's head movements and brain activity in place of a camera to identify unusual behavior. For the purpose of preventing and lowering accidents or injuries, data retrieved from SSH is used to calculate the risk of an accident (a safety level).

3. METHODOLOGY

This module includes transmitter circuitry as well as other sensors. Alcohol, vibration, and infrared sensors are three of the sensors found in microcontrollers. The alcohol emphasis has been identified using Alcohol sensor. The alcohol sensor will be located within the rider's helmet, near to his or her mouth. Vibrates individualized for crash location Pulse and UV sensors are located on another microcontroller. The measurement of pulse rate has been done using pulse sensors. Increased pulse rate triggers LED1, which blinks white light. To prevent collisions and manage the accident, a UV sensor will detect the front moving vehicle. When a vehicle is seen close to our vehicle, LED2 is activated, blinking a red light. It has been used an RF transmitter that can send data from any controller or standard Encode IC. Through the transmit antenna, the RF transmitter sends data from the microcontroller on the helmet side to the recipient on the vehicle side.

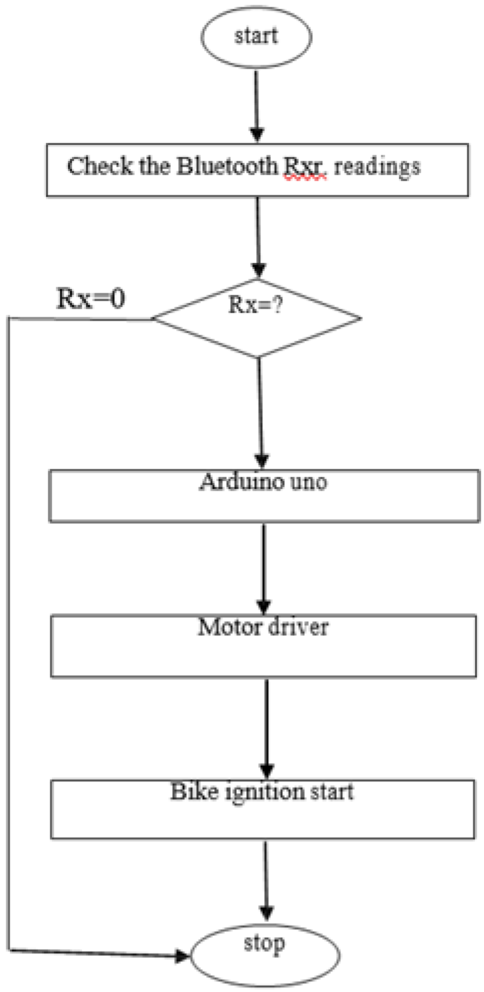

Fig 1, Flowchart

This receiver has GPS, GSM, an LCD screen, a DC motor, and an L293D driver. The location of the accident is determined using the GPS. This is received by our smartphone. When an accident is detected, GSM is used for messaging and calling purposes. All sensor output is shown on an LCD screen. If the vibration sensor is activated, it appears that something is wrong with the person. It appears that the individual is tired if the IR sensor activates, and it appears that alcohol has been detected if the alcohol sensor activates. In the vehicle's receiver, a DC motor is used. When the sensor activates, the vehicle slows down and enters stop.

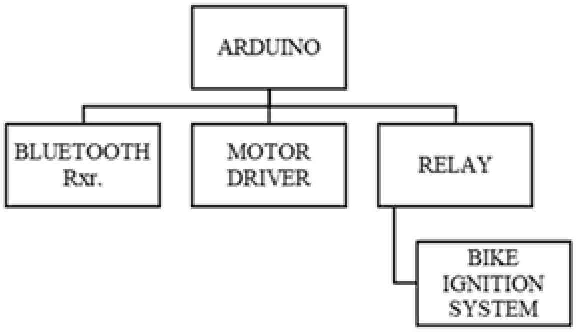

Fig 2, Block Diagram

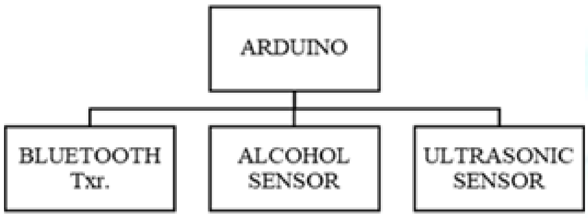

Fig 3, Sensor Arrangement

A. <u>SYSTEM INTERFACING</u>

After all the needed components are categorized, the interfacing plays a vital role in particular system. The connection work of this system can be explained in step wise

<u>STAGE 1:</u>

The Arduino is considered as heart of the whole system because it is the communicating part for it. Now The proposed system is classified into two sections as Transmitter and Receiver.

<u>STAGE 2:</u>

Now consider the transmitter section, in which all the needed sensors are interfaced with Arduino, for their respective pins.

<u>STAGE 3:</u>

Mainly the ultrasonic sensor is having 4 pins called VCC, TRIG, ECHO, GND. The trig and echo pins are connected to the pins 9 and 10 (as per program) for communicating. Here the pin trig is useful for output and the echo pin is for input. The remaining pins Vcc and Gnd are connected to the respective pins on PCB.

<u>STAGE 4:</u>

The alcohol sensor MQ3 comprise of 4 pins called Dout, Aout ,VCC,GND. Here the pins Dout and Aout are connected to the pins 8 and 13.

<u>STAGE 5:</u>

Now the Bluetooth module is connected with Arduino to the Tx and Rx pins , normally the HC-05 is a 6 pin structure in which 2 pins are unused. The transmitter pin of the module is connected to the receiver pin of Arduino and receiver pin of the module is connected to the transmitter pin of Arduino, which will help in the cross communication.

Then all the ground pins of the sensors are connected to the common ground and the power supply is provided commonly to all by soldering.

<u>STAGE 6:</u>

Let's consider the receiver portion, It is mainly employed with a Bluetooth module(receiver),and a DC motor and motor driver(for temporary) and a relay.

4. RESULT

The UV sensor, pulse sensor, alcohol sensor, and Arduino Uno microcontroller are all found on the helmet's transmitter side. The transmitter component, which connects to all sensors, is managed by an Arduino Uno microcontroller. The first sensor is a UV sensor that gauges the width of a moving object in front of it. With the aid of an RF transmitter, it uses a laser to measure the separation between vehicles, slows down at vital points, and ultimately stops. The second sensor is a pulse-rate sensor that was once used. 80 to 120 beats per minute are typical for humans. This sensor takes continuous measurements, but it transmits data once the pulse rate crosses a normal range, which suggests that someone may be in danger. Alcohol concentration is detected by a third sensor, which is primarily used to avoid accidents.

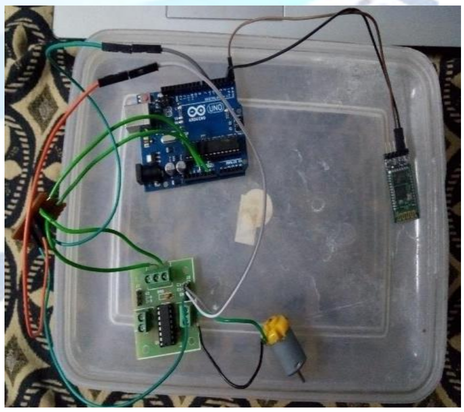

Fig 4. Practical view

GPS, GSM, an LCD screen, a DC motor, and an 1The GPS is utilised to pinpoint the accident's location. This is received by our mobile device. When an accident is detected, GSM is used for calling and messaging. The output of all sensors is shown on an LCD screen. It appears that the person is in difficulty if the vibration sensor activates. When the alcohol sensor engages, it appears as though alcohol has been detected, much as when the IR sensor activates, it appears as though the user is drowsy. The vehicle's receiver uses a DC motor. When a sensor is activated, the vehicle slows down before coming to a stop.

5. CONCLUSION

In order to show that electrodes put inside a motorbike helmet can accurately record dozing behavior, alcohol detection, and heart rate, we carried out a proof-of-concept study. Signals indicating pulse rate have been recorded. The

damage caused by accidents to automobiles can also be reduced with the use of helmets. Thus, making it required aids in reducing traffic accidents. A person's precious life is saved by helmet safety, alcohol content detection while starting a bike, and most critically, since a person cannot operate a motor vehicle while intoxicated or without a helmet. Additionally, family members will be informed. Utilizing a UV sensor, we can determine the distance between the two vehicles that is safer.

FUTURE WORK

As the development for the project in future, it can be successfully implemented to all the available motor vehicles, which will be leading for the successful and safe travel to a particular person. So in future we hope implementation of this system can be helpful in reducing the death rate caused due to accidents.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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