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Design Of Smart Helmet for Accident Prevention and Alcoholic Detection

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Abstract: Here, propose Smart Helmet for Accident Prevention and Alcoholic Detection which automatically checks whether the person is wearing the helmet and has non- alcoholic breath while driving. Here we have a transmitter at the helmet and the receiver at the bike. There is a switch used to sure the wearing ofhelmet on the head. The ON condition of the switch ensures the placing of the helmet in proper manner. An alcohol sensor is placed near to the mouth of the driver in the helmet to detect the presence of alcohol. The data to be transferred is coded with RF encoder and transmitted through radio frequency transmitter. The receiver at the bike receives the data and decodes it through RF decoder. The engine should not ON if any of the two conditions is violated.

Keywords: Atmega 328p, alcohol sensor, GSM, RF transmitter.

INTRODUCTION

1.1 PROJECT OVERVIEW

In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities. The problems with state drunk driving control systems can be solved in many ways. The most effective will follow several principles: They will invest authority and responsibility in people and organizations at all levels, local to national, because drunken driving control requires action at all levels. They will operate in the public eye, using the media to report on problems and solutions, because ultimate decisions on priorities and resources to control drunk driving must have public support. They will not promise instant solutions based on a single action but rather will take steady steps towards long-term improvement.

1.2 OBJECTIVE

- To design the circuit that can improve the safety of motorcyclists.
- To develop an Smart safety helmet for complete rider.

1.3 EXISTING SYSTEM

In the Existing system, the sensors are used such as IR sensor, load sensor, vibration sensor and gas sensor, mems. The gas sensor detects the measure of liquor consists in the breath of a person wearing the helmet. The Alcohol recognition sensors connected with the helmet in distinguish the Alcohol detection. MEMS based handle bar control of the vehicle. The Vibration sensor is used to detect any accident. Load checking to recognize the load of the vehicle and alongside the sensor to locate the quantity of individuals travelling in the bike. Here they have used an Alcohol Sensor, Accelerometer, Microcontroller, Communication modules and a buzzer for alert purpose. Here we designed a system which checks the two conditions before turned ON the engine of the bike.This system includes an alcohol sensor and a helmet sensing switch. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON.

1.4 PROPOSED SYSTEM

In proposed system, here designed a system which checks the conditions before turned ON the engine of the bike. A switch is used to detect whether the biker is wearing helmet or not. The proposed system continuously monitors for the drunken drive and if it is detected, vehicle is stopped immediately there by avoiding the possible accident. MQ-3 gas

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sensor (alcohol sensor) is suitable for detecting alcohol content from the breath. Firstly the Limit switch in transmitter checks whether the rider has worn the helmet or not. If yes, then it will send a signal to the receiver and it will provide ignition. A RF Module as wireless link which able to communicate between transmitter and receiver. The accident detected by using vibration sensor. The accident is identified by the probability of vibration experienced by the helmet. Here vibration is detected by placing a vibration sensor on the helmet and gives to microcontroller.

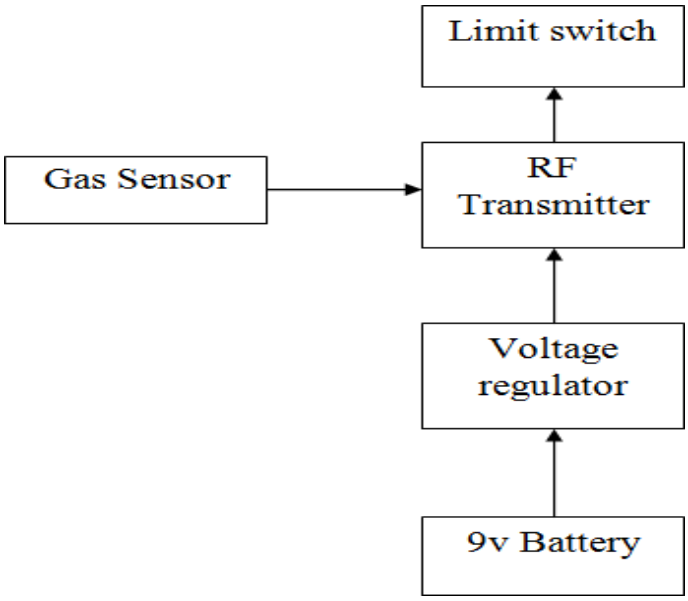

Fig1.1 HELMET PART

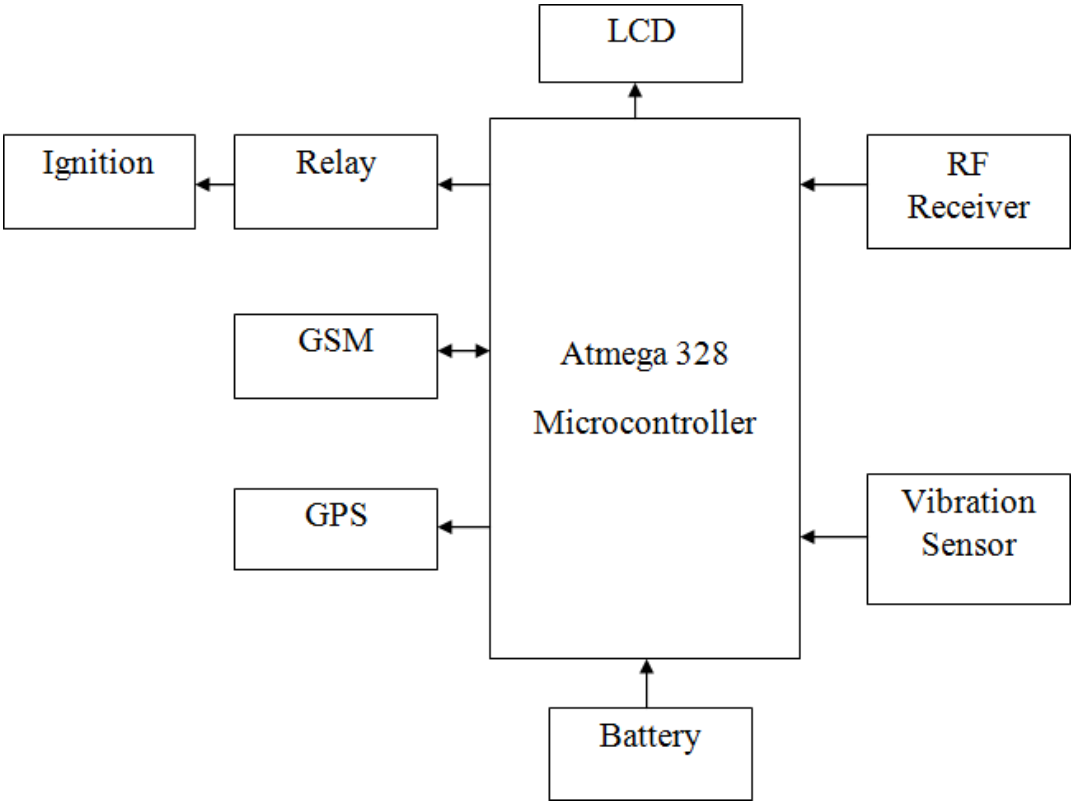

Fig.1.2 BIKE PART

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1.5 PROBLEM DEFINITION

Many people die because of not wearing the helmet. They also die because of not being able to get treatment in time. If an accident occurs at a remote place its hard for the emergency service to know that an accident has occurred. Many lives can be saved simply by wearing a helmet. About 60% of deaths in an accident can be prevented just by getting treatment in time. This project will make sure that rider wears the helmet and notifies the emergency service in case of an accident.

1.7 APPLICATION

AurdinoNano

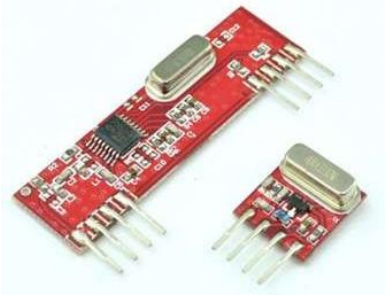
It is an open source tool to which we can interface sensors and modules. It has a microcontroller Atmega328P. It contains 22 Digital (I/O pins). We can program it by C, embedded C or C++. Arduino provides open source IDE to program the device. Operating voltage is 5V. Its clock speed is 16MHz. We can power it by using adaptor or USB cable. We can program it by C, embedded C or C++. Arduino provides open source IDE to program the device

GSM Module

Gsm module is used to call, send and receive SMS, and to access the internet. It establishes a connection between the device and the Global System for Mobile Communications. To start the connection it needs 5 V. Its idle operating voltage is 3.3 V. In this project we used it to send the location of rider via SMS to the selected contacts in case of emergency or while tracking.

RF Module

An RF module is an electronic device used to transmit and/orreceive radio signals between two devices. It contains the transmitter and receiver. It works at 433 MHz frequency. RF signals travel from the transmitter to receiver even when there is an obstruction. In this project, we placed the transmitter in helmet and receiver in the bike. The transmittersends the information whether the rider wore the helmet or not. The receiver receives the information.



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MCQ2 GAS SENSOR

Using an MQ sensor it detects a gas is very easy. You can either use the digital pin or the analog pin to accomplish this. Simply power the module with 5V and you should notice the power LED on the module to glow and when no gas it detected the output LED will remain turned off meaning the digital output pin will be 0V. Remember that these sensors have to be kept on for pre-heating time (mentioned in features above) before you can actually work with it. Now, introduce the sensor to the gas you want to detect and you should see the output LED to go high along with the digital pin, if not use the potentiometer until the output gets high. Now every time your sensor gets introduced to this gas at this particular concentration the digital pin will go high (5V) else will remain low (0V).

Fig. MCQ2 gas sensor

1.8 Working

There are two main parts of this project

Helmet detection
The first is to check whether the rider wore the helmet or not.When the bike lock is opened the rf receiver will wait for the signal from the helmet. When the rider wears the helmet the transmitter will send the signal to the receiver so that bike can be started. If the rider doesn't wear the helmet the ignition won't start. If at any time the helmet is removed the bike will give a warning and after 2 minutes the ignition will stop.

Accident detection
We will detect the crash or accident by using the accelerometer. If there is any sudden change in accelerometerreadings system will beep continuously and will wait for 20 seconds. if the driver pushes the button on the helmet to tell its a false case no SMS will be sent. If its a real accident the GPS location will be retrieved. The information and location will be sent to emergency contacts stored in EEPROM using GSM module.

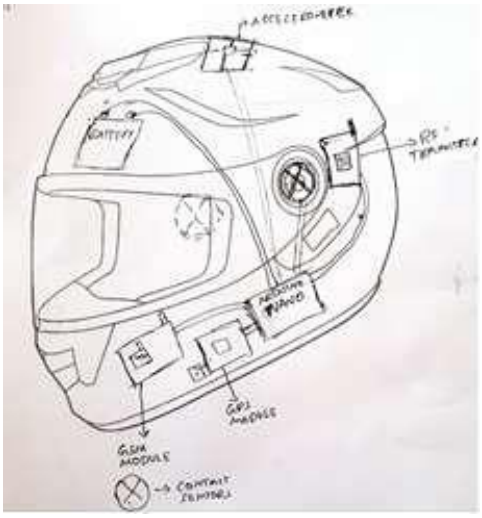

Figure show: internal structure

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1.9 Flow Charts

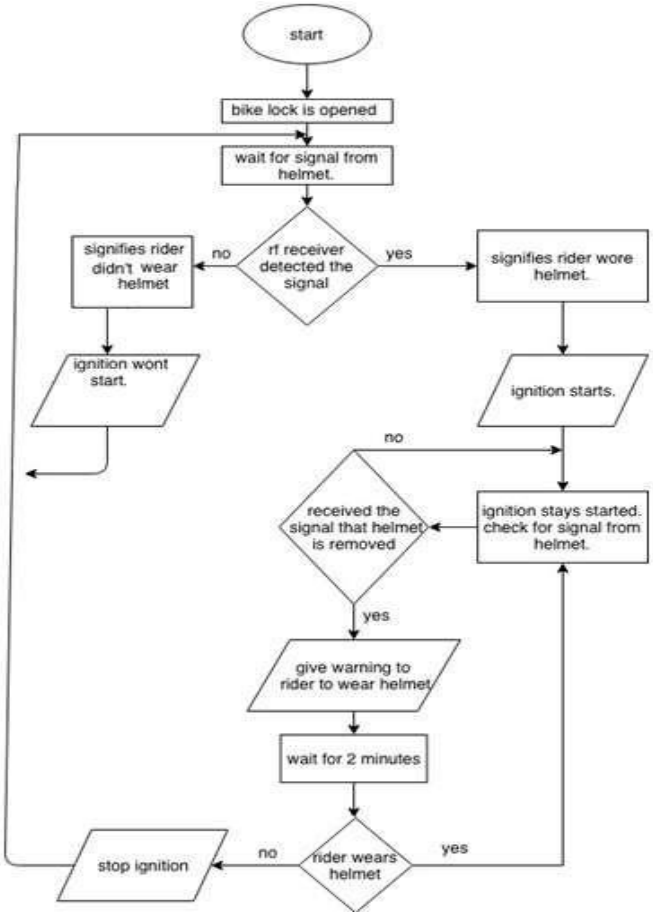

Figure 8: Flowchart of helmet detection

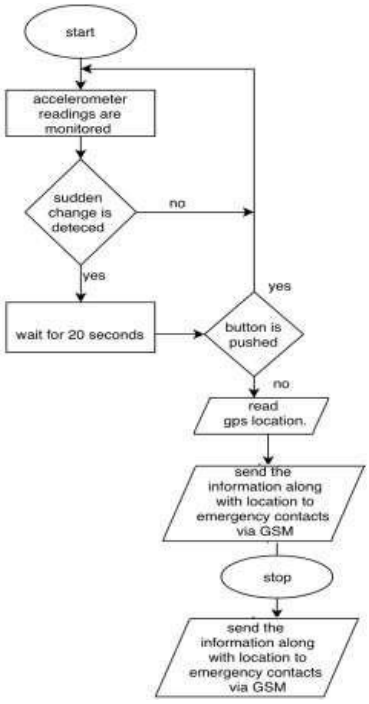

Figure 9: Flowchart of helmet detection

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Future Scope

We can make further modifications to this project for moreuse cases like

- By adding microphone and speaker for seeking directionsor sending messages without using mobile
- Biometrics for authentication. Thefts can be avoided.
- Speed regulation or Speed alerts can be generated ifspeed exceeds the required limit.
- Alcohol detection can be obtained.
- Solar panels can be used as power supply for self-charging.

1.10 CONCLUSION

The accident prevention and detection part involves in this project, Smart Helmet, which automatically checks whether the person is wearing the helmet. The relay does not ON the engine if these conditions are not satisfied. A prototype model of controller is built on the speed mixing capability. The signal from sign board of various zones (school zone, college, hospitals etc) is treated individually & generates input signals for driving actuators – bike engine and additional DC motor. They, in turn, jointly control the speed of vehicle wheels. This design successfully utilizes a new idea of hybrid vehicle recently immerged in automotive industry. The system does not require a physical braking subsystem which will reduce the overall cost of a bike.

REFERENCES

[1] SayanTapadar, Arnab Kumar Saha, Dr. Himadri Nath Saha, Shinjini Ray, "Accident and Alcohol Detection in Bluetooth enabled Smart Helmets for Motorbikes"978-1-5386-4649-6/18/$31.00 ©2018 IEEE.

[2] Ms. Rekha. M, Ms. Bharathi. K, Ms. Cynthia, "Drink and Drive Detection System" © 2014- 17, IJIRAE.

[3] P. THARANGAI THAMIL, S. VANITHA "Survey on Rash Driving Detection Using Acceleration and Orientation Sensors" ISSN 2278 – 0882 Volume 4, Issue 3, March 2015.

[4] Amrutha Madhusan, Lavanya Viswanathan, Vaishnavi Ravindran, Dr. ShantaRangaswamy," A survey on Road Accident Detection and Reporting" Volume 7, Issue 4, April-2016.

[5] C. Prabha, R.Sunitha , R.Anitha,"Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem", Vol. 3, Issue 7, July 2014 DOI: 10.15662/ijareeie.2014.0307062.

PROJECT KIT