

RESEARCH ARTICLE



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SPEECH RECOGNITION BASED RIDING PROTECTION USING PIC MICRO CONTROLLER

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ABSTRACT

Accidents are the unexpected incidents which causes a loss of life, economy and welfare of both the victims. As per the senses released by WHO (World Health Organisation), it is found that more than 10% of global accidents occur in India alone. Among that drunken drive and usage of mobile phones accounts more than 70%. Excess alcoholic content in our body during riding may cause rider to impair ability, degrade performance and result in serious sickness. Real time sensing of alcohol content in human body is thus an important research nowadays. This paper majorly deals with usage of alcoholic sensor and a speech recognition based sensor. Victims who meet with accidents may suffer lots of head injuries which are due to the fact that not wearing helmet during riding. So our project focuses to make helmet as an unavoidable life saver. As our government also taking steps to make helmet as a compulsory one but it can't be implemented successfully our project helps for this task to be implemented successfully.

KEY WORDS: Accident, helmet, speech sensor, alcoholic sensor, helmet lock.

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INTRODUCTION

It is well known that people with high blood alcohol concentration usually show poor judgement and coordination, slow decision making and slow reaction speed and low precision of body moments in chemistry alcohol refers to organic components in hydroxyl group in our daily life alcohol refers to ethanol content in the blood. Normally the amount of alcoholic content present in normal human body may range from 0.03% to 0.04%. Now a days road accidents that occurs due to drunken drive increases drastically. The recent report says that average of 10% road accidents increases every annum. Application of electronics in the auto mobile field is

very much popular now. Because of low price and various varieties available in the market, people prefer motorbikes to buy over 4 wheelers hence road safety becomes a major issue of concern. Therefore it becomes necessary to implement such a technique which is not easy to bypass the basic rule of wearing helmet to avoid drunken drive. Here we designed a system which checks the three conditions before turned ON the engine of the bike. Our system includes an alcohol sensor, a helmet sensing switch and a speech sensor. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect whether the rider is drunk, the output is fed to the MCU. Both the switch

and the alcohol sensor fitted in the helmet. If any of the three conditions are violated the engine will not turn ON.

Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides analogue resistive output based on the alcohol concentration. MCU is the microcontroller unit, which controls all the functions of the blocks in the system. Alcohol sensor and speech sensor is connected to the MCU. The helmet sensing switch is connected to encoder. Encoder receives data from these sensors and it gives the digital data to MCU through RF module.

EXISTING METHOD:

It uses with alcoholic sensor made up of MQ 3 that are placed in front of driver in four wheelers and other heavy vehicles to check the drunk and drives. Alcohol consumption is confirmed by measuring alcoholic content present in our body. But these system leads to misreading, inaccuracy in result and complexity in circuit and also it cannot be implemented on any two wheelers. Two wheeler riders undergo alcoholic test only when the police officers wishes this could not prevent drunk and driving and it's also a temporary test. It measures the presence of helmet but it fails to check presence of helmet throughout the journey.

PROPOSED METHOD:

In this method we have implemented a helmet locking system, alcoholic sensor and a speech sensor to enhance safety and security to the two wheeler riders. Since two wheelers are the luxury cars for many of the middle class people so it is important to make safety to two wheelers. To ensure safeguard to two wheelers we use three main concepts,

1. Speech sensor
2. Helmet confirmation system
3. Alcoholic sensor

Alcohol sensor sense the alcoholic content in the human body and when it increase beyond the limit then it will consider as the rider is in drunken state and switches off the vehicle.

Helmet confirmation system is used to confirm presence of if it failed to lock helmet then engine system will not turn ON.

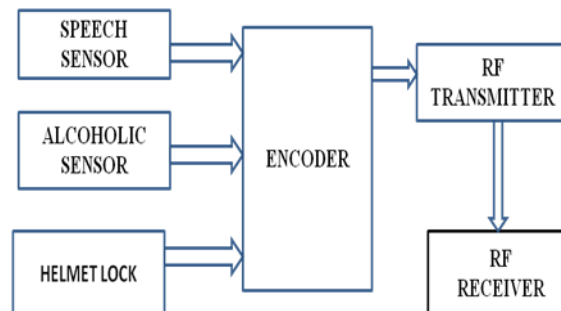
Speech sensor is used to prevent the rider from using mobile phone while riding and also prevent rider from talking with some other while riding, so

road accidents can be avoided due to carelessness of rider.

BLOCK DIAGRAM:

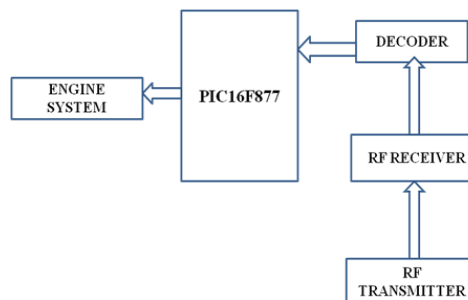
Our paper focuses on avoiding drunken driving. This controller will not switches on the vehicle, when the user is in drunken condition In addition it will not allow rider's to use mobile while riding. Our system consists of two major units. They are 1) Helmet unit and 2) Vehicle unit.

TRANSMITTER SECTION:



Our project focuses on the design of an security system for a bike, in order to avoid accidents. Two wheeler accidents due drunken drive increases nowadays and wearing of the helmet decrease the severity of the accidents. In our project we combine these two aims in a single embedded system. This section consists of an alcohol sensor, helmet sensing switch, speech sensor, encoder and an RF transmitter. Both the switches and the sensors(alcohol, speech) are fitted in the helmet. Data from the sensors are passed to the controller which finds if the rider has non-alcoholic breath and helmet sensor switch is in closed position, whether absence of voice signals and gives corresponding digital output to an encoder. It encodes one of the active inputs to a coded binary output. RF transmitter transmits this coded binary output from the encoder.

RECEIVER SECTION:



The receiver section is placed on the bike to control the ignition; it consists of an RF receiver, RF

decoder, microcontroller, visual indications (LCD). The coded binary data transmitted by the RF transmitter is received through RF receiver and send to the RF decoder. RF decoder decodes to give four bit digital data to the microcontroller. Only when the address bits of encoder and decoder matches microcontroller ignites the engine when it receives digital data from the transmitter section, it operates the engine with help of a relay circuit but it is impossible for operating the relay directly, so an interface for a relay is also used.

WORKING PRINCIPLE:

Our project uses two sensors namely alcohol and a speech sensor, along with a helmet lock switches. Digital signal from all these sensors and switches are send to the RF receiver through the decoder and RF transmitter. Transmitter can transmit the signal through the free space (air medium) .receiver receives the signal and gives to the decoder to convert it to parallel data. This parallel data is send to microcontroller which makes the decision according to the program.

When the alcohol content exceeds 0.004% then it will be considered as consumption of alcohol.

When speech sensor output falls to low value it is considered as the rider is speaking.

Signal from helmet lock is used to confirm the helmet.

When all these condition are satisfied then microcontroller switches on the motor through relay then it turn off the motor through switch

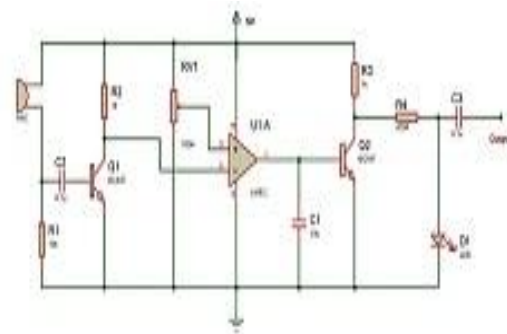
SPEECH SENSOR

Speech sensor is a device that is used to detect the voice that occurs during our speech .so it can be placed in helmet nearer to alcohol sensor and closer to our mouth.

This sensor consist of

- 1) Condensermic
- 2) Transistor (BC547)
- 3) op-amp (LM358)

Based on the intensity of our speech diaphragm in the condenser mike vibrates which makes change in area. Thus change of area produce variable output voltage .Since the voltage produced will not be sufficient enough for producing required output voltage, so they have to be amplified using op-amp (LM358). LED is used to indicate the presence of output. This sensor produces an analog output.



MICROCONTROLLER

Micro controller used here is PICF877A. It is a 16 bit and has five ports and 40 pins. It operates at 5V and 20 MHz frequency

CONFIRMATION OF HELMET

Power supply to the MCU is given through the helmet lock only. If power reaches MCU then it confirms that helmet lock is enabled.

CONFIRMATION OF NOISE

When rider produces a sound speech sensor produces a signal which indicates that the person is speaking to someone else which produces a signal to the controller.

CONFIRMATION OF ALCOHOL

When the output signal of alcohol sensor exceeds the critical level then it's confirmed that person had consumed alcohol and this makes engine to switch off.

CONCLUSION

Nowadays the major causes of road accident by two wheelers are due to drunken drive ,usage of mobiles and failure of helmet. In our project we have developed a embedded electronic system that can effectively check all this condition and protect the rider to save their lives. Helmet is made compulsory in our project which reduces head injuries and saves most riders. Alcohol sensor and speech sensor prevents accidents due to drunken drive and mobile usage .This may help the government as well as police officials by reducing their work.

FUTURE SCOPE

We have planned to add many more specification to our project which makes the project a standard one by using GSM module and internet connections to alert the riders about no parking areas and no entry areas. In case of when there occurs any accident then this information is automatically send to their family members, ambulance, hospital, and police. This may helps us to track our vehicle when it is

missing and can thus be made lock using online process.

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