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Smart Helmet with Alcohol Identification, Accident Detection, and Drowsiness Detection System

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Abstract: *Presently a-days more mishances are happening because of absence of appropriate care and consideration, safe trip is the essential thing while at the same time going in the vehicle. This paper clarifies a portion of the anticipation frameworks by which a large portion of the mishaps happen. The keen cap is a sort of defensive head center utilized by the rider which makes the bicycle driving more secure than previously. The keen cap comprises of eye flicker sensor, liquor sensor and an IR sensor. In the event that driver devours liquor or he doesn't wear the protective cap, vehicle would not begin. For this situation, it is obligatory for a driver to wear protective cap and breezing through liquor test keeping in mind the end goal to ride the vehicle. It likewise distinguishes the laziness with the assistance of eye flicker sensor and cautions the driver by influencing the signal to sound. In the vehicle area, vibration sensor is set for mishap location. On the off chance that on the off chance that mishap occurred the framework send messages and offers area utilizing GSM and GPS module to the enlisted versatile numbers.*

Keywords: *Sensors, GPS module, GSM, Drowsiness system, Smart Helmet.*

I. INTRODUCTION

The World Health Organization expresses that 1.2 million individuals lose their lives every year because of street movement wounds. The reasons might be numerous, for example, no appropriate driving information, over speed, tiredness, plastered and drive and so forth. Numerous mindfulness programs have been propelled, law have been authorized out in the open interests yet at the same time we discover individuals disregarding tenets and driving coolly without wearing protective caps and along these lines taking a chance with their lives. Thus to beat these issues we concoct a venture "Arduino based Smart Helmet and Intelligent Bike Controlling System". The primary destinations of this undertaking are: 1. Make Wearing the protective cap is mandatory. 2. To keep away from alcoholic and drive. 3. In the event that a man met with a mishap, nobody is there to help him. Just leaving or disregarding the individual. In such circumstances, it sends a message to the enrolled numbers.

II. LITERATURE SURVEY

Existing framework is an Arm based framework for street wellbeing. It incorporates alcoholic sensor, vibration sensor, ultrasonic sensor, RF transmitter and recipient. Alcoholic sensor identifies whether the driver expends liquor or not. In the event that he devours liquor the start will be off. At the point when the vehicle goes into the school zone, doctor's facility zone the RF transmitter synchronizes with the collector and speed is controlled. Ultrasonic sensor identifies the impediment and influences the vehicle to lull to consequently. Vibration sensor is utilized to make a ringer sound to the surroundings when vehicle met with the mishap. There is no eye flickering sensor for tiredness discovery. The vehicle will be begin without wearing a cap. This framework does not send messages or area to the relatives and separate experts.

III. PROPOSED SYSTEM

The mainaim of this task is to build up an assurance framework in a protective cap to make the adventure safe. It is worked with Arduino-UNO board utilizing ATMEGA328p microcontroller. The square outline of microcontroller and its interfacing with sensors and their depiction is demonstrated as follows:

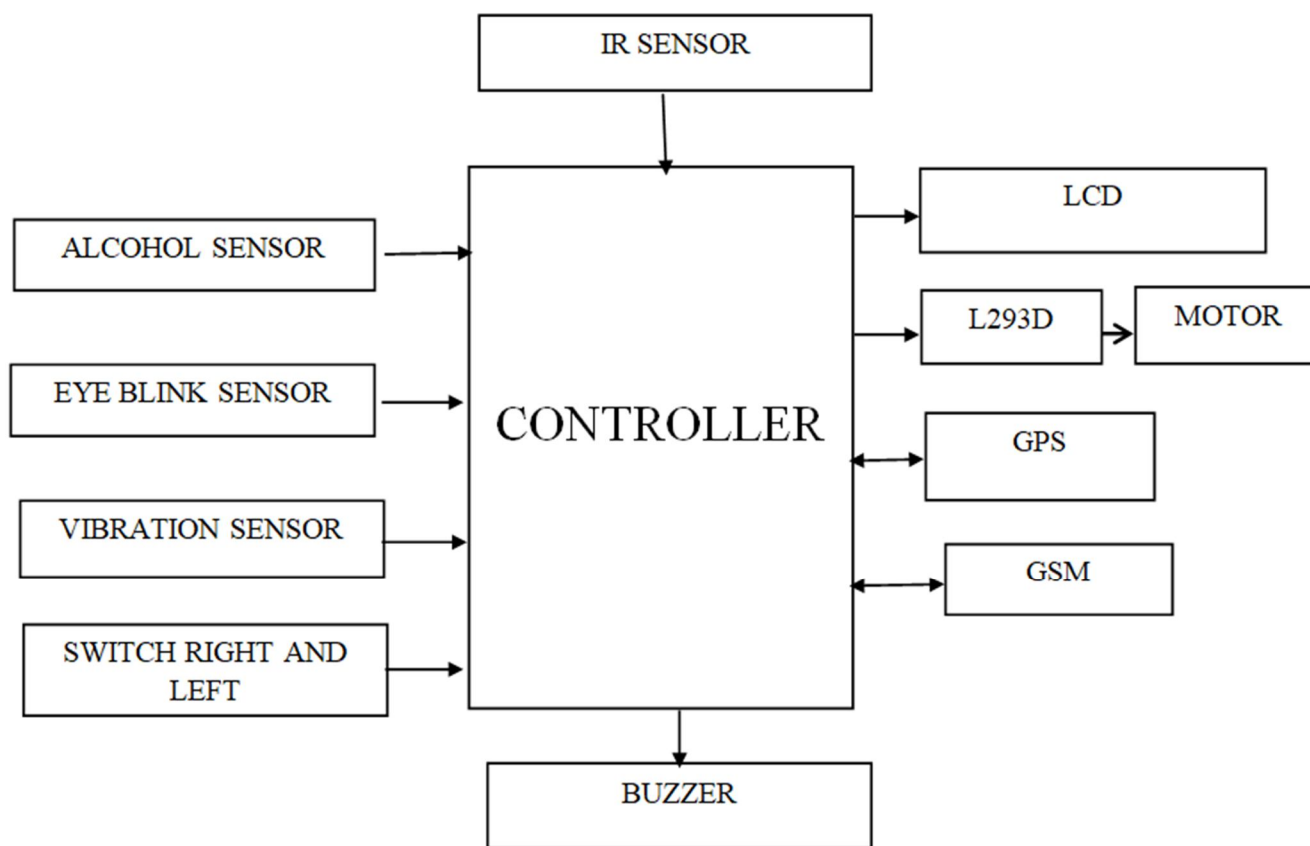


Fig.1. Block diagram

A. ATMEGA328p Microcontroller

The elite microchip 8-bit AVR RISC based microcontroller joins 32KB ISP streak memory with read and compose capacities, 1KB EEPROM, 2KB SRAM, 23 universally useful I/O pins, 32 broadly useful registers, 3 adaptable clocks/counters with look at mode, serial programmable USART, programmable guard dog clock with inward oscillator and five programming selectable power sparing modes. It works between 1.8v to 5.5v.

By executing powerful instructions in a single clock cycle, the device achieves throughputs approaching 1MIPS per MHz, balancing power consumption and processing speed.



Fig.2. Arduino UNO board

B. IR Sensor

An Infrared sensor is an electronic gadget which detects a few parts of the environment. These latent IR sensor measures just infrared radiation, instead of emanating it. The locator is essentially an IR photodiode which is touchy to IR light of a similar wavelength. Here it identifies whether the protective cap is wear or not. It is put in the head protector segment. At the point when light flag falls on the collector, the yield will be high, it creates message as "Wear Helmet" which is shown on LCD screen. Once the protective cap is settled to the head, no light flag falls on the recipient, the sensor yield is low then start will be on or it stays off. The working voltage ranges from 3.3v to 5v.

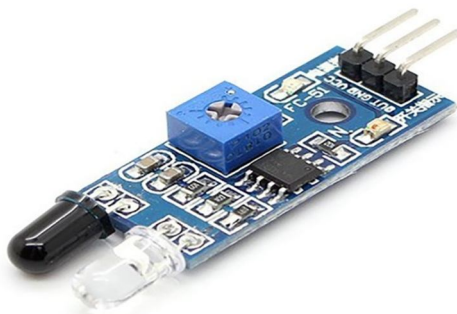


Fig.3. IR Sensor

C. Alcoholic Sensor

The alcoholic sensor detects the alcoholic substance devoured by the driver. Sensor gives a similarity resistive yield in view of the liquor focus. It is associated with the MCU (Microcontroller unit) through the comparator. The comparator contrasts the simple esteem and reference esteem and sends information to MCU. MCU gets information from the comparator and performs task, if liquor content is more it naturally stops the start and send orders to stop start.



Fig.4. Alcohol Sensor

D. Eye Blink Sensor

It is an intelligent sensor that incorporates infrared producer and phototransistor in a lead bundle which squares unmistakable light. The transmitter transmits IR beams into the eye of the rider. At the point when eye is shut it transmits rationale 1 to MCU through the comparator. The MCU alarms the driver by influencing bell to sound and it naturally stops the start and send summons to stop start. For open eye the yield will be low.



Fig.5. Eye Blink Sensor

E. Vibration Sensor

It assumes a noteworthy part in this framework. A mercury fluid compose vibration sensor is utilized. In the event that mercury fluid is tilted it sends rationale 1 to the MCU and presentations message on LCD screen as "Mischance Occurred". It likewise hint the surroundings by influencing bell to sound and sends messages to the enlisted numbers with the area utilizing GSM and GPS module.

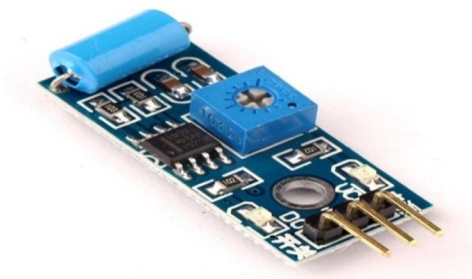


Fig.6. Vibration sensor

F. GSM

AGSM inferred named PCS-1990 appeared with late section of north America in the GSM advertise. Presently the acronym GSM is "Worldwide SYSTEM FOR MOBILE COMMUNICATION ". Since it is existed in the `continent the stage 1 GSM-900 was the principal GSM framework initially produced for just voice and it works in the recurrence band of 900 MHZ, at that point in the year 1995 stage 2 was advanced the contained copy, video, information, correspondence benefits alongside the voice. Later GSM 1800 and 1900 presented utilizing the PCS recurrence 1800 MHZ. GSM comprises of three noteworthy subsystems.

- 1) Base Station Subsystem
- 2) Network Switching Subsystem
- 3) Operation support sub system

The various Accessing Techniques used by GSM are

- 1) Frequency division multiplexing
- 2) TDMA, FDMA combination

The outstanding feature of GSM is the subscriber identity module. This is a memory device that store information like the subscriber identification number, the network where the subscriber is empowered to the service.

The second outstanding feature of GSM is air privacy, which is supported by the system. The privacy is attained by the encrypting the digital bit stream, covered by a GSM transmitter, with a specified secret cryptography key that is only known to cellular carrier.



Fig.7. GSM module

G. GPS

GPS receiver is the Global Positioning System receiver. It is used to find the accurate position of an object with the help of signals received from the satellite. The parallel multichannel design of GPS receiver helps in finding the position of the body more accurately. The location of an object can be easily found by the GPS receiver using minimum three satellite signals and an extra satellite can be considered to offset timing error.

The receiver consists of the following units

- 1) The antenna used for receiving signal is of circularly polarized patch type antenna with a LNA placed over it
- 2) An IF signal of bandwidth 2 MHz is generated by the super heterodyne receiver.
- 3) Sampling and quantization of this signal is done by A/D converter and Digital Signal Processing.
- 4) The timing and accurate measurements are processed by microprocessor and finally the current position of receiver is calculated.

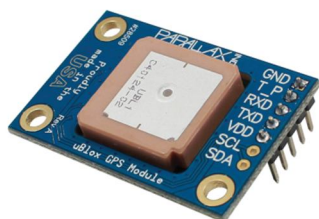


Fig.8. GPS module

IV. RESULT

A. IR Sensor

If rider is not wear helmet, then it display the message “ware helmet” and also on the buzzer and stop the ignition.

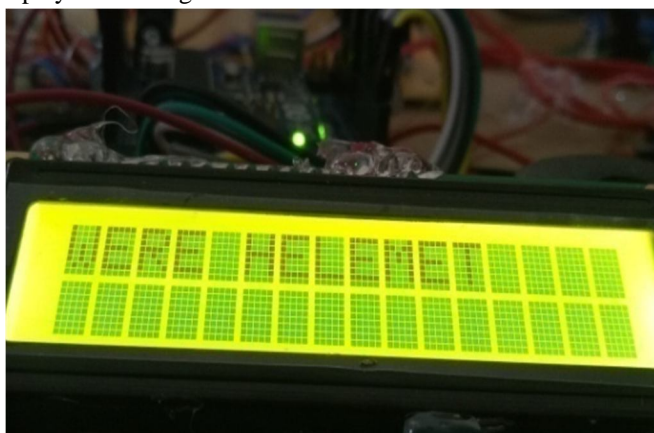


Fig.9. ware helmet detection

B. Alcohol sensor

When alcohol is detected automatically motor will stop and on the buzzer

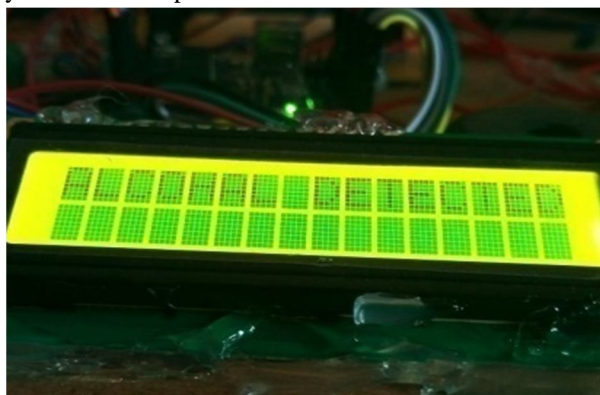


Fig.10. Alcohol detection

C. Vibration sensor

If vibration is tilted, it treated as accident occurred and message is sent to respective mobile numbers and buzzer is on to alert people on road.

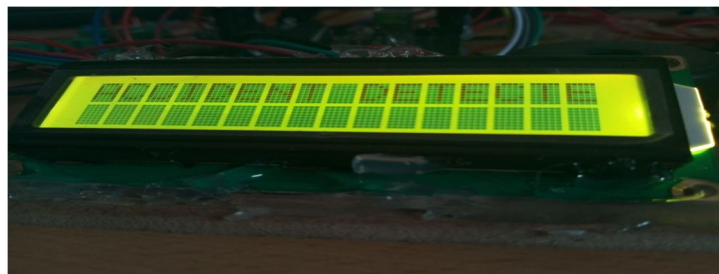


Fig.11(a). Accident detection

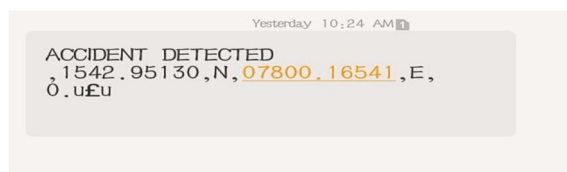


Fig.11(b). Message in mobile phone

D. EYE Blink sensor

If the person is in sleepy mode then the eye blink sensor detect and stop the ignition and also on the buzzer to alert the driver.

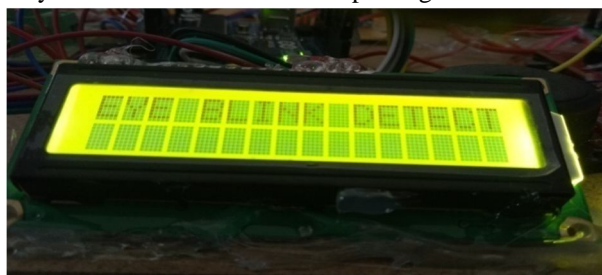


Fig.12(a). EYE blink detected

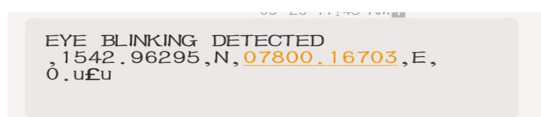


Fig.12(b) message in mobile

E. Project kit screen short

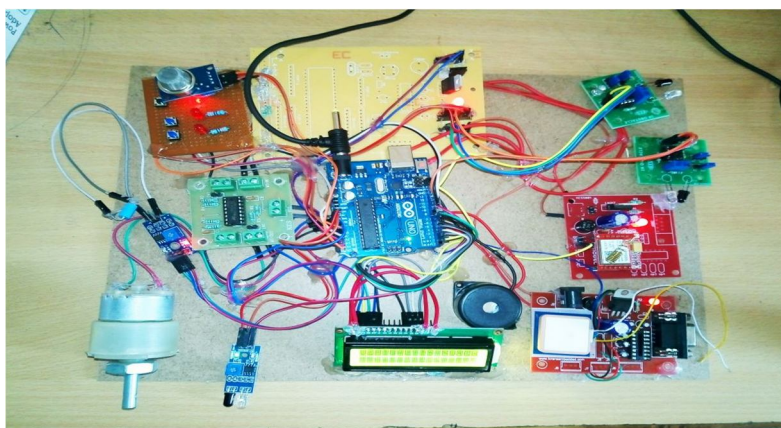


Fig.13. Equipment board

V. CONCLUSION

We are seeing numerous mishaps in daily paper and in Television essentially because of a rash driving and smashed state. Keeping in mind the end goal to avoid by actualizing the previously mentioned sensors in the head protector with arduino controller one can have a sheltered voyage while voyaging. The result of the task has demonstrated that the bicycle start will begin if the protective cap is worn and it additionally identify if the individual is in plastered state or not. with the goal that numerous mishaps decreases on streets.

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