INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & MANAGEMENT

TO DESIGN A CIRCUIT DIAGRAM FOR SMART HELMET USING ARDUINO UNO

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ABSTRACT

This paper presents shrewd head protector that guarantees rider can't begin the bicycle without wearing the cap. This head protector utilizes basic link exchanging on a bicycle, so the bicycle would not begin without both the key and the cap. Likewise, at whatever point the driver begins start, the liquor sensor measures the substance of the liquor in his breath and naturally turns off the bicycle on the off chance that he is smashed. To make driving more sheltered GSM and GPS innovation is utilized. Vibration sensors are put in better places of cap where the likelihood of hitting is more which are associated with microcontroller board. So when the rider crashes and the head protector hit the ground, these sensors sense and provides for the microcontroller board, at that point controller remove GPS information utilizing the GPS module that is interfaced to it. At the point when the information surpasses least pressure confine then GSM module naturally sends message to rescue vehicle or relatives.

KEYWORDS - ARDUINO, GSM, GPS, Alcohol Sensor (MQ3), Vibration Sensor, HELMET, LCD (16*2).

INTRODUCTION

Street car accidents end the lives of almost 1.3 million consistently and harm 20-50 million more on the planet. As indicated by Global status give an account of street security 2013 aggregate number of street activity passing remains unsatisfactorily high at 1.24 million for each year[6]. Just 28 nations, covering 7% of the total populace, have extensive street security laws on five key hazard factors: drinking and driving, speeding, and neglecting to utilize cruiser protective caps, safety belts and youngster limitations. In this way, to overcome from this issue this keen head protector is being acquainted which assists with decrease number of mishaps that takes each day and furthermore lessens demise ratio[10]. A large portion of the general population utilize customary protective caps just to keep from fine done by movement control police not for the wellbeing purposes[5]. In this way, these caps don't guarantees the wellbeing of the driver.

WORKING PRINCIPLE

The working standard of the brilliant protective cap is extremely basic. Cap hit the ground, this sensors sense and provides for the microcontroller .at that point controller separate GPS information utilizing GPS module then clocks begin checking up to 10 min. In the event that the individual isn't able to driven bicycle up to 10 min at that point consequently sends back rub to emergency vehicle and guardians. This undertaking is fundamentally to identify the liquor smashed individuals and to guarantee the protective cap is wear. Here we are utilizing microcontroller which is interfaces to liquor sensor. Liquor Sensor is a sensor that measures the measure of liquor that is available in encompassing condition. On the off chance that any plastered individual came, liquor sensor sense it and passes it to controller through ADC and after that it stop the start of bicycle through relay[1].

SMART HELMET

For bike rider, Helmet go about as a fundamental insurance gadget. Be that as it may, it doesn't guarantee whether the rider entirely takes after the movement leads or not. Along these lines, to overcome from this issue this savvy protective cap can be utilized. The keen protective cap depicted in this paper depends on one single thought i.e. to guarantee the security of the driver as the bicycle won't begin till the biker won't wear this brilliant protective cap. Likewise, if the biker is tanked then additionally start of the bicycle won't takes place[11]. In the event that somebody lamentably met with a mishap then the area of that specific place will be send to his neighbour and also to close-by police headquarters as longitude and scope values[2]. The piece chart of shrewd protective cap is appeared in figure 1. The Power supply is a gadget which is utilized to supply electric power. Here we utilizing 12v and 5v managed supply utilizing 7812 and 7805.
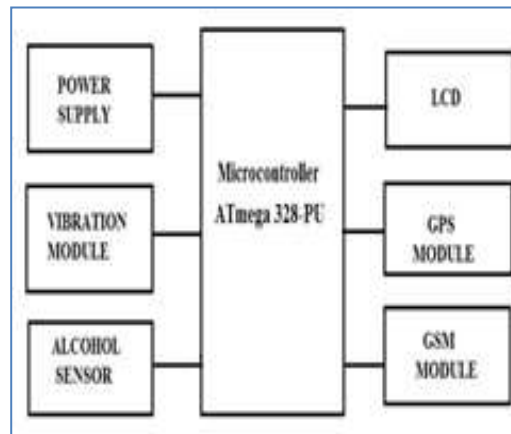
Fig. 1: block diagram of smart helmet

A. Vibration Module

Piezo electric is a vibration sensor whose esteem can be estimated in change in voltage. Here it is utilized to identify change in voltage that happens amid mishap assist it send information to the microcontroller.
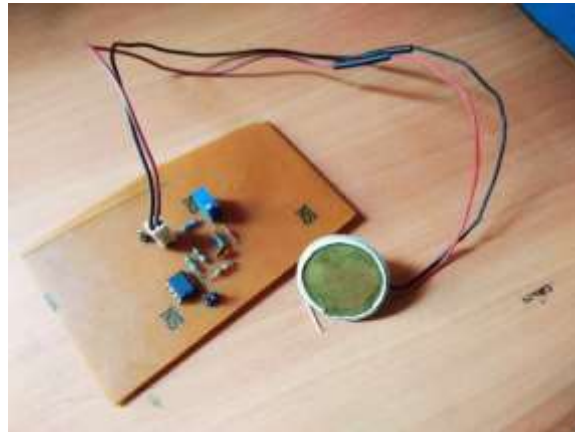

Fig. 2: Vibration Module

B. Alcohol Sensor (MQ-3)

This sensor is utilized to recognize liquor content in biker's breath. It keeps running on voltage supply of 2-3.3V. It requires radiator voltage with working temperature of - 10 to 70 degrees C. Its radiator utilization is under 750mW. Its measurements are 16.8mm in width and 9.3mm in stature without pins. It has a high affectability and quick reaction time. In this circuit, initial 3 pins are associated specifically to the power supply and fifth stick is associated with the ground while fourth and sixth stick of gas sensor is associated with the microcontroller. At the point when a smashed individual interacts with this sensor, the liquor vapors draws near to MQ3 identifier and its protection changes.

Fig. 3: Alcohol Sensor (MQ-3)

C. Microcontroller ATMEGA 328-PU

The ATmega328 is a solitary chip microcontroller. The superior 8 bit AVR RISC-based microcontroller joins 32 kb ISP streak memory with read while compose capacities, 1 kb EEPROM, 2 kb SRAM, 23 broadly useful I/O lines, 32 universally useful working register, 3 adaptable clocks/counters with analyse modes, inside and outer intrudes on, serial programmable URAST, a byte-situated two wire serial interface, SPI serial port, 6 channels 10 bit A/D convertor, programmable guard dog clock with interior oscillator and 5 programming selectable power sparing modes. The gadget works between 1.8 –5.5volts[7].

Fig. 4: Microcontroller ATMEGA 328-PU

D. Liquefied crystal display

Melted precious stone show is an electronic show module. It is accessible in wide range. Here we utilize 16*2 compose lcd. In this lcd, there are 16 segment and 2 push. It has 16 stick that comprise 8 information pins, ground, Vcc, Vee, enlist select, read/compose, empower, led+, drove . It is associated with microcontroller to show message. Library utilized for coding show in ardiuno.
#include <LiquidCrystal.h>

Fig. 5: Liquefied crystal display (LED)

E. GPS Module

The Global Positioning System (GPS) is a satellite-based route framework which is utilized to identify the area where the mishap will be occurred. It recognizes the Longitude and Latitude estimations of specific place and sends it to GSM module. It works in every single climate condition. It additionally decides different units like speed, remove, time, and so on. There are 3 pins of GPS module which is utilized as a part of this undertaking. Collector stick of GPS is associated with the transmitter stick of GSM module and Transmitter stick of GPS is associated with the recipient stick of GSM module and third stick is associated with Vcc.

Fig. 6: Global Positioning System (GPS)

F. GSM Module (SIM900)

GSM truncates as Global System for Mobile correspondence. It is utilized to set up association between a PC and GSM framework. It incorporates standard interfaces like RS232, USB, and so on. The power supply circuit is likewise worked in the module that can be enacted by utilizing an appropriate connector. It is utilized to send messages through the SIM.

Fig. 7: GSM Module (SIM900)
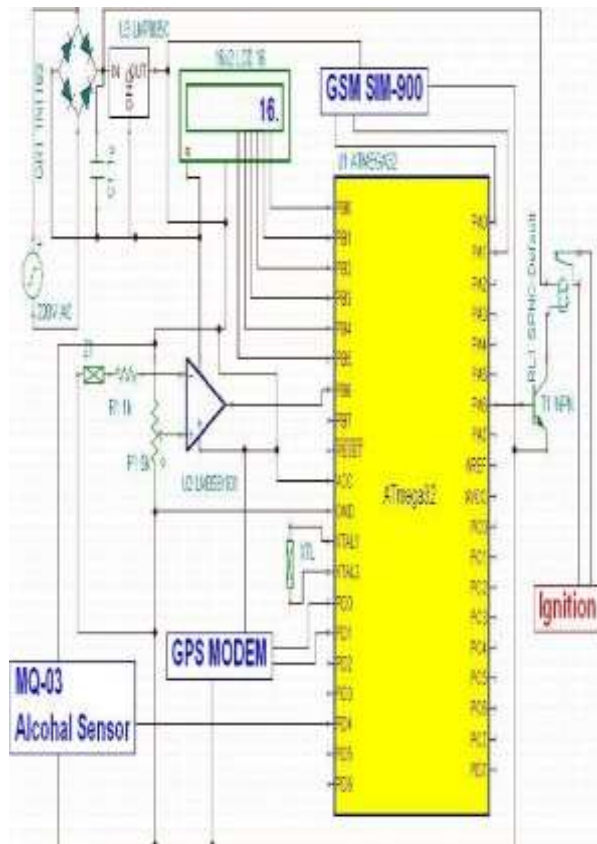
CIRCUIT DIAGRAM

Fig. 8: Circuit Diagram of Smart Helmet

All the sensors and modules are connected with microcontroller(ATmega328). LCD is connected with pin number 7,6,5,4,3,2. GSM module, Rx of gsm is connected with Tx of microcontroller and Tx of gsm is connected with Rx of microcontroller. Alcohol sensor is connected with pin number 11. GPS module is connected with pin number 14. Ignition of bike is controlled by relay which connected by pin number 12. Vibration module is connected with pin number 10 to detect accident.
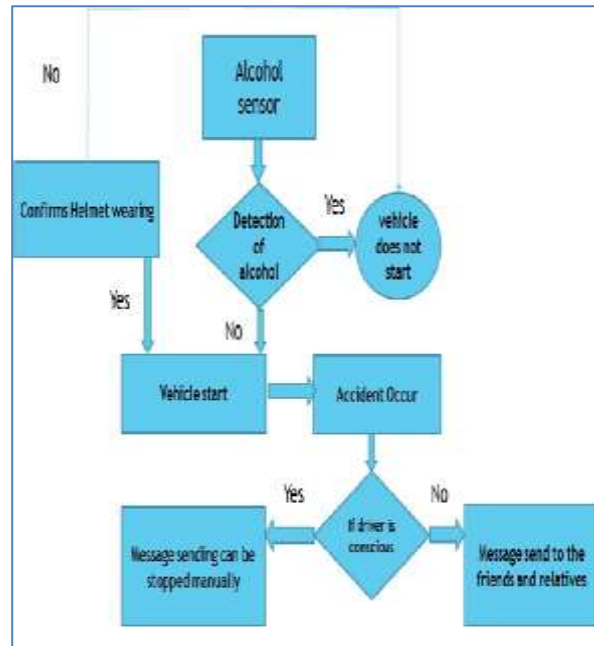
FLOW CHART

Fig. 9: Flow Chart of Smart helmet

There are two prerequisite to start bike. Helmet should be connected and alcohol level should be low. If the above mentioned prerequisite are not met then the bike will not start. After accident, it will wait for 5 minutes. If the rider is conscious then he can stop the message from sending manually. Orelse the message will be sent to their emergency contact and nearest police station.

CONCLUSION AND FUTURE ENHANCEMENT

This helmet is very useful to reduce the number of accident that take place every day on the road. It ensure the ride safety, if accident take place, it send message to the victim's family. By this helmet chances of death can be decreased by taking immediate action. This project is good for real life, if it is implemented by the government. It can help to save lots of life. This project can be enhance by adding wireless connection between helmet and bike though this is comfortable for rider while riding the bike also we can add google glass for navigation system and also solar panel can be added for power to the circuit. This is eco friendly, it will not harm nature.

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