

SMART AND SAFETY HELMET FOR A RIDER

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ABSTRACT

The impact when a motorcyclist involves in an accident without wearing a helmet is very dangerous and can cause fatality. This paper will be designing helmet with some new innovative ideas. Like for accident purpose, alcohol detection, ignition concept. This helmet parameters are reliable for making any helmet to complete. Smart helmet is an innovative concept which makes motorcycle driving safer than before. The circuit in each helmet is designed in such a manner that the bike won't start unless the rider had not worn the helmet. Some author has discussed on speed of a vehicle and alcohol detection. As soon as the alcoholic rider wear the helmet alcohol will be detected. But alcohol is not the main reason for the accident many other circumstances we will be working on that issues also. The smart and safety helmet will be the combination of all the features which are been studied n applied by the other author and there will be other additional features developed by us in this paper.

Keywords: - GSM module, GPS module, ARM controller, sensor, display device

1. INTRODUCTION

The thought of developing this project comes to do some good things towards the society. Day by day the two-wheeler accidents are increasing and leads to loss of many lives. The reasons may be many such as no proper driving knowledge, no fitness of the bike, fast riding of bike, drunken and drive etc. Roads accidents are on the rise day by day and in countries like India where bikes are more prevalent many people die due to carelessness caused because of not wearing helmet. In order to put an end to this misery we have developed the smart helmet for motorcycle the motorcycle will not start without helmet. It is being featured with the GPS and GSM based tracking system in order to track location of accident. The project is being implemented with all the sensor which will send the information to the module connected with the bike engine wirelessly. This smart bike helmet system has two modules, one on the bike. Accident sensor, helmet sensor is attached on the helmet

The helmet is being design in such a way that if the biker is drunk bike won't start. There is alcohol detector which will detect alcohol. There is more feature which are been implemented and updated that are accident tracker sends the message to the register mobile number. This smart helmet is also used for the ignition purpose, speed of the bike is being affected because the helmet, so this is the smart n safety helmet for a biker that has been design for reducing the accidents which are increasing.

OBJECTIVES: -

- The primary goal of motorcycle helmet is motorcycle safety i.e. to protect rider.
- To minimize the chances of accident.
- To form a corporate relationship between helmet and 2-wheeler.
- To provide the facility of medical treatment in the case of emergency.
- To Avoid drunk and drive parameter.

3.BLOCK DIAGRAM: -

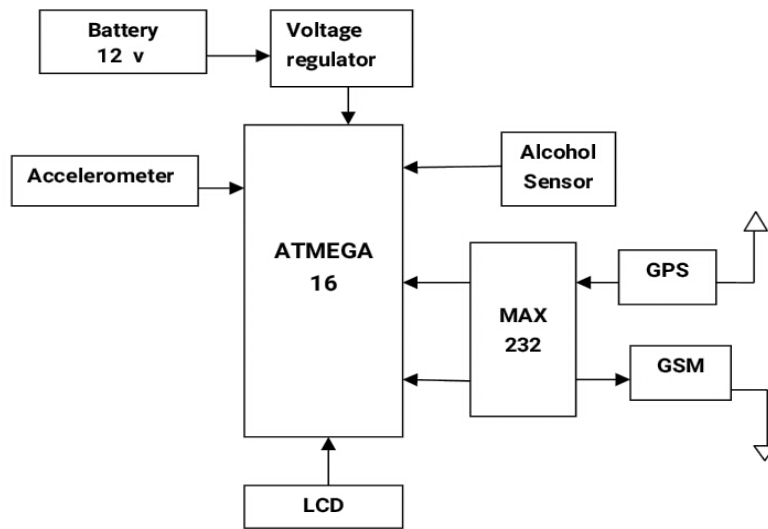


Fig-1: Block Diagram of Smart and Safety Helmet

4.WORKING:-

The working principle of the smart helmet is very simple. Helmet hit the ground, this sensor sense and gives to the microcontroller. then controller extract GPS data using GPS module. If the person is not capable to driven bike up to 10 min then automatically sends message to ambulance and parents. This project is mainly to detect the alcohol drunken people. Here we are using microcontroller which is interfaces to alcohol sensor. Alcohol Sensor is a sensor that measures the amount of alcohol that is present in surrounding environment. If any drunken person came, alcohol sensor senses it and passes it to controller through ADC. Micro-controller board is a low power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash Programmable and Erasable Read Only Memory (ROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the MCS-51. Instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. GSM is an open, digital cellular technology used for transmitting mobile voice and data services. Here we are using it only for transmitting and receiving the messages. GSM wireless data module is used for remote wireless applications, machine to machine or user to machine and remote data communications in many applications. Microcontroller sends AT commands to GSM modem and accordingly it operates. Accelerometer sensor can measure static (earth gravity) or dynamic acceleration in all three axes. Application of the sensor is in various fields and many applications can be developed using this sensor Initial stage of every electronic circuit is power supply system that provides required power to drive the whole system. The specification of power supply depends on the power requirement and this requirement is determined by its rating. For our project we require + 5 Volt.

5.SOFTWARE USED: -

5.1 Embedded C program:

Embedded C is nothing but a subset of C which is compatible with ATMEGA 32 very efficiently. It is very easiest for the programmer to develop applications of embedded systems using this

5.2 Proteus Software:

Proteus combines ease of use with powerful features to help us design, test and layout professional PCBs. Proteus PCB design seamlessly combines Schematic capture and PCB layout to provide a powerful, integrated and easy to use suit of tools for professional design. So, it is used to design circuit diagram and PCB layout

5.3 AVR studio:

AVR Studio is a software development environment developed by Atmel with an editor, simulator, programmer, etc. It comes with its own integrated C compiler the AVR GNU C Compiler (GCC). As such you do not need a third-party C compiler. It provides a single environment to develop programs for both the 8-bits, 32-bits microcontrollers. So, we are using it to simulate programs.

6. FLOWCHART:-

Transmitter

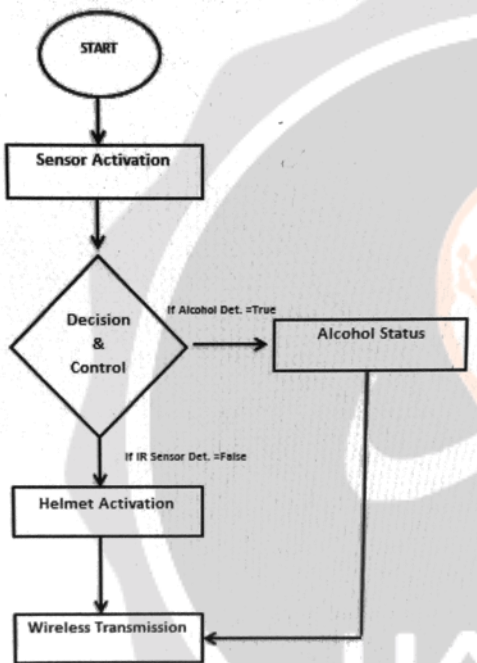


Fig-2: Flowchart of transmitter

Receiver

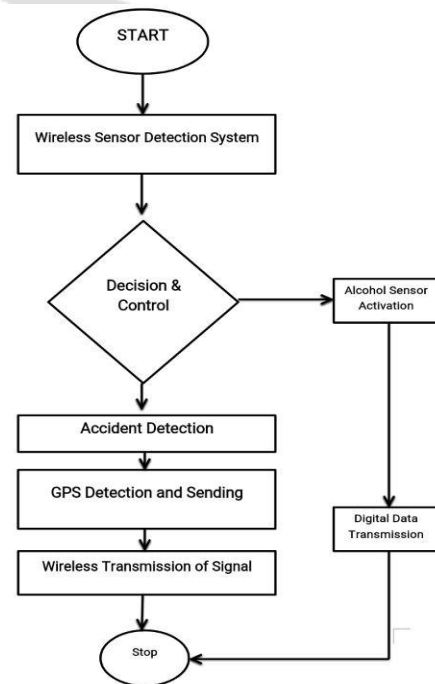


Fig-3: Flowchart of Receiver

COMPONENTS

ATMEGA 16

The ATmega16 contains 16K bytes On-chip In-System Reprogrammable Flash memory for program storage. Since all AVR instructions are 16 or 32 bits wide, the Flash is organized as 8K x 16. For software security, the Flash Program memory space is divided into two sections, Boot Program section and Application Program section.

The Flash memory has an endurance of at least 10,000 write/erase cycles. The ATmega16 Program Counter (PC) is 13 bits wide, thus addressing the 8K program memory locations.

GPS

Global Positioning System (GPS) satellite broadcast signal from space that GPS receivers, use to provide three-dimension location (latitude, longitude, and altitude) plus precise time. GPS receivers provides reliable positioning,

navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth.



Fig-4: GPS module

GSM

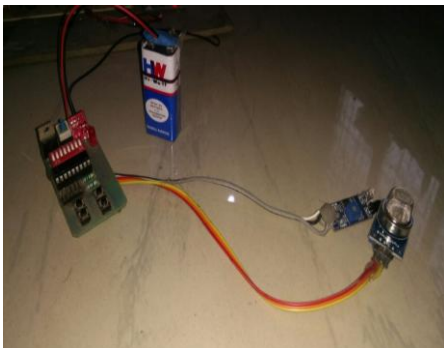
A GSM modem is a wireless modem that works with a GSM wireless network. The GSM modem is having internal TCP/IP stack to enable you to connect with internet. It is suitable for SMS, voice as well as DATA transfer application in M2M interface, attending incoming calls etc., through simple AT commands. A GSM modem doesn't have a keypad and display to interact with. It just accepts certain commands through a serial interface and acknowledges for those. These commands are called as AT commands. There are lists of AT commands to instruct the modem to perform its functions. Every command starts with "AT". That's why they are called as AT commands. AT stands for attention. In our project, the program waits for the mobile number to be entered through the keyboard. When a ten digit mobile number is provided, the program instructs the modem to send the text message using a sequence of AT commands.



Fig-5: GSM module

RF module



Transmitter section**Receiver section****7.ADVANTAGES**

- A helmet is a protective layer that is worn in order to prevent head injury.
- It is used to authenticate with bike to unlock the ignition.
- The life of rider on 2-wheeler can be saved from road accident.
- Helmet indicators are used for turning purpose.

8.FUTURE SCOPE

If the person riding the vehicle is drunk the second person sitting beside can hold the helmet who is not drunk then also the vehicle may start this can be overcome in future.

9.APPLICATIONS

- Can be applied at any weather conditions.
- Useful for college student.
- Useful for two wheelers.
- Help to protect life in accident case.
- Number of cases of violated traffic rules can be reduced Call center.

10. CONCLUSION

Hence all the module was designed and all the components were assembled. The Testing of each module was carried out successfully. The Parallel data from all sensors, detectors was successfully recorded. This was transmitted wirelessly from one module to other. This research has been completed as per the requirement and growing need in day to day life. The smart helmet has been designed completely by knowing the future scope. The alcohol detector which will detect alcohol and will have less accident due to drunk and drive. Accident detector will detect accident and reduce death chances by sending message via GPS and GSM. It has also worked on the ignition purpose to have the control on vehicle.

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