

REVIEW PAPER ON SMART HELMET USING GSM AND GPS TECHNOLOGY

Arpit Jain*

*Associate Professor,

Department of Computer Science, Faculty of Engineering,
Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, INDIA

Email id: arpit.computers@tmu.ac.in

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ABSTRACT

Now a days most of the countries are enforcing their citizen to wear helmet while riding bike and not to ride bike when the person is under the influence of alcohol, but still rules are being violated. In order to overcome this problem, "Accident Detection, Alcohol Detection, protection using GSM based Smart Helmet". The project aims of the security and safety of the bikers against road accidents. A Smart Helmet is special idea which make motor cycle driving safer than before, this is implemented using GSM and GPS technology. The other advantage of this project is to measure the alcohol level of drunken people who is riding bike. We are developing an embedded kit or embedded system which will be placed in Helmet. consist of some sensors and electronic circuitry which continuously monitoring and measuring the alcohol level and condition of accelerometer. We measure the alcohol level in and show it in the LCD display. Whenever the alcohol level crosses the predefined value, the alarm starts and we get notification about the drunken person. An accident is an unexpected and unintended event.

KEYWORDS: GPS, GSM, Alcohol Sensor, Tilt Sensor.

1. INTRODUCTION

In today's world road accidents stand among the leading cause of human death, Road safety for driver is an essential requirement of society, As the Number of vehicles increase day by day, Collision of vehicle also increases simultaneously, in this situation this project fulfills the purpose of saving lives. Helmet is best safety equipment for driver. In this system initially we try to avoid accidents by using, the sensor will activate the GPS to find the location and further SMS will send to ambulance and family members. This will optimize accidents as well as human death ratio by accidents due to providing proper care with in time frame. Micro-controller board: It 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[1]–[3].

The helmet used by a motorcycle rider is a sort of protective headgear. The primary goal is to protect the rider's head from the impact of an accident. The helmet protects the rider's head while also providing ventilation. The leading causes of deaths and injuries are speeding and not

wearing a helmet. It has been proved that when motorbike speeds rose, the frequency of accidents and deaths climbed as well. This is due to the impact of the collision, which caused the shock. In India, motorcycles are the most popular and widely accessible means of transportation. Because of their simplicity of use, motorbikes have a number of drawbacks, the most obvious of which being traffic accidents. Motorcycle accidents occur for a variety of causes, including malfunctioning bikes, a lack of equipment, and incorrect motorcycle usage[4][5].

In India, 25 percent of all motorcycle-related traffic accidents result in the death of the driver. The main cause for this is that the individual did not get prompt medical assistance. Consider three important elements for preventing accident causes, such as making helmet usage mandatory, avoiding driving when inebriated, and if a person is involved in an accident, no one is available to assist him. He may die as a result of just leaving or ignoring the individual. The purpose of this project is to provide information on a rider who has been involved in an accident, as well as the location of the accident[6][7].

This smart helmet contains two operating modules, one for the receiver and one for the transmitter. The transmitter is built within the helmet, while the receiver may be fitted on any bike. As a result, wireless communication occurs between two units. The pressure signal is detected by a pressure transducer within the helmet in the transmitter module. A comparator transforms an analog signal to a digital signal and sends it to the transmitter's input as logic level 1, while the transducer provides the output. When the user removes the helmet, the output of the transducer becomes zero, and the transmitter's input logic level becomes 0. The output pin in the receiver module will provide a high-level digital output until the rider puts on his helmet, and the ignition unit circuit of the bike will be finished when this signal actuates the digital relay. When the rider removes his helmet, the relay opens, and the circuit's connections are ended. A MQ-3 gas detector (alcohol sensor) is also utilized to detect the presence of alcohol in the rider's breath. It may be positioned slightly behind the face shield so that it is immediately detectable. When a cyclist is inebriated, the resistance value lowers, resulting in an abrupt shift in voltage value. Then this value is sent to the microcontroller, which prohibits the bike from starting in this situation (Figure 1).

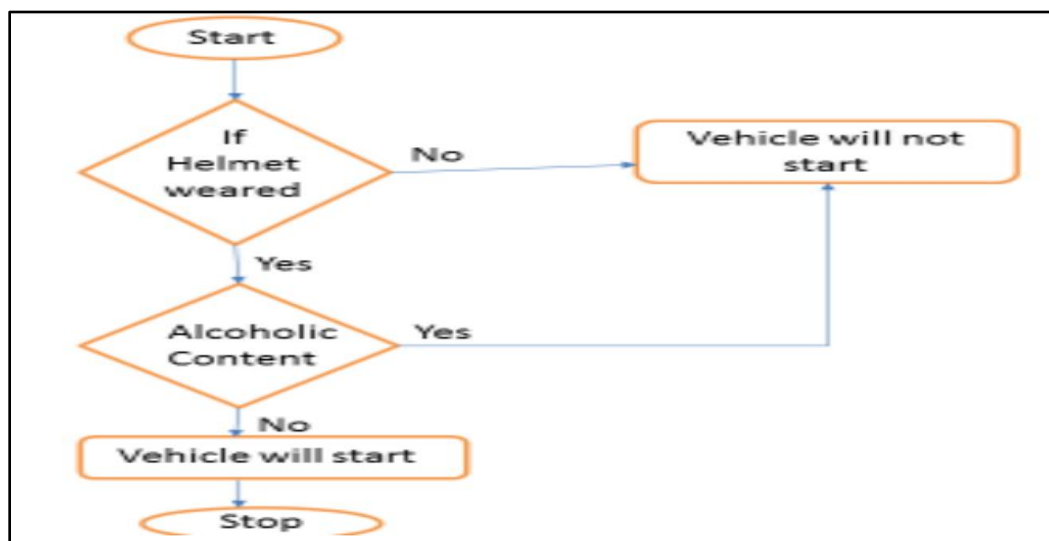


Figure 1: Illustrating the Flow of the Process involved in the Smart Helmet.*1.1. Problem Statement:*

Smart Helmet is a real-time safety technology that may be employed. We can eventually turn the whole circuit into a tiny module. Safety system that uses less energy. By substituting the helmet with a seat belt, this safety system technology may be upgraded to a four-wheeler. The smart helmet system, which includes enhanced alcohol detecting as well as GSM and GPS technology, is utilized to authenticate with the bike and unlock the two-ignition. wheelers with conventional protection and safety features, a rider on a two-life wheeler's may be spared from a traffic collision.

1.2.Existing System

This is a story about a smart helmet that makes riding a motorcycle safer than ever before. This project's major goal is to ensure that the rider cannot start the bike without wearing a helmet. Wearing a helmet causes a pressure on the helmet, and a data signal is sent to the transmitter, which redirects the bike ignition control to switch on, according to a previous suggested work that is based on the concept of pressure sensing. In addition, the transmitter and receiver modules are IR-based. Both technologies, however, have certain disadvantages[8]–[10].

2. DISCUSSION

The concept behind our project is that a biker must wear a helmet to start his bike; otherwise, the bike will not start. It also provides information on the biker's location in the event of an accident. A GSM module sends the location of the accident to the mobile phones of relatives and friends through SMS. Sending an accident-related SMS will not aid the rider unless and until the location of the accident is also known. We utilize a GPS module to track down the site of an accident. Using a microcontroller, an SMS containing information about the accident as well as the position (latitude and longitude) of the region is sent to family and friends(Figure 2).

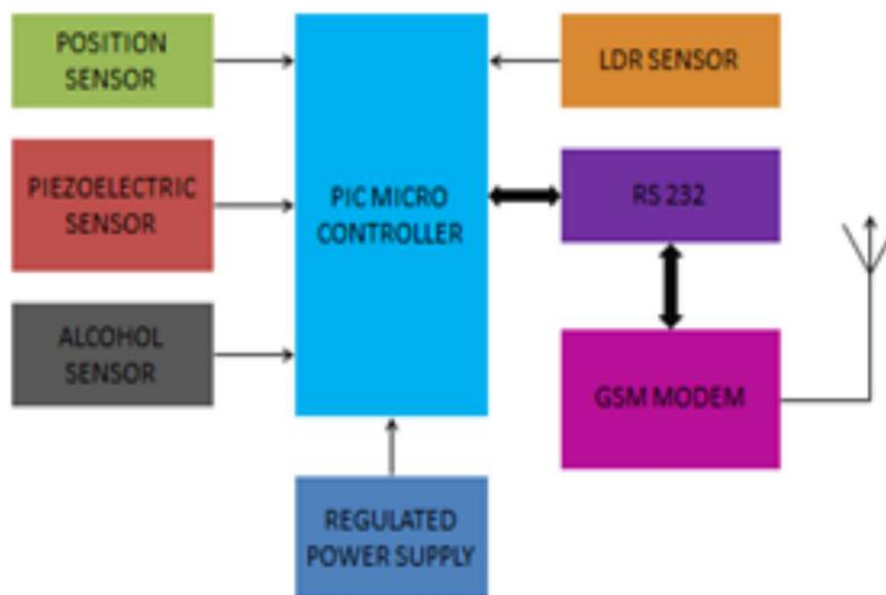


Figure 2: Illustrating the Circuit Diagram of the suggested System

2.1. Overview of the System

A system that uses a 3 axis accelerometer to check for helmet use and, if the rider is wearing the helmet, tests for alcohol concentration in the rider's breath using an alcohol sensor MQ3. If no alcohol concentration is detected, the data from this sensor is received by the PIC microcontroller, which then sends it to the RF transmitter. The data will be sent from the RF transmitter to the RF receiver, which will then drive the motor linked to it. If one of the above two criteria is broken, the motor will stop working and a beep sound will be heard. To detect the accident, a piezoelectric sensor is utilized, which operates on the concept of piezoelectricity. When the sensor output exceeds a specified threshold (0-5V), the PIC microcontroller interprets it as a crash.

2.2. MODULE FOR GPS AND GSM.

The Global Positioning Technology (GPS) is a satellite-based navigation system that is used to pinpoint the exact position of an accident. It detects and communicates the Longitude and Latitude values of a specific location to the GSM module. It works in all kinds of weather. It also aids in the calculation of other units such as speed, distance, and time. In this project, a GPS module with three pins is utilized. The GPS receiver pin is linked to the GSM module's transmitter pin, while the GPS transmitter pin is attached to the GSM module's reception pin and the third pin is connected to Vcc (Figure 3).



Figure 3: Illustrating the Global Positioning System (GPS) Modem

2.3. GSM MODEM (B)

The acronym GSM stands for Global System for Mobile Communication. It's used to establish a connection between a computer and a GSM network. Standard interfaces such as RS232, USB, and others are included. The module also has a power supply circuit that may be triggered with an appropriate adapter. It will set you back approximately \$20. It is used to deliver SMS messages using the SIM card (Figure 4).



Figure 4: Illustrating the Global System for Mobile Communication (GSM) Modem

3. CONCLUSION

This helmet has the potential to lessen the amount of traffic accidents that occur on a daily basis. It assures the biker's safety while also informing family members and the local police station of the victim's whereabouts. Also, by making this circuit essential when driving, the fatality rate may be dramatically lowered, making everyone's life simpler and smoother. This initiative is an example of a methodical strategy to preventing individuals from becoming involved in accidents. As a result, we can only start the bike if we wear the helmet. We can avoid many accidents in this world by doing so; most accidents occur as a result of people not wearing helmets. Our government is enacting a number of rules to encourage people to wear helmets, but our people are not complying, so this is a better way to follow the rules and save people from serious head injuries.

Adding Google Glass Technology to the project will improve it. Biker may visualize the oncoming route with this technology before they get at their destination. It can protect bikers from pits and poor road conditions. Also, when taking fast curves, the cyclist may see navigation on it and can inform him. It may also be used on automobiles. People may use their seat belts to start the car's ignition, which improves the driver's safety.

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