Review Paper on Smart Helmet using GSM and GPS Technology

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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".

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

I. INTRODUCTION

The project aim 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 continuosly monitoring and measuring the alcohol level and condition of accelerometer. We measure the alcohol level inand 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. 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.

II. WORKING PRINCIPLE

The working principle of the smart helmet is very simple. Helmet hit the ground, this sensors sense and gives to the microcontroller .then controller extract GPS data using GPS module then timers start counting upto 10 min. If the person is not capable to driven bike upto 10 min then automatically sends massage 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 sense it and passes it to controller through ADC.
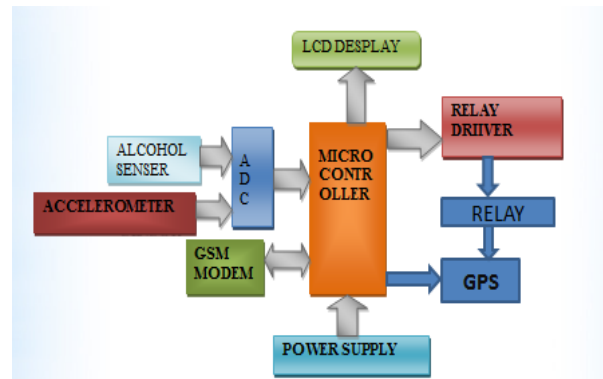
III. BLOCK DIAGRAM

Fig.1 Block Diagram of smart helmet using GSM, GPS based system

1. 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. The on chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, it provides a highly flexible and cost effective solution so many embedded control applications.

GSM MODEM:
GSM (Global System for Mobile communications) 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.
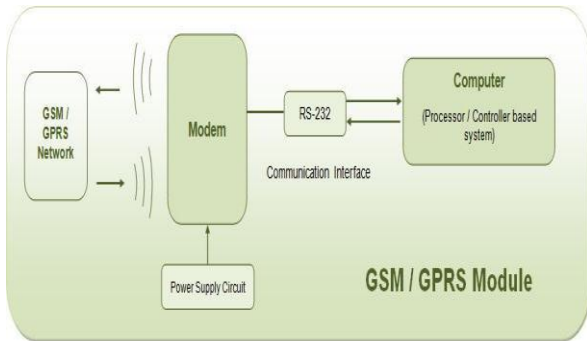

Fig. 2.GSM and GPRS Module

2. ADC: A/D converter is that it can continuously follow the input signal and give updated digital output data if the signal does not change too rapidly. In addition, for small input changes, the conversion can be quite fast.
Accelerometer/Vibration/Tilt Sensor

Fig.3. Accelerometer

3. Accelerometer sensor can measure static (earth gravity) or dynamic acceleration in all three axis. Application of the sensor is in various fields and many applications can be developed using this sensor.

Accelerometer sensor measures level of acceleration where it is mounted this enable us to measure acceleration/deceleration of object like vehicle or robot, or tilt of a platform with respected to earth axis, or vibration produced by machines.

4. Power Supply:
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. GPS:

Fig 4.GPS Tracking Location

The GPS concept is based on time and the known position of specialized satellites. The satellites carry very stable atomic clocks that are synchronized with one another and to ground clocks. Any drift from true time maintained on the ground is corrected daily. Likewise, the satellite locations are known with great precision.

GPS receivers have clocks as well; however, they are usually not synchronized with true time, and are less stable. GPS satellites continuously transmit their current time and position. A GPS receiver monitors multiple satellites and solves equations to determine the precise position of the receiver and its deviation from true time. At a minimum, four satellites must be in view of the receiver for it to compute four unknown quantities (three position coordinates and clock deviation from satellite time)

IV. SOCIETAL BENEFITS

The safety helmet system devised aims to reduce the number of deaths caused by not wearing helmets. We want the riders to be safe and adhere to the law. As for a society we would want to see more discipline when it comes to commuting. Pollution statistics keep the citizens informed about the pollution of the locality they live in.

As people become aware of the pollution levels they transform into a more concerned and responsible Human beings thus making them more disciplined. As this change begins our environment will be more livable, safer, healthier and friendly

V. CONCLUSION

In this project, we developed a smart helmet based system which was successfully able to detect whether the rider as worn the helmet or not. It also sets an alarm if he has consumed alcohol beyond permissible levels. Apart from this, the system also monitors atmospheric pollution levels.

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