INTELLIGENT HELMET FOR ROAD SAFETY

PROJECT REFERENCE NUMBER: 38S0686

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Helmet, Accident, Alcohol, Bikers, GSM, Message

Introduction:

In today's era, especially in the young generation, the craze of motorbikes is really remarkable. As the bikers in our country are increasing, the road mishaps are also increasing day by day, due to which many deaths occur, most of them are caused by the negligence in wearing helmet. And one of the reasons for this accident is alcohol consumption.Eventhough breath analyzers are used to detect whether the rider has consumed alcohol or not by the traffic department, it is difficult to check each and every rider on the road. Most of the deaths will occur since the injured person is not given proper medical attention.

In order to overcome the above mentioned problem we are designing an intelligent system that prevents road accident and detects alcohol consumption and also this will be able to detect crash and will be able to notify quickly the accident to predefined number.

Objective:

The main objective of the project is to design a low-cost intelligent helmet that is capable of identifying alcohol consumption and preventing roadaccidents. This system is capable of providing security and safety of the bikers against road accidents.The circuit is so designed that the bike won't start without wearing helmet and if the rider is drunk.And in case of accident, GSM system will globally locate the biker and immediate message will be sent to the family members about the location of accident.

Methodology:

Intelligent helmet system is a cost-effective assistive technology to provide security and safety of the bikers against road accidents. It includes PIC-P40 development board, MAX232 level converter, PIC16F877A microcontroller, power supply, 3-axis acceleration sensor board, alcohol sensor, buzzer, vibration module, and finally a GSM module(as shown in fig 1).

Functional partitioning of project:

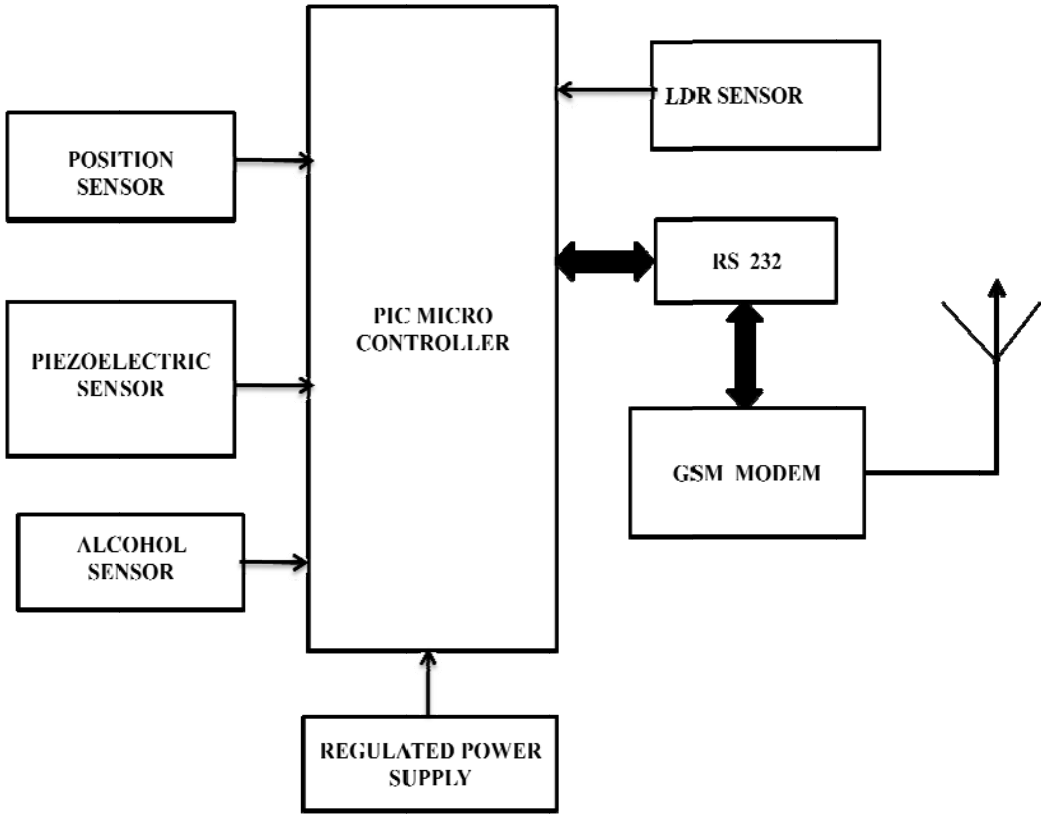

Fig1. Block Diagram of Intelligent Helmet System

Here we designed a system which checks the two conditions before ignition of the engine. The first condition is whether the rider is wearing helmet or not and it is detected by a position sensor. The second condition is detection of alcohol content in rider's breath with the help of an alcohol sensor. If any of the two or both the conditions are violated then the bike will not start. If the rider is wearing helmet and the alcohol content is not detected then ignition of engine starts.

If any accident occurs then a piezoelectric sensor detects it and short message service will be send to the predefined numbers using GSM modem .If there is no accident then vehicle reaches its destination.

This system first checks wearing of helmet with the help of 3 axis accelerometer and if the rider is wearing the helmet system checks for content of alcohol in rider's breath using an

alcohol sensor MQ3.In case the alcohol content is not detected pic microcontroller receives data from these sensors and gives digital data to the RF transmitter connected to it.RF transmitter will send this data to the RF receiver which is connected to another pic microcontroller this in turn runs the motor connected to it. If any of the above two conditions are violated motor which is connected to the pic microcontroller won't work and this will be indicated by a beep sound.

A Piezoelectric sensor is used here to detect the accident which works on the principle of piezoelectricity. In this system Analog pin of PIC reads the data from this sensor and converts 0-5volts into 0-1023 divisions from the internal ADC.If the sensors output is stronger than a certain threshold, then the PIC microcontroller reads it as a crash.

Flowchart:

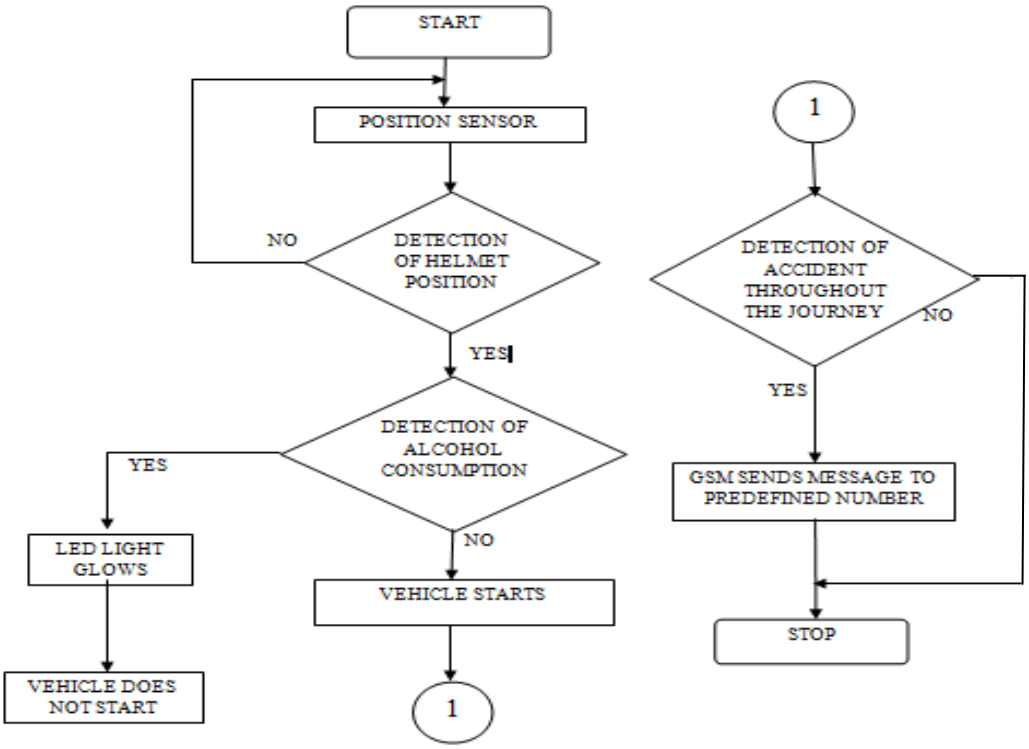

Fig2. Flow chart of intelligent helmet system

Results and Conclusion:

Nowadays, most cases of accidents area unit by motor bikes. The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. In our project we have a tendency to develop an electronic intelligent helmet system that efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe 2 wheeler journey is possible which would decrease the head injuries throughout accidents

caused from the absence of helmet and additionally reduce the accident rate due to drunken driving.

A GSM modem is used in this system that will send a message to the predefined numbers that are programmed using microcontroller in case of any accident. We have a tendency to introduce advanced sensors techniques and radio frequency wireless communications are included in this project to make it a good one.

Scope for Future Work:

- In future we have planned to construct our intelligent system during a compact size and additionally as globally acceptable to notify the No entry and No parking areas.
- Can be modified for four wheelers.
- GPS can be used to track the location of accident.
- Light dimmer sensors can be used to dim the light automatically when light from other vehicles falls on it.