Helmet Detection Based Bike Security with GPS

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Abstract— According to WHO (World Health Organization) about 1 million people die due to road accidents in that approximately 25% of them die with accidents due to motorcycles. And more than half of the deaths are due to head injuries because of not wearing helmets. Most of these deaths are preventable by the compulsory use of helmets. It is found that wearing helmets can reduce the death percentage by 70%. To prevent this so many rules are made and wearing helmet is made compulsory. But still so many people are breaking the rules and driving very casually without wearing helmets and thereby risking their lives. To prevent this problem we have created this project "Helmet Detection Based Bike Security with GPS". We developed this system is designed in such a way that the vehicle will not start until and unless the rider wears a helmet. We added addition feature to this system of accident detection in which we added GSM and GPS module through which if accident of rider happens, the location of rider is automatically to hospitals and his relatives. We develop this project for the safety of people.

Key words: Helmet, Accident reporting, Safety, GSM-GPS

I. INTRODUCTION

There is drastic increase in sell of two wheelers in this decade. Due to this the road accidents are also increased. There are many reasons for that like not wearing helmets, violation of traffic rules, drunk driving, carelessness etc. It is found that wearing helmets can reduce chances of injuries and deaths by 70 percent. People are aware of that, but still they ignore these simple rules of safety and risk their lives as well as others. Also it is observed that the some deaths are occurred because the person did not get help on time as hospitals did not get information of accident on time and ambulance did not get on the location on time. To overcome these problems we come with the project "Helmet Detection Based Bike Security with GPS". The very simple idea is that the vehicle will not start unless the rider wears a helmet by the help of IR sensor to detect the person's head. The helmet will also have motion sensor for accident indication and GPS and GSM module for accident reporting.

II. PROPOSED SYSTEM

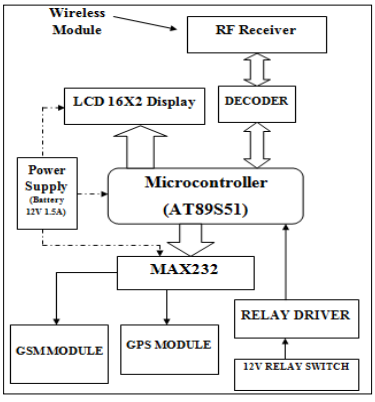

Fig 2.1: Block Diagram Helmet Detection System

Above figure shows basic block diagram of Helmet Detection System.

In this system microcontroller is used as controller. The RF is used for start the two wheeler. The small voltage of ignition of the two wheeler is grounded. In normal condition when the helmet is wearied the pressure sensor is senses pressure and the RF transmitter radiates the FM Modulated signal. The RF receiver is connected with the two wheeler which is receive the radiated signal and activate the relay .The relay is remove the ignition wire from the ground and connected with the starter switch now the two wheeler will start.

When driver met with accident vibration sensor sends message to microcontroller. The GPS receives the location of the vehicle that met with an accident and gives the information back. This information will be sent to a mobile number through a message. This message will be received using GSM modem present in the circuit. The message will give the information of longitude and latitude values. Using these values the position of the vehicle can be estimated.

III. HARDWARE & IMPLEMENTATION

A. RF Receiver

This module converts the high frequency (433MHZ) electromagnetic signal to electrical signal. This is a single bit receiver.

B. Microcontroller (8051)

AT89s51 microcontroller is used as main control & Decision element. This is an 8-bit Microcontroller with 4K Bytes in-System Programmable Flash

C. MAX232

It is a logic level convertor & it converts TTL logic to 232 & vice versa. It is used to interface microcontroller with GSM & GPS.

D. GPS Module

We have used GPS module to retrieve and longitude and latitude of the location. This GPS modem communicates using serial communication with the Controller. GPS modem sends a bunch of data to the Controller. This bunch of Data contains many parameters which include longitude and latitude.

E. GSM Module

In this project GSM is used to send a text message along with the location to the pre-defined number via AT-Command

F. Relay Driver

Relay Driver is same as current amplifier. Here we transistor as relay driver (BC547). It increases the current up to 200m.

G. Power Supply

The system needs regulated power supply which provides necessary voltages for proper working of its blocks. This unit is specially designed to gives out all necessary voltage levels required for working of all blocks

H. RF Receiver

This module converts the high frequency (433MHZ) electromagnetic signal to electrical signal. This is a single bit receiver

IV. FLOW CHART

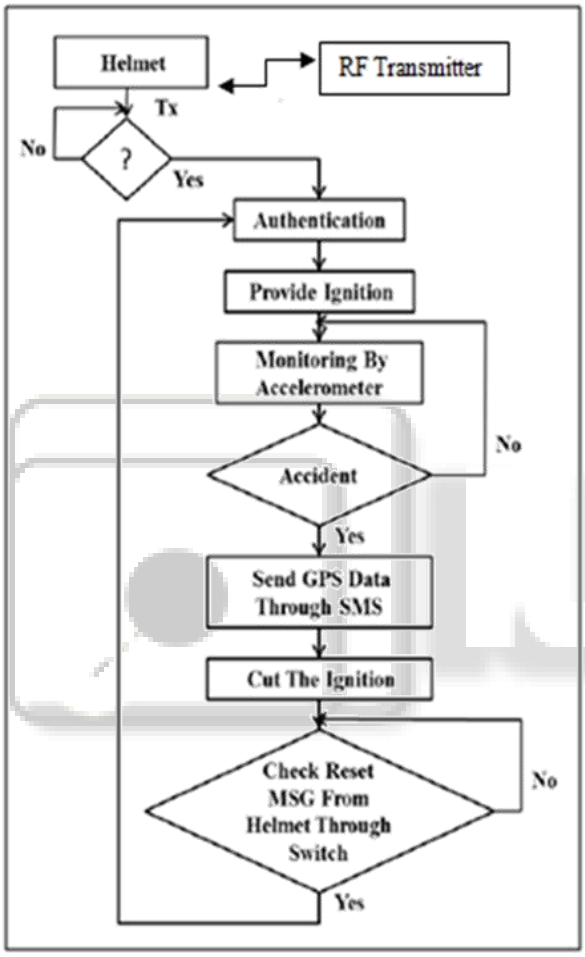

Fig. 4.1: Flow Chart

V. RESULT & CONCLUSION

When our project was completed, all the circuitry works properly.

The main purpose of this project is to secure and avoid road accidents. It is user friendly and easy to install and operate. Our aim for this project is to help riders by making helmet wearing essential. This project ensures safety of riders and prevention of road accidents to some extent. This project is cost efficient and user friendly. Also as a future scope it can be combined with many existing technologies to provide guidance and on road track facility. Also to detect weather rider is drunk or not.

Fig. 5.1: Helmet Detection Based Bike Security with GPS

Fig. 5.2: RF Transmitter

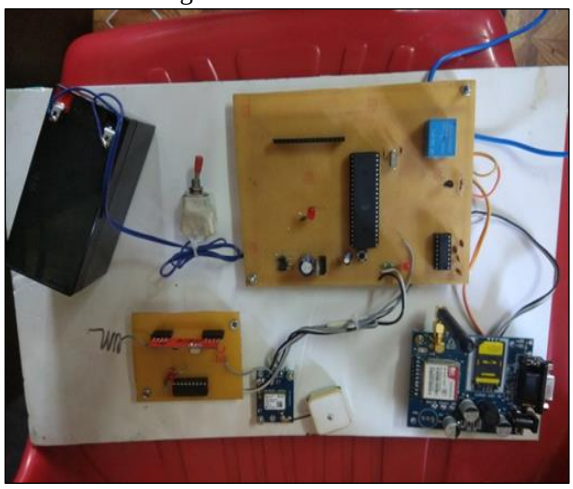

Fig. 5.3: RF Receiver

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