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SMART HELMET SYSTEM USING ALCOHOL DETECTION FOR VEHICLE PROTECTION

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ABSTRACT:

An accident is an unexpected action, which occurs in a particular situation and place. Carelessness is the major factor for such accident. The government is forcing the drivers to wear helmet during driving. But many of them are not following the rules. We are introducing a smart helmet system which detects that, the person wearing helmet or not and also the system detect the person is drunk, If the driver using cell phone during driving means the bike will be jammed slowly. Here we have transmitter in the helmet and receiver at the bike. A switch will be there to ensure that the person is wearing the helmet or not. And also a alcohol sensor is placed in the helmet near the mouth of the driver to check whether the driver is drunk. If a vehicle across this system, then the head light is automatically dimmed and dipped. In this system there is a switch ensures the placing of the helmet in proper manner.The conclusion of this paper is to prevent the accident while driving in the vehicle.

Key words-*Alcohol sensors, PIC, SUC, Relay, LDR,*

I.INTRODUCTION:

In this paper we are introducing a smart helmet which is used to detect alcohol consumption, usage of mobile phones while driving. In this we are insisting that every bike riders must wear the helmet. The existing system is used to detect the alcohol consumption if accident occurs the information conveyed to relative via SMS or Short Message Service. If the driver is drunk then the engine will not get started. In proposed method a smart helmet system which detects that, the person wearing helmet or not and also the system detect the person is drunk, If the driver using cell phone during driving means the bike will be jammed slowly. If a vehicle across this system, then the head light is automatically dimmed and dipped. We are using alcohol sensor to detect the person is drunk and we fix it in helmet. Hence this paper is very much helpful for all the bike drivers and also the traffic rules will be followed properly.

II.RELATED WORK:

Every person must wear a helmet while travelling by motorcycle or two wheeler. Road-traffic accidents are a major cause of premature death and disability all over the world and motorized two wheelers account for the majority of such cases, particularly, in the developing countries like India where they are most convenient mode of transportation. Head, face injuries are leading causes of death due to motorcycle crashes. Despite of the availability of substantial evidence that safety helmets are effective in reducing the incidence and severity of head injuries, people are reluctant to use helmet. In recent years, mandatory helmet use for motorcyclists has received a considerable attention across the country. However, effective enforcement of law, rules & regulations regarding mandatory use of helmet is limited to metro cities and urban areas [1].

In present scenario, we encounter numerous cases of death due to two wheeler road accidents. The main reason being severe head injuries. Road accident casualties toll has reached 21,48,100 within five years i.e. 2008-2012[2]. In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities [3].

The main difficulty of headlight detection is to discern vehicle headlights from environment lamps and reflections. Reflections include reflective lane markings, traffic signs and reflections of headlights on road or water surfaces. To solve the problem different methods have been designed, which can be classified into rule-based, physical-model-based and machine learning-Technique - based methods. Rule-based methods are the most commonly used ones. Following a threshold based blob extraction, or some variants such as adaptive threshold and multilevel threshold, they detect headlights according to rules which include prior knowledge and statistical laws on contrast, color, position, size and shape. Huang *et al.* [4] introduced a block-based contrast analysis method to detect vehicles in nighttime scenes. Though it can effectively detect moving objects, it has difficulty in filtering out moving and high-contrast reflections. Chern and Hou [5] analyze data in red–green–blue (RGB) color space to detect the redness of rear lights. They adopt a variable threshold respecting the fact that near spots are brighter than the spots faraway. Other color spaces such as Hue, Saturation, and Value (HSV) [6], $L * a * b$ [7] and Y Cb Cr color space [8] are also used to extract headlights. Chen *et al.* [9] used rules on the width-height-ratios and areas to identify blobs as potential vehicle headlights.

III.METHODOLOGY

In this system we are introducing smart helmet to prevent accident. Here we are using Alcohol sensor to detect the person drink alcohol or not.

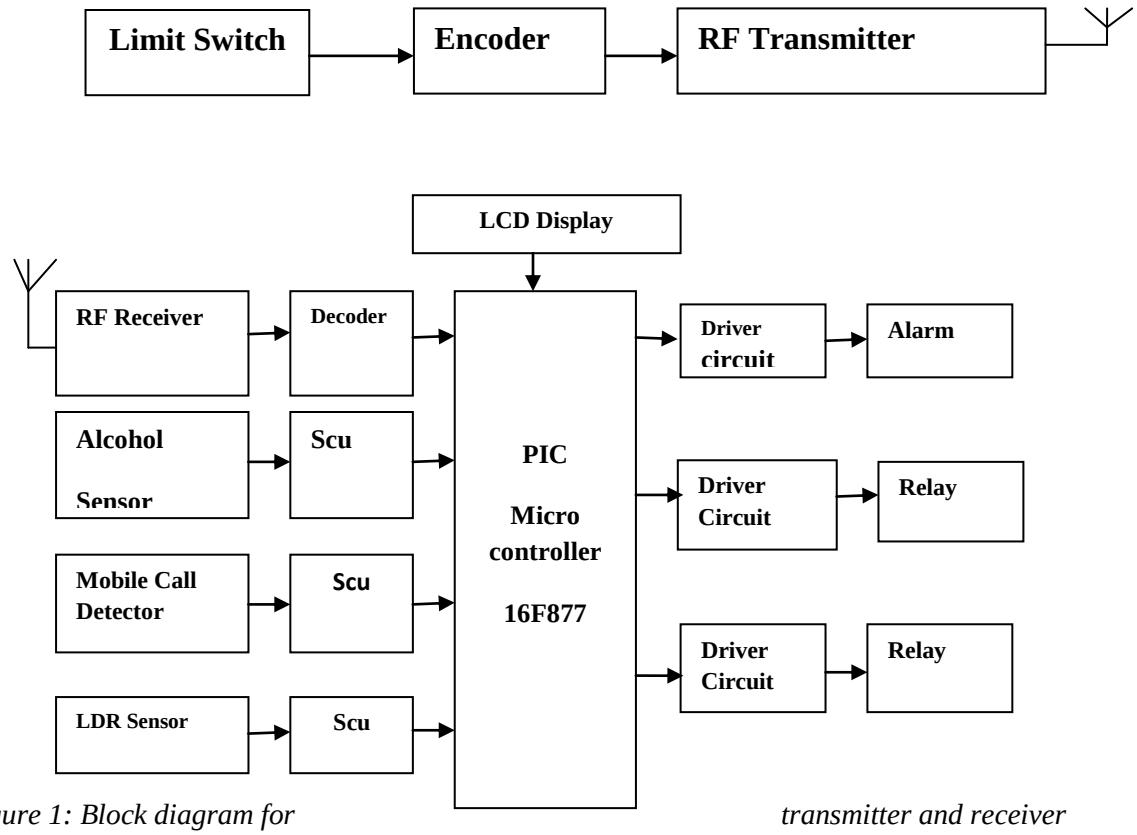

Figure 1: Block diagram for transmitter and receiver

A) LIMIT SWITCH:

In an electrical engineering a limit of switch operated by the motion of a machine part or either the presence of an object. They are used for controlling machinery as a safety interlocks, as a part of a control system. A limit switch act as an electromechanical device that consists of an actuator mechanically linked to a set of contacts. When an object comes into contact with the actuator, the device operate to contacts are make to break an electrical connection.

B) ENCODER AND DECODER:

An **encoder** is a device.It act as a circuit, transducer, software program, algorithm.It converts information from one format or code to another, for the purposes of standardization, speed, secrecy, security, or saving space by shrinking size. A **decoder** is a device which it can operate reverse function of an encoder, undoing the encoding process original information can be recover back. While encoding ,the decoding is also used in same manner. In digital electronics, a decoder can take the form of a multiple-

input, multiple-output logic circuit that converts coded inputs into coded outputs, where the input and output codes are different.

C) ALCOHOL SENSOR:

Blood alcohol content (BAC), also called blood alcohol concentration, blood ethanol concentration, or blood alcohol level is most commonly used as a metric of alcohol intoxication for medical or legal purposes. Blood alcohol content is usually in the form of percentage of blood . For instance, a BAC of 0.10 means that 0.10% of a person's blood, by volume, is alcohol.

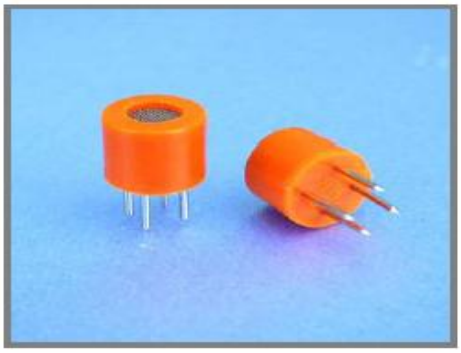

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Figure 2: Alcohol sensor

This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration.

Alcohol Gas Sensor MQ-3 Features:

- 5V DC or 5V AC
- Requires heater voltage
- Operation Temperature: -10 to 70 degrees C
- Heater consumption: less than 750mW

Dimensions:

- 16.8mm diameter
- 9.3 mm height without the pins

D) PIC MICROCONTROLLER:

The microcontroller that has been used for this project is from PIC series. PIC microcontroller is the first RISC based microcontroller fabricated in CMOS (complementary metal oxide semiconductor) that uses separate bus for data and instruction allowing simultaneous access of data memory and program.

PIC (16F877):

The micro controller offers different kinds of memories. EEPROM, EPROM, FLASH etc., are some of the memories of which FLASH is the most recently developed. Technology that is used in pic16F877 is flash technology, so that data is retained even when the power is switched off. Easy Erasing and Programming are other features of PIC 16F877.

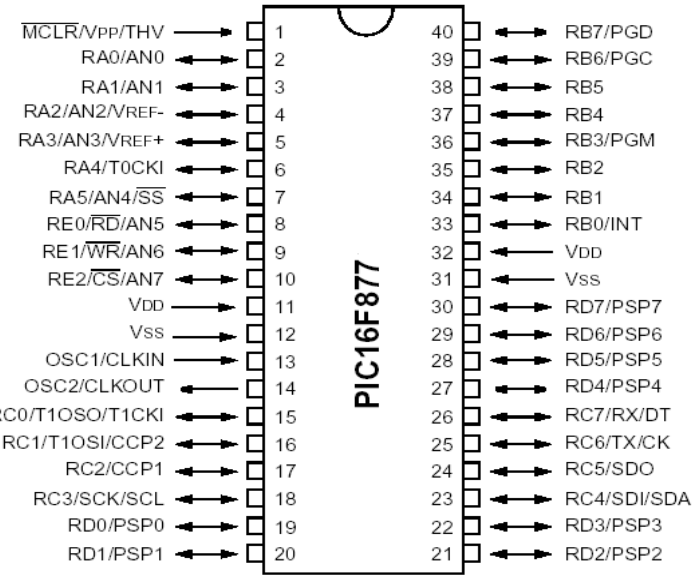

Figure 3: PIN DIAGRAM OF PIC 16F877

E) DRIVER CIRCUIT:

In electronics, a driver is an electrical circuit or electronic component used to control another circuit such as a high-power transistor. The term is used for a specialized computer chip that controls the high-power transistors in AC-to-DC voltage converters. An amplifier can also be considered as an driver for loudspeakers, or a constant voltage circuit that keeps an attached component operating within a broad range of input voltages.

F) RELAY:

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be operated as on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow controlling one circuit to switch a second circuit which can be completely separate from the first switch. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection between the two circuits; the link is mechanical and magnetic. The coil of a relay passes through a very large current, typically 30mA for a 12V relay, but it can be as much as 100mA for relays designed to operate from lower voltages. Most ICs (chips) cannot provide this current and a transistor is usually used to amplify the small IC current to the larger value required for the relay coil. The maximum output current for the popular 555 timer IC is 200mA so these devices can supply relay coils directly without amplification.

Figure 4: relay

G) SIGNAL CONDITIONING UNIT:

The signal conditioning unit accepts input signals from the analog sensors and it gives a conditioned output of 0-5V DC corresponding to the entire range of each parameter. This unit also accepts the digital sensor inputs and outputs in 10 bit binary with a positive logic level of +5V. Microcontrollers are widely used to control in power electronics. They provide real time control by processing analog signals to obtained from the system. A suitable isolation interface needs to be designed for interaction between the control circuit and high voltage hardware .A signal conditioning unit which provides necessary interface between a high power grid inverter and a low voltage controller unit.

H) LDR:

A photo resistor or LIGHT DEPENDEN T RESISTOR or cadmium sulfide (CdS) cell is a resistor whose resistance decreases with increasing incident light intensity.

Figure 5: LDR

It can also be referred to as a photoconductor. A photo resistor is made of a high resistance semiconductor. If light falling on the device is of high enough frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electron (and its hole partner) conduct electricity, thereby lowering resistance. A photoelectric device can be either intrinsic or extrinsic. An intrinsic semiconductor has its own charge carriers and is not an efficient semiconductor. Extrinsic devices have impurities, also called do pants, and added whose ground state energy is closer to the conduction band; since the electrons do not have as far to jump, lower energy photons (i.e., longer wavelengths and lower frequencies) are sufficient to trigger the device.

I) ALARM AND BUZZER:

An **alarm** gives an audible or visual warning about a problem or condition. A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors

connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise).

Figure 6: ALARAM AND BUZZER

IV.CONCLUSION:

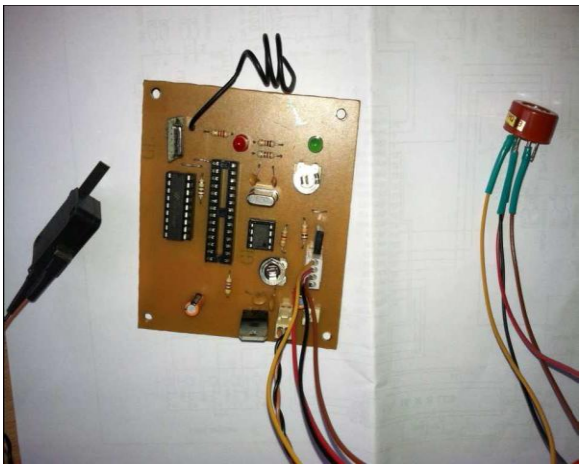

Figure 7: Hardware setup

This system was designed majorly to avoid motor bike accident. The accidents are increased majorly due to absence of helmet or the usage of alcoholic drinks so the major objective of this system is to develop an electronic smart helmet system. This system sequently checking the helmet wearing and drunken driving. By implementing this system we can reduce head injuries occur offently. It helps the driver to control vehicle easily. And it is most economical and easy to use. So it has good social aspects.

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