ISSN (Print): 2320-5504

ISSN (Online): 2347-4793

Asia Pacific Journal of Research
A peer reviewed international Journal
IMPACT FACTOR : 6.58
Print -ISSN -2320 - 5504
Online-E-ISSN - 2347 - 4793

ACCIDENT PREVENTION USING EYE BLINK SENSOR

M Hemamalini
Final year- Dept.of E.E.E
Periyar Maniammai University
Thanjavur, India
malini17eee@gmail.co

M Sathis Kumar
Asst. Professor- Dept.of E.E.E
Periyar Maniammai University
Thanjavur, India
sathishkumarm@pmu.edu

P Muhilan
Asst. Professor- Dept.of E.E.E
Periyar Maniammai University
Thanjavur, India
muhilaneee@yahoo.com

***Abstract*—This project presents an accident prevention using eye blink sensor for preventing accident due to drowsy is prevented and controlled when the vehicle is out of control. And also the drunken drive also prevented by installing alcohol detector in the vehicle. The term used here for the recognisation that the driver is drowsy is by using eye blink of the driver. In recent times drowsiness is one of the major causes for highway accidents. The drowsiness is identified by the eye blink closure and blinking frequency through infra-red sensor worn by driver by means of spectacles frame. If the driver is drunk then the buzzer indicates and the vehicle doesn't allow the driver to start the vehicle. If the driver is drowsy, then the system will give buzzer signal and the speed of the vehicle is reduced. A marketable design would also shut down power to the vehicle, thus providing maximum probability for avoiding road accidents and extending a crucial window for preventive and mitigation measures to be taken.**

Keywords—Driver drowsiness detection; accident avoidance; google; IR sensor; microcontroller16f877A.

I. INTRODUCTION

We can't take care of ours while in running by less conscious. If we done all the vehicles with automated security system that provides high security to driver, also gives alarm. All vehicles should be equipped with eye blink sensor and alcohol sensor in future avoids these types of accidents Vehicle accidents are most common if the driving is inadequate. These happen on most factors if the driver is drowsy or if he is alcoholic. Driver drowsiness is recognized as an important factor in the vehicle accidents. Advanced technology offers some hope avoid these up to some extent. This project involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening Position. This output is give to logic circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. A from PIC and other necessary elements as per our design requirement results as output. As microprocessor designs get faster, the cost of manufacturing a chip (with smaller components built on a semiconductor chip the same size) generally stays the same. Before microprocessors, small computers had been implemented using racks of circuit boards with many medium and small-scale integrated circuits. Microprocessors integrated this into one or a few large-scale ICs. Continued increases in microprocessor capacity have since rendered other forms of computers almost completely obsolete with one or more microprocessors used in everything from the smallest embedded systems and handheld devices to the largest mainframes and supercomputers.

II. PROBLEM DEFINITION

A. Need of the System

Road accidents claim a staggeringly high number of lives every year. From drunk driving, rash driving and driver distraction to visual impairment, over speeding and over-crowding of vehicles, the majority of road accidents occur because of some fault or the other of the driver/occupants of the vehicle. According to the report on "Road Accidents in India, 2011" by the Ministry of Transport and Highways, Government of India, approximately every 11th person out of 100,000 died in a road accident and further, every 37th person was injured in one, making it an alarming situation for a completely unnecessary cause of death. The above survey also

ISSN (Print): 2320-5504

ISSN (Online): 2347-4793

concluded that in 77.5 percent of the cases, the driver of the vehicle was at fault. The situation makes it a necessity to target the root cause of road accidents in order to avoid them. While car manufacturers include a system for avoiding damages to the driver and the vehicle, no real steps have been taken to actually avoid accidents. "Road Accident Prevention Unit" is a step forward in this stead. This design monitors the driver's state using multiple sensors and looks for triggers that can cause accidents, such as alcohol in the driver's breath and driver fatigue or distraction. When an alert situation is detected, the system informs the driver and tries to alert him. If the driver does not respond within a stipulated time, the system turns on a distress signal outside the vehicle to inform near by drivers and sends a text message to the driver's next of kin about the situation. A marketable design would also shut down power to the vehicle, thus providing maximum probability for avoiding road accidents and extending a crucial window for preventive and mitigation measures to be taken.

According to the study conducted by the Ministry of Transport and Highways, only 9 percent of the accidents observed were attributed to material causes such as faults in the road, weather conditions, vehicular defects etc. And a meager 3.7 percent of the accidents were caused when a cyclist or pedestrian was at fault. Further, 60 percent of the driver-caused road accidents were attributed to over speeding, 16.7 percent of these were due to alcohol or drug consumption and lastly 23.6 percent were caused due to driver fatigue or overcrowding of vehicles. These clearly bring to light the gravity of the situation and the enormous responsibility of vehicle drivers towards causing road accidents."R.A.P.U"is motivated by the desire to curb such incidents which are caused due to a moment of madness or complete irresponsibility of the driver as such situations are easily avoidable. A life lost in a road accident is unforeseen and absolutely unnecessary, making the addressing of the situation a complete must.

B. Analysis of Eye blinks Sensor

The technical content of R.A.P.U's design is inspired by the module suggested in "Accident Prevention Using Eye Blinking", published in the International Journal for Computer Applications. Our goal was to make the suggested design simpler to implement, low cost, low power, easily installable and extendable. R.A.P.U has been dealt with in an entry level manner and has been tested for premium effectiveness.

This issue has previously been dealt with in quite detail in "Accident Prevention Using Eye Blinking", published in the International Journal for Computer Applications. The author suggested the use of spontaneous video capture and image processing to analyze the driver's state. However the key factors inhibiting the driver's ability i.e. Eye blinking can be easily analyzed using low cost sensors such as accelerometers and IR sensors, thus obviating the need for expensive equipment as well as advanced processing platforms. Including these in the "Road Accident Prevention Unit" has made the design a low cost, low power implementation which can be easily installed and changed. The accident prevention and mitigation steps involve a Distress Signal visualization outside the vehicle using a, alarm intimation for the driver at non-attendance of the situation.

III. PROPOSED SYSTEM DESIGN

A. Block Diagram

The following diagram will give the details about the proposed system design.

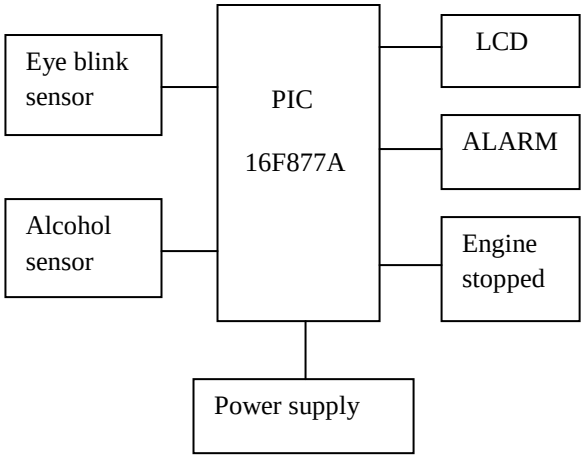

Figure 01: Block Diagram of the System

B. Microcontroller PIC16F877A

The PIC microcontroller PIC16f877a is one of the most renowned microcontrollers in the industry. This controller is very convenient to use, the coding or programming of this controller is also easier. One of the main advantages is that it can be write-erase as many times as possible because it use flash memory technology. It has a total number of 40 pins and there are 33 pins for input and output. PIC16F877A is used in many PIC microcontroller projects. PIC16F877A also have many application in digital electronics circuits.

PIC16f877a finds its applications in a huge number of devices. It is used in remote sensors, security and safety devices, home automation and in many industrial instruments. An EEPROM is also featured in it which makes it possible to store some of the information permanently like transmitter codes and receiver frequencies and some other related data. The cost of this controller is low and its handling is also easy. Its flexible and can be used in areas where microcontrollers have never been used before as in coprocessor applications and timer functions etc.

C. Eye blink sensor

The eye-blink sensor works by illuminating the eye and/or eyelid area with infrared light, then monitoring the changes in the reflected light using a phototransistor and differentiator circuit. The exact functionality depends greatly on the positioning and aiming of the emitter and detector with respect to the eye. Connect regulated DC power supply of 5 Volts. Black wire is Ground, Next middle wire is Brown which is output and Red wire is positive supply. These wires are also marked on PCB.To test sensor you only need power the sensor by connect two wires +5V and GND. You can leave the output wire as it is. When Eye closed LED is off the output is at 0V.Put Eye blink sensor glass on the face within 15mm distance, and you can view the LED blinking on each Eye blink. The output is active high for Eye close and can be given directly to microcontroller for interfacing applications.

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ISSN (Online): 2347-4793

D. Diagram

The following diagram shows the schematic view of sensor.

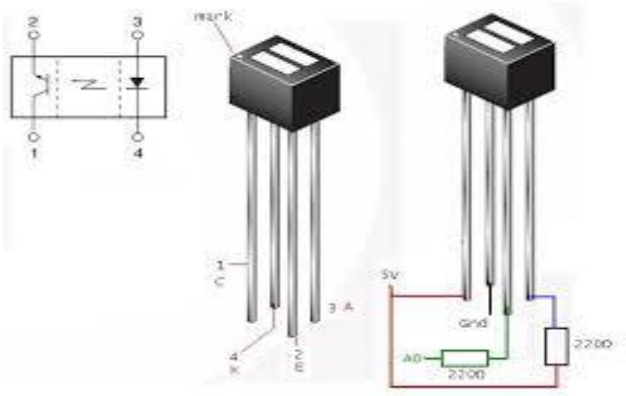

Figure 02: Pin Diagram of Eye blink sensor

E. Features

- Eye blink indication by LED
- Instant output digital signal for directly
- Connecting to microcontroller
- Compact Size
- Working Voltage +5V DC

F. Specification

- Operating voltage= +5v DC supply
- Operating current= 100mA
- Output data level = TTL
- Eye blink = Indicated by led and output high pulse

G. Eyeblinkoutput

- 5V (High) → LED ON When Eye is close.
- 0V (Low) → LED OFF when Eye is open.

IV. CONCULSION

This project has proposed a design and implementation of accident prevention using eye blink sensor with PIC 16F877A Microcontroller Successfully. With future aims to implementing further advanced technology offers some hope avoid this up to some extent. This project involves measure and controls through eye blink using IR sensor.

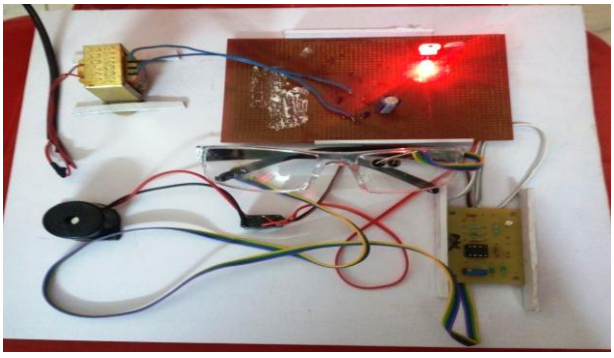

Figure 03: Real time of the output of the system.

A. Advantages

- Intelligent transportation
- Accident due to drowsiness can be avoided
- Spectacle are used to detect the eye movement and closure, it's free from reflection
- and easy to use
- Easily affordable
- Easily portable
- It can be used by any one
- Control process of this device is so easier
- Power consumption is very low

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