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ARDUINO BASED ACCIDENT PREVENTION SYSTEM USING EYE BLINK SENSOR

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ABSTRACT

This paper aims to create a framework to keep the car safe and secure through critical activity. When we run in ignorance we cannot take care of our own. If we make all vehicles with an automatic safety system that gives the driver a high level of protection, an alarm will also be issued. The device has an installed a eye blink sensor. Once the driver has started the engine, the sensors automatically detect the blink of eye. On this device the output of the sensor is provided for comparison with ARDUINO. When the value reaches the set level, the buzzer automatically vibrates, the LED glows, and the car stops automatically when eye blink sensor receives a signal from the transmission module.

Keywords: Arduino, Eye Twitch Sensor, Led, Dc Motor.

I. INTRODUCTION

The failure of drivers in any vehicle incidents is a very important part of the dangerous problem facing the community. It can cause serious accidents for a variety of reasons and sometimes fatal as most drivers are out of control. Various things involved in car crashes such as high speed, sleep while driving other distractions such as texting while driving, talking to others, playing with children, etc. Citizens are aware of dangerous drive cars but do not understand the level of driving. fatigue. About 1374 people die every day, and about 400 people die. Approximately 57 road accidents and 17 deaths per hour as a result of motor vehicle accidents. In car accidents, 54.1 percent are between the ages of 18 and 34. The Government of India, the Department of Border Transport and the Department of Highways are planning to reduce the number of road accidents and fatalities by 50 percent by 2022. Globally, car accidents have proven to be one of the world's biggest security concerns. In 2015 about 5 lakh road accidents occurred in India. A tired driver is not able to steer the car by those who are sleep at work, he is unable to take adequate steps leading to an accident so it is necessary to monitor the driver's drowsiness to avoid accidents. We focused on this issue using the eye twitch sensor to introduce a car accident prevention program. This paper examines the detection of various collisions and the reduction of such a system.

II. SYSTEM DESCRIPTION

Embedded system devices are an important part of daily life. These are a combination of hardware and software, in which software is commonly known as hardware embedded software. One of the most important features of these systems is that they provide o/p within time limits. So we often use embedded systems on simple and sophisticated devices as well. In many devices like microwave, calculators, TV remote control, home security and crowded control systems, embedded system applications are very much involved in our real life. Embedded system block diagram is shown in Fig 1. Embedded devices are widely divided into several categories, depending on the hardware and software and the microcontroller "8 or 16 or 32-bit"

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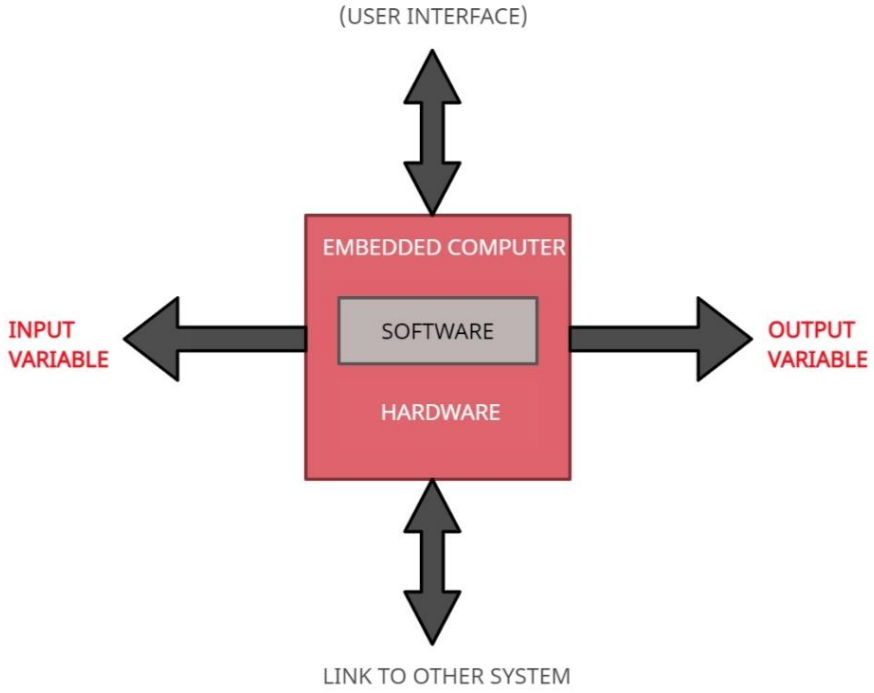

Figure 1: Embedded Systems block diagram

Airbags are currently a variety of features found in cars that are useful for car safety and security. In particular, these vehicles have been standard front airbags since 1998. This function aims that when the driver is sleepy, a buzzer signal in the system is provided, which reduces the driver's speed. The marketable design will still shut off the car power to maximize the chances of avoiding road accidents and opening the window for preventive and mitigation measures.

III. SYSTEM DESIGN IMPLEMENTATION

System block diagram is comprise of: Eye blink (IR): related to sleep detection and alert the driver with the components used in the proposed operation are Eye blink length and frequency, Power supply, Buzzer, LED ARDUINO (UNO), Relay Module, DC as shown in Figure 2. The main component is Arduino Uno which is an ATmega328 based microcontroller (MC) that performs all functions related to controlling the embedded system circuit. The blinking module works by illuminating the eye area with infrared light, and then detecting changes in scattered light using an image transistor and a separation circuit. Each of the components is described below.

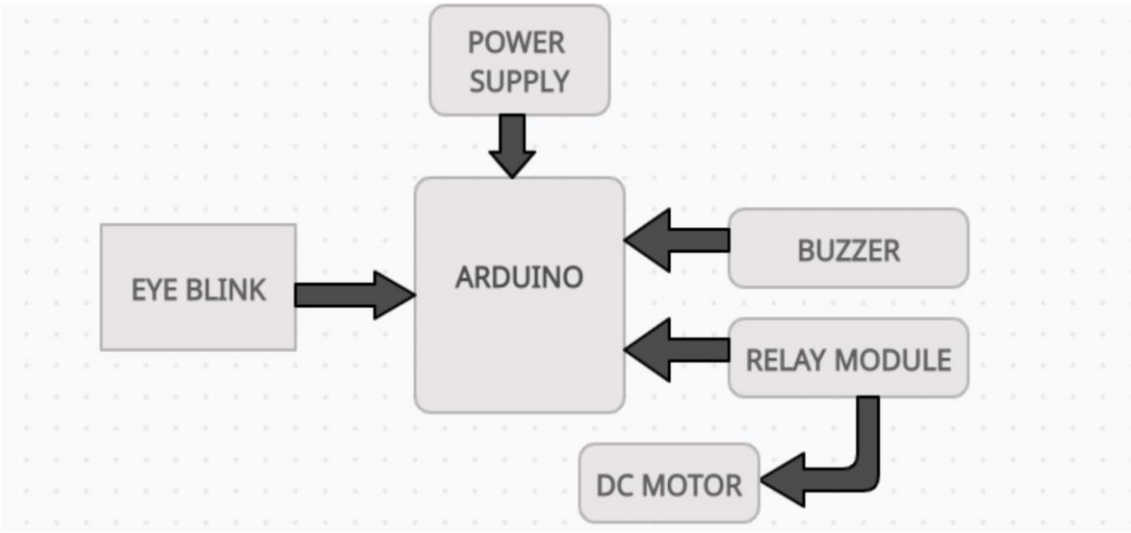

Figure 2: Schematic Block Diagram

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A. Arduino

Arduino is an open source MC board based on ATmega328P MC and developed by Arduino.cc. The board has 14 PINs and 6 analog pins. All of this will help the microcontroller by attaching the board to a computer for continuous operation. Strom supply of this board can be made using AC to DC Converter, USB cable, otherwise plug.Figure 3 shows arduino.

Figure 3: Arduino

B. Eye Blink Sensor

Using a phototransistor and a separator circuit, the blink sensor illuminates the eye area and eyelid with infrared light and detects changes in the reflected light. This study includes measuring and monitoring the blink of an eye with the help of an IR sensor. Closed eye indicates that the output of the IR receiver is high except that the output from the IR receiver is low. Figure 4 shows an instant blink sensor with an IR attached to it.

Figure 4: Eye Blink Sensor

C. Buzzer

The "Piezoelectric Sound Modules" presented here work on the concept of conversion using natural piezoelectric ceramic oscillation. These buzzers are available in lightweight, portable sizes ranging from a small diameter of 12 mm to large electrical outlets from peizo. The one shown in fig 6 below is a simple word that when enabled makes a continuous beep. To alert the driver when he first falls sleepy, the buzzer will be connected to the Eye-Blink Sensor.

Figure 5: Buzzer

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D. LED

LED is an semiconductor light source. LED is a separate diode form and has certain electrical features of the PN junction diode. The LED therefore allows the current to flow forward and blocks the energy flowing in the opposite direction. The LED takes up less than 1 mm in the field. LED technology used to perform various electrical and computer functions.

E. DC Motor

A DC is an electric motor that converts mechanical energy into electrical energy. The first widely used car was the DC engine, as it could be used for current direct distribution systems. The speed of a DC car can be adjusted to a wider spectrum, using a variable voltage and converting winding current strength into its field. Small DC engines are used in cars, toys and electrical appliances. The universal motor is capable of running precise action, and with integrated power tools and devices, a lightweight brush engine. Large DC engines commonly used in electric vehicles, elevator and hoist propulsion, as well as rolling steel drivers. For practical reasons in this project we have used a DC motor instead of a car. The motor acts as a car axle, and rotates as electricity is fed to it. Arduino UNO is an open source MC board based on ATmega328P MC and developed by Arduino.cc. The merging process involves pre-processing the arduino system to convert the design into a C ++ system. It will then be sent to a moderator who provides readable human code into computer-readable commands. Start the integration and upload process by pressing the sub-project toolbar or in the "Visual Studio> Create & Upload menu.

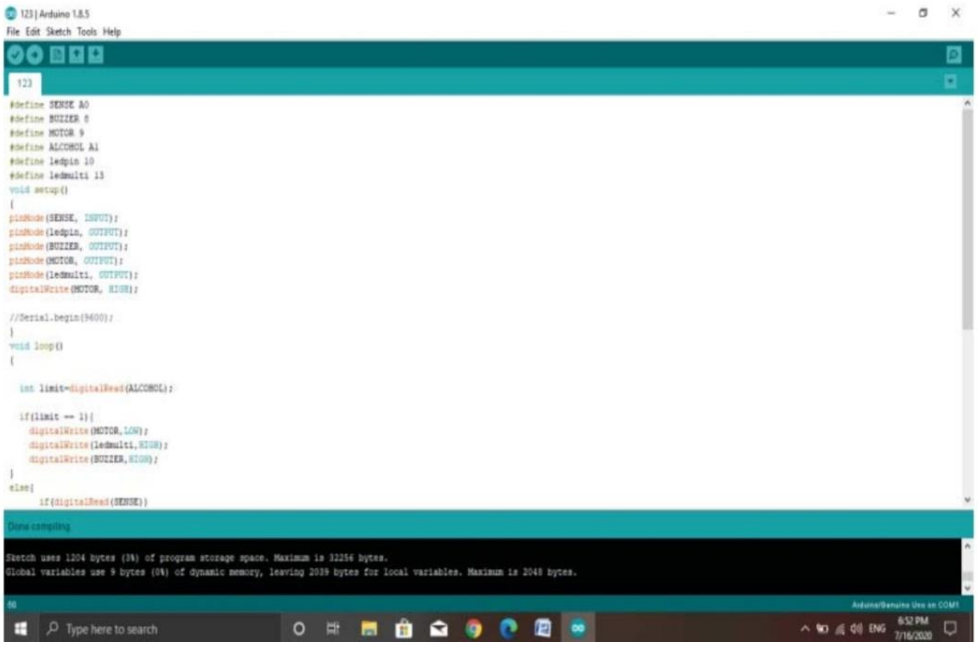

Figure 6: Arduino Compiler

CODE:

```
#include<reg51.h>
//#include<lcd.h>
sbit s1=P1^4;
sbit s2=P1^5;
sbit s3=P1^6;
sbit s4=P1^7;
sbit r1=P1^0;
sbit r2=P1^1;
sbit r3=P1^2;
sbit r4=P1^3;
```

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```
 sbit rs=P3^7;
sbit en=P3^6;
void delay(unsigned int ch) //delay function
          {
            unsigned int i=0,j=0;
for(i=0;i<=ch;i++)
            {   for(j=0;j<=i;j++)
                          {
                          }
          }
          }
          void clcd(unsigned char ch)
{
           P2=ch;
           rs=0; en=1;
      delay(15);
       en=0;
}

          void dlcd(unsigned char ch)
          {
           P2=ch;
           rs=1;
           en=1;
           delay(15);
           en=0;
           }
          void stringlcd(unsigned char ch,unsigned char *chrt)
           {
           unsigned int ix=0;
           if(ch==0x80)
           clcd(0x01);
           clcd(ch);
           for(ix=0;chrt[ix]!='\0';ix++)
           {
           dlcd(chrt[ix]);
          }
          }
           void initlcd()
           {
           clcd(0x38);
           clcd(0x0e);
           clcd(0x06);
           clcd(0x01);
```

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```
        clcd(0x80);
}
        void main()
{
P1=0x00;
initlcd();
stringlcd(0x80,"hai");
        while(1)
        {
                if(s1==0)  //front
                {
                r1=1;
                r2=0;
                r3=1;
                r4=0;
                stringlcd(0xc0,"front   ");
                }
                else if(s2==0)
                {
                r1=0;
                r2=1;
                r3=0;
                r4=1;
                stringlcd(0xc0,"back   ");
                }
        else if(s3==0){
                r1=1;
                r2=0;
                r3=0;
                r4=1;
                stringlcd(0xc0,"left   ");    }
                else if(s4==0){
                r1=0;
                r2=1;
                r3=1;
                r4=0;
                stringlcd(0xc0,"right   ");}
                else {
                r1=0;
                r2=0;
                r3=0;
                r4=0;stringlcd(0xc0,"stopped   ");}
                delay(300);
        }
```

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IV. DESIGN ANALYSIS & RESULT

The system works with the goal of the eye twitch sensor that receives the driver's sleep. This effect is given to the buzzer. The rotation speed is reduced when the driver is sleep, while on the other hand the blink sensor receives the sensor stops the wheel. This program offers a new way to stop drowsy men. The device has an installed blink sensor. Once the driver has started the engine, the sensors automatically detect the blink of an eye and check the his or her breath. The process is depicted by the flow diagram shown in fig 7. On this device the sensor output is given to compare with ARDUINO. If the value exceeds the limit when the buzzer automatically generates vibration, the LED glows and the car stops automatically.

Procedural steps for implementation:

- Connect eye Blink sensor to Arduino pin D0 illustrated in fig 8.
- Connect Buzzer to Arduino pin D13.

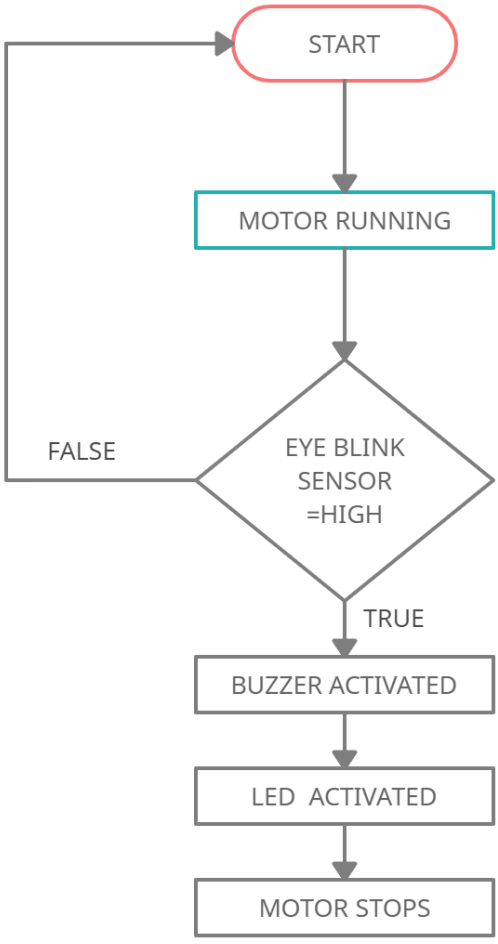

Figure 7: Flow Diagram

Methodical Steps for execution:

Connect DC motor to relay and give relay connection to the Arduino pin A0. Now dump the code into Arduino using USB cable Connect USB cable to pc and open arduino software, enter the code and compile & run then select the arduino port and click upload button then your code will be uploaded into arduino. Now connect the batteries and check the output of eye blink sensor. If blink of eye is more than 2 seconds car (motor) will be stopped. The proposed work is completely illustrated in fig.8

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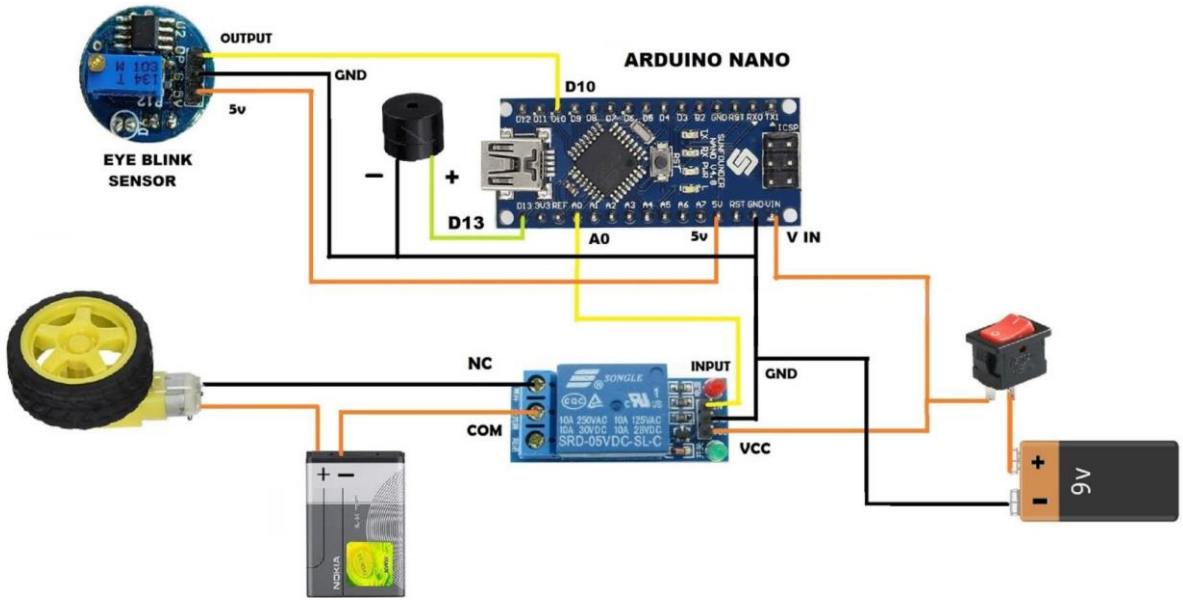

Figure 8: Final Connection of the Block

V. CONCLUSION

People are increasingly exposed to dangers today. Therefore, we need to take action against this as an engineer and have the solution we need. Any automation is designed to protect a person. Such a model is tasked with developing a system for diagnosing and controlling the speed of vehicles to prevent accidents. To some extent, modern technology offers some hope of stopping these. This paper includes monitoring the blink of an eye with the help of an IR sensor. On this device the output of the sensor is provided for comparison with ARDUINO. When the value reaches the set level, the buzzer automatically vibrates, the LED glows, and the car stops automatically when the eye blink sensor receives a signal from the transmission component.

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