DETECTING DROWSINESS AND ALERTING THE DRIVER
A PROJECT REPORT

Submitted in partial fulfilment of project
For the award of the Degree of

BACHELOR OF TECHNOLOGY
IN
ELECTRONICS & COMMUNICATION ENGINEERING

By

I.SIVARAMAKRISHNA (R141089)

Under the Guidance of

Mr. J.RAJ SEKHAR
AP IIIT RKVALLEY, RGUKT

RAJIV GANDHI UNIVERSITY OF KNOWLEDGTECHNOLOGIES, ANDHRA PRADESH
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DECLARATION

I here by declare that, s a part of my 3rd year academic curriculum and under the guidance of

Mr .J.RAJA SEKHAR(Project Guide), AP IIIT, Idupulapaya for my minor project program of 2019-2020. Duration of minor project is 02/01/2019 to 03/05/2019. In this minor project, I developed my knowledged and practical experiences. This is my original work and it has been out presented earlier in this manner. This information is purely academic interest.

I.SIVA RAMAKRISHNA(R141089)

CERTIFICATE

This is to certify that the third year semister-2 mini project **DETECTING DROWSINESS AND ALERTING THE DRIVER** submitted by **I.SIVA RAMAKRISHNA(R141089)** under the guidance of **Mr .J.RAJA SEKHAR** in Electronics & Communication Engineering at RGUKT- RK Valley .

Internal guide

ECE Department
RGUKT, RK- Valley

Head of the Department

Head & Asst.Professor
ECE Department
RGUKT, RK- Valley

ACKNOWLEDGEMENT

Every successful task involves the support of many intellectuals and their encouragement of knowledge for me. The word thanks would really be small to express my gratitude, yet this is all I can do. I deeply express my acknowledgements to all the people who directly or indirectly helped in my endurances. It is pleasure to me to add heart full words for the people who were part of this training in numerous ways and gave me their never ending support right from the stage the training was conceived.

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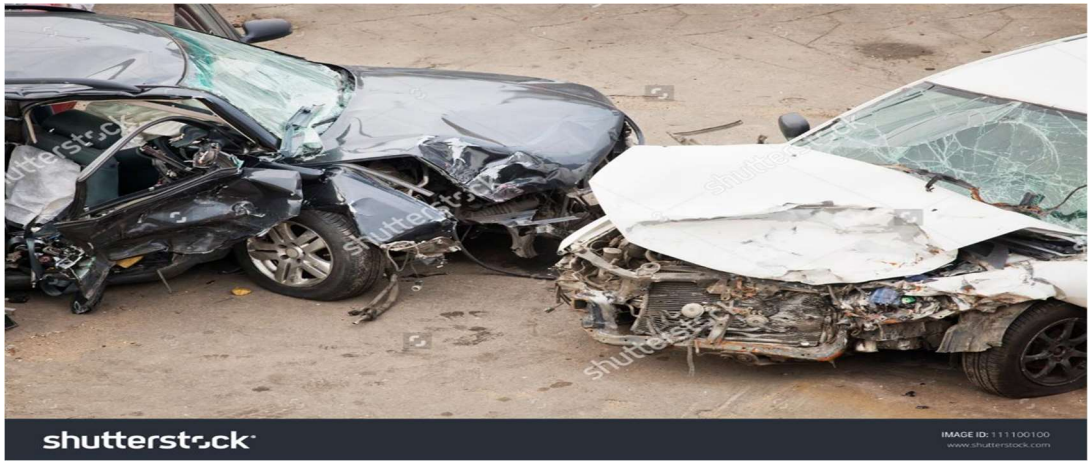
I.SIVA RAMAKRISHNA(R141089)

CONTENTS

ABSTRACT

Whenever a person feels asleep is called drowsiness.Now a days road accidents are happening more due to many reasons in that on of the main reason is drowsiness .And another reason is drunk and drive .In night times vehicle drivers feels drowsiness ,and he lost his body control which leads to accidents.This is because when the driver is not able to control his vehicle at very speed on the road .And the same problem occures if he was drunk.The national highway traffic safety administration (NHTSA) said that there are 100000 of accidents are occured due to the drowsiness .Because of these drowsiness 71000 injuries are occured and 12.5 billion in damazed productivity and property loss.Driving performance deteriorates with incresed drowsiness with resulting crashing consistuting 20%-23% of all vehical accidents.

Eye blink sensors works based on the eye moment of the driver .We already fixing the sensors,by using these sensors we absorbs the moment of blinking of eyes when the drivers eye is at almost close position then the performance of the sensors output is low.Uring the driving when driver feels drowsiness the sensors recognizes the condition of the driver and give the input to the microcontroller.Based on the sensor readings MICROCONTROLLER alerts the driver by using buzzer and speaker and if he doesn't respond it will stops the vehicle by using an electrical break at a time.It will alert the opposite vehicle also.



CHAPTER-1

Working Operation of our proposed model

This proposed system consists the equipment like Arduino uno, eye blink sensor, buzzer for alerting the driver and servo motor for showing the vehicle speed, Jumper cable, Male and female header pins.

The wiring of the device is done in a following manner. In the eye blink sensor have the three colors of wires which are “red”is connected to the 5 volts of aurdino,”yellow”is connected to GND of the Arduino and “grey” the logic out put is connected to the analog pin(A0)of the aurdino .Buzzer is connected to the 8&9 pins of the aurdino .

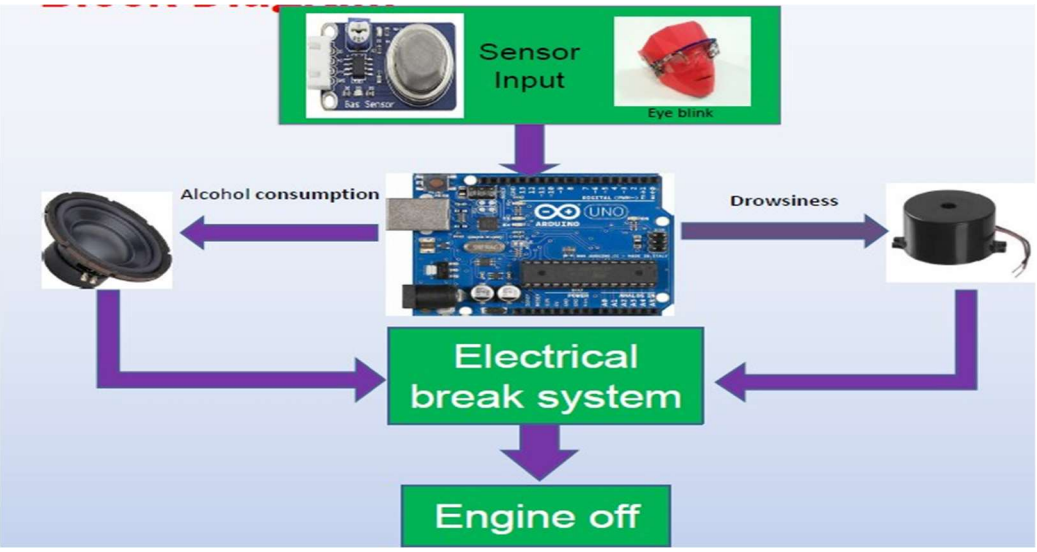
Then solder all the things and connect the arduino and eye blink sensor to the board.In the end after all the cnnections are done to the Arduino board, upload the code to arduino board.

The eye blink sensor is a transducer, and is used in pair as transreceiver. eye blink sensors works based on the eye moment of the driver .We are already fixing the sensors ,by using these sensors we absorves the moment of blinking of eyes .When the drivers eye is at almost close position then the performance of this sensors output is high.During the driving if driver feels drowsiness the sensor recognizes the condition of the driver and give input to the microcontroller. The wheel is slowed or stopped depending on the condition. This is accompanied by the owner being notified through the GSM module, so the owner can retrieve the driver’s location, photograph and police station list near to driver’s location. This is how the driver can be alerted during drowsiness and the owner can be notified simultaneously.

CHAPTER-2

DETECTING DROWSINESS AND ALERTING THE DRIVER

💔 BLOCK DIAGRAM:



CHAPTER-3

WORKING OF SENSORS

★ EYE BLINK SENSOR:

➢ 3.1 Working of Eye blink sensor:

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.

EYE BLINK OUTPUT:

5V (High) → LED ON When Eye is close.

0V (Low) → LED OFF when Eye is open.

SPECIFICATION:

Operating Voltage :+5V DC regulated

Operating Current :100mA

Output Data Level : TTL Level

Eye Blink Indicated by LED and Output High Pulse

★ **PIEZO BUZZER:**

★ **3.2 Working of piezo buzzer:**

★ This Piezo Buzzer is ideal to connect to a compatible flight controller as a low voltage alarm or lost model alarm. This Piezo Buzzer operates at 5v input which is ideal since most flight controllers use this voltage.

Specifications:

★ Voltage: 5V

★ Current: less than 32mA

★ Frequency: Approx. 2300Hz

★ Diameter: 12mm

★ Thickness: 9.6mm

★ Color: Black

CHAPTER 4
INTRODUCTION TO EMBEDDED SYSTEM AND AURDUINO

💔 4.1 Classification of Embedded Systems:

Based on functionality and performance requirements, embedded systems are classified as :

- ➢ Stand-alone Embedded Systems
- ➢ Real-time Embedded Systems
- ➢ Networked Information Appliances
- ➢ Mobile Devices

💔 Stand-alone Embedded Systems:

As the name implies, stand-alone systems work in stand-alone mode. They take inputs, process them and produce the desired output. The input can be electrical signals from transducers or commands from a human being such as the pressing of a button. The output can be electrical signals to drive another system, an LED display or LCD display for displaying of information to the users. Embedded systems used in process control, automobiles, consumer electronic items etc. fall into this category.

★ Real Time Systems:

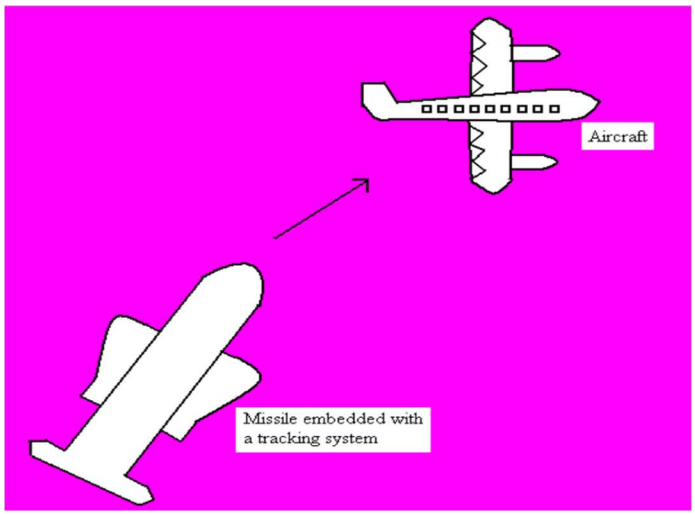
One subclass of embedded is worthy of an introduction at this point. As commonly defined, a real-time system is a computer system that has timing constraints. In other words, a real-time system is partly specified in terms of its ability to make certain calculations or decisions in a timely manner. These important calculations are said to have deadlines for completion. And, for all practical purposes, a missed deadline is just as bad as a wrong answer.

The issue of what if a deadline is missed is a crucial one. For example, if the real-time system is part of an airplane's flight control system, it is possible for the lives of the passengers and crew to be endangered by a single missed deadline. However, if instead the system is involved in satellite communication, the damage could be limited to a single corrupt data packet. The more severe the consequences, the more likely it will be said that the deadline is "hard" and thus, the system is a hard real-time system. Real-time systems at the other end of this discussion are said to have "soft" deadlines.

All of the topics and examples presented in this book are applicable to the designers of real-time system who is more delight in his work. He must guarantee reliable operation of the software and hardware under all the possible conditions and to the degree that human lives depend upon three

system's proper execution, engineering calculations and descriptive paperwork.

Fig:Hard Real-Time Embedded System:



➢ Application Areas:

Nearly 99 percent of the processors manufactured end up in embedded systems. The embedded system market is one of the highest growth areas as these systems are used in very market segment- consumer electronics, office automation, industrial automation, biomedical engineering, wireless communication, data communication, telecommunications, transportation, military and so on.

➢ *Consumer appliances:*

At home we use a number of embedded systems which include digital camera, digital diary, DVD player, electronic toys, microwave oven, remote controls for TV and air-conditioner, VCO player, video game consoles, video recorders etc. Today's high-tech car has about 20 embedded systems for transmission control, engine spark control, air-conditioning, navigation etc. Even wristwatches are now becoming embedded systems. The palmtops are powerful embedded systems using which we can carry out many general-purpose tasks such as playing games and word processing.

interacts with the smart card reader! ATM machine and acts as an electronic wallet. Smart card technology has the capability of ushering in a cashless society. Well, the list goes on. It is no

exaggeration to say that eyes wherever you go, you can see, or at least feel, the work of an embedded system.

➢ 4.2 Overview of Embedded System Architecture:

Every embedded system consists of custom-built hardware built around a Central Processing Unit (CPU). This hardware also contains memory chips onto which the software is loaded. The software residing on the memory chip is also called the 'firmware'. The embedded system architecture can be represented as a layered architecture as shown in Fig. 1.1.

The operating system runs above the hardware, and the application software runs above the operating system. The same architecture is applicable to any computer including a desktop computer. However, there are significant differences. It is not compulsory to have an operating system in every embedded system. For small appliances such as remote control units, air conditioners, toys etc., there is no need *for* an operating system and you can write only the software specific to that application.

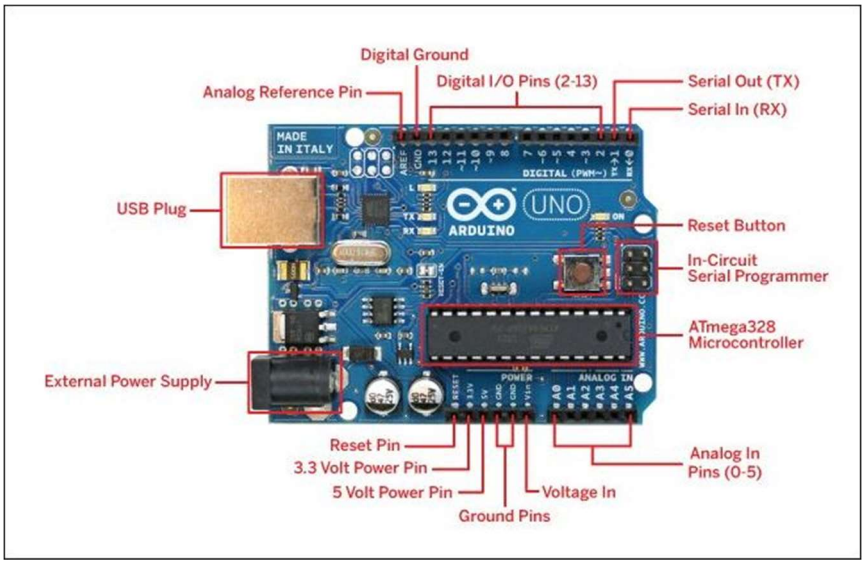
For applications involving complex processing, it is advisable to have an operating system. In such a case, you need to integrate the application software with the operating system and then transfer the entire software on to the memory chip. Once the software is transferred to the memory chip, the software will continue to run *for* a long time you don't need to reload new software.

➢ 4.3Application-specific circuitry:

Sensors, transducers, special processing and control circuitry may be required fat an embedded system, depending on its application. This circuitry interacts with the processor to carry out the necessary work. The entire hardware has to be given power supply either through the 230 volts main supply or through a battery. The hardware has to design in such a way that the power consumption is minimized.

★ 4.4What is Arduino ?:

A microcontroller board, contains on-board power supply, USB port to communicate with PC, and an Atmel microcontrollerchip.It simplify the process of creating any control system by providing the standard board that can be programmed and connected to the system without the need to any sophisticated PCB design and implementation. It is an open source hardware, any one can get the details of its design and modify it or make his own one himself.



Arduino function				Arduino function
reset	(PCINT14/RESET) PC6	1	28 PC5 (ADC5/SCL/PCINT13)	analog input 5
digital pin 0 (RX)	(PCINT16/RXD) PD0	2	27 PC4 (ADC4/SDA/PCINT12)	analog input 4
digital pin 1 (TX)	(PCINT17/TXD) PD1	3	26 PC3 (ADC3/PCINT11)	analog input 3
digital pin 2	(PCINT18/INT0) PD2	4	25 PC2 (ADC2/PCINT10)	analog input 2
digital pin 3 (PWM)	(PCINT19/OC2B/INT1) PD3	5	24 PC1 (ADC1/PCINT9)	analog input 1
digital pin 4	(PCINT20/XCK/T0) PD4	6	23 PC0 (ADC0/PCINT8)	analog input 0
VCC	VCC	7	22 GND	GND
GND	GND	8	21 AREF	analog reference
crystal	(PCINT6/XTAL1/TOSC1) PB6	9	20 AVCC	VCC
crystal	(PCINT7/XTAL2/TOSC2) PB7	10	19 PB5 (SCK/PCINT5)	digital pin 13
digital pin 5 (PWM)	(PCINT21/OC0B/T1) PD5	11	18 PB4 (MISO/PCINT4)	digital pin 12
digital pin 6 (PWM)	(PCINT22/OC0A/AIN0) PD6	12	17 PB3 (MOSI/OC2A/PCINT3)	digital pin 11(PWM)
digital pin 7	(PCINT23/AIN1) PD7	13	16 PB2 (SS/OC1B/PCINT2)	digital pin 10 (PWM)
digital pin 8	(PCINT0/CLKO/ICP1) PB0	14	15 PB1 (OC1A/PCINT1)	digital pin 9 (PWM)

Digital Pins 11,12 & 13 are used by the ICSP header for MOSI, MISO, SCK connections (Atmega168 pins 17,18 & 19). Avoid low-impedance loads on these pins when using the ICSP header.

CHAPTER-5

PROJECT CODE AND ALGORITHAM

```
int x;
int array[100];
void setup() {
Serial.begin(9600);
pinMode(A0,INPUT);
pinMode(8,OUTPUT);
pinMode(9,OUTPUT);
}
void loop(){
int c=0;
int i=0;
for(i=0;i<15;i++)
{
x=analogRead(A0);
Serial.println(x);
delay(500);
array[i]=x;
if(array[i]>100)
{
c=c+1;
//Serial.println(c);
}
}
if(c<3)
{
digitalWrite(8,HIGH);
digitalWrite(9,LOW);
Serial.println("alaram");
```

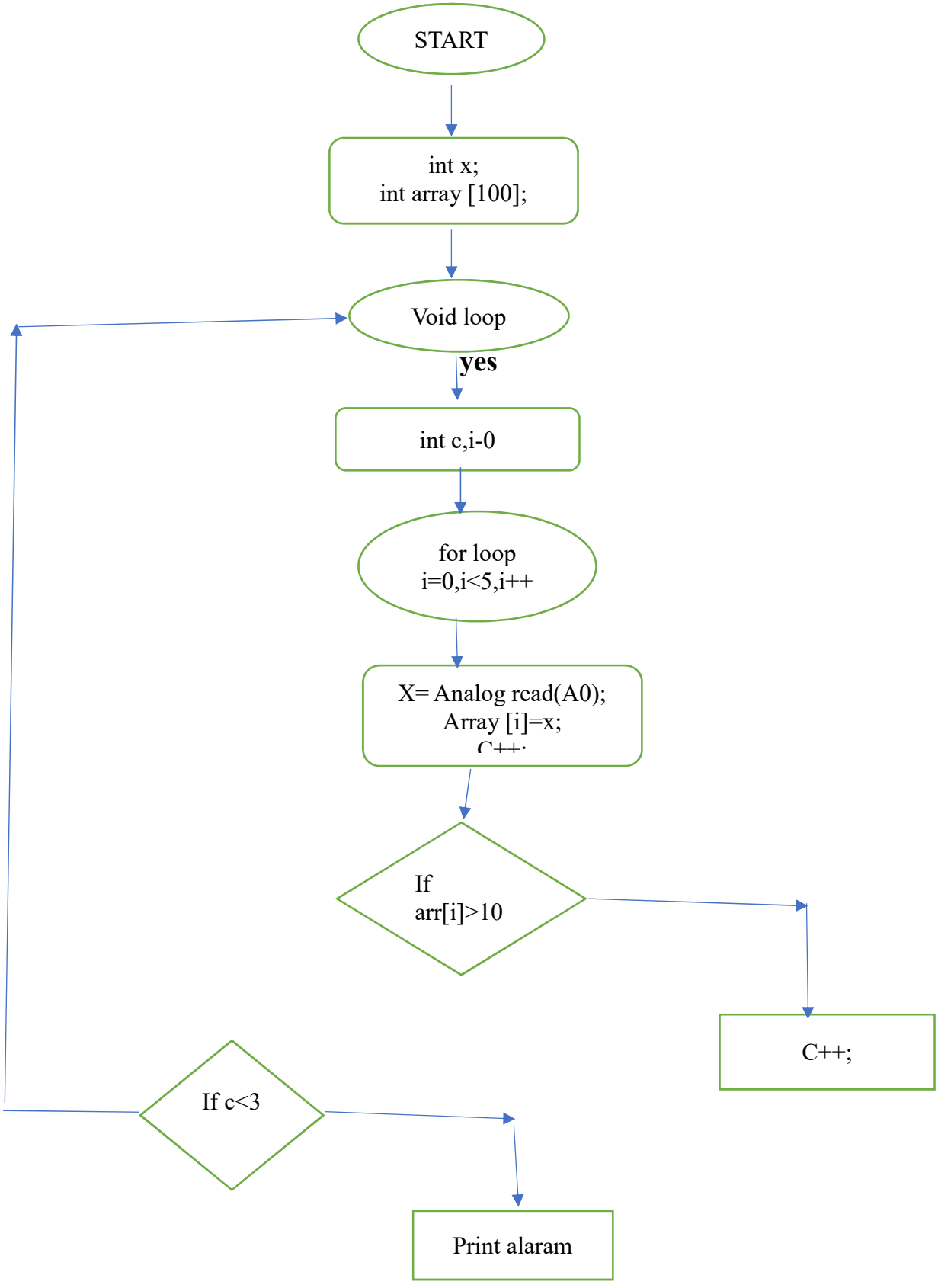
delay(1000);digitalWrite(8,HIGH);

digitalWrite(9,HIGH);

}

}

Alogiritham for detecting drowsiness and alerting thr driver



CHAPTER-6

RESULTS

➢ 6.1 Advantages :

- Accidents due to driver drowsiness can be prevented using eye blink sensors.
- The driver is supposed to wear the eye blink sensor frame throughout the course of driving and blink has to be for a couple of seconds to detect drowsiness.
- Any random changes in steering movement leads to reduction in wheel speed. The threshold of the vibration sensor can be varied and accordingly action can be taken.
- By using this project we can save lot of lives
- And it is very useful to the people who is walking on the road and also for the other vehicles.

➢ 6.2 Drawbacks:

However, when developing a better drowsiness detection system, several other issues need to be addressed;

the two most important ones are discussed below.

The subjective self-assessment of drowsiness can only be obtained from subjects in simulated environments. In real conditions, it is unfeasible to obtain this information without significantly distracting the driver from their primary task. Some researchers have conducted experiments to confirm the validity of simulated driving environments.

- In everytime put the eyeblink sensor on our face is irritating.
- people sometimes neglect to wear eyeblink sensor.

➢ Future Improvements:

By using image processing we can devolope our model

- Automatic driver drowsiness can be detected using artificial intelligence and visual information.
- Vehicle-based measures—A number of metrics, including deviations from lane position, movement of the steering wheel, pressure on the acceleration pedal, *etc.*, are constantly monitored and any change in these that crosses a specified threshold indicates a significantly increased probability that the driver is drowsy .

- Behavioral measures—The behavior of the driver, including yawning, eye closure, eye blinking, head pose, *etc.*, is monitored through a camera and the driver is alerted if any of these drowsiness symptoms are detected.
- Physiological measures—The correlation between physiological signals (electrocardiogram (ECG), electromyogram (EMG), electrooculogram (EoG) and electroencephalogram (EEG)) and driver drowsiness has been studied by many researchers.

• 6.3 REFERENCES:

Detection of Driver Drowsiness using Eye Blink Sensor.Kusuma Kumari B.M1, Sampada Sethi2, Ramakanth Kumar P3, Nishant Kumar4, Atulit Shanka

💔 6.4 CONCLUSION:

💔 The proposed system helpful to avoid vehicle accidents because of driver's sleepiness using eye blink sensor, in this paper we study International Journal of Engineering & Technology and design the system for driver fatigue detection. If the driver becomes drowsy the eye blink sensor's frame vibrates attached to the vehicle and also the computers the warning messages and it alerts the driver's through alarm sound to avoid the road accidents. The wheel is slowed or stopped depending on the condition. This is accompanied by the owner being notified through the GSM module, so the owner can retrieve the driver's location, photograph and a list of nearby police stations.