Project Report

On

EYE BLINK SENSING SYSTEM

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF DEGREE OF BACHELOR OF TECHNOLOGY in ELECTRICAL ENGINEERING

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JALANDHAR

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CANDIDATE'S DECLARATION

We hereby certify that the work which is being presented in the project entitled "EYE BLINK SENSING SYSTEM" by Maninder Singh, Aakash Kumar, Aditya Gautam, Anshul, Parvesh Kumar, Jaskaran Singh in partial fulfillment of requirements for the award of degree of Bachelor of Technology (Electrical Engineering) submitted to the department of Electrical Engineering at Sant Baba Bhag Singh University, Jalandhar, is an authentic record of our own work carried out during the period from July 2024 to December 2024. The matter presented in this project has not been submitted to any other University/Institute for the award of Bachelor of Technology (Electrical Engineering) degree.

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This is to certify that the above statement made by the candidates is correct to the best of my /our knowledge.

The Major Project Viva-Voce Examination of this group has been held on 27/11/2024 and accepted.

Signature of Internal Examiner

Signature of External Examiner

ACKNOWLEDGEMENTS

We would like to express our special thanks of gratitude to our Project Supervisor and Head of the Electrical Engineering (EE) Department Dr. Gurmanik Kaur (Associate Professor & Head, EE, UIET) who gave us the golden opportunity to do this wonderful project on the topic "EYE BLINK SENSING SYSTEM". We are deeply grateful to her for the guidance, patience and support.

Secondly we would also like to thank faculty of the EE Department, our parents and friends who motivated us to complete this project before the timeline.

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CHAPTER 1

Introduction

For any vehicle accidents driver's faults are the most accountable aspects to cause dangerous problem to the society. Many drivers cannot control the vehicles due to different reasons it may cause severe accidents and sometimes death. For vehicle accidents various factors involved such as drunk driving, over speeding, many distractions like texting while driving, talking with others, playing with children etc. One of the important factor is sleeping on the wheel. People know the dangerous of alcohol consumption and run the vehicles but they not understand the seriousness of fatigue driving. A fatigue Driver those who falls asleep at the move fails to control the vehicle, not possible to take immediate action and result in a crash so it is necessary to monitor the drowsiness of the driver to prevent accidents.

The eye blink sensor illuminates the eye with infrared light and monitors the changes in the reflected light. The infrared light reflected from the eye is used to determine the results. The sensor output is active high for eye close and can be given directly to microcontroller for interfacing application. The eye blink sensor constantly sends infrared waves which are reflected and detected by the receiver. As soon as the eye blinks the output of the sensor goes high. This output is sent to the Arduino board. The Arduino sends the signal to the buzzer to make the noise.

CHAPTER 2

Components Used

2.1 BUZZER

An audio signalling device like a beeper or buzzer may be electromechanical or piezoelectric or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printers, alarms, computers, etc. Based on the various designs, it can generate different sounds like alarm, music, bell & siren.

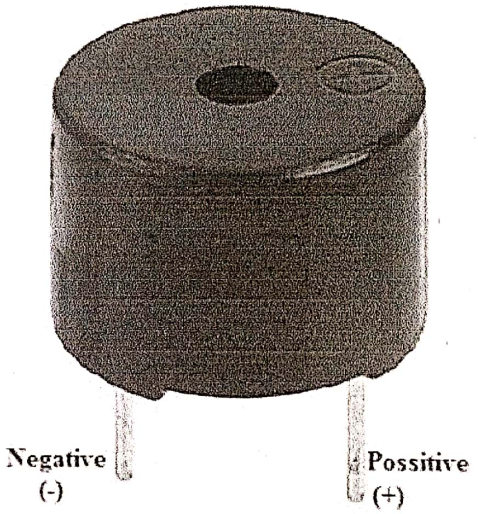

Fig. 2.1 Buzzer Pin Configuration

The pin configuration of the buzzer is shown in Figure 2.1. It includes two pins namely positive and negative. The positive terminal of this is represented with the '+' symbol or a longer terminal. This terminal is powered through 6Volts whereas the negative terminal is represented with the '-'symbol or short terminal and it is connected to the GND terminal.

2.1.1 Specifications

The specifications of the buzzer include the following:

1. Colour is black
2. The frequency range is 3,300Hz
3. Operating Temperature ranges from – 20° C to +60°C
4. Operating voltage ranges from 3V to 24V DC
5. The sound pressure level is 85dba or 10cm
6. The supply current is below 15ma

2.2 ARDUINO NANO

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.x). It has more or less the same functionality of the Arduino Duemilanove.

2.2.1 Pinout Diagram

The pin diagram of Arduino Nano is shown in Figure 2.2

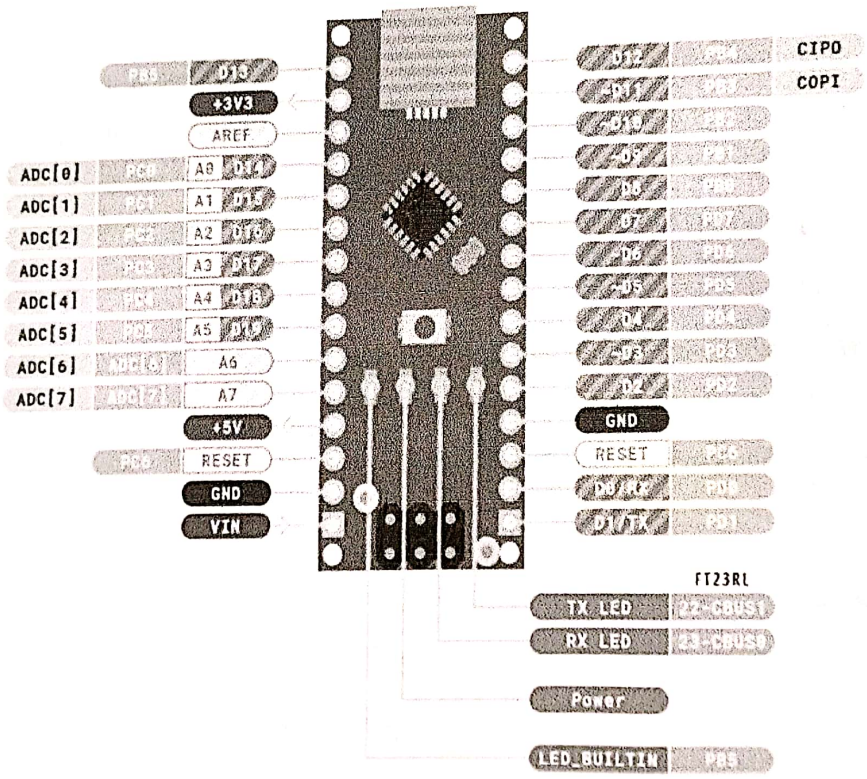

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Fig 2.2 Pin diagram of Arduino Nano

2.2.2 Memory

The ATmega328 has 32 KB, (also with 2 KB used for the bootloader. The ATmega328 has 2 KB of SRAM and 1 KB of EEPROM.

2.2.3 Input and Output

Each of the 14 digital pins on the Nano can be used as an input or output, using pin mode(), digital write(), and digital read() functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40ma and has an internal pull-up resistor (disconnected by default) of 20-50kohms.

2.2.4 Communication

The Arduino Nano has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provide UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An FTDI FT232RL on the board channels this serial communication over USB and the FTDI drivers (included with the Arduino software) provide a virtual com port to software on the computer.

The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the FTDI chip and USB connection to the computer (but not for serial communication on pins 0 and 1).

A Software Serial library allows for serial communication on any of the Nano's digital pins. The ATmega328 also support I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus.

2.2.5 Programming

The Arduino Nano can be programmed with the Arduino software (download). Select "Arduino Duemilanove or Nano w/ATmega328" from the Tools > Board menu (according to the microcontroller on your board). The ATmega328 on the Arduino Nano comes preburned with a bootloader that allows you to upload new code to it without the use of an external hardware programmer

It communicates using the original STK500 protocol. You can also bypass the bootloader and program the microcontroller through the In-Circuit Serial Programming (ICSP) header using Arduino ISP or similar.

2.2.6 Automatic (Software) Reset

Rather than requiring a physical press of the reset button before an upload, the Arduino Nano is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines of the FT232RL is connected to the reset line of the ATmega328 via a 100 nanofarad capacitor.

When this line is asserted (taken low), the reset line drops long enough to reset the chip. The Arduino software uses this capability to allow you to upload code by simply pressing the upload button in the Arduino environment. This means that the bootloader can have a shorter timeout, as the lowering of DTR can be well-coordinated with the start of the upload.

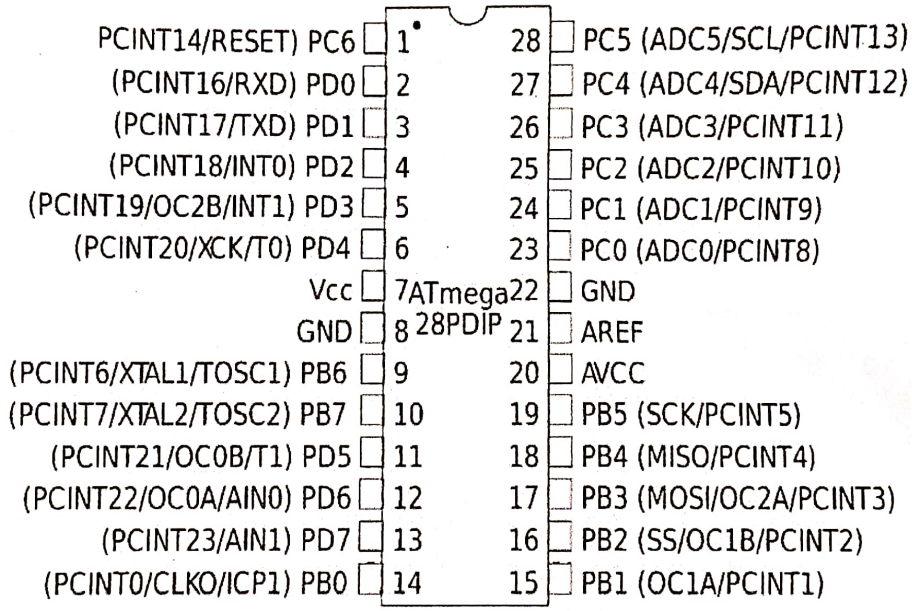
This setup has other implications. When the Nano is connected to either a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half-second or so, the bootloader is running on the Nano. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened.

If a sketch running on the board receives one-time configuration or other data when it first starts, make sure that the software with which it communicates waits a second after opening the connection and before sending this data.

2.3 MICROCONTROLLER

The **ATmega328** is a single-chip microcontroller created by Atmel in the megaAVR family. It has modified Harvard architecture 8-bit RISC processor core.

2.3.1 Pin Diagram of Microcontroller ATmega328



The Atmel 8-bit AVR RISC-based microcontroller combines 32 KB ISP flash memory with read-while-write capabilities, 1 KB EEPROM, 2 KB SRAM, 23 general-purpose I/O lines, 32 general-purpose working registers, 3 flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter, programmable watchdog timer with internal

oscillator and 5 software-selectable power-saving modes. The device operates between 1.8 and 5.5 volts.

2.3.2 Applications

ATmega328 is commonly used in many projects and autonomous systems where simple, low-powered, low-cost micro-controller is needed. Perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno, Arduino Pro Mini and Arduino Nano models.

2.4 INFRARED (IR) SENSOR

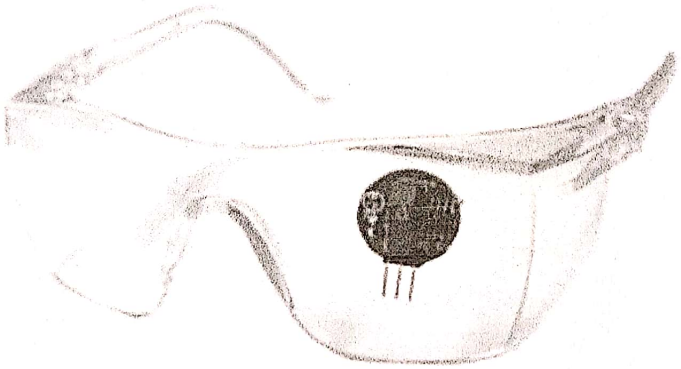


Fig 2.3 Eye blink sensor attached to test goggles

Infrared Sensor contains two parts a transmitter and a receiver. The transmitter continuously emits infrared waves onto the eye. While the receiver continuously looks for variations in the reflected waves which indicates that the eye has blinked.
If the eye is closed that means it will give high output. If the eye is open then it will give a low output.

This sensor can be used in a very different variety of robotics and mechantronics projects as it provides excellent results and is very economical.

2.5 BATTERY

A battery can be defined as an electrochemical device that converts chemical energy contained within its active materials directly into electric energy by means of an electrochemical oxidation-reduction reaction

2.5.1 Specifications of Battery used in the project is shown in Table-1

Voltage	9V
Brand	Hi-Watt
Battery Type	Lithium-Ion
Usage/Application	DJ Products
Capacity	600 mAh
Size	6F22 006P
Colour	White, Blue
Power Source	DC
Feature	High Quality long durability
Discharge Resistance	620 Ohm
Minimum Order Quantity	10

Table-1 Specifications of Battery

2.6 TOGGLE SWITCH

Toggle switches are mechanical devices that make or break electrical connections in a circuit by the closing or opening electrical contacts when the protruding actuator is manually moved from one position to another. Toggle switches are defined by their number of poles and throws. In a toggle switch you have a lever that you turn to one side or to the other to make the current flow to one side or to other or to not flow at all.

2.6.1 Toggle switch used in this project is shown in Figure 2.7

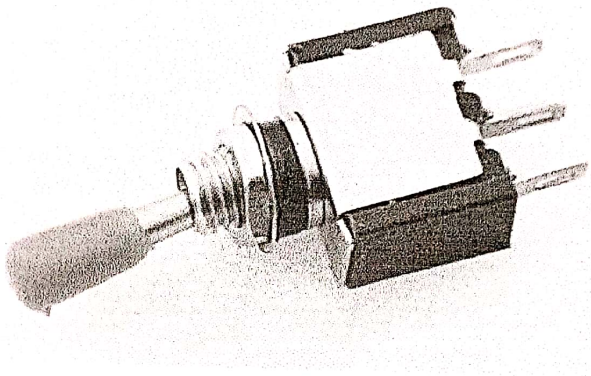


Fig 2.4 Toggle switch

CHAPTER 6

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