

GOVERNMENT ENGINEERING COLLEGE WAYANAD

(Affiliated to KTU)

Mananthavady, Kerala – 670644



**Department of Electrical & Electronics Engineering
Government Engineering College Wayanad**

2022-2023

**A MINI-PROJECT REPORT ON
“POV DISPLAY USING ARDUINO”**

Submitted by
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CERTIFICATE

This is to certify that Abhinav M T, Aswanth M C and Swapnil P have successfully completed the project titled "POV DISPLAY USING ARDUINO" at Government Engineering College Wayanad under the supervision and guidance in the fulfilment of requirements of fifth Semester, Bachelor of Technology (Electrical and Electronics Engineering of Kerela technical University).

Prof. Resnitha K S

Prof.Rajil P

Electrical and Electronics Engineering

ACKNOWLEDGEMENT

We deem it a pleasure to acknowledge our sense of gratitude to our project guide Prof. Resnitha K S under whom we have carried out the project work. Her incisive and objective guidance and timely advice encouraged us with constant flow of energy to continue the work.

We wish to reciprocate in full measure the kindness shown by Prof. Resnitha K S and Prof. Rajil P (Electrical and Electronics Engineering) who inspired us with valuable suggestions in successfully completing the project work.

Finally, we must say that no height is ever achieved without some sacrifices made at some end and it is here where we owe our special debt to our parents and our friends for showing their generous love and care throughout the entire period of time.

Date: 06.01.2023

PROJECT REPORT

ABSTRACT

The purpose of this project is to design and to create a persistence of vision (POV) display. The objective is to develop an LED display system which uses enormously lesser number of LEDs and power consumption than the normal LED display and which is compact in nature using persistence of vision-based technology. This display will allow users to upload an image to be displayed through wireless communication using LED lights. The rotational speed of the LED's is fast enough such that the human eye perceives a two-dimensional image. Our project focuses on meeting the tremendous growth of advertisement.

INTRODUCTION

Persistence of Vision (POV), occurs when a visual image seems to persist continuously when a stream of light is repeatedly interrupted for very brief instances and does not enter our eyes during those durations. A POV display exploits this phenomenon by spinning a one-dimensional row of LEDs through a two-dimensional space at such a high frequency that a two-dimensional display is visible. There are a lot of applications of persistence of vision. For example, Newton Disc, Kaleidoscopic colour top, Thaumatrope, rubber pencil trick etcetera. A visual form of memory known as iconic memory has been described as the cause of this phenomenon. A critical part of understanding that emerges with these visual perception phenomena is that the eye is not a camera and does not see in frames per second. In other words, vision is not as simple as light registering on a medium, since the brain has to make sense of the visual data the eye provides and construct a coherent picture of reality.

COMPONENTS USED

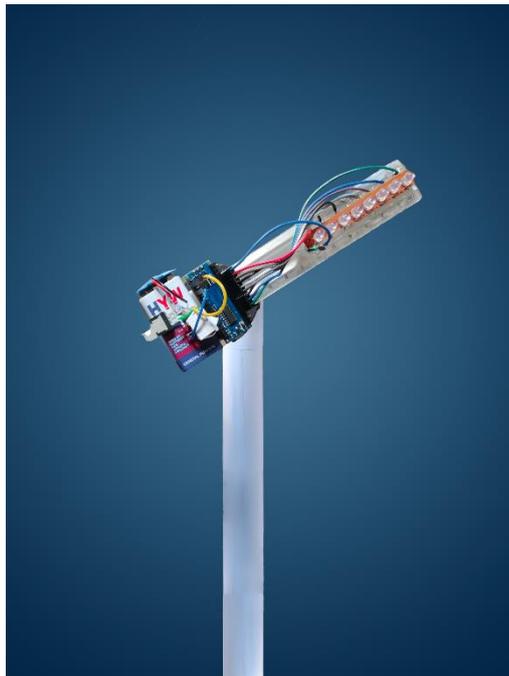
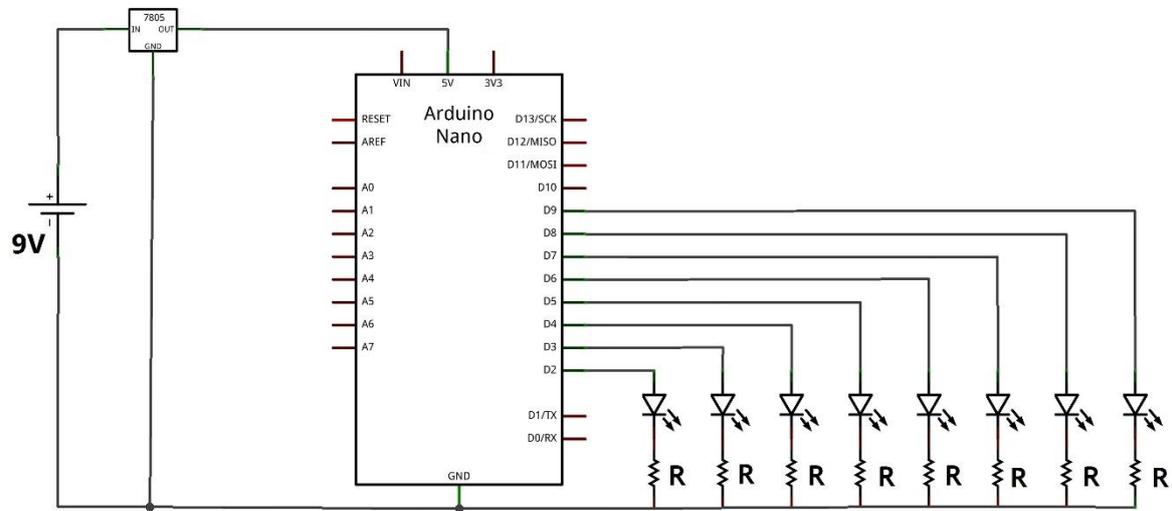
- AURDINO NANO
- LED- 8Nos
- 18V DC MOTOR
- 9V BATTERY
- IC 7805
- RESISTOR - 150Ω
- SWITCH
- PCB

PRINCIPLE

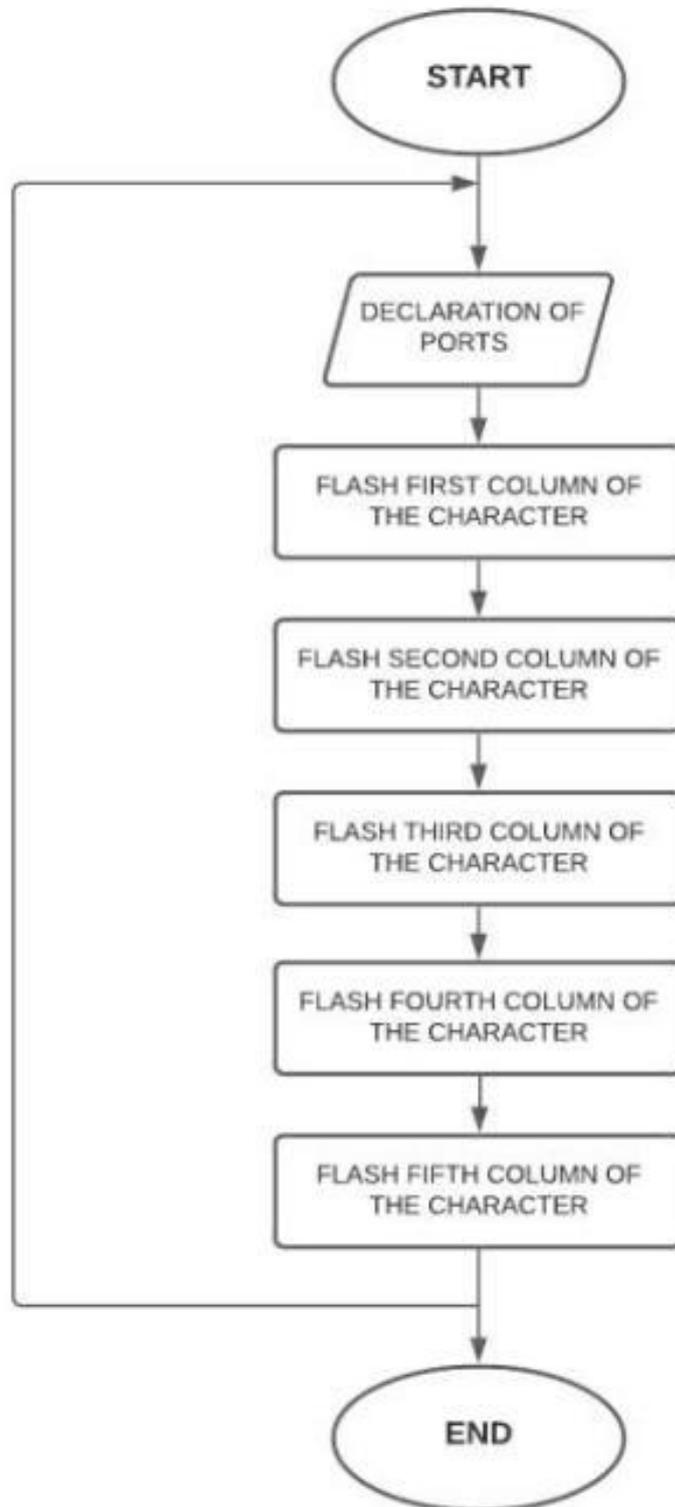
Persistence of Vision is the ability of the eye to retain the impression of an image for a short time after the image has disappeared. This ability can be used to create an illusion of images/characters floating in the air, by rapidly flashing a column of LEDs while moving the display in air. So, to display letters we need to do the following:

1. Design a circuitry to control the flashing of LEDs in a LED column.
2. Program the circuit to flash in an appropriate pattern.
3. Synchronize the flashing with the motion of the display.

CIRCUIT DIAGRAM



BLOCK DIAGRAM



PROGRAM

```
int NUMBER9[]={1,1,1,1,0,0,0,1, 1,0,0,1,0,0,0,1, 1,0,0,1,0,0,0,1,
1,0,0,1,0,0,0,1, 1,1,1,1,1,1,1,1};
int NUMBER8[]={0,1,1,0,1,1,1,0, 1,0,0,1,0,0,0,1, 1,0,0,1,0,0,0,1,
1,0,0,1,0,0,0,1, 0,1,1,0,1,1,1,0};
int NUMBER7[]={1,0,0,0,0,0,0,0, 1,0,0,0,1,0,0,0, 1,0,0,0,1,0,0,0,
1,0,0,1,1,1,1,1, 1,1,1,0,1,0,0,0};
int NUMBER6[]={1,1,1,1,1,1,1,1, 1,0,0,0,1,0,0,1, 1,0,0,0,1,0,0,1,
1,0,0,0,1,0,0,1, 1,0,0,0,1,1,1,1};
int NUMBER5[]={1,1,1,1,1,0,0,1, 1,0,0,0,1,0,0,1, 1,0,0,0,1,0,0,1,
1,0,0,0,1,0,0,1, 1,0,0,0,1,1,1,1};
int NUMBER2[]={1,0,0,0,0,0,1,1, 1,0,0,0,0,1,0,1, 1,0,0,0,1,0,0,1,
1,0,0,1,0,0,0,1, 0,1,1,0,0,0,0,1};
int NUMBER1[]={0,0,1,0,0,0,0,0, 0,1,0,0,0,0,0,0, 1,1,1,1,1,1,1,1,
0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0};
int NUMBER0[]={1,1,1,1,1,1,1,1, 1,0,0,0,0,0,0,1, 1,0,0,0,0,0,0,1,
1,0,0,0,0,0,0,1, 1,1,1,1,1,1,1,1};

int _[] = {0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0};
int A[] = {1,1,1,1,1,1,1,1, 1,0,0,1,0,0,0,0, 1,0,0,1,0,0,0,0,
1,0,0,1,0,0,0,0, 1,1,1,1,1,1,1,1};
int B[] = {1,1,1,1,1,1,1,1, 1,0,0,1,0,0,0,1, 1,0,0,1,0,0,0,1,
1,0,0,1,0,0,0,1, 0,1,1,0,1,1,1,0};
int C[] = {0,0,1,1,1,1,0,0, 0,1,0,0,0,0,1,0, 1,0,0,0,0,0,0,1,
1,0,0,0,0,0,0,1, 1,0,0,0,0,0,0,1};
int D[] = {1,1,1,1,1,1,1,1, 1,0,0,0,0,0,0,1, 1,0,0,0,0,0,0,1,
0,1,0,0,0,0,1,0, 0,0,1,1,1,1,0,0};
int E[] = {1,1,1,1,1,1,1,1, 1,0,0,1,0,0,0,1, 1,0,0,1,0,0,0,1,
1,0,0,1,0,0,0,1, 1,0,0,1,0,0,0,1};
int F[] = {1,1,1,1,1,1,1,1, 1,0,0,1,0,0,0,0, 1,0,0,1,0,0,0,0,
1,0,0,1,0,0,0,0, 1,0,0,1,0,0,0,0};
int G[] = {0,1,1,1,1,1,1,1, 1,0,0,0,0,0,0,1, 1,0,0,0,1,0,0,1,
1,0,0,0,1,0,0,1, 1,0,0,0,1,1,1,0};
int H[] = {1,1,1,1,1,1,1,1, 0,0,0,0,1,0,0,0, 0,0,0,0,1,0,0,0,
0,0,0,0,1,0,0,0, 1,1,1,1,1,1,1,1};
int I[] = {1,0,0,0,0,0,0,1, 1,0,0,0,0,0,0,1, 1,1,1,1,1,1,1,1,
1,0,0,0,0,0,0,1, 1,0,0,0,0,0,0,1};
int J[] = {0,0,0,0,0,1,1,0, 0,0,0,0,1,0,0,1, 0,0,0,0,0,0,0,1,
0,0,0,0,0,0,0,1, 1,1,1,1,1,1,1,0};
int K[] = {1,1,1,1,1,1,1,1, 0,0,0,1,1,0,0,0, 0,0,1,0,0,1,0,0,
0,1,0,0,0,1,0, 1,0,0,0,0,0,0,1};
int L[] = {1,1,1,1,1,1,1,1, 0,0,0,0,0,0,0,1, 0,0,0,0,0,0,0,1,
0,0,0,0,0,0,0,1, 0,0,0,0,0,0,0,1};
int M[] = {1,1,1,1,1,1,1,1, 0,1,0,0,0,0,0,0, 0,0,1,0,0,0,0,0,
0,1,0,0,0,0,0,0, 1,1,1,1,1,1,1,1};
int N[] = {1,1,1,1,1,1,1,1, 0,0,1,0,0,0,0,0, 0,0,0,1,1,0,0,0,
0,0,0,0,0,1,0,0, 1,1,1,1,1,1,1,1};
int O[] = {0,1,1,1,1,1,1,0, 1,0,0,0,0,0,0,1, 1,0,0,0,0,0,0,1,
1,0,0,0,0,0,0,1, 0,1,1,1,1,1,1,0};
int P[] = {1,1,1,1,1,1,1,1, 1,0,0,1,0,0,0,0, 1,0,0,1,0,0,0,0,
1,0,0,1,0,0,0,0, 0,1,1,0,0,0,0,0};
int Q[] = {0,1,1,1,1,1,1,0, 1,0,0,0,0,0,0,1, 1,0,0,0,0,1,0,1,
0,1,1,1,1,1,1,0, 0,0,0,0,0,0,0,1};
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```

int R[] = {1,1,1,1,1,1,1,1, 1,0,0,1,1,0,0,0, 1,0,0,1,0,1,0,0,
1,0,0,1,0,0,1,0, 0,1,1,0,0,0,0,1};
int S[] = {0,1,1,1,0,0,0,1, 1,0,0,0,1,0,0,1, 1,0,0,0,1,0,0,1,
1,0,0,0,1,0,0,1, 1,0,0,0,1,1,1,0};
int T[] = {1,0,0,0,0,0,0,0, 1,0,0,0,0,0,0,0, 1,1,1,1,1,1,1,1,
1,0,0,0,0,0,0,0, 1,0,0,0,0,0,0,0};
int U[] = {1,1,1,1,1,1,1,0, 0,0,0,0,0,0,0,1, 0,0,0,0,0,0,0,1,
0,0,0,0,0,0,0,1, 1,1,1,1,1,1,1,0};
int V[] = {1,1,1,1,1,1,0,0, 0,0,0,0,0,0,1,0, 0,0,0,0,0,0,0,1,
0,0,0,0,0,0,1,0, 1,1,1,1,1,1,0,0};
int W[] = {1,1,1,1,1,1,1,1, 0,0,0,0,0,0,1,0, 0,0,0,0,0,1,0,0,
0,0,0,0,0,0,1,0, 1,1,1,1,1,1,1,1};
int X[] = {1,1,0,0,0,0,1,1, 0,0,1,0,0,1,0,0, 0,0,0,1,1,0,0,0,
0,0,1,0,0,1,0,0, 1,1,0,0,0,0,1,1};
int Y[] = {1,1,0,0,0,0,0,0, 0,0,1,0,0,0,0,0, 0,0,0,1,1,1,1,1,
0,0,1,0,0,0,0,0, 1,1,0,0,0,0,0,0};
int Z[] = {1,0,0,0,0,1,1,1, 1,0,0,0,1,0,0,1, 1,0,0,1,0,0,0,1,
1,0,1,0,0,0,0,1, 1,1,0,0,0,0,0,1};
int* alpha[]= {A,B,C,D,E,F,G,H,I,J,K,L,M,N}; //,T,U,V,W,X,Y,Z};
int letterSpace;
int dotTime;
void setup()
{ Serial.begin(9600);
// setting the ports of the leds to OUTPUT
for( int i = 2; i<10 ;i++ )
{ pinMode(i, OUTPUT);
}

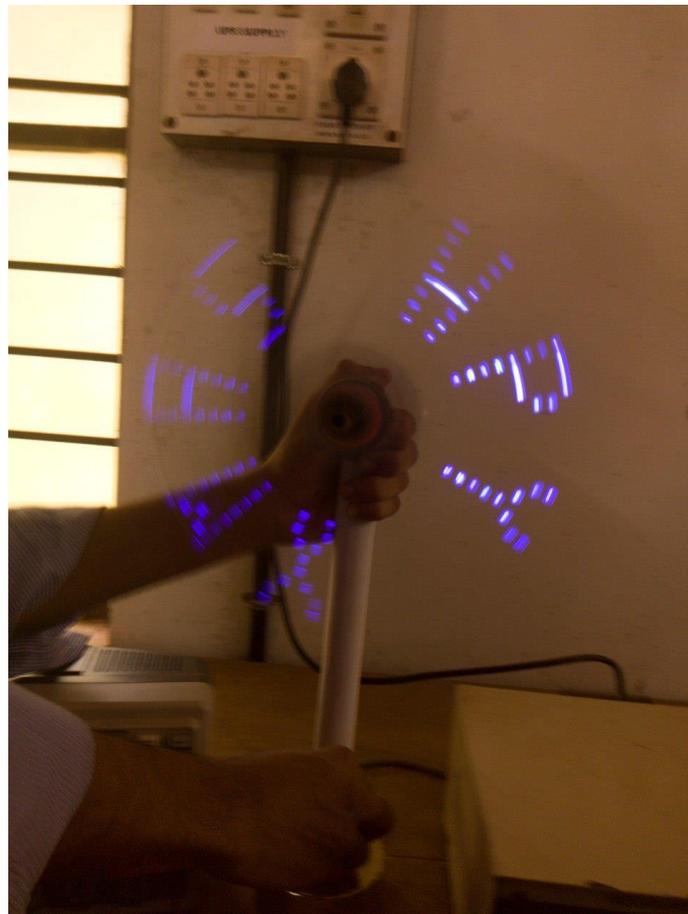
// defining the space between the letters (ms)
letterSpace = 6;
// defining the time dots appear (ms)
dotTime =1;
}
void printLetter(int letter[])
{
int y;
// printing the first y row of the letter
for (y=0; y<8; y++)
{
digitalWrite(y+2, letter[y]);
}
delay(dotTime);
// printing the second y row of the letter
for (y=0; y<8; y++)
{
digitalWrite(y+2, letter[y+8]);
}
delay(dotTime);
// printing the third y row of the letter
for (y=0; y<8; y++)
{
digitalWrite(y+2, letter[y+16]);
}
delay(dotTime);
for(y = 0; y<8; y++) {
digitalWrite(y+2, letter[y+24]);
}
delay(dotTime);
}

```

```
for(y = 0; y<8; y++) {
  digitalWrite(y+2, letter[y+32]);
}
delay(dotTime);
// printing the sspace between the letters
for (y=0; y<8; y++)
{
  digitalWrite(y+2, 0);
}
delay(letterSpace);
}
void loop()//write here =)
{
  printLetter (H);
  printLetter (P);
  printLetter (Y);
  printLetter (_);
  printLetter (X);
  printLetter (M);
  printLetter (A);
  printLetter (S);
  printLetter (_);
}
```

CONCLUSION

In our project, hardware and software-based system were designed and developed for the implementation of persistence of vision phenomenon through Arduino technology using various LEDs and an AC motor. The software algorithm, electrical and mechanical systems were designed from the scratch and were implemented through a working physical model of the project. The main aim of the project was achieved and various images and text could be displayed on the POV display which uses an AC motor.



REFERENCE

<https://youtu.be/NnkjYKN3tRo>.