MISSILE DETECTION AND ALARMING FOR MILITARY APPLICATIONS

Guide
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CONTENTS

INTRODUCTION

- War is an organized armed conflict that is carried out by states, nations, national and social groups.
- The purpose of this project is to design and construct automatic missile detection and alarming system.
- Used in war-field.
- This system is designed to detect the target (missile) by rotating in multiple directions.

EXISTING SYSTEM

- The existing systems in market, help detect the missile using a remote control, i.e they are not automatic.
- They need remote control which are highly unreliable.

PROPOSED SYSTEM

- This proposed system uses a fully automated system and due to this time can be saved.
- Sensor mounted on a rotating arm - rotates from 0 to 180 degrees.
- Here the controller is interfaced with sensors and keeps on sending the signal to the controller.
- When object is detected, the launching machine will turn towards the degree of detected target and shoots.

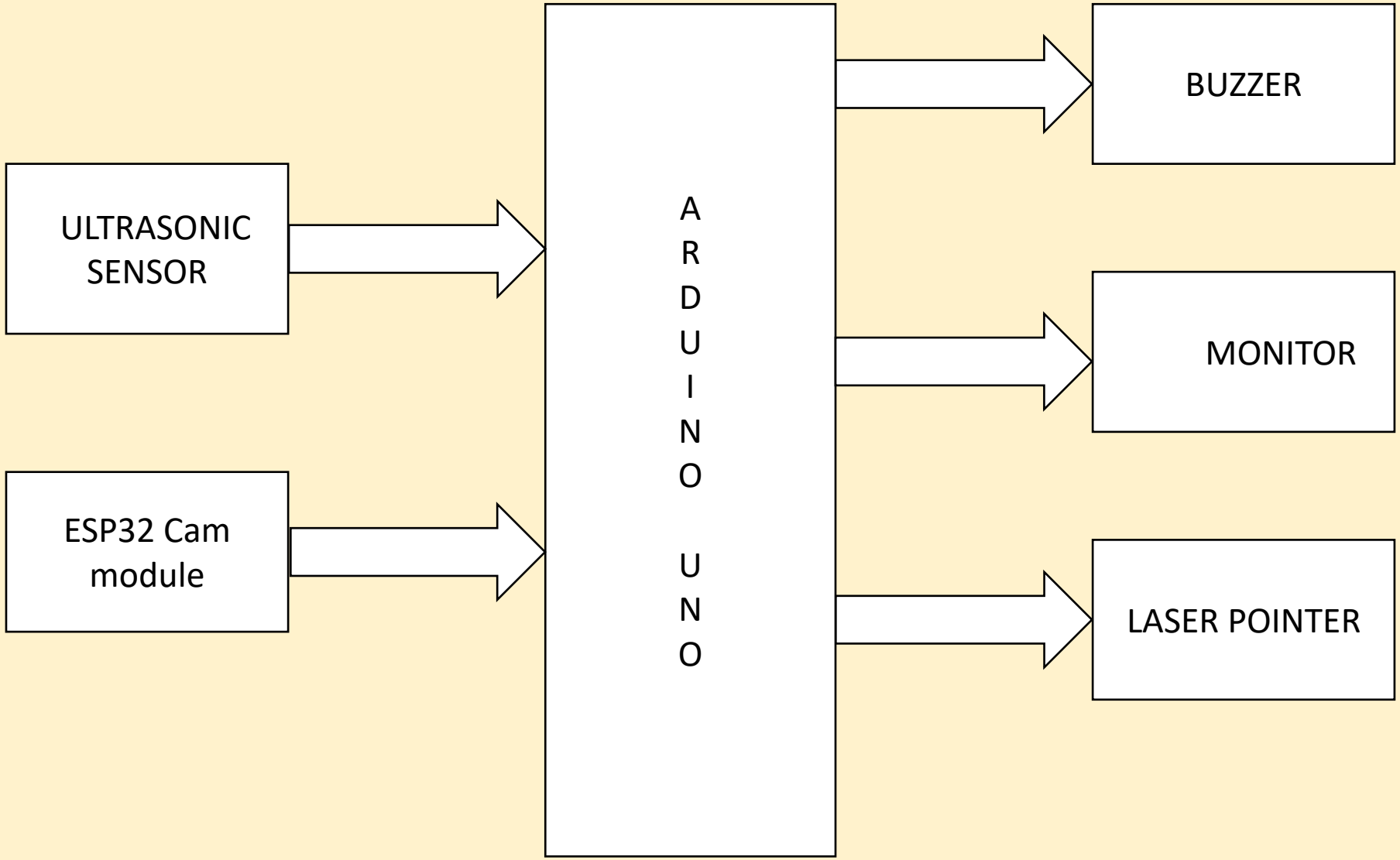
OBJECTIVES

- 4 main objectives of the project:
  1) Detecting the target
  2) Alarming system
  3) Live visual streaming
  4) Shooting in the direction of target

Phase-1

Phase-2

BLOCK DIAGRAM



HARDWARE COMPONENTS

- ESP32 Camera module
- Ultrasonic sensor
- Arduino UNO
- Buzzer
- LCD Display
- Laser Pointer

ESP32 Camera module

- Low power consumption camera, small sized.
- Applications such as wireless video monitoring, WiFi image upload, QR identification, facial recognition systems.
- Has wireless connectivity
- Input power requirements: 5V and 2A
- Intergrated with low-noise receive amplifier, filters, and power management modules.

Ultrasonic sensor

- Input power requirements : +5V and <15mA
- Measuring Distance: 2cm to 80cm
- Set distance: 32cm
- Measuring angle covered: <15°
- Operating Frequency: 40Hz

- They can be divided into three broad categories: transmitters, receivers and transceivers.
- Transmitters convert electrical signals into ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound.

Arduino UNO

- The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller.
- 14 digital I/O pins
- Operating voltage : 9 volt
- Input voltage : 7 to 20 volts
- Flash Memory : 32 KB
- SRAM: 2 KB
- Clock Speed: 16 MHz

Buzzer

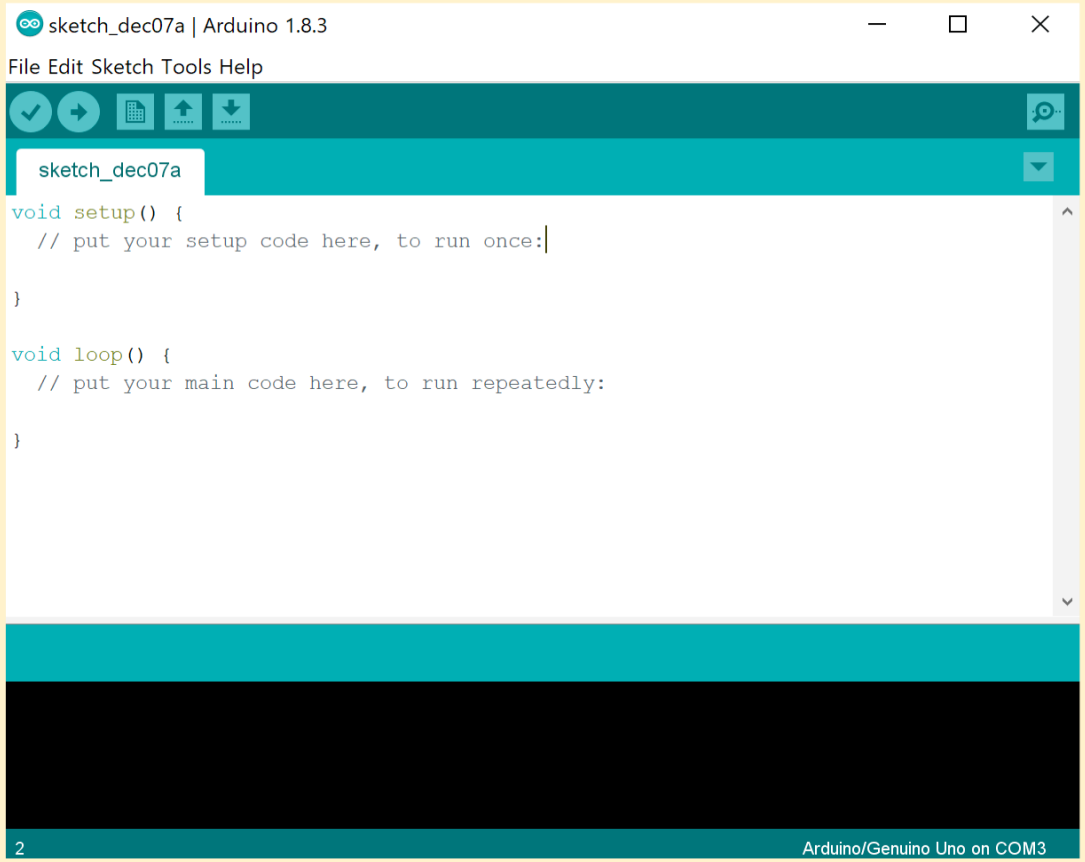
- Rated Voltage: 6V DC
- Operating Voltage: 4-8V DC
- Rated current: <30mA
- Sound Type: Continuous Beep
- Resonant Frequency: ~2300 Hz
- Uses of buzzers include alarm devices and timers

Laser Pointer

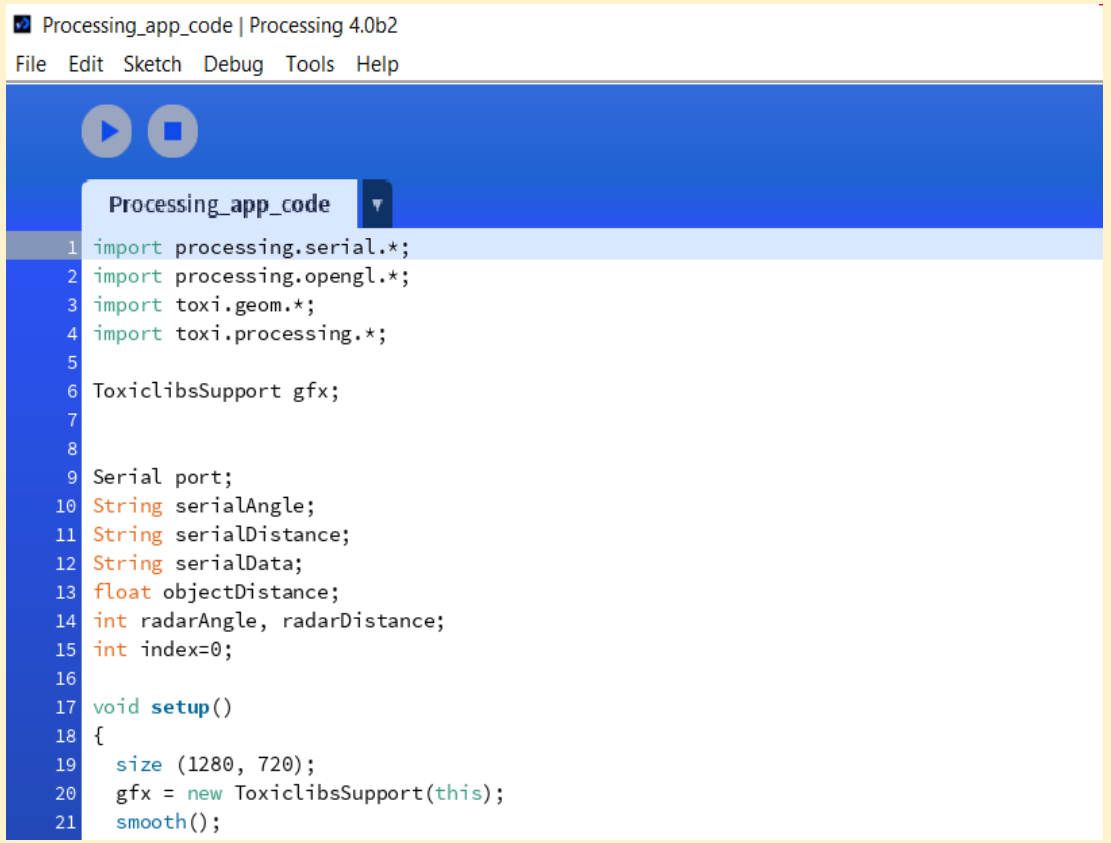
- Laser is a narrow beam that is emitted in a specific direction
- Has a power source and a laser diode emitting a very narrow coherent low-powered laser beam of visible light.
- 200mW output power
- Colour green is the best at strength for visibility

SOFTWARE COMPONENTS

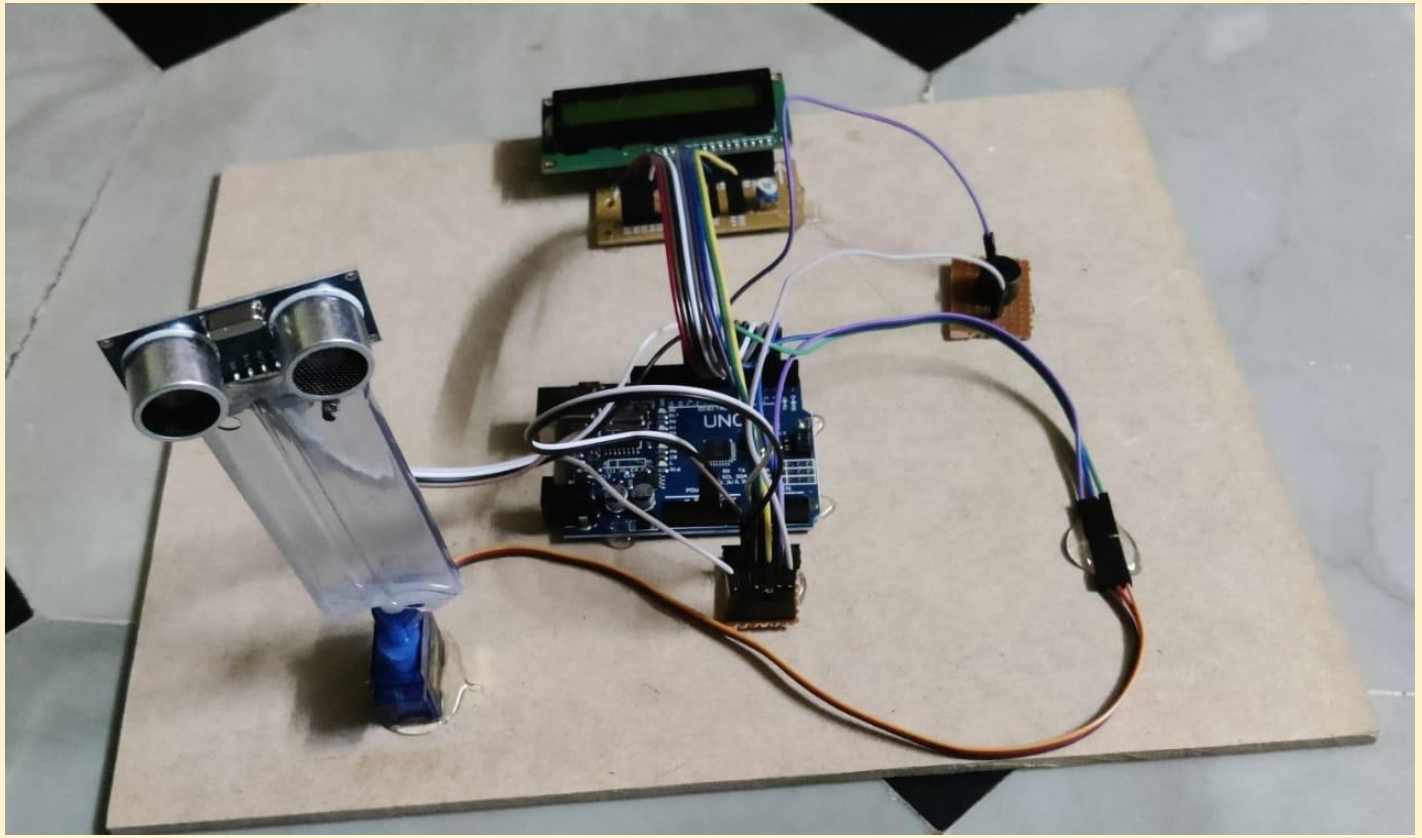
Arduino IDE

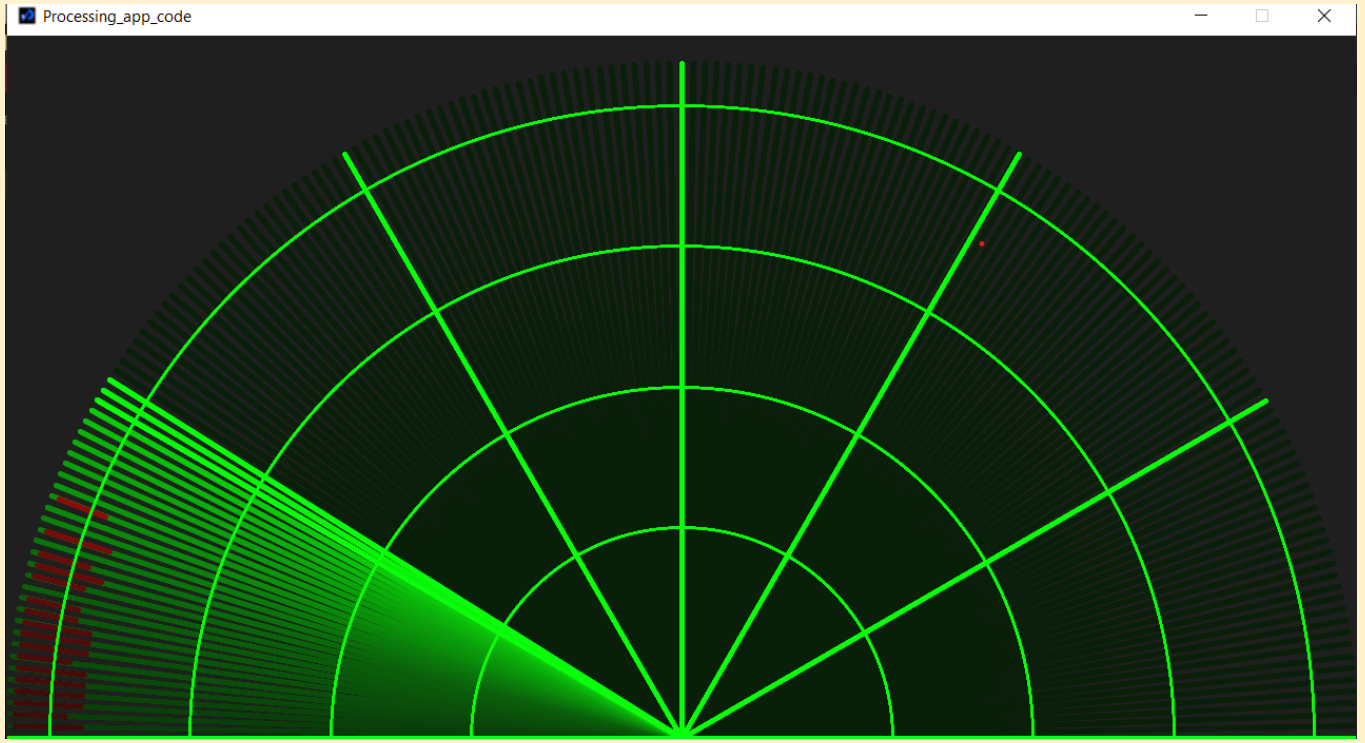


Processing 4



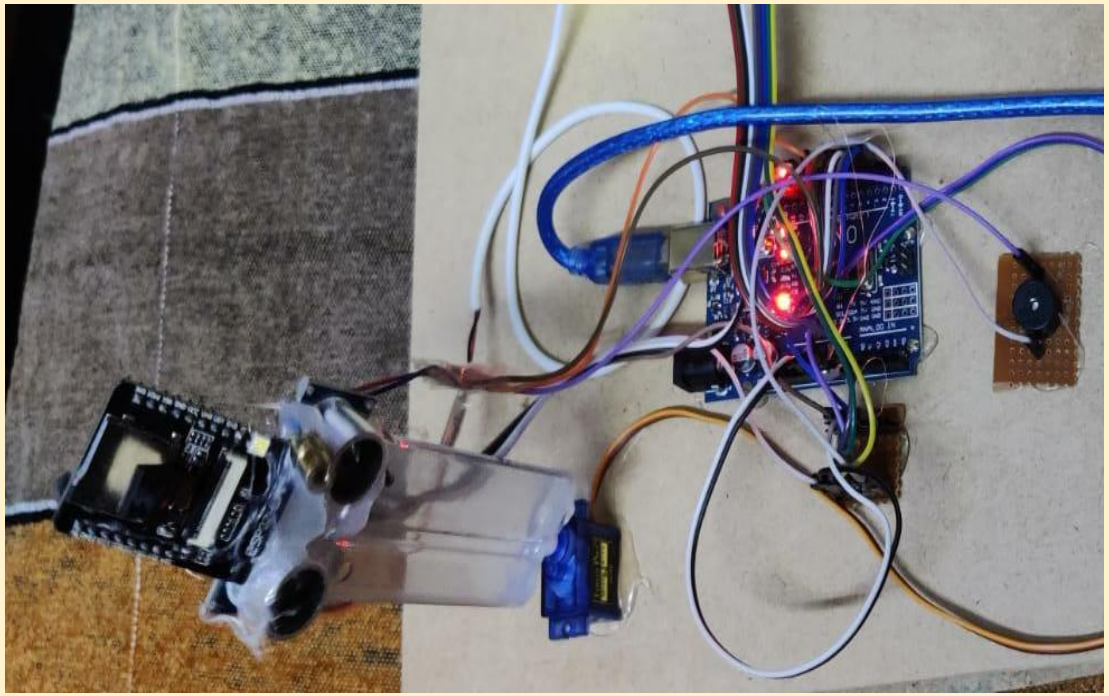
RESULTS (Phase I)

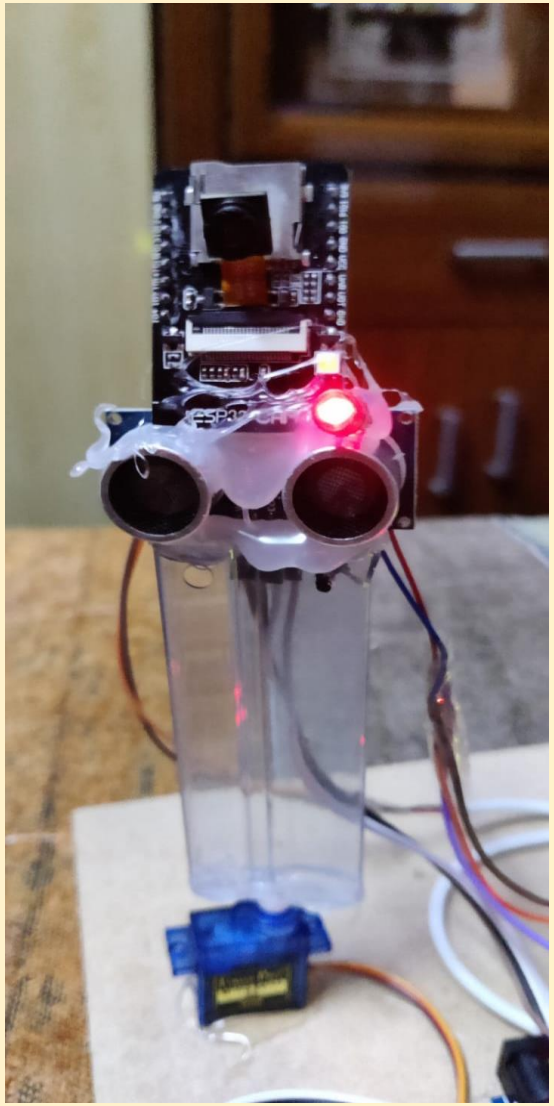


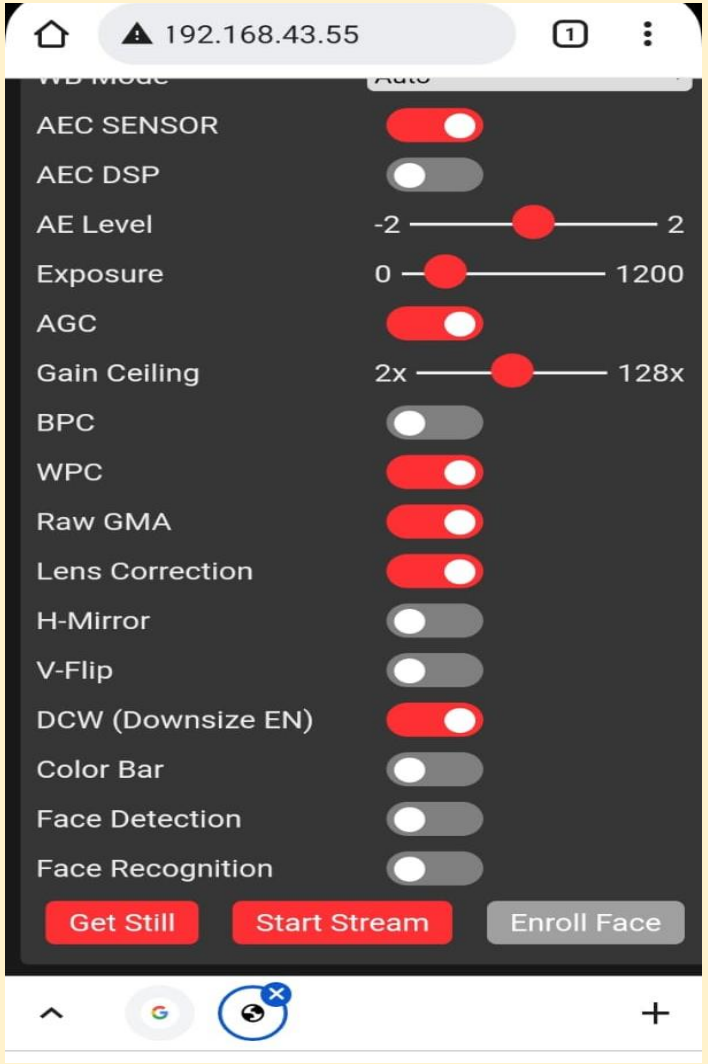


- Processing 4
- 0-180 degree cover
- 4 semicircles, each at a distance of 4 cm from the before one
- Object detection is shown by the red pointers

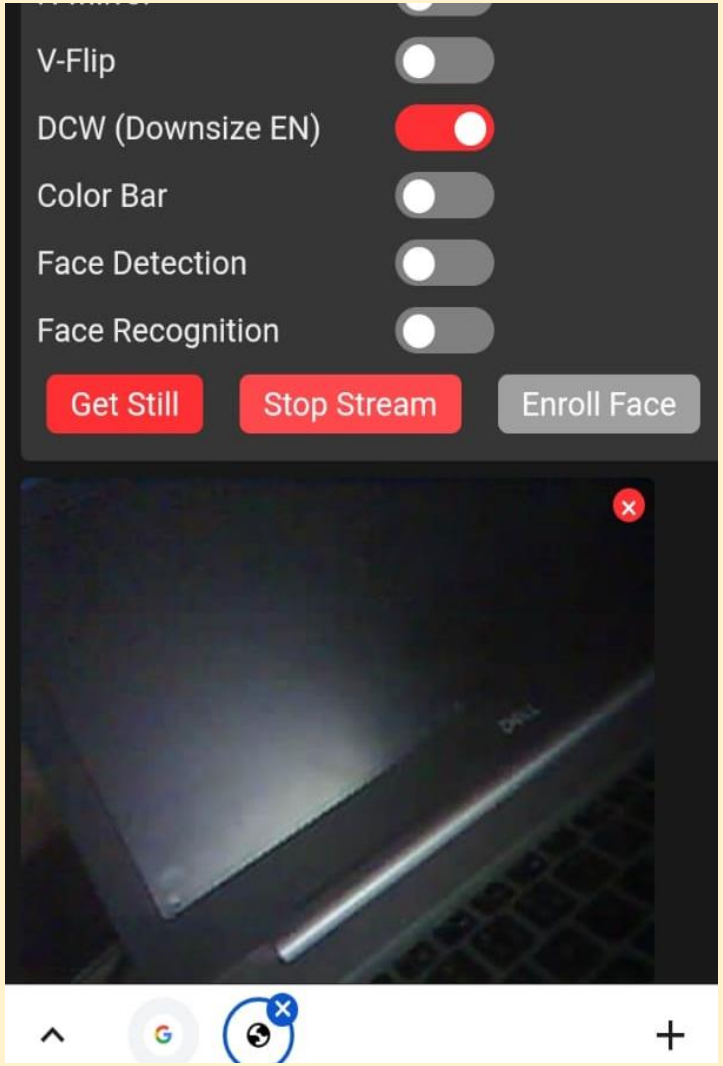
RESULTS (Phase II)







- Camera - IP address
- Supported by any network
- Good accuracy



THANK YOU