

SURVEILLANCE ROBOT



What is our product?

Surveillance Robot travels by wheels with a camera attached to its body for obstacle and surrounding detection, the video is then streamed to the GUI website. The robot has 2 features, auto-pilot mode and manual control mode.

Product Objective

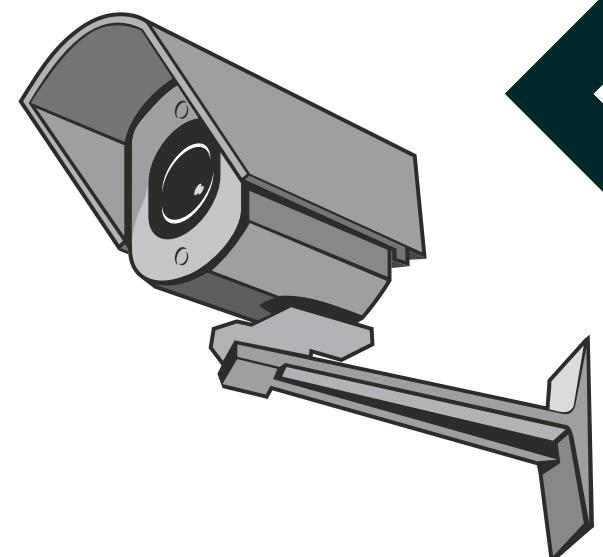


Surveillance

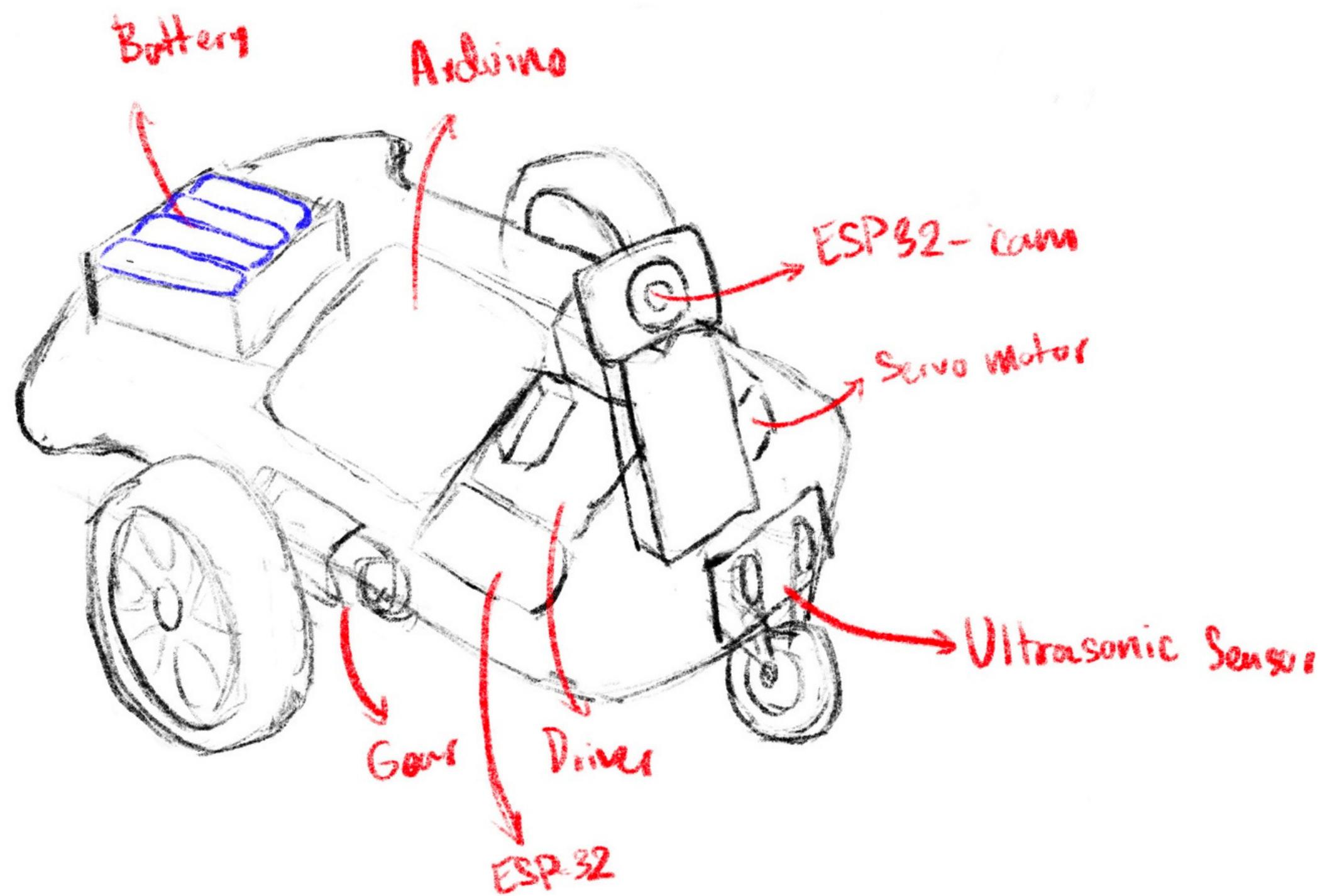
Surveillance and keep watch around small areas and properties. For example, younglings, valuable belonging, trespassing etc.

Accessing blindspots

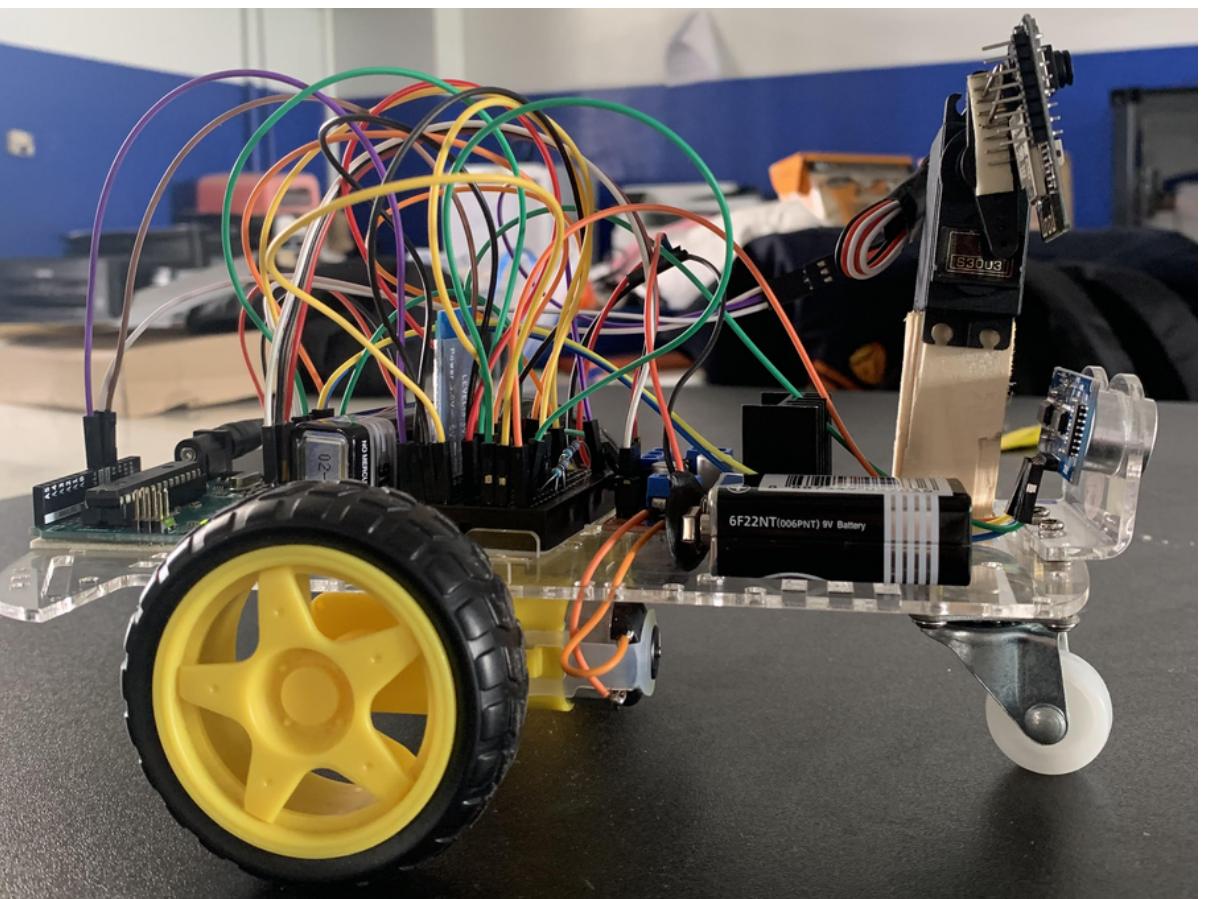
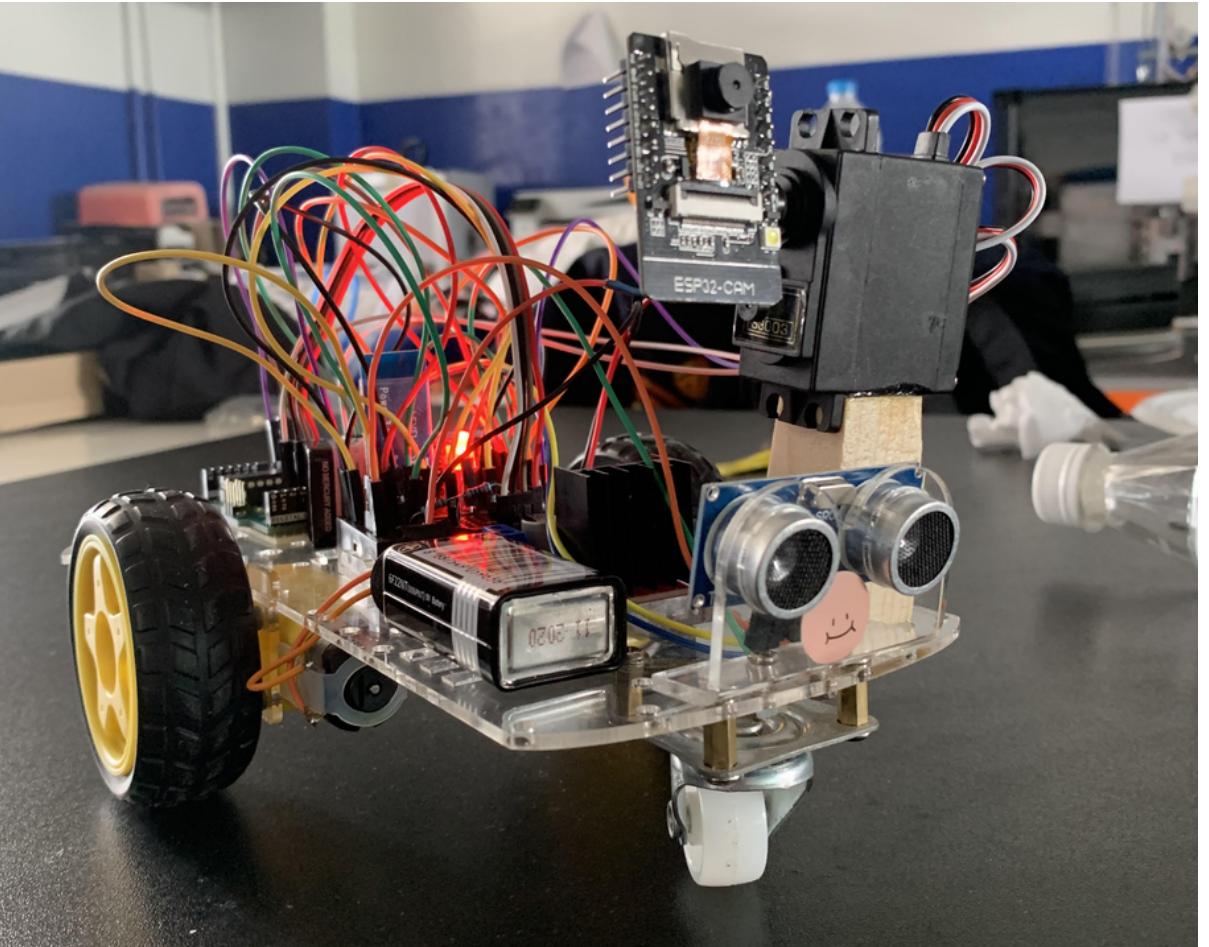
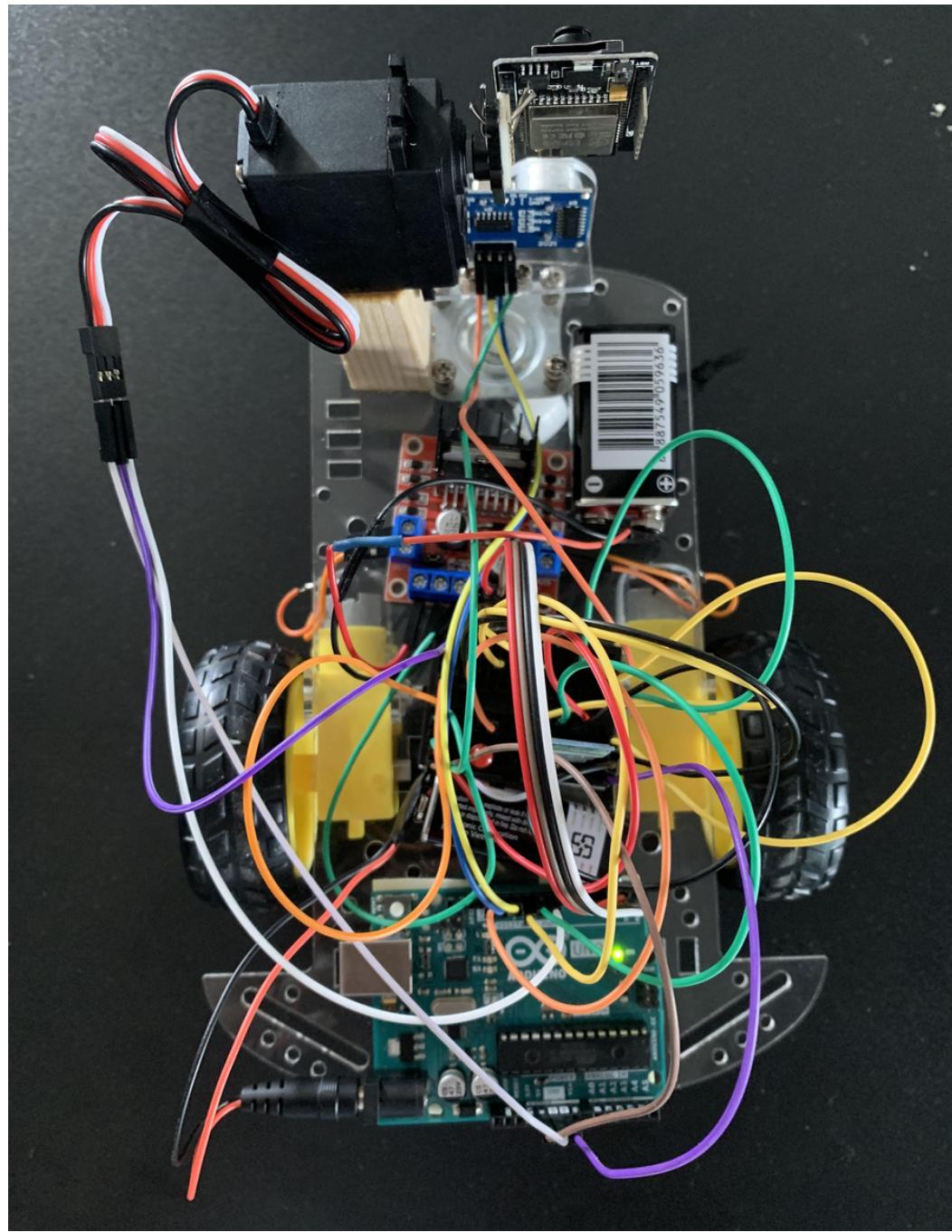
Accessing and surveying around the area that the CCTV camera doesn't have access to.



PROPOSED DESIGNED



Final Product



Proposed Features



GUI website controls

Manual Mode allows The user will be able to control the robot from the mobile GUI website.



Video Live Stream

The video from the camera is streamed into the GUI website through an IP address.

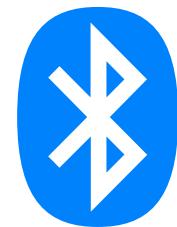


AutoPilot Mode

Ultra Sonic sensor will detect and measure the distance from the robot to the obstacle and avoid it.



Final Features



Bluetooth Connection

Initial plan was to use wifi connection to control robot.



Application Manual Controls

The user is allowed to control the robot's movement and camera angle through an application with serial inputs.



Video Live Stream

The video from the camera is streamed into the GUI website through an IP address.

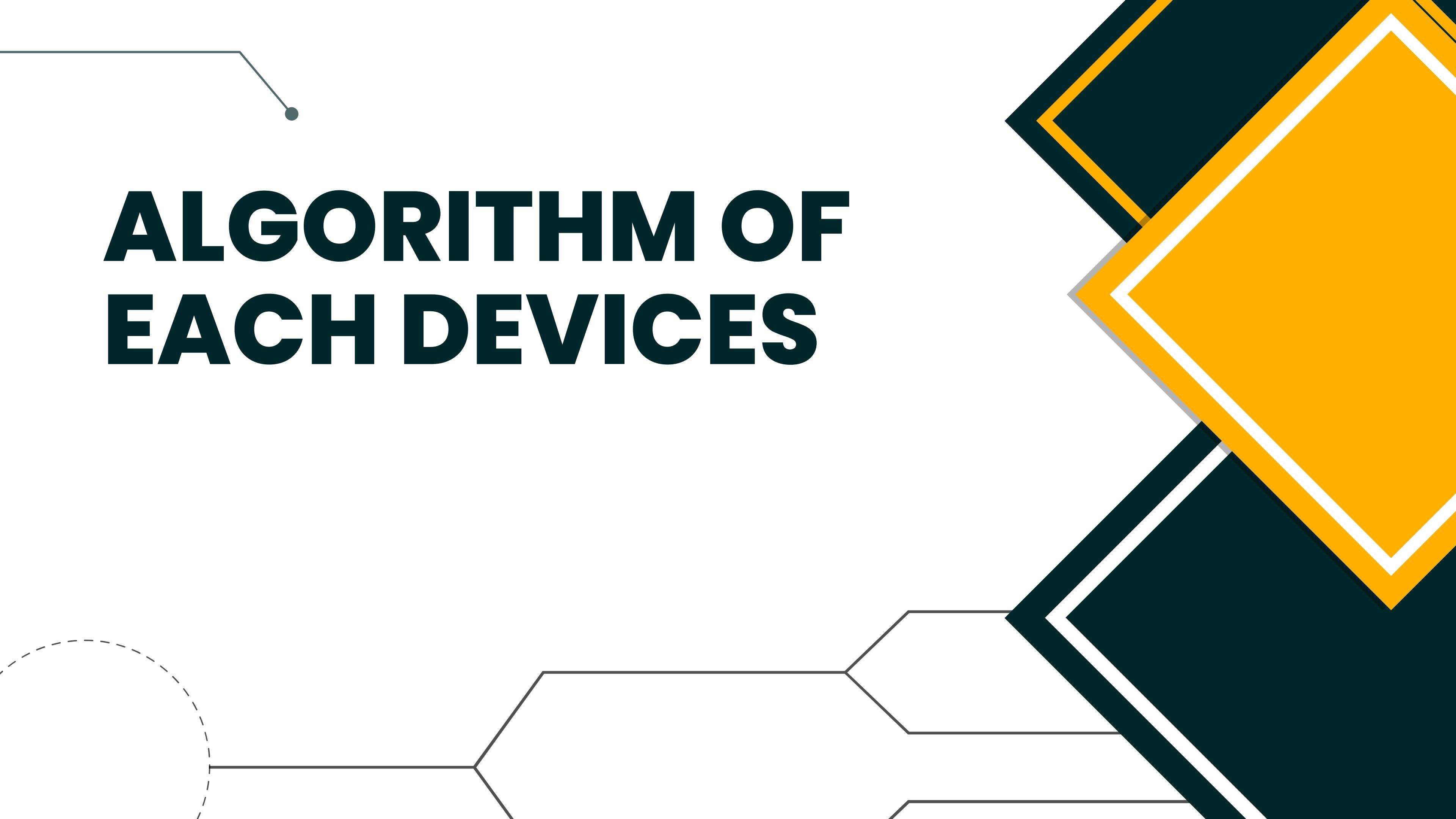


AutoPilot Mode

Ultra Sonic sensor will detect and measure the distance from the robot to the obstacle and avoid it.

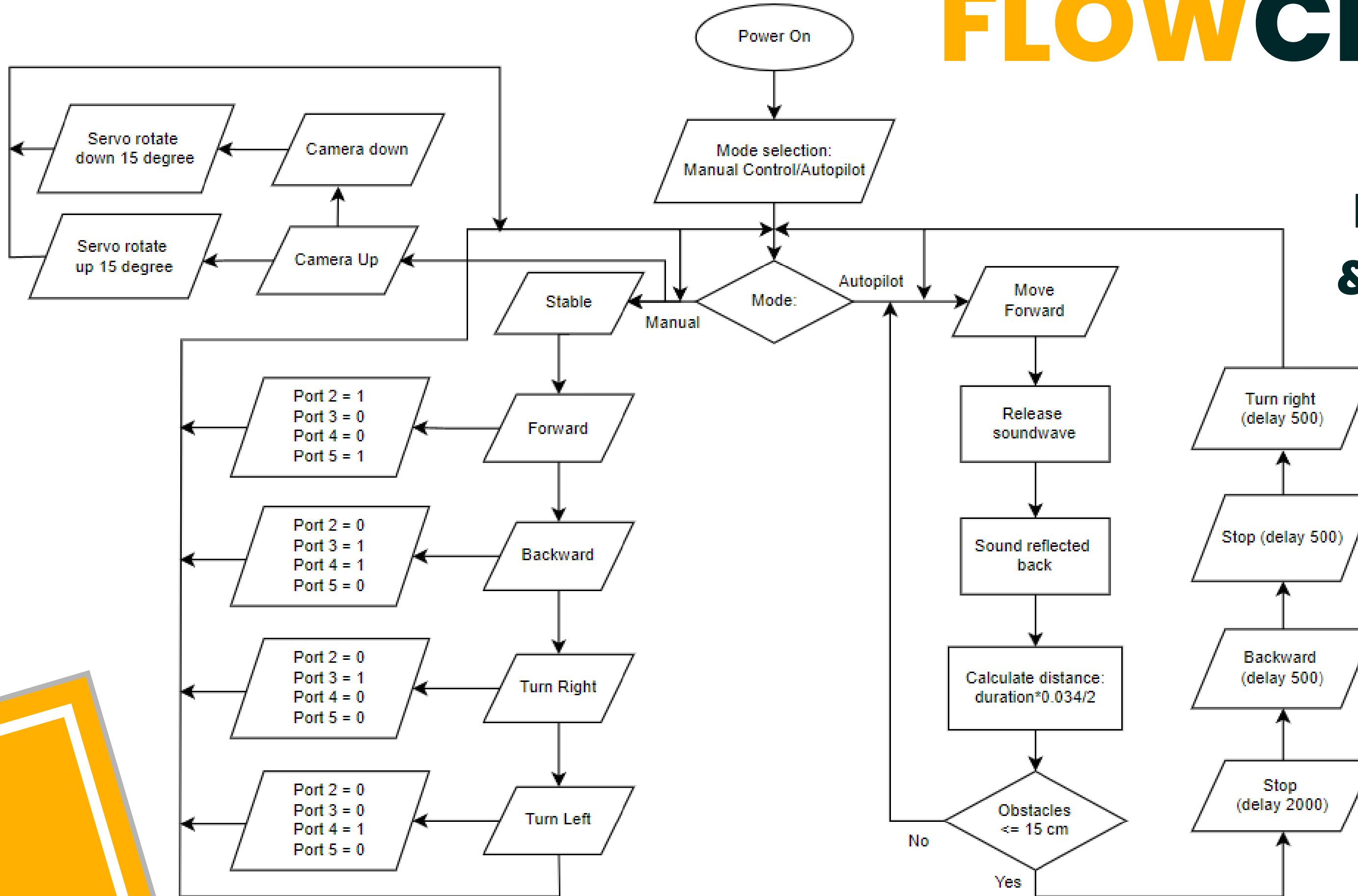


ALGORITHM OF EACH DEVICES



FLOWCHART

Robot's Movement & functions



Programming

Problems

01 Not Running Straight

The robot couldn't run straight, tends to turn right with the move forward command.

02 The ESP-32 camera

The camera's video output was significantly uncleared, and the framerates is very low.

03 The robot not running

As we connect all the wires and power supply, the robot is not running when it supposed to. However, as we measure the current, there is nothing wrong.

04 ESP-32 and Arduino to the webserver

The ESP-32 and Arduino act as two separated devices, the code from the two device overwrites each other on the webserver.

Solutions

01

Not Running Straight

There was unbalanced weight distribution. We adjusted the components of the car to make the weight more balance.

03

The robot not running

As we change the battery to the new one, it is running properly, then after several tries, it stop running again. So we try it with function generator and it work really well. So we figured it out that the 9v battery is not really proper for our product but it works, however, new ones requires.

02

The ESP-32 Camera

The Camera lens were changed as there were problems with the initial one.

04

ESP-32 and Arduino to webserver

The webcam stream and the manual control can't work at the same time. We displayed the stream on the webserver and the controls are controlled by bluetooth through a phone application.

CURRENT PROBLEM

- Error in some features due to not enough power from the power supplies
- 12V power supply doesn't work properly – burned jumper
- Sometimes unable to avoid side obstacle

FUTURE WORK

- Better power supplies that suit our product
- Rotatable ultrasonic sensor for avoiding side obstacle

Work Distribution



Nata

Main Software Developer

Software

- Overall movement
- Autopilot Mode
- Manual Mode
- Webcam streaming
- ESP-wifi
- Servo



Pann

Hardware Developer

Software

- Manual Control

Hardware - Circuit

- Arduino
- Motor
- HC06
- Problem Fixing



Mill

Hardware Developer

Software

- Overall movement

Hardware - Circuit

- Motor Driver
- Ultrasonic Sensor
- ESP-32
- Problem Fixing
- Gathering Materials



Vitchawong

Designer

Hardware

- Initial design
- Initial model structure
- Servo
- Getting missing components