Project Setup Steps

1. Set Up the Raspberry Pi 4B

1.1 Install Raspbian OS

1. Download the latest Raspbian OS image from the [official Raspberry Pi website](https://www.raspberrypi.org/downloads/raspberry-pi-os/).

2. Use software like Balena Etcher to flash the OS image onto a microSD card.

3. Insert the microSD card into the Raspberry Pi and power it up.

1.2 Initial Configuration

1. Connect the Raspberry Pi to a monitor, keyboard, and mouse.

2. Complete the initial setup wizard:

- Configure Wi-Fi

- Set the locale

- Update the software

1.3 Install VNC

1. Install VNC Viewer on your system using browser to start the OS
2. Using Raspberry pi's IP Address connect raspberry pi to VNC Viewer to start the OS

2. Install Necessary Software and Libraries

2.1 Update the System

sudo apt update

sudo apt upgrade

2.2 Install Python and Pip

sudo apt install python3 python3-pip

2.3 Install OpenCV

sudo apt install libopencv-dev python3-opencv

2.4 Install TensorFlow and Keras

pip3 install tensorflow keras

2.5 Install Additional Libraries

pip3 install numpy scipy imutils

sudo apt install espeak

3. Set Up the Camera

3.1 Enable the Camera Interface

1. Open the Raspberry Pi configuration tool:

```
sudo raspi-config
libcamera-hello
```

2. Navigate to `Interfacing Options` and enable the camera.

3. Reboot the Raspberry Pi:

```
sudo reboot
```

4. Connect the Ultrasonic Sensor

4.1 Wiring

1. Connect the VCC pin of the ultrasonic sensor to the 5V pin of the Raspberry Pi.

2. Connect the GND pin to a ground pin on the Raspberry Pi.

3. Connect the TRIG pin to a GPIO pin (e.g., GPIO 23).

4. Connect the ECHO pin to another GPIO pin (e.g., GPIO 24).

4.2 Install GPIO Library

sudo apt install python3-rpi.gpio

5. Download and Set Up the SUPERVISION Code

5.1 Download Code File
1. Download the code manually

https://drive.google.com/drive/folders/1inbCx8TVoCqqKD_S0SUUODfJ1cdpVXyd?usp=sharing

5.2 Prepare the Model

1. Download the pre-trained MobileNetV2 model and COCO names file.

2. Ensure they are placed in the correct directory as specified in your code.

6. Run the Script and Bluetooth

Run the script using python object_detection1.py --labels labels.txt --model mobilenet_ve.tflite

Using Bluetooth Option connect the earphones to the Bluetooth

7. The User setup

7.1 Wear the Prototype to the user carefully and connect Bluetooth for voice commands
7.2 The Scripts runs for 1 min
7.3 To rerun the script please run the script command again

8. Close the Script

Close the terminal and shut down the system.