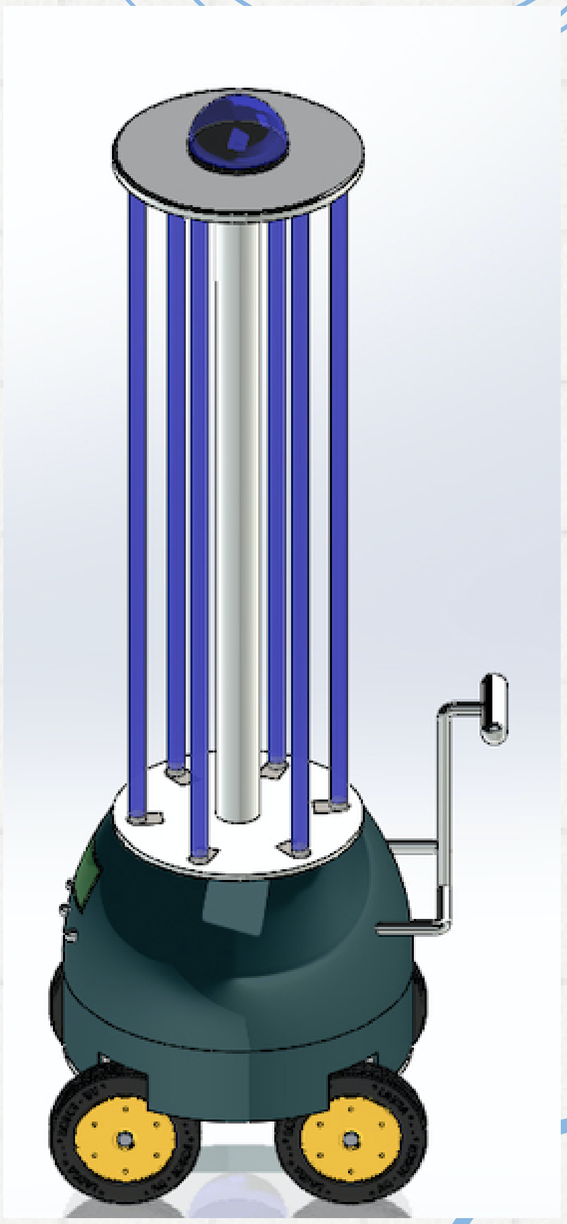
AUTONOMOUS UV ROBOT WITH SLAM

Team 7

WHAT IS AUTONOMOUS UV ROBOT ?

The affordable autonomous robot provides localization and mapping facilities and safely navigate the robot through the environment.

3D MODEL OF UV-ROBOT



HARDWARE COMPONENTS

- Raspberry Pi 3 Model B
- Arduino UNO
- Ydlidar X4
- UV lights
- Din 45 Ah battery
- Inverter 650 watts
- Seeed Studio Wio Terminal
- ULTRAVIOLET UV DETECTION SENSOR BASED ON GUVA-S12SD 240NM-370NM
- ControlEverything.com 4-CHANNEL RELAY CONTROLLER FOR I2C
- 12V to 5V buck converter
- IB2 BTS7960 Monstor motor driverDHT11 Temperature & Humidity Sensor (4 pins)
- Arduino Mega 2560
- TFT Touchscreen, 320x240

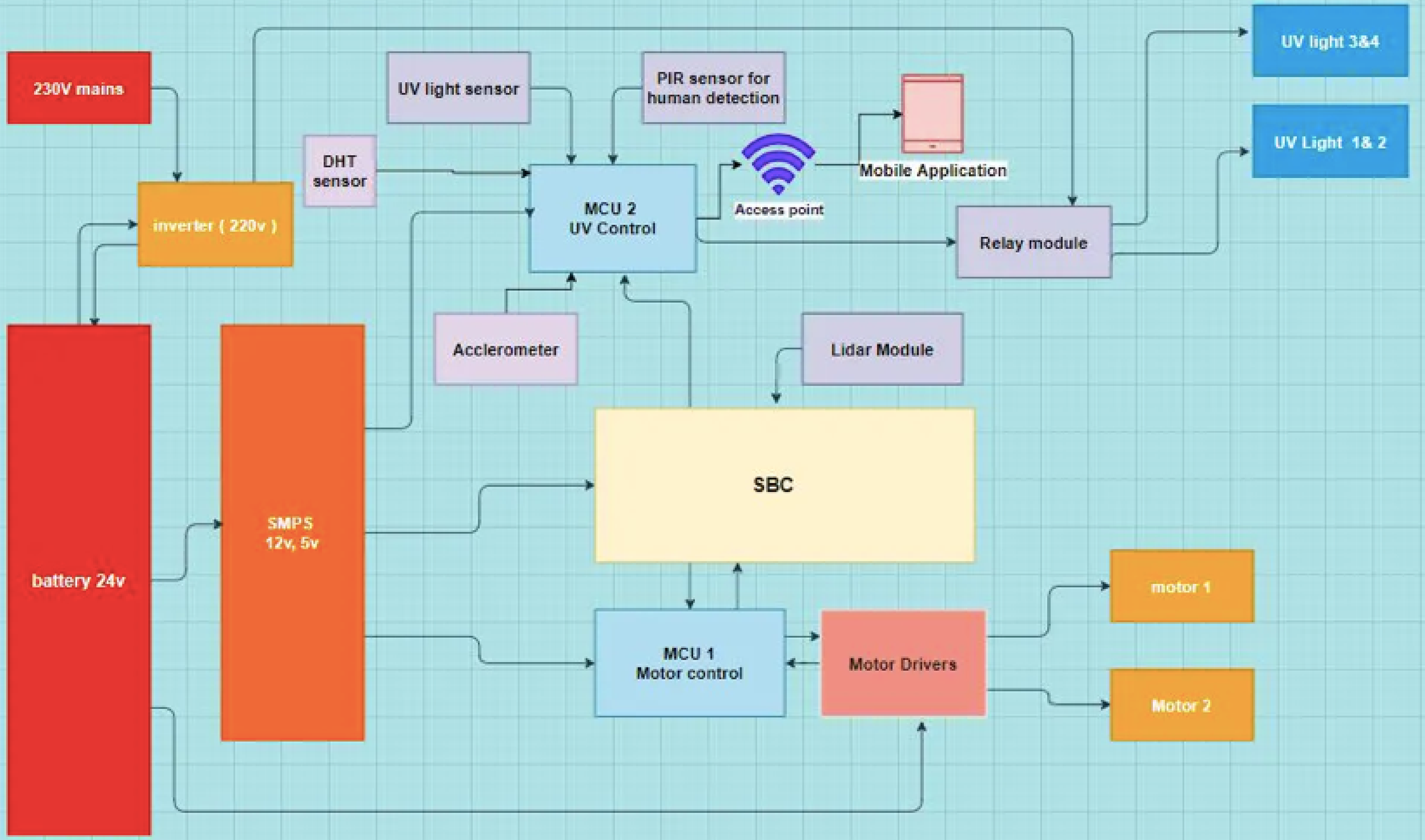
SOFTWARE APPS AND ONLINE SERVICES

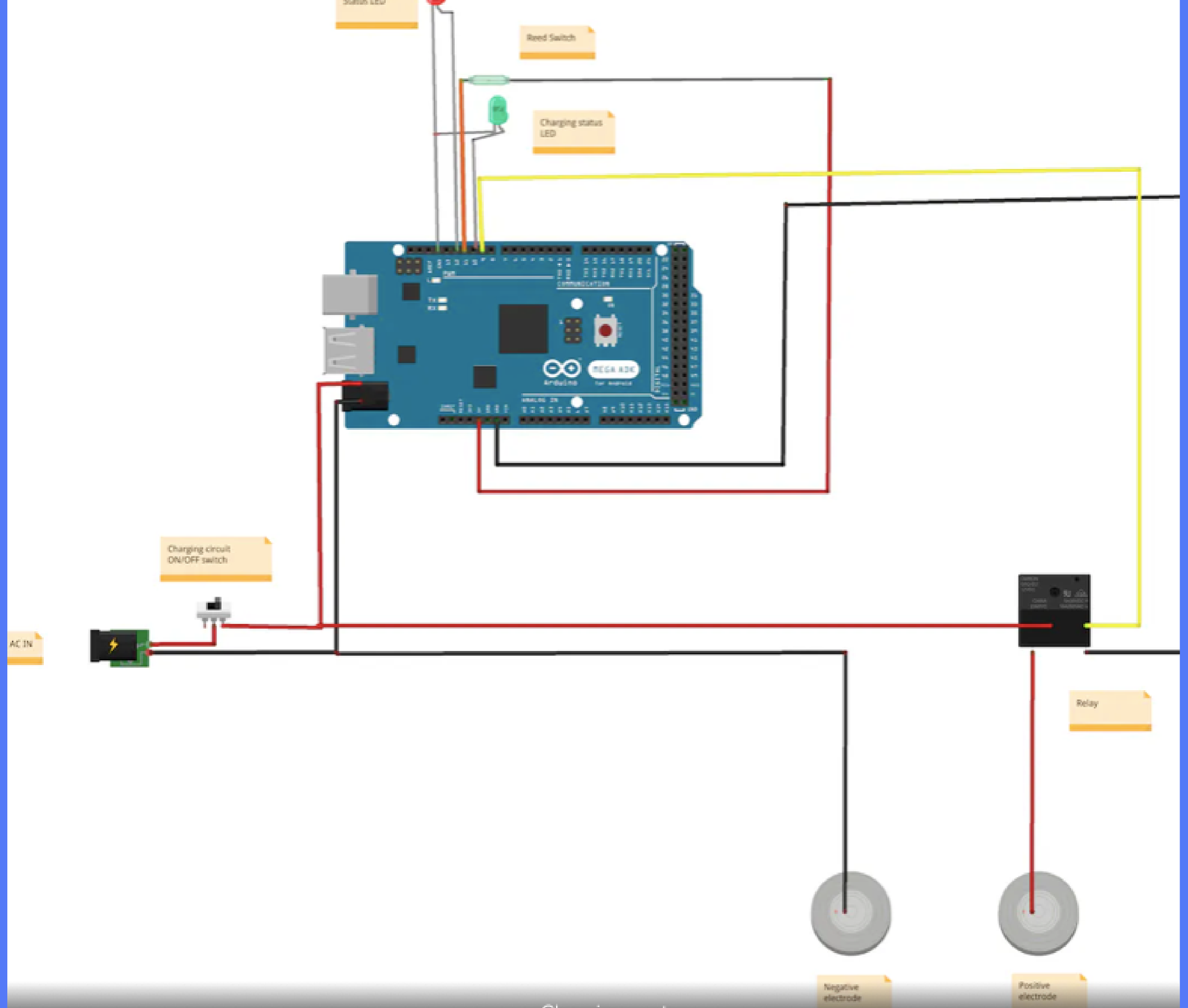
- Arduino IDE
- MIT App Inventor 2
- ROS Robot Operating System
- Autodesk Fusion 360
- CircuitMaker by Altium Circuit Maker

HAND TOOLS AND FABRICATION MACHINES

- 3D Printer (generic)
- Wire Stripper & Cutter, 18-10 AWG / 0.75-4mm² Capacity Wires
- Drill / Driver, Cordless
- Soldering iron (generic)
- Solder Wire, Lead Free
- Tape, Electrical
- Hot works
- Digilent Mastech MS8217 Autorange Digital Multimeter
- Hand cutter
- Welding machine
- Digital signal Oscilloscope

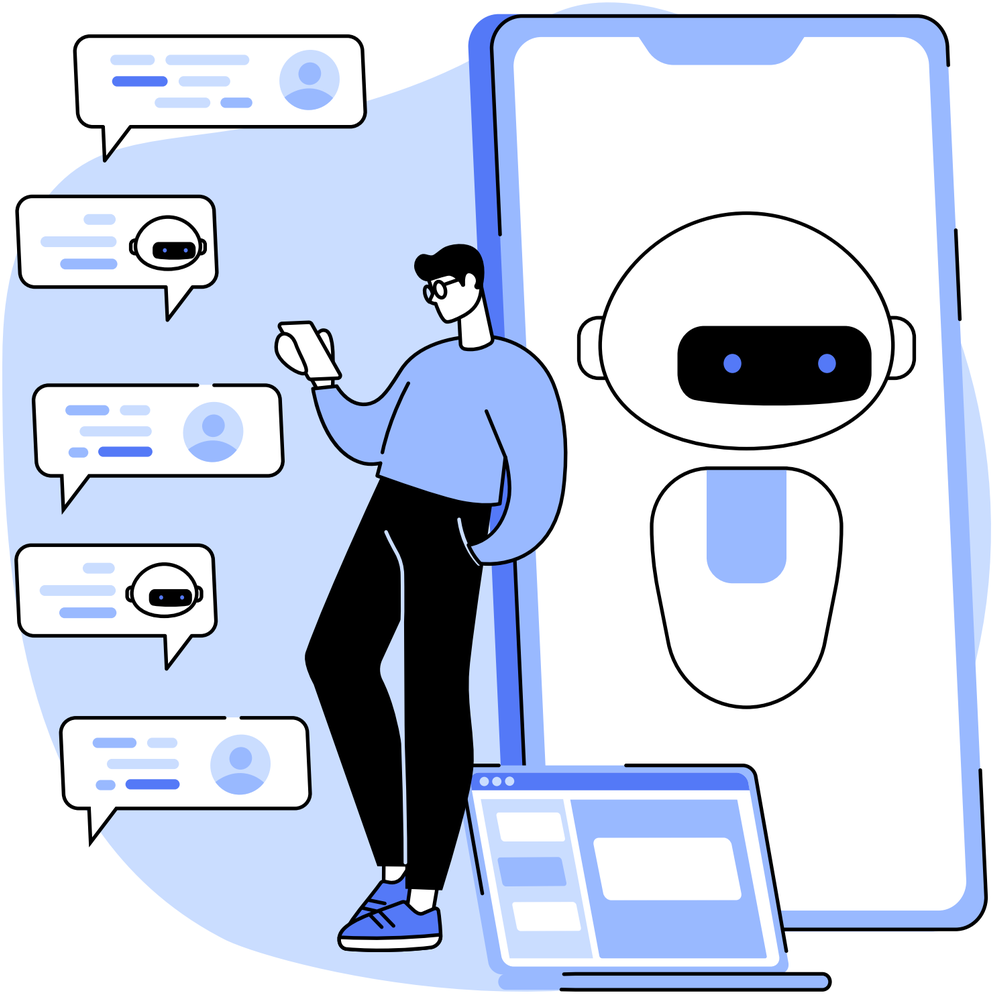
BASIC BLOCK DIAGRAM UV-BOT




Reed Switch
Charging status LED
Charging circuit ON/OFF switch
AC IN
Relay
Negative electrode
Positive electrode

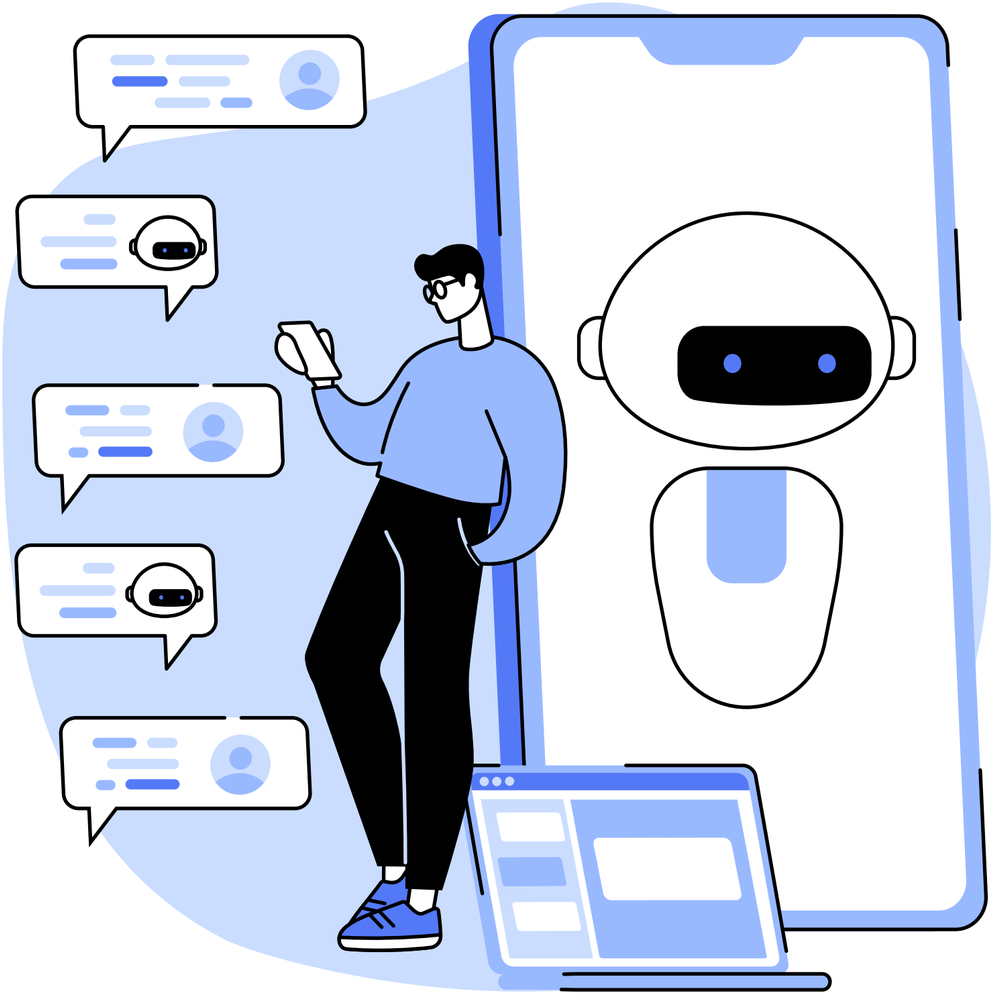
ROS

ROS (Robot Operation System) is a framework that facilitates the use of a wide variety of "packages" to control a robot.



ROS + ARDUINO COMMUNICATION

We know that the Raspberry Pi is the most important part of our robot. The Arduino will be controlling the motors.So we require communication between Raspberry Pi and Arduino, we will install rosserial, a ROS module that enables Arduino communication, on both the Raspberry Pi and the Arduino.



ONLINE SIMULATION

MAPPING

ROS SERIAL MOTOR CONTROL

ROS AUTONOMOUS SETUP CODE

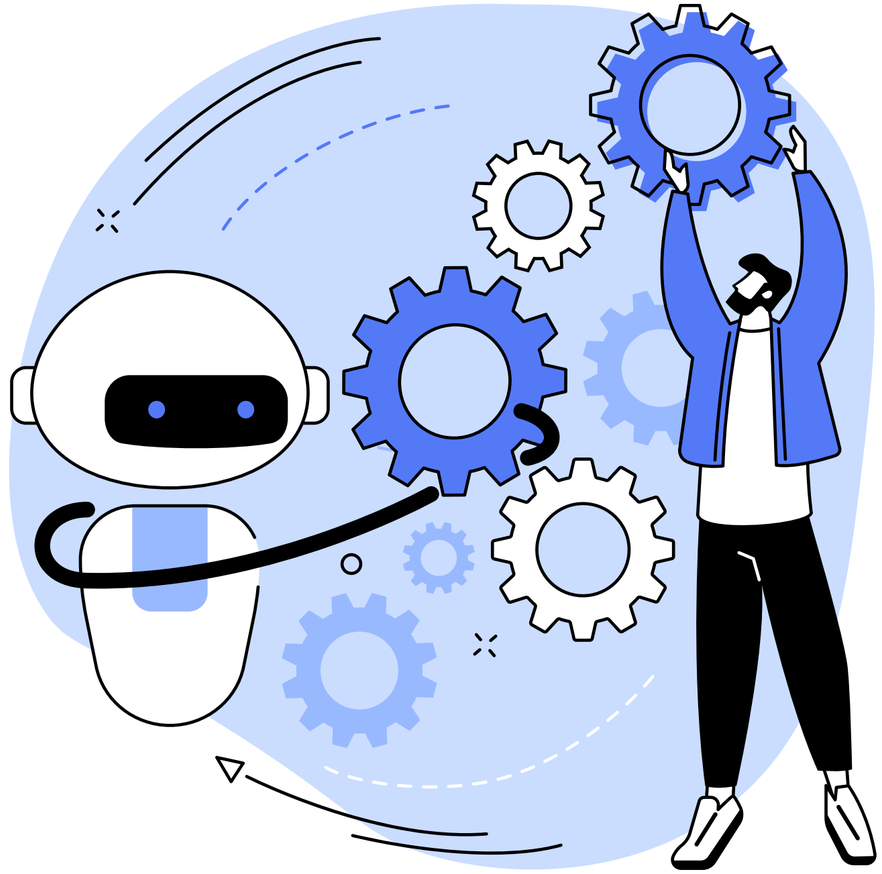
FUTURE PLANS FOR ROBOT

Switch on the Robot. It connects to the wifi of the WIO terminal.

We can switch on the UV light with the app.

We can see the status of the UV robot in the app.

Better sensors for human detection.



THANK YOU FOR YOUR ATTENTION!