OBJECTIVE

- Disinfect a 1.2m by 0.7m in a single charge
- Under $300 to manufacture
- Obstacle Avoidance + Negative Incline Detection
- Safe to use with emergency features
- Support >1 kg load
- Palm size chassis

TableUV
T. UV

"To significantly reduce disease transmission by designing an accessible and economical device for the general public."
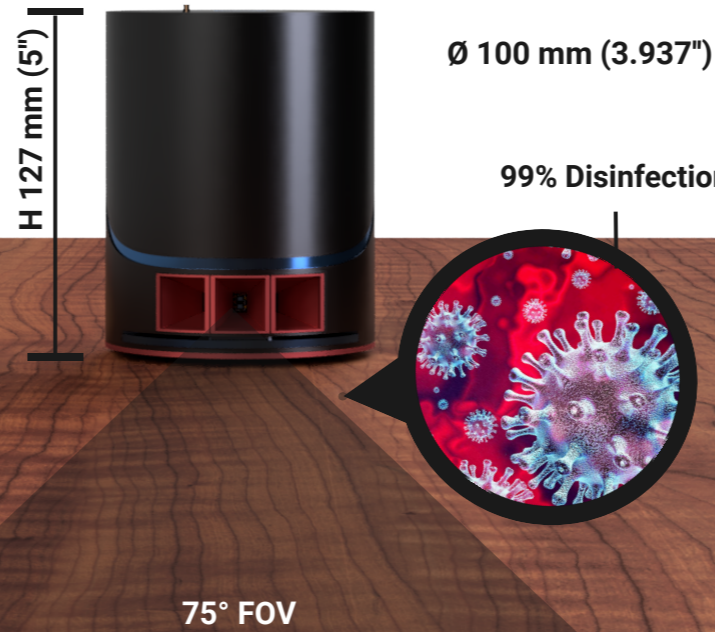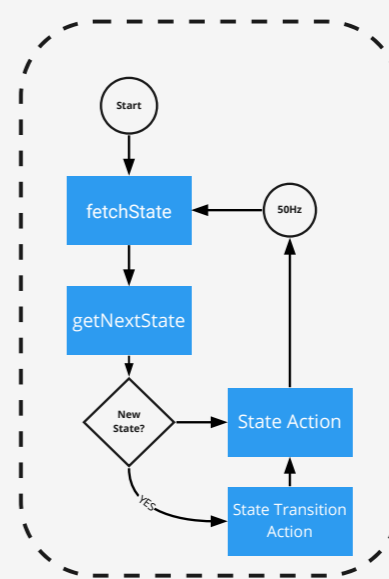
SOFTWARE

Supervisor

SLAM

FEATURES

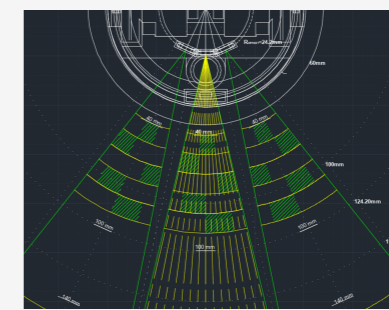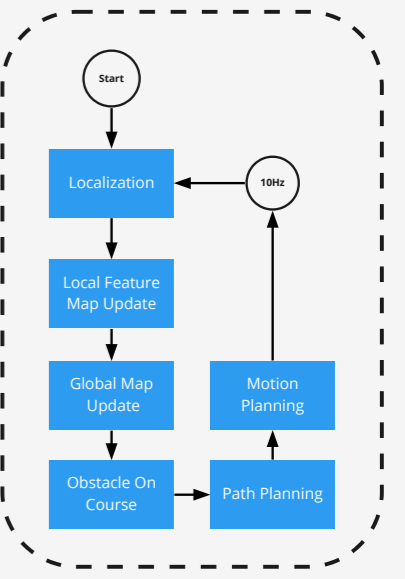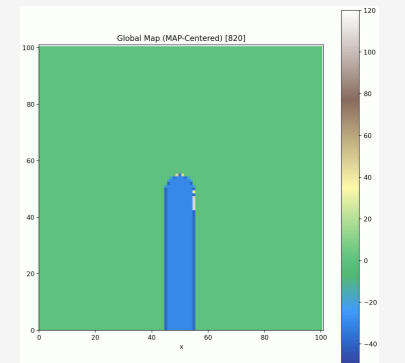| Collision Avoidance	Object Detection	Table Edge Detection
UV Disinfection Control	Alcohol Dispensing Control	Compact Design
Circuit Protections	UV LED Safety Shutdown	Rechargeable Battery

MECHANICAL

- Start/Pause Button
- MCU Board
- Power Delivery + Driver Board
- IMU - ICM 20948
- ToF Lidar - VL53L1x
- Front Bumper
- Bottom Grill
- Mist Outlet
- Spring Loaded Caster Wheel
- UV-C (277nm) Sanitization Array
- IR Sensor Arrays
- Geared Motors
- Quad-Encoders
- Bumper Sensors
- Charging Board
- Power Button (E-Stop)
- 2.4 GHz Antenna
- Alcohol Liquid Level Sensor
- Modular Mounting Grill

Ø 100 mm (3.937")

H 127 mm (5")

99% Disinfection

75° FOV

ToF Field of View

Global Map Generation

IMU Visualization

Yaw: 67.708992, Pitch: 9.627983, Roll: -40.246841
Press Escape to exit.

Simulation

ELECTRICAL & FIRMWARE
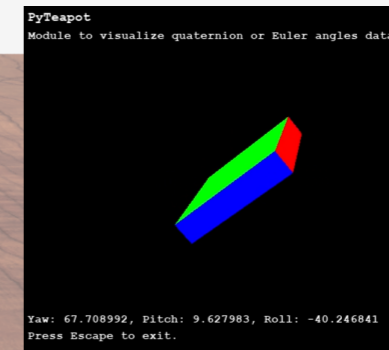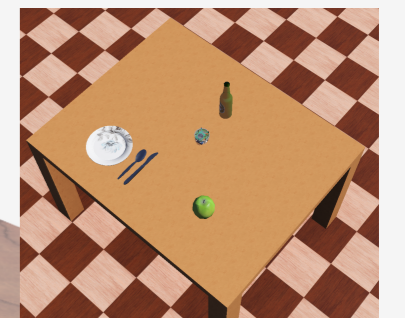
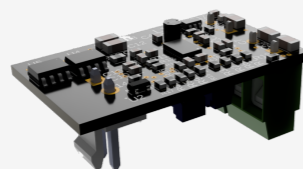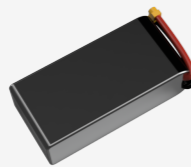## MCU BOARD
- ESP32 - Main MCU
- 3x ATTiny84 - Sensor & Motor Driver MCU
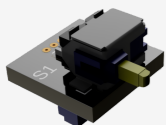- UV LED Driver
- USB-C Charge Input
- LEDs & Button

POWER & DRIVER BOARD
- Motor Driver DRV8835
- 3.3V Buck Regulator
- 6V Buck Regulator
- 10V Buck Regulator
- 24V Boost Regulator
- Alcohol Mist Haptic Driver

COLLISION BOARD
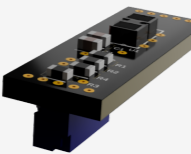- 2x Switch Detectors
- 35gf Actuation Force

CHARGER BOARD
- LiPo Charger IC
- Battery Voltage Monitor
- Battery Temperature Monitor
- Battery Charging Profiler
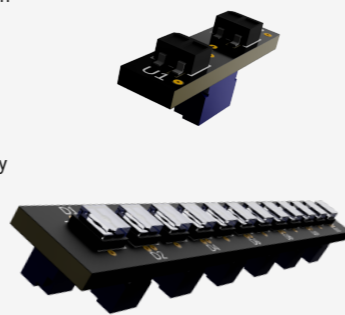- Battery Fault Detection

BATTERY
- 3 Cell LiPo
- 11.1V 1300mAh
- Fast Charge Capability

TOF SENSOR BOARD
- 3x ToF Sensors
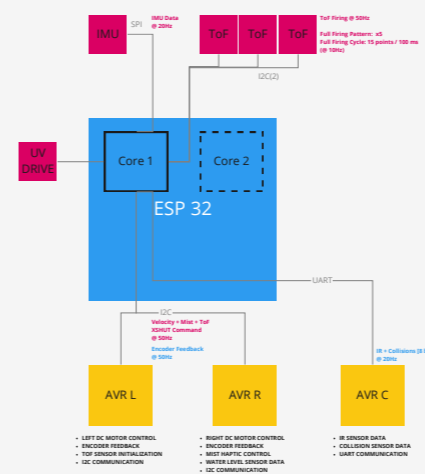- 4m Sensing Distance
- Configurable ROI

IR SENSOR BOARD
- 6x IR sensors (2 per board)

UV LED ARRAY BOARD
- 12 UV LEDs
- 277nm wavelength
- 7.2V Forward Voltage

LOW LEVEL FIRMWARE ARCHITECTURE

ESP 32
Core 1   Core 2
AVR L   AVR R   AVR C

TEAM 55

Dong Jae Park   **Jerome Villapando**   **Jack Xu**   **Tsugumi Murata**

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FACULTY OF ENGINEERING
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Open Source @ *https://github.com/TableUV*