

DR. MOOVY

A mobile robot made to help patients, doctors and other staff of the hospital who are involved in the pandemic COVID19

Team Members:

1. Subham Agarwal – Team Lead (IOT/Programming/App Development/Software stack)
2. Maaruf Vazifdar (Mechanical)
3. Pratik Bhajpal (Electronics/Programming)
4. Maitreya Kulkarni (Programming)
5. Krishna Deb (App Development/ Software stack)
6. Rishabh (App Development/Software stack)
7. Viral Panchal (Mechanical)
8. Joseph Joel (Electronics/Programming)

Helping Members on campus:

1. Pawan Raj Singh
2. Tanooj Jagdeep
3. Divya Kumar
4. Burhan

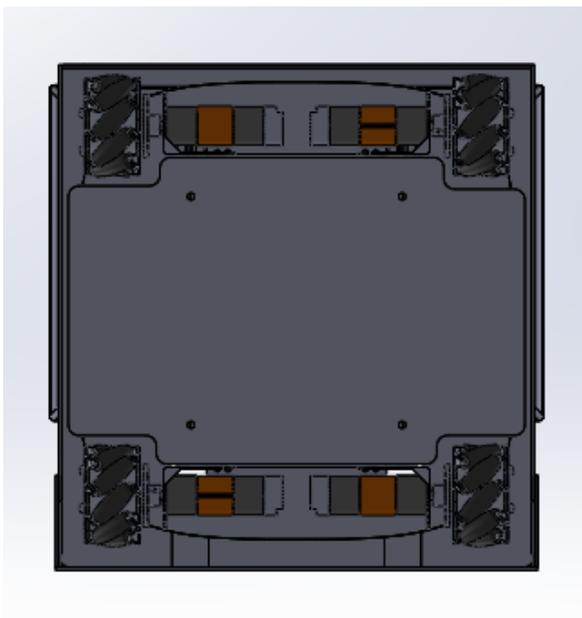
Project Guide: Ranjith Pillai R

1. Introduction

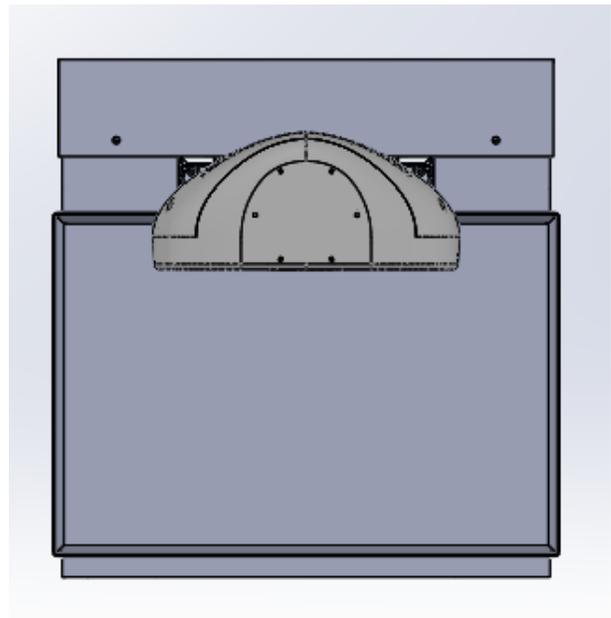
Dr. Moovy is specifically designed mobile robot for helping patients, doctors and other staff members of a hospital. The idea that this type of robot can help reduce the risk that doctors and staff members of an hospital face during interaction with patients who are affected with the virus. This can also reduce the spread. The main motive is to help the doctors and reduce some work from their shoulders so that they can respond to emergency situations as well.

2. Details of the robot

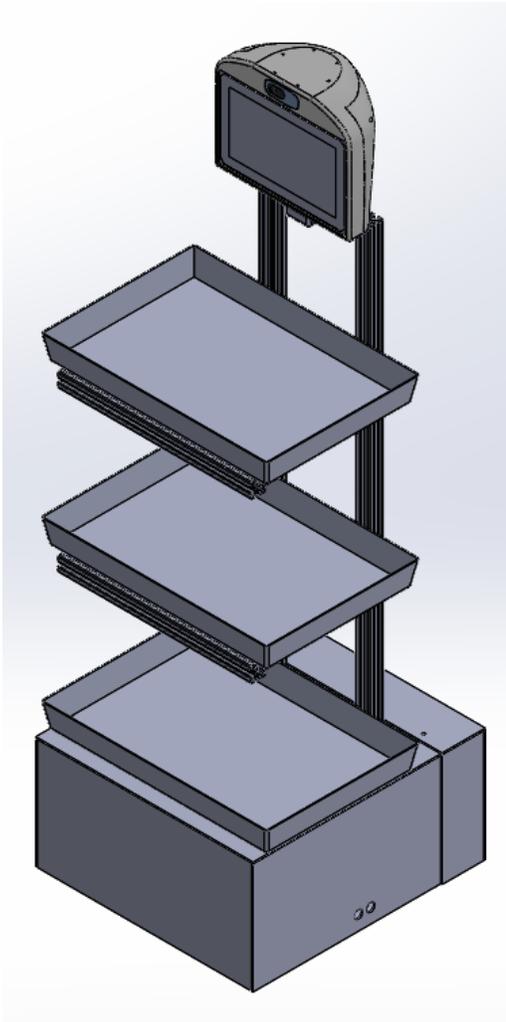
a. CAD Model



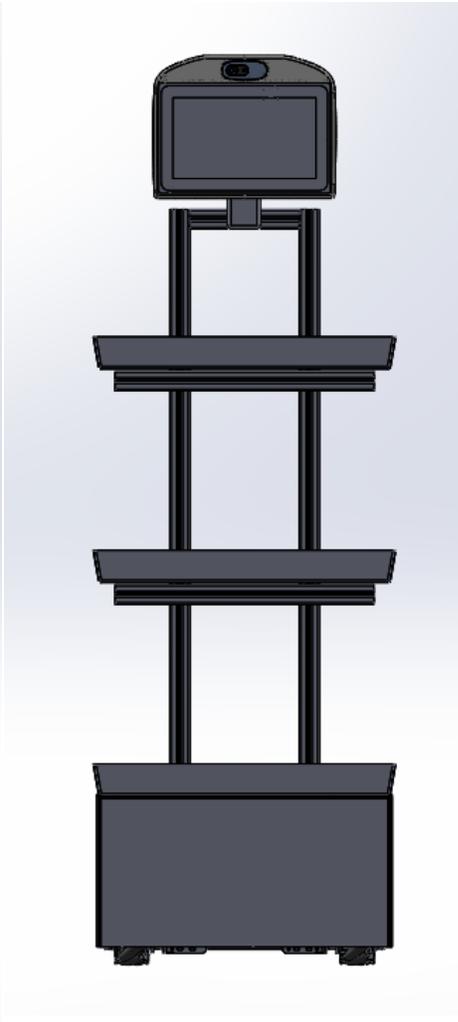
Top View



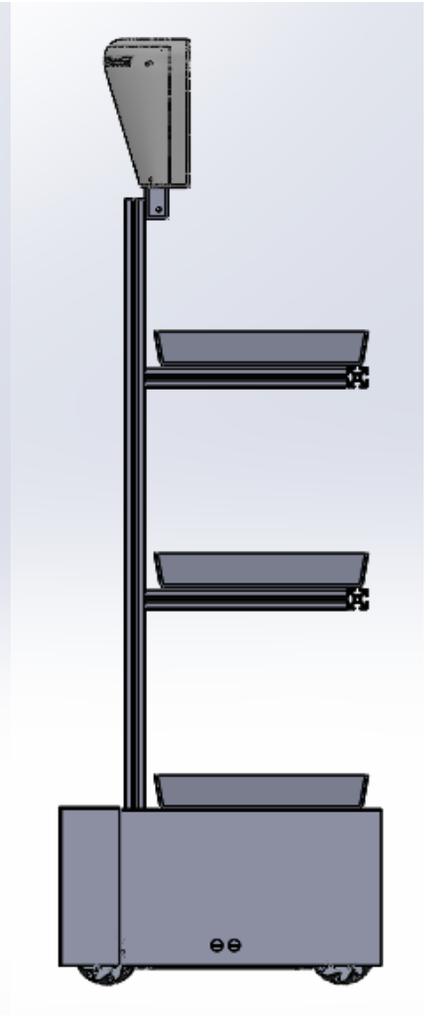
Bottom View



Isometric View



Front View



Side View

b. Dimensions

Height: **1400 mm**

Max Width (Base): **450 x 480 mm**

Weight of the Robot: **12 – 15 kg**

Maximum Payload: **20 kg**

Tray size: **450 x 300 x 60 mm**

Number of trays: **3**

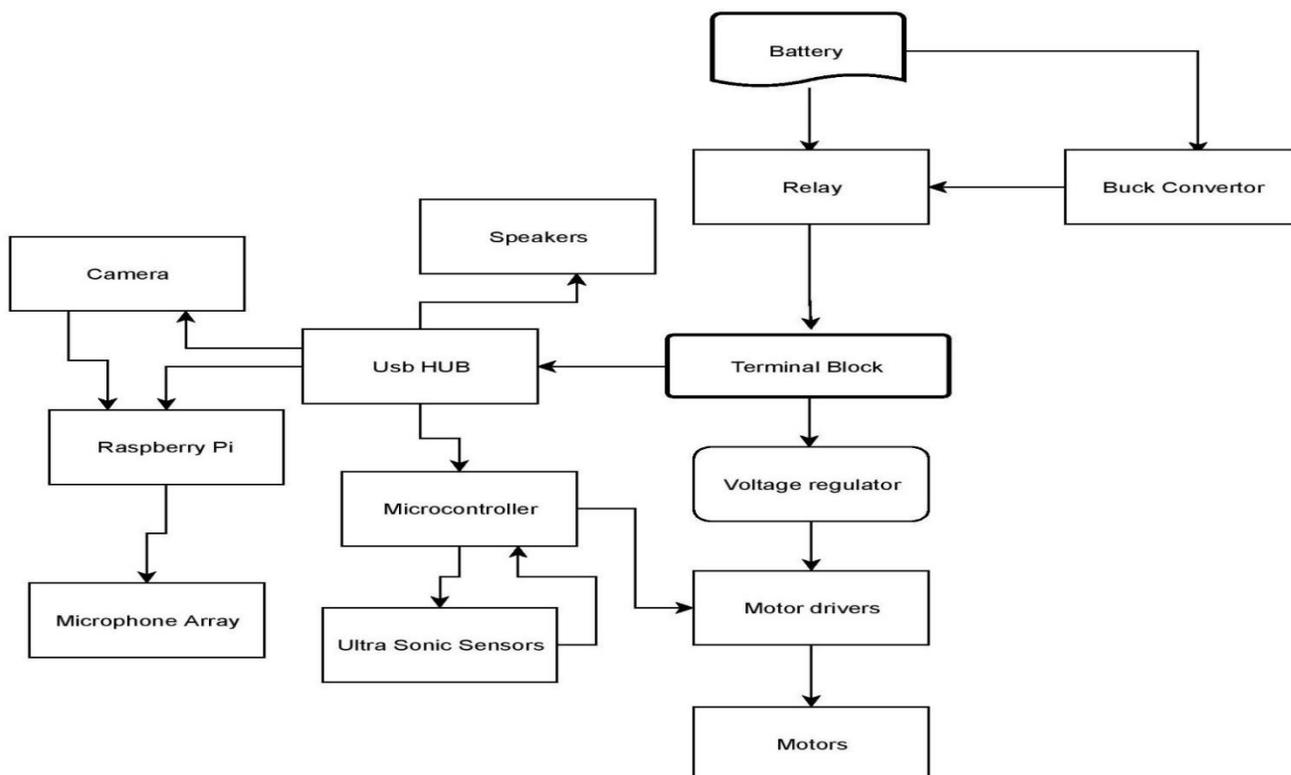
c. Working Model



d. Sensors

1. Microphone Array
2. Ultrasonic Sensor
3. Camera
4. Speakers

e. Electronics

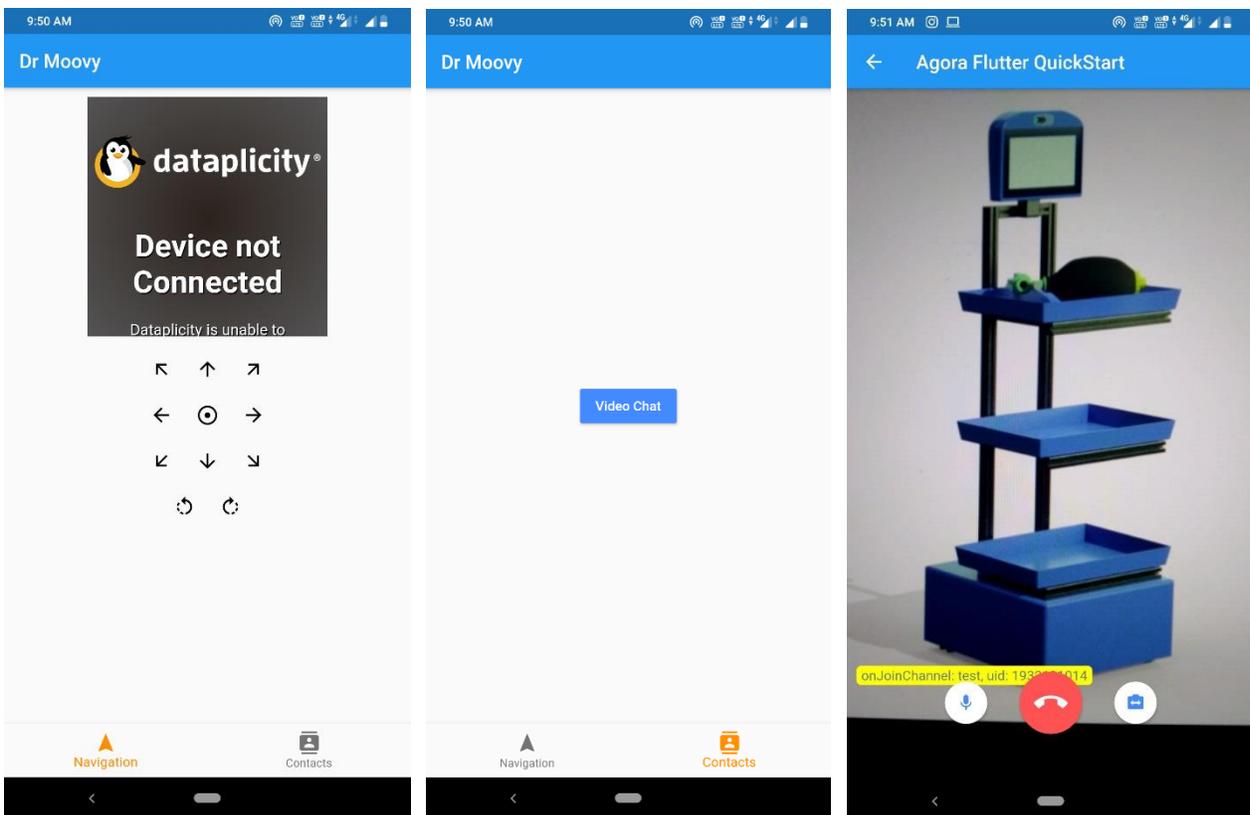


f. Features of the Robot

1. Mobile Robot with additional freedom of movement
2. Live video feed
3. Remote Controlled by App
4. Audio/Microphone
5. Trays to store medical supplies
6. Modular structure
7. Payload up to 20 kg
8. Maximum runtime: 3 hrs (Can be expanded based on requirement)
9. Obstacle avoidance
10. Robot's main controls are waterproofed

g. Features of the App

The app is a simple to use, user-friendly with two main pages; Navigation and Video Call. The Navigation page consist of all the controls required to move the robot along with live video feed which can be used to control the robot remotely. The second page allows the user to video call the person on the other side to help and give further assistance. The app is natively designed in a way that it can be installed in any operating system (iOS/Android/Web)



h. Communication

The robot can be controlled from a safe distance through a mobile app. The user can see what the robot see's through a live feed from the robot. The tested latency is less than 1s. The user can interact with the patient via the bi-directional communication protocols set in the robot. The network-based control has a latency of 0.5 – 1s which is ideal for a mobile robot control. The backend is real-time where the control parameters are set.

i. Renders

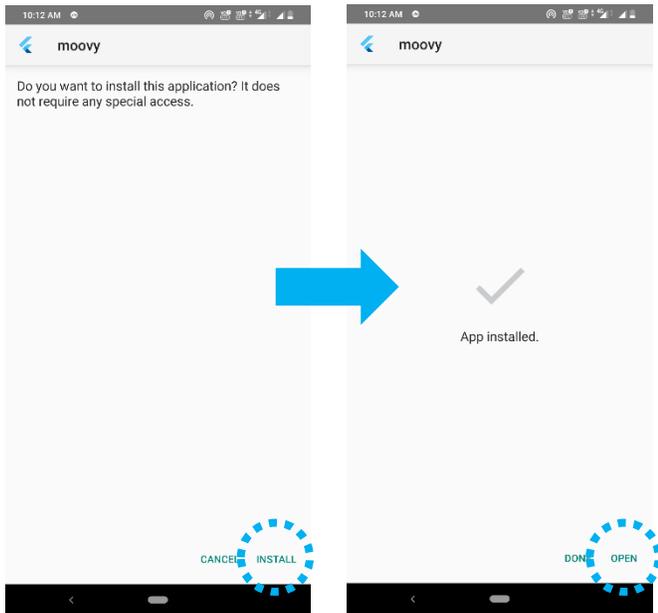


Conclusion

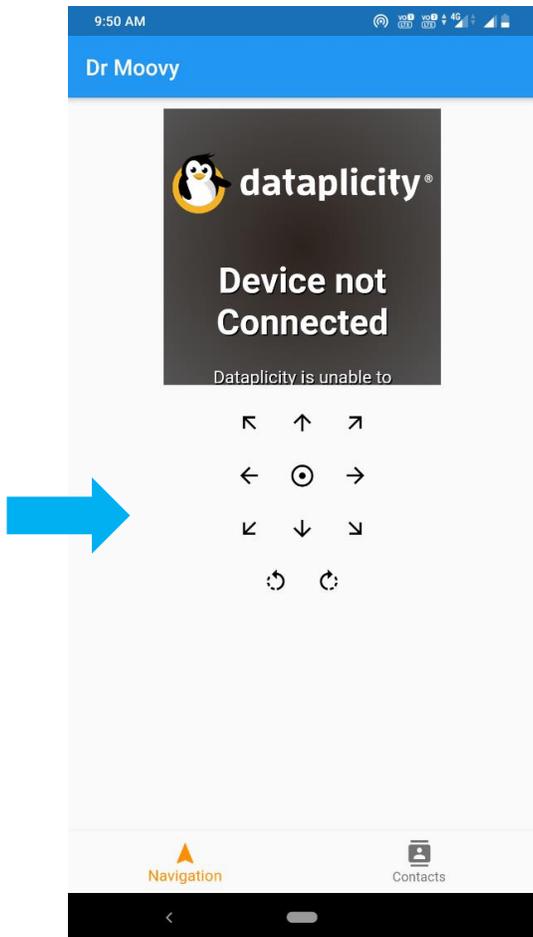
The robot as of now only can be controlled through a user application. But it can be turned into an autonomous robot by adding additional sensors and high computing capacity controllers. The robot will also need a map of the hospital for which map generation and tuning can take any time between 3 – 7 days. Since there is a shortage of time, we can use it as an internet controlled mobile robot. The algorithms to develop the autonomous mode is already developed and is ready to be deployed given the necessary hardware

User Guide

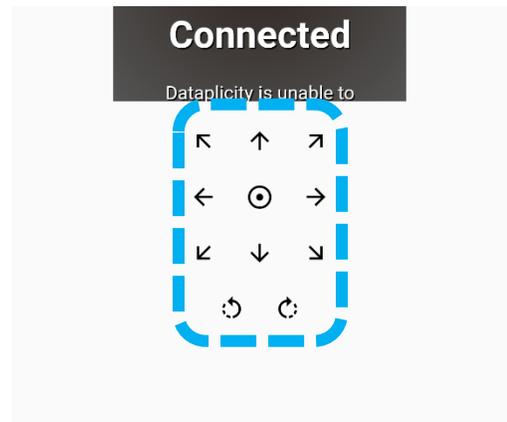
1. Install the App and Open it.



2. Check if the robot is connected to the app.



3. Control the robot with given controls.



4. Use the video call feature.

