IoToy Documentation

1. Installation steps

1. For both RPI0 and RPI4, download an image from
   https://www.raspberrypi.org/downloads/raspbian/
   Image that come with recommended software sometimes does not work with Eduroam, it is advised to use the image without recommended software
2. Connect Raspberry pi 4 with Accelerometer, RFID and proximity sensor, check diagram below for guidance
3. For both RPI0 and RPI4, Clone from https://github.com/XZ-XuZhang/IoToy.git
4. Create system service file to run scripts on RPI0 on boots up.
   Check this link for how to create service file
   https://www.raspberrypi.org/documentation/linux/usage/systemd.md
   You will need to do this for the following files
   i. /IoToy/RPI0/Accelerometer.py
   ii. /IoToy/RPI0/Proximity.py
   iii. /IoToy/RPI0/RFID Reader/SPI-Py/MFRC522-python/Read.py
5. Now setup a LAN on RPI0 with name IoToy and IP 192.168.4.1, following the steps in this link
   https://www.raspberrypi.org/documentation/configuration/wireless/access-point.md
6. Make RPI0 boot into console, this can be done by making change raspi-config and now reboot RPI0
7. If all previous steps are followed correctly, all sensors are now running and LAN IoToy should be visible to devices around RPI0
8. Connect RPI4 to LAN IoToy, and create executable bash file for running command
   This is the format for creating bash file, change directory to whichever script you are creating for.

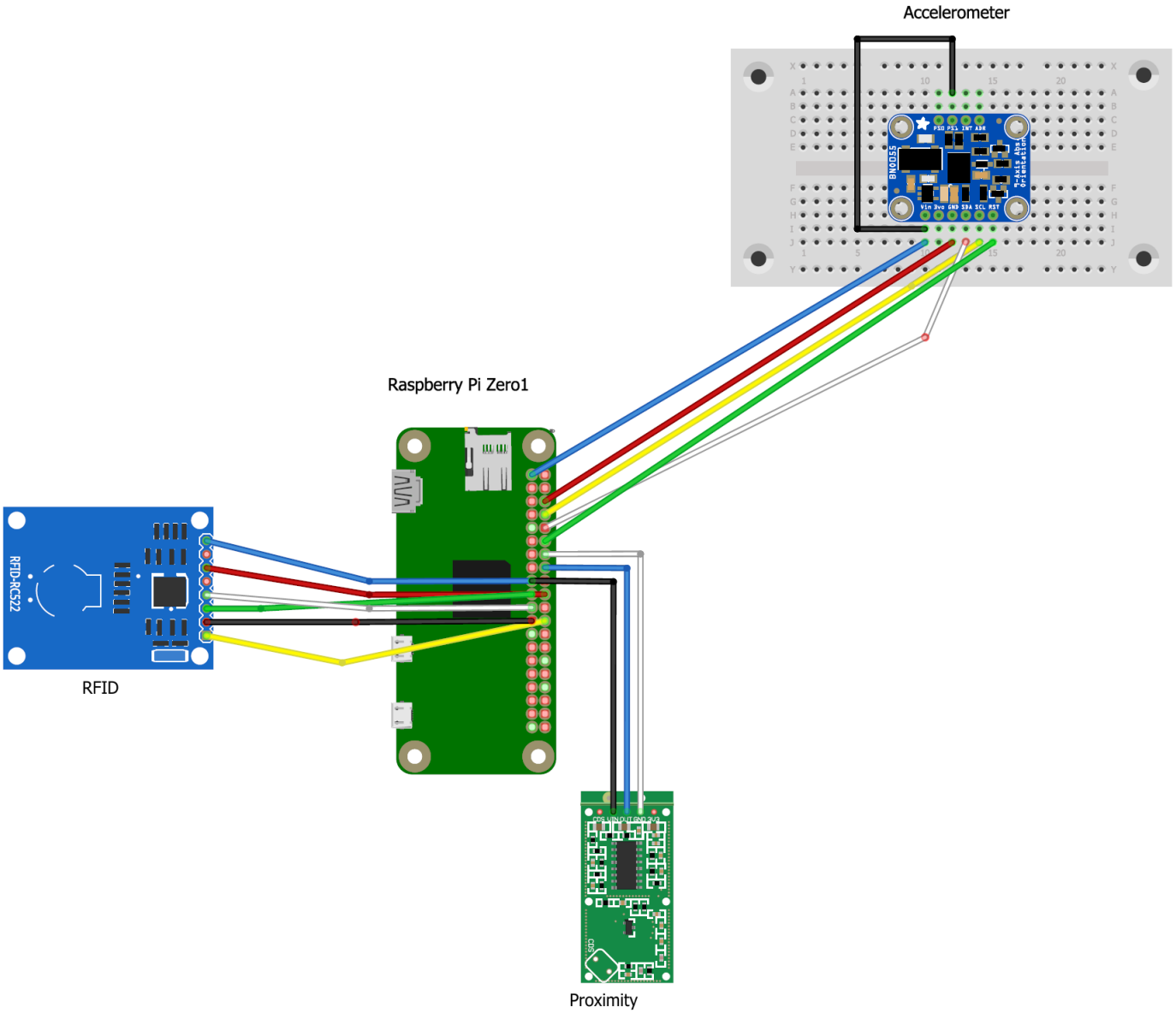
```
#!/bin/bash
python3 /home/pi/IoToy/RPI4/graphs/level1/magnitude.py
```

9. In terminal run sudo chmod +x bash_file_name to make this bash file executable by double click
10. Repeat step 8 and 9 for all graph scripts under graph folders, and receivePi4.py under 3D_render folder.
11. Now a User without terminal knowledge can click on these bash file to run Graph Visualisation scripts
12. To view 3D render of the bear, first run bash file associated to receivePi4.py then go to http://0.0.0.0:5000/ in the browser

Additions note:

I was not involved in making code for 3D render, So I do not yet have a full list of installed Libraries for running all the scripts. It is probably best to run each script first and see what library is missing. I will try to create a list of required libraries.

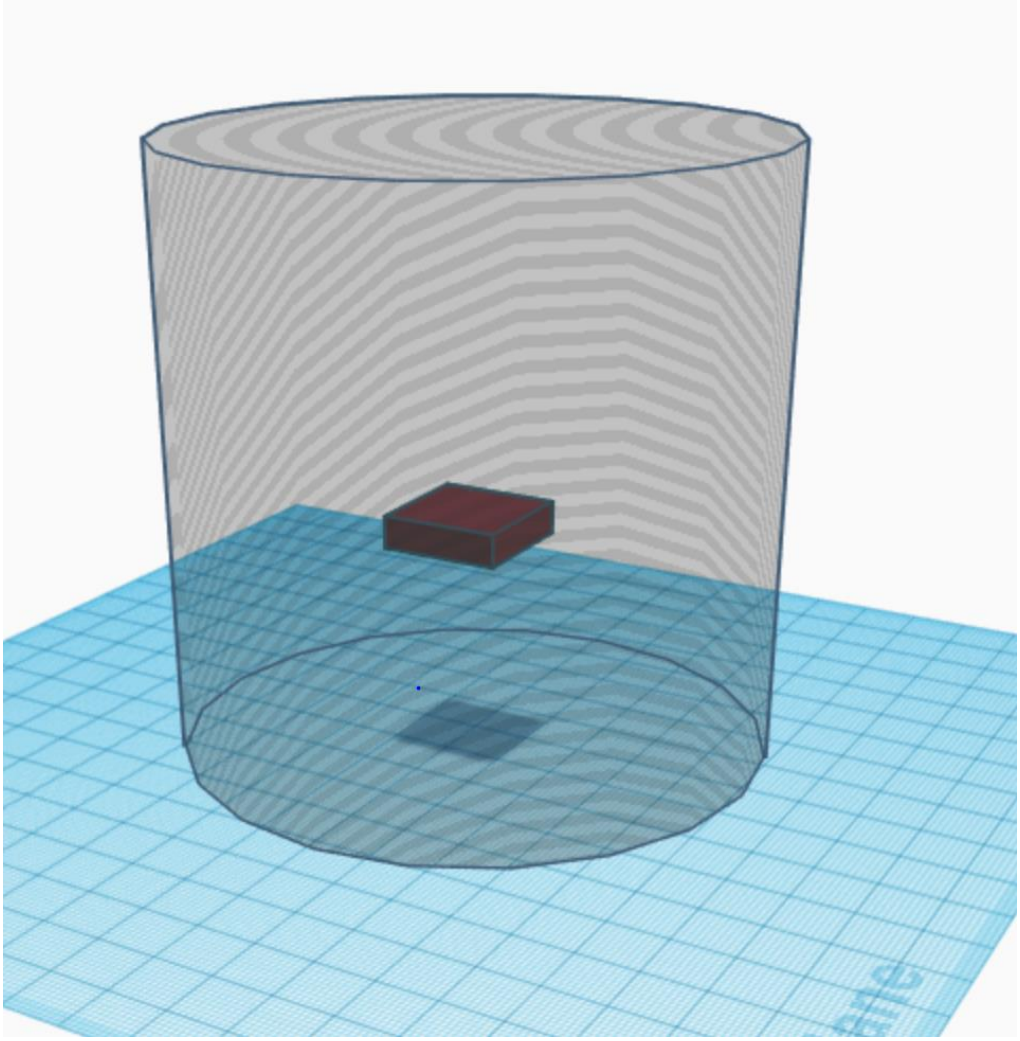
2. IoToy connection diagram

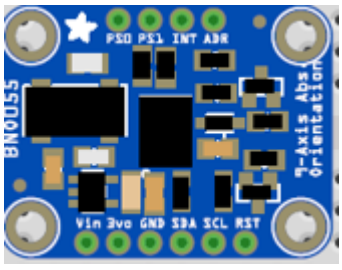


Putting everything inside the bear:

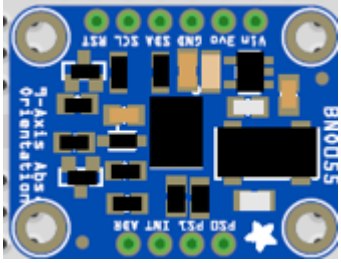
Everything else can be put inside the bear in any orientation, However, the 3D rendering straighten button only works if accelerometer is place in correct orientation

If this cylinder is bear siting upright, then the accelerometer sensor must be place like this,





so, this side is now facing the ceiling,



I am not sure about rotation, if its not working properly, rotate 180, like this