

# MemoryMate

The MemoryMate is a device that helps people who struggle with Alzheimer's, some form of dementia, and face blindness, in the elderly community. It has several features: face recognition, step counter, and fall detection. Face recognition allows the user to upload photos to add to the database, which will identify anyone the user sees. Step counter counts the number of steps the user has taken to track their health. Fall detection will trigger when the user falls to the ground, then email close contacts with the user's current location.

## Cloning and Installing Dependencies

If you do not have conda installed, please install it by following the steps outlined here:

<https://www.anaconda.com/download/>

If you are on windows, please download pscp following the instructions here:

<https://comtechies.com/copy-files-between-windows-and-linux.html>

Begin by cloning this repository and navigating to the Team4 folder. Run the following commands to make the binaries for fall detection:

```
git clone https://github.com/180D-FW-2023/Team4.git
cd Team4
cd fall_detection/fall_detection-v3
make clean
make -j4
cd ../subscriber
make clean
make bin
make bin/simple_subscriber
make bin/gps_subscriber
cd ../../..
```

Now, we will install the remaining dependencies in a virtual environment by running the following commands:

```
conda create --name MemoryMate
```

```
conda activate MemoryMate  
conda install python=3.11  
pip install -r requirements.txt
```

If on Mac or Linux, run the following commands:

```
/bin/bash -c "$(curl -fsSL  
https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh"  
brew install esolitos/ipa/sshpass
```

Finally, run this command to finish installation of dependencies:

```
conda deactivate
```

Finally, make sure you have executable permissions by running the following commands:

```
chmod +x fall_detection/while_loop_gps.sh  
chmod +x fall_detection/while_loop.sh  
chmod +x fall_detection/shell_script_new.sh
```

## Start Up the GUI

Start up your virtual environment again and run the GUI:

```
cd Team4  
conda activate MemoryMate  
streamlit run Welcome.py
```

## Setup

### Bluetooth Connection Setup

On this page, you can view your laptop's bluetooth device and select the one you want to connect to your facial recognition module. The selected device will be listed on the Initial Setup page.

The screenshot shows a sidebar menu on the left with options: Home, Setup, Bluetooth Connection Setup (selected), Email Setup, Initial Setup, Load Facial Recognition Data, Run and Stop Server, Output, Overall Output, Focus Camera, Fall Detection, Facial Recognition, and Step Counter. The main content area has a title "Bluetooth Connection Setup". Below it is a table showing MAC addresses for various devices:

	MAC Address
Hesh Evo	98:67:2E:CB:DB:AB
Home's Keyboard	70:F0:87:05:CA:F6
Home's Mouse	E0:EB:40:5F:AA:93
JBL Flip 5	D8:37:3B:52:B1:D1
Krishna's AirPods Pro	0C:E4:41:92:77:37
Krishna's iPhone	B4:19:74:E4:04:D6
Minocha's Keyboard	E0:EB:40:DC:6B:92
Minocha's Mouse	90:9C:4A:A2:22:E7
Soundcore Life Q20	88:D0:39:9E:FB:43

A dropdown labeled "Select Device" is set to "Hesh Evo". A "Save" button is at the bottom.

## Email Setup

On this page, you can add emails you would like to send a message to if a fall is detected. All emails you are currently subscribed to will be listed under "Subscribed Emails".

The sidebar menu is identical to the previous screenshot. The main content area has a title "Email Setup". It includes a "Add Email" input field and a "Submit" button. Below that is a section titled "Subscribed Emails" with a list of two email addresses:

- [kminocha4@gmail.com](mailto:kminocha4@gmail.com)
- [kminocha4@ucla.edu](mailto:kminocha4@ucla.edu)

Buttons for "Select All" and "Unselect All" are available, along with a "Remove Selected Emails" button.

## Initial Setup

You should rarely need to run this page as we code is already on the Pi's that are shipped. However, if for some reason the file that runs on the Pi gets deleted such as if you wipe your Pi, you can add the code to your Pi here. To use this page, first plug in your Pi to your laptop ensuring that you are plugged into the Data USB port on your Pi. You will have to enter your username, password, and hostname you use to ssh into your Pi (USERNAME@HOSTNAME). Also make sure to correctly select which Pi you are uploading to.

The screenshot shows a window titled "Initial Setup". On the left is a sidebar with the following menu items:

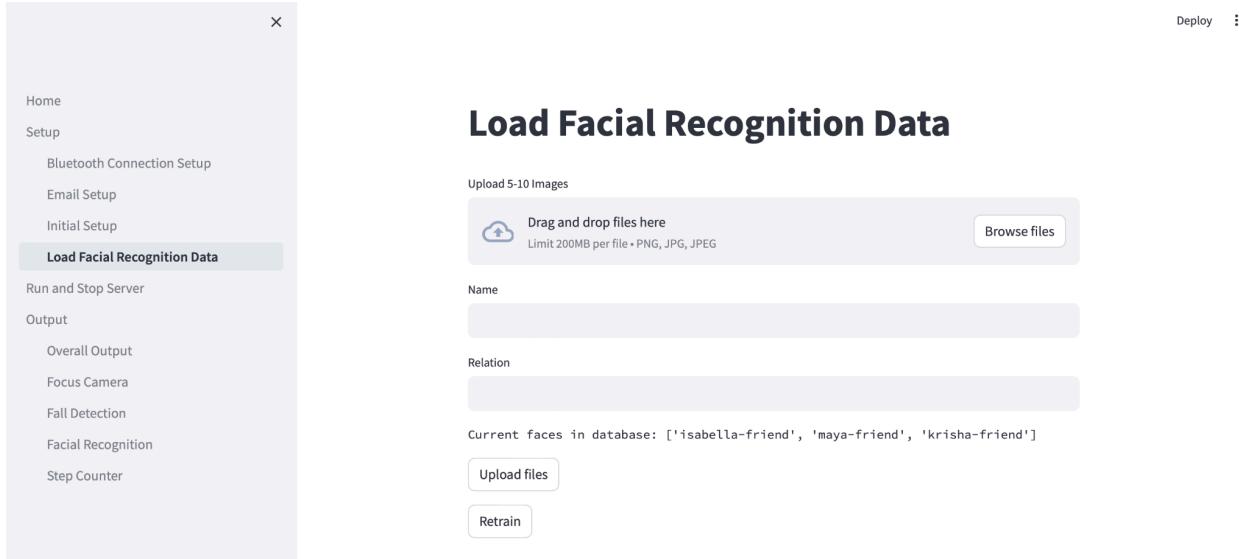
- Home
- Setup
- Bluetooth Connection Setup
- Email Setup
- Initial Setup** (highlighted)
- Load Facial Recognition Data
- Run and Stop Server
- Output
- Overall Output
- Focus Camera
- Fall Detection
- Facial Recognition
- Step Counter

The main area is titled "Initial Setup" and contains the following fields:

- Username: (input field)
- Password: (input field with eye icon)
- Hostname: raspberrypi.local
- Which Pi?: Step Counter (dropdown menu)
- Current bluetooth device: JBL Flip 5
- Make sure device is in pairing mode (text in yellow box)
- I'm on Windows
- Click to Run (button)

## Load Facial Recognition Data

Add 5-10 pictures for each person to be identified with the correct name. Make sure you click "Upload files" for each person! After all your photos are uploaded, go ahead and click the retrain button to update the facial recognition model.



## Run the Server:

With the GUI still running, navigate to the Run and Stop Server page and click the button to run it. After you hit the button, it may take a few minutes to get booted up and start working. While the server is running, you can navigate to the Fall Detection, Recognized Face, and Step Count pages to view subsystem specific output. To get a cohesive view of the output, you can also navigate to the Overall Output page.

## Stop the Server

Once you are finished running the server, navigate back to the Run Server page and click the Stop server button.

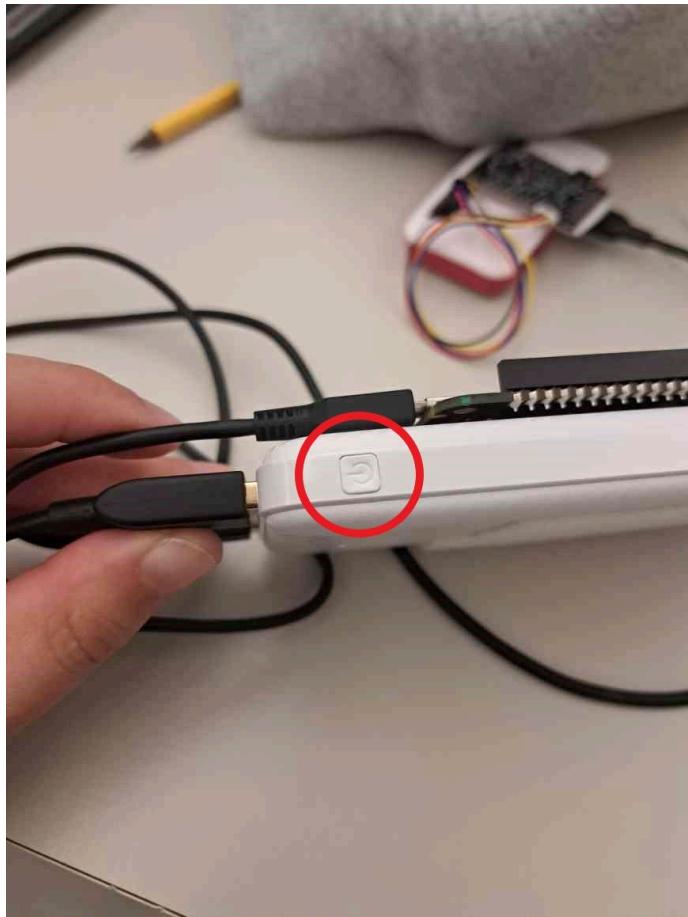
## Stopping the GUI

Once you are finished, you can stop the GUI and exit the virtual environment by running the following commands from the terminal where you started the GUI.

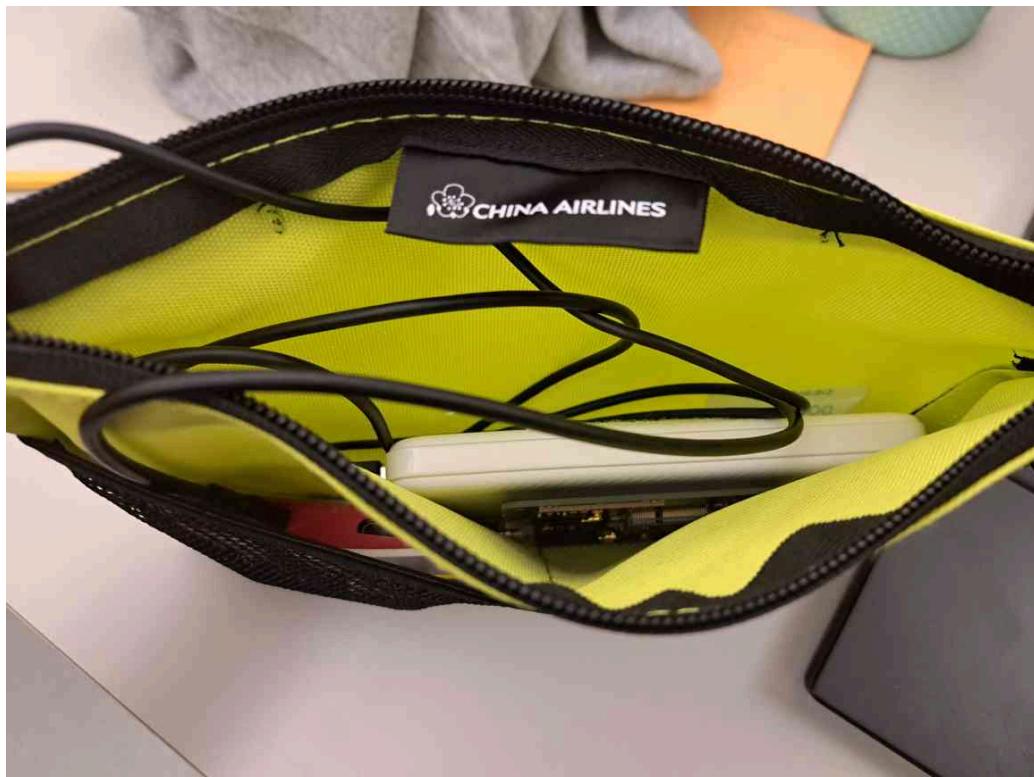
```
Ctrl-C  
conda deactivate
```

# Setting Up The Physical Product

## Fall Detection



Connect the powerbank to the power ports on the Notecard and the Raspberry Pi (with 2 USB-A to micro USB cables). The lights on the powerbank should turn on. Once the lights are on, hold the power button on the side of the power bank until the lights start flashing in order.

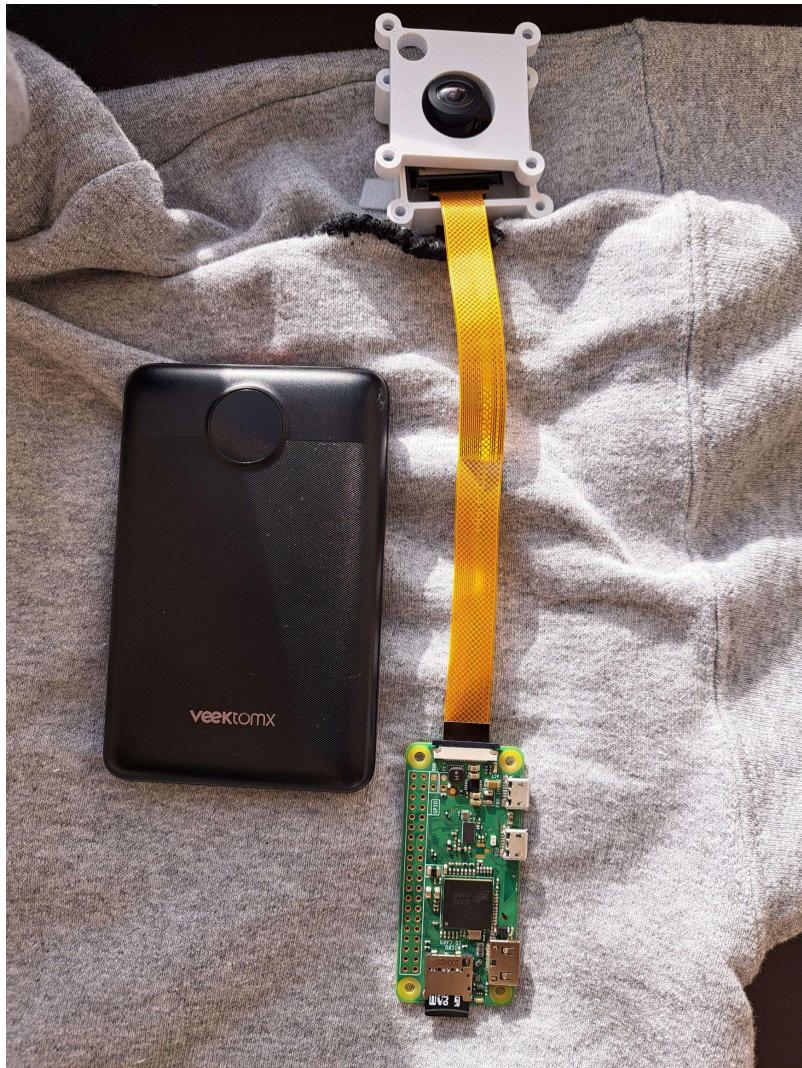


Place the powerbank and Notecard/Notecarrier into the pouch, then place the Raspberry Pi into one of the outside pockets with the Micro-USB connection pointing up. Place the pouch into the center pocket of the sweatshirt, zipper on the top side.

## Face Recognition

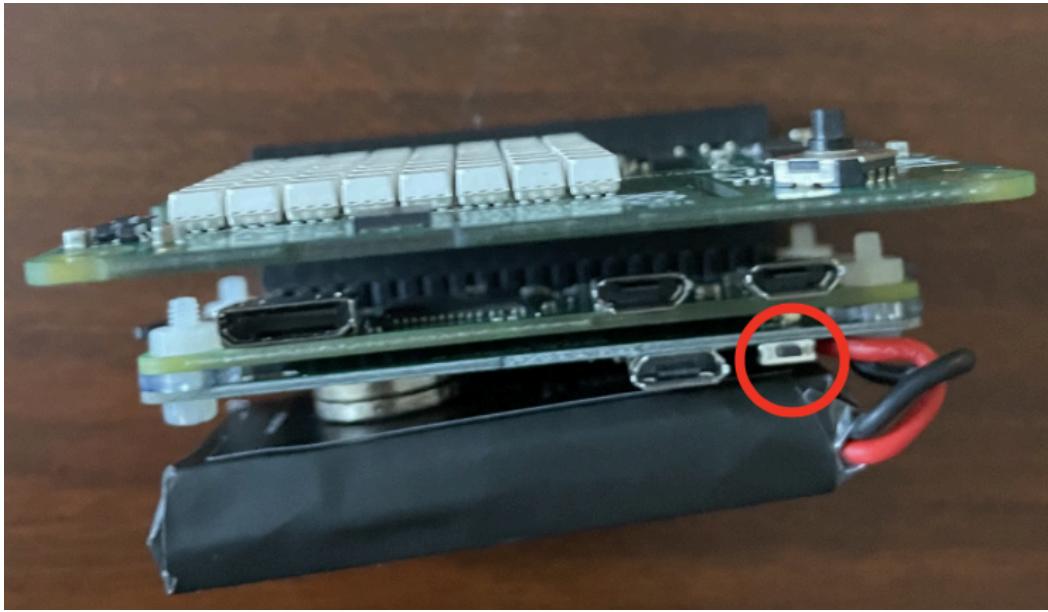


Connect the camera to the Raspberry Pi and connect the power bank/battery to the Pi. Velcro the Pi and battery into the shoulder pouch inside the sweatshirt, and put the camera through the slit.

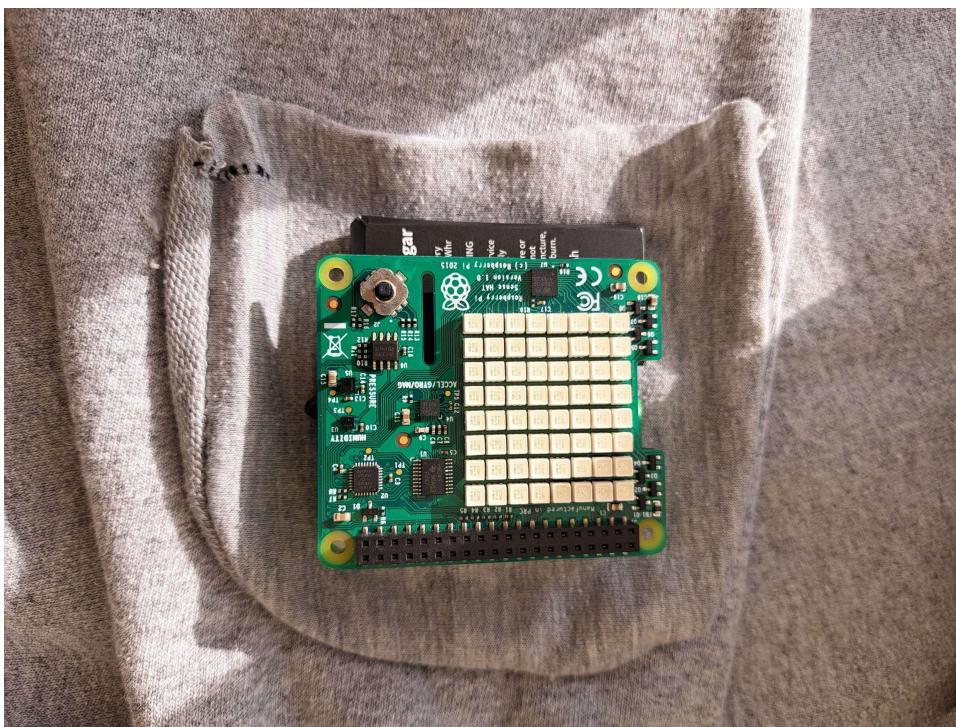


## Step Counter

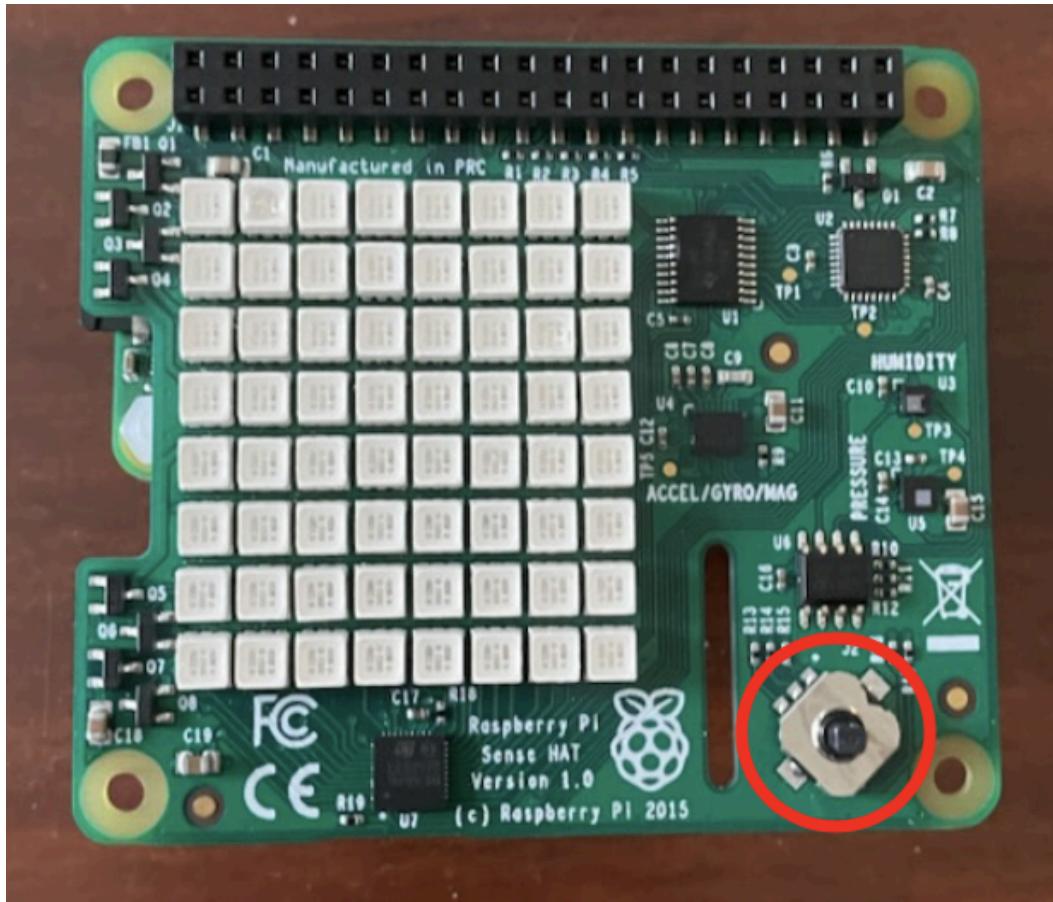
Power on the battery for the Raspberry Pi by pressing the button circled in red below once. To turn it off, press the button twice. The pi has finished booting once the rainbow display on the LED display turns off.



Place it in the wrist pocket such that the LED display is facing outwards.



The button circled in red in the image below indicates the bottom right of the device (for display purposes). You can orient the device however you may like within the pocket.



When the server is running, you can press the button circled in red in the image above to see your current daily step count show on the LED display.