Sharker Documentation

Project Scope

This project involves the development of sustainable office automation system based on biometric authentication with the following features:

• Control of physical smart switches

• Shop Floor application (MES) login based on personnel's identity

• Wake up workstations by authenticated personnel

ws.py	Main code to Run on PC/Raspberry Pi
switch.py	Code to Remotely control switches
mes.py	Code to log in mes using RPA (currently using chrome as example)
wakepc.py	Code to wake up PC remotely
postV2_petlover/ postV2_helmet (named after setup/object near computers)	Code to run on the PC to Needed to be woken up Remotely and play the html

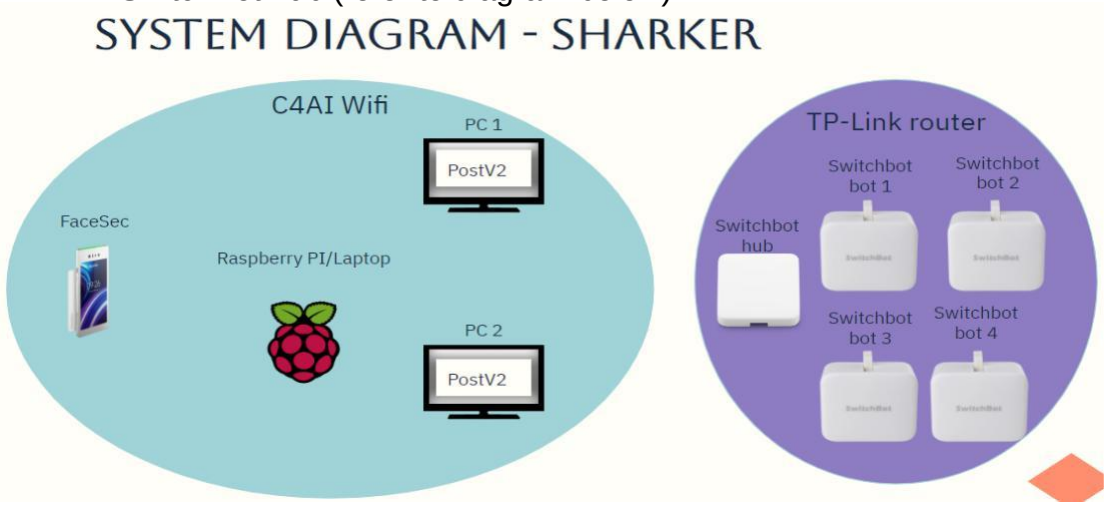
System Setup

Prerequisites

- Make sure time on Raspberry pi/FaceSec matches your laptop (NTP doesn't work on C4AI WiFi)

For raspberry pi type sudo date -s "2024-05-16 15:45:00" in terminal if the year is 2024, month is May and date is 16th at 15:45:00.

- Make sure that all the devices is connected to the same Wi-Fi except the SwitchBot hub (refer to diagram below)

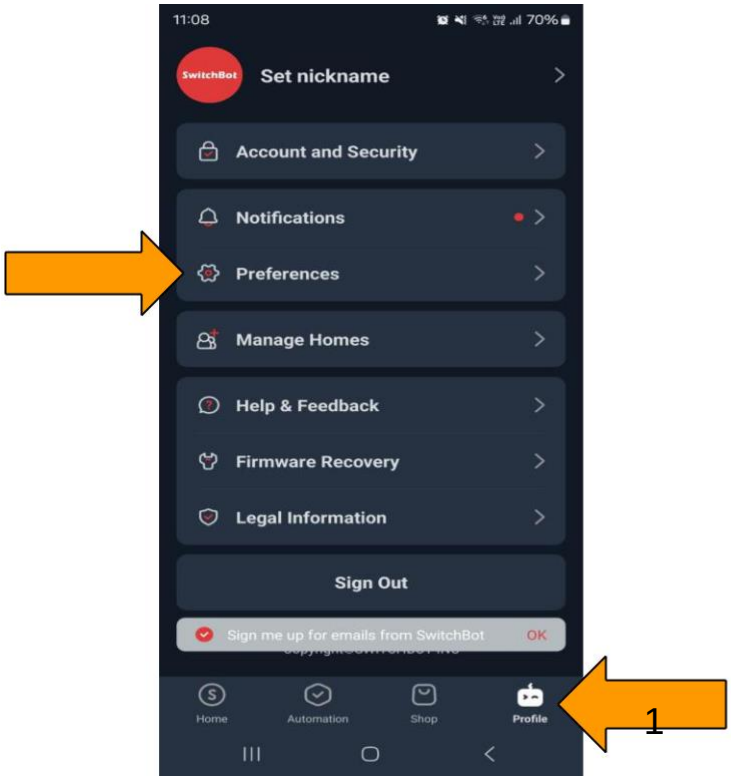


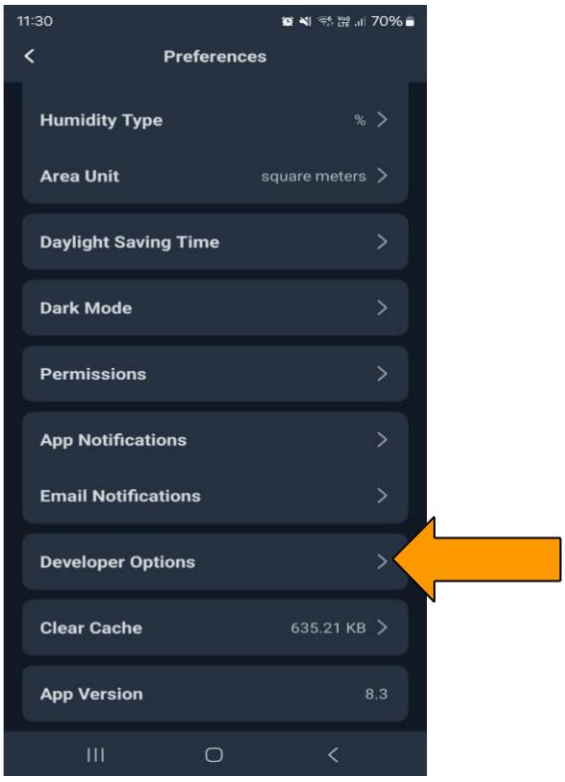
Switchbot

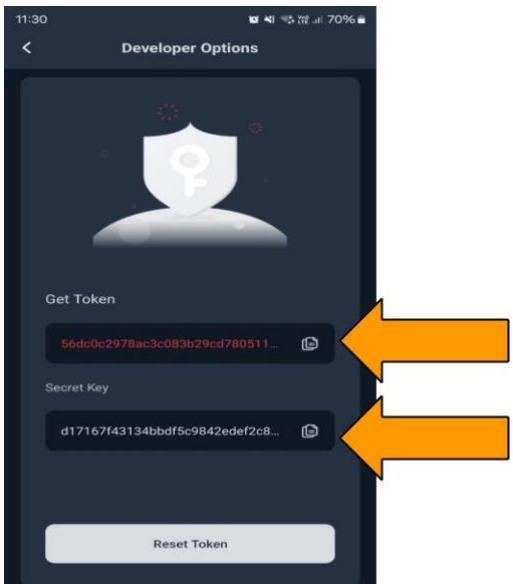
1. Download the “SwitchBot” app (connect device with the app to TP-Link router)
2. Login username: aig.training01@gmail.com
3. Login password: training01

To get token and secret key for API:

1. Click ‘Profile’ icon at bottom right
2. Click ‘Preferences’
3. Scroll & click ‘Developer Options’(might need a few clicks)
4. Copy & paste ‘token’ & ‘secret key’ into respective variables in ‘switch.py’







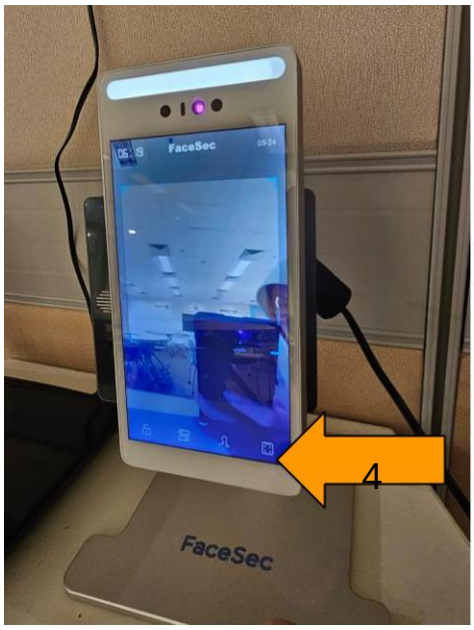
*can reset token if the token doesn't work

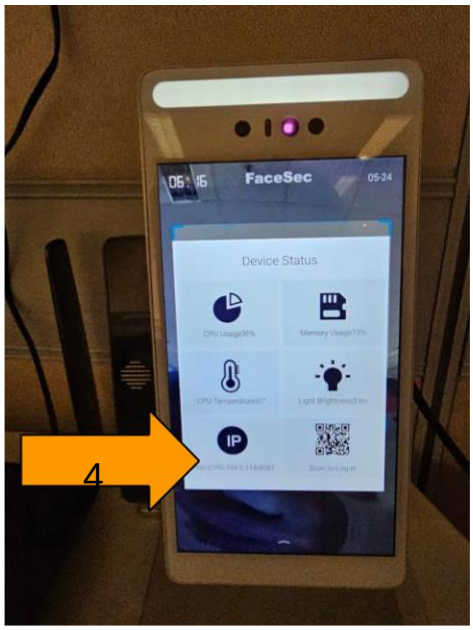
Refer to https://github.com/OpenWonderLabs/SwitchBotAPI#introduction for API

FaceSec Device

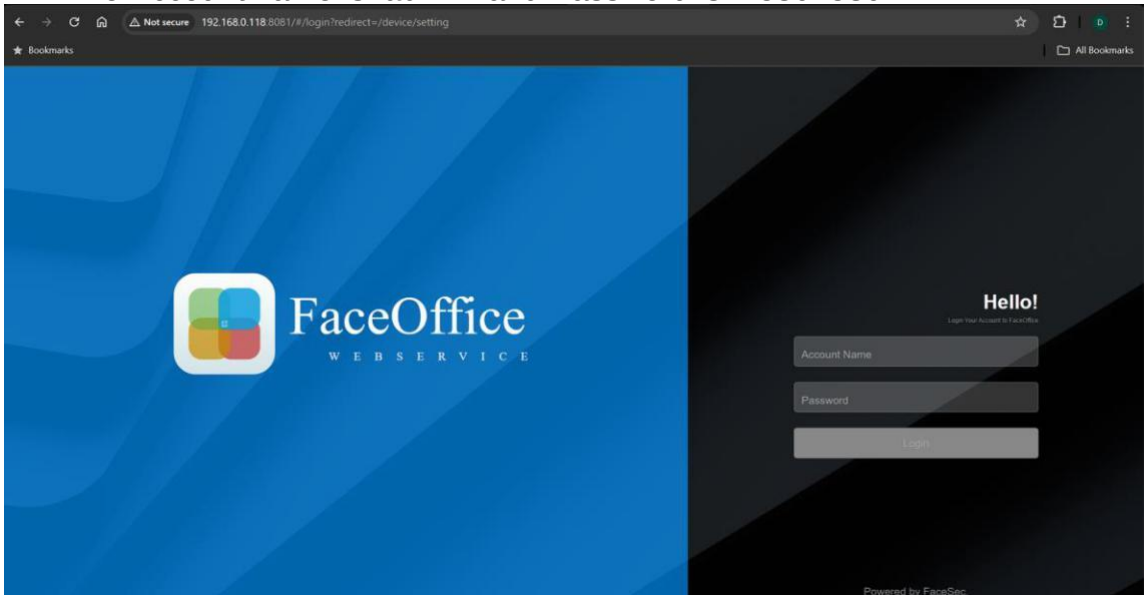
To configure Wi-Fi settings, follow the steps:

- Connect to the power plug and press the power button on the side to turn it on.
- It will connect to the Wi-Fi in the C4AI room if the router is turn on, if it is not, manually change the Wi-Fi to the C4AI_5GHz (name of Wi-Fi) Wi-Fi
- The password of the device is 25802580
- To get to the web UI for FaceSec, click the 4th icon and type the URL into your computer to access the web browser

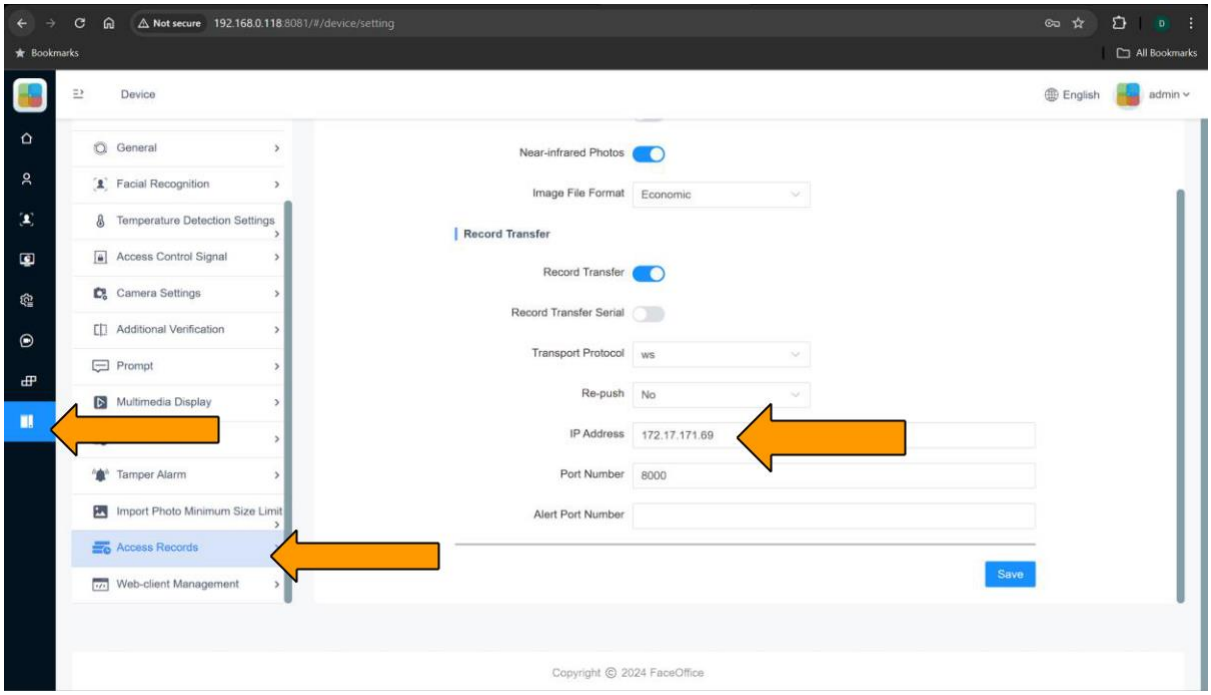




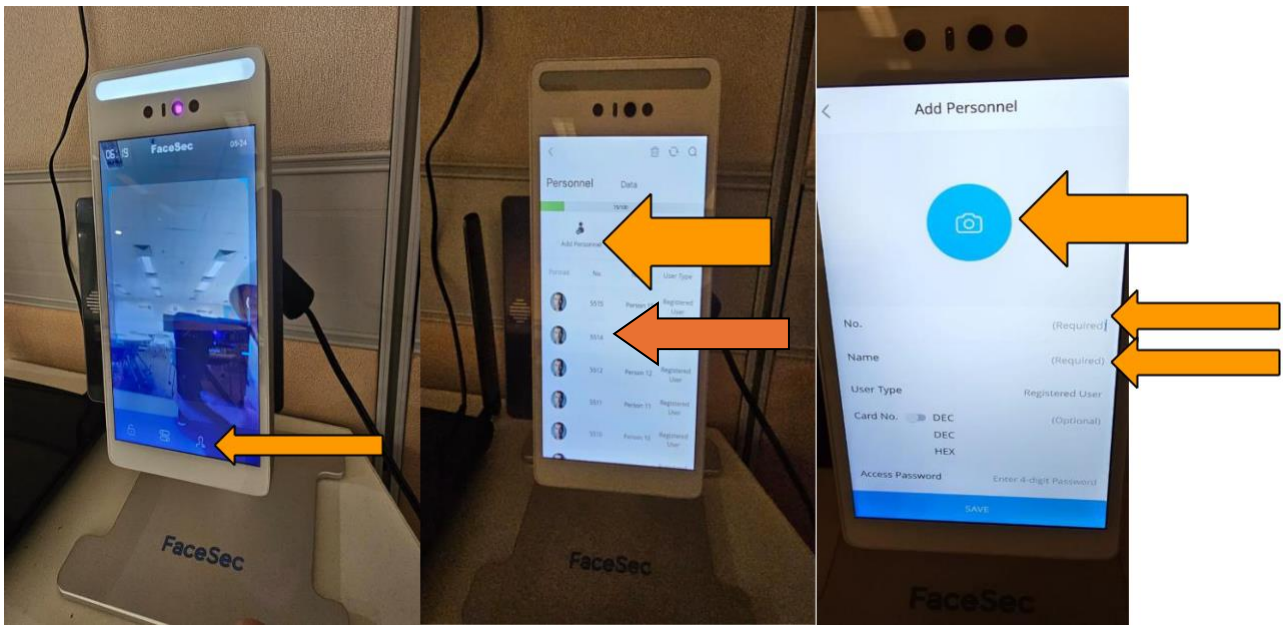
- The Account name is: **admin** and Password is: **25802580**



- Go to ‘Device’ > ‘Access Records’ and change IP address to your laptop’s



To add your face, press third icon & enter 25802580> pick one of the personnel with the stock face image > fill in required fields (picture), name & no.



Finally, change the timing of the FaceSec Device into the same timing as your laptop’s

To change the timing, press the second icon & enter 25802580 as the password > General > Date & Time > Fill in the current time in your laptop.

TV Screens (C4AI ROOM)

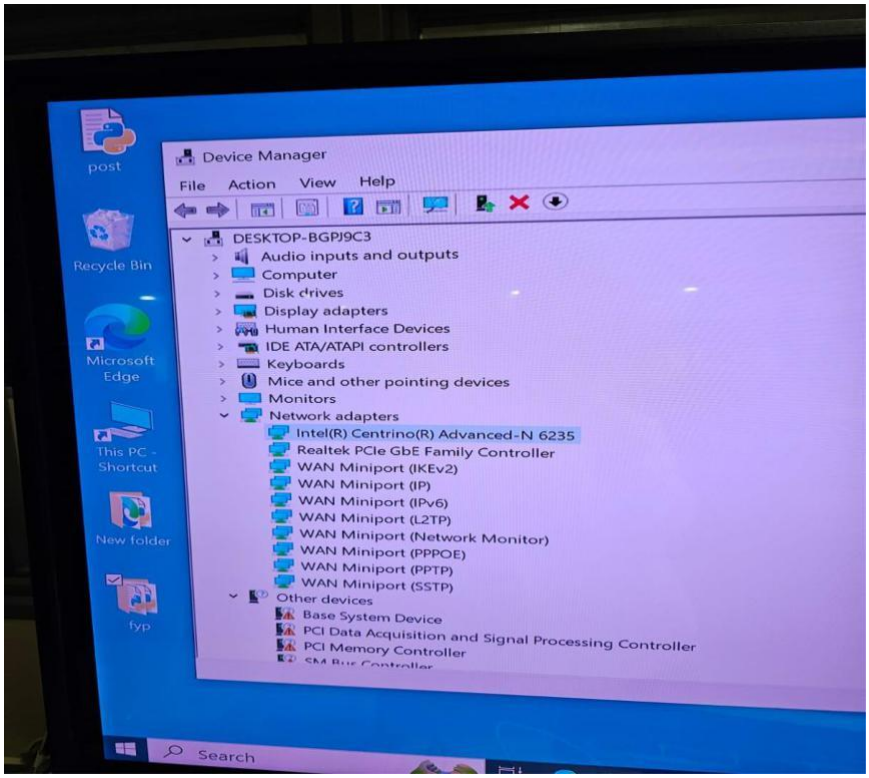
1. Make sure that the Tv Screen is connected to the C4AI_5GHz Wi-Fi
2. Double click on the post_V2_petlover/helmet found in ‘fyp’ folder to Open the code, for the TV screen with VsCode click on the run logo, for the TV screen without VsCode, it will automatically runs when opened
3. To configure any part of the code on the TV screen without VsCode, tap and hold the PostV2 and ‘open with’ notepad
4. Libaries that need to be install are wakeonlan,using pip install --user (name of libraries) for example pip install --user wakeonlan
5. You can change x_time or y_time in PostV2

```
7   x_time =18   #What time to put the Pc to sleep in 24-Hour format
8   y_time =7200 #Number of seconds after the Pc Wake up to put to sleep
```

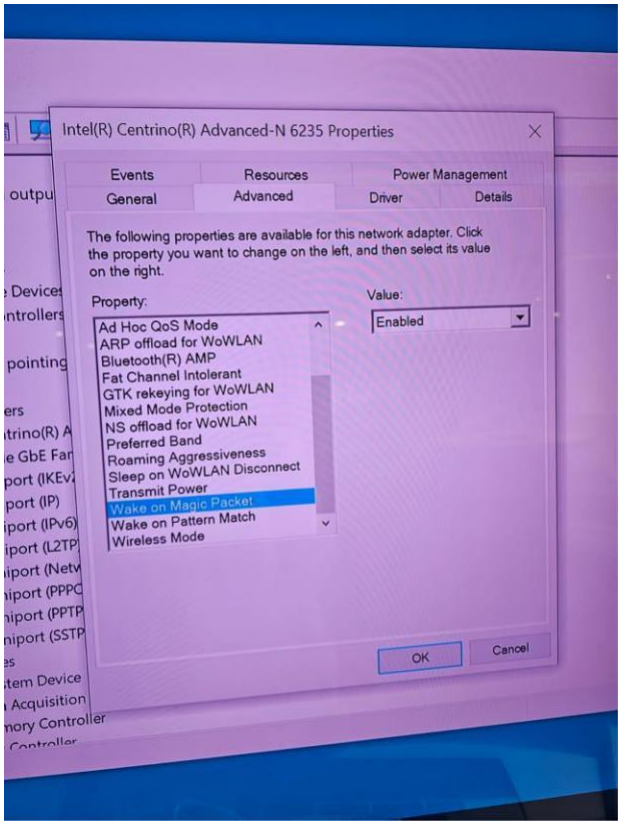
6. In the last line of Postv2, change IP address to match the TV screen

```
51  if __name__ == '__main__':
52      # Start the sleep_after function in a separate thread
53      sleep_thread = threading.Thread(target=sleep_after)
54      sleep_thread.start()
55
56      # Start Flask app
57      app.run(debug=True, port=5000, host='192.168.0.101')
```

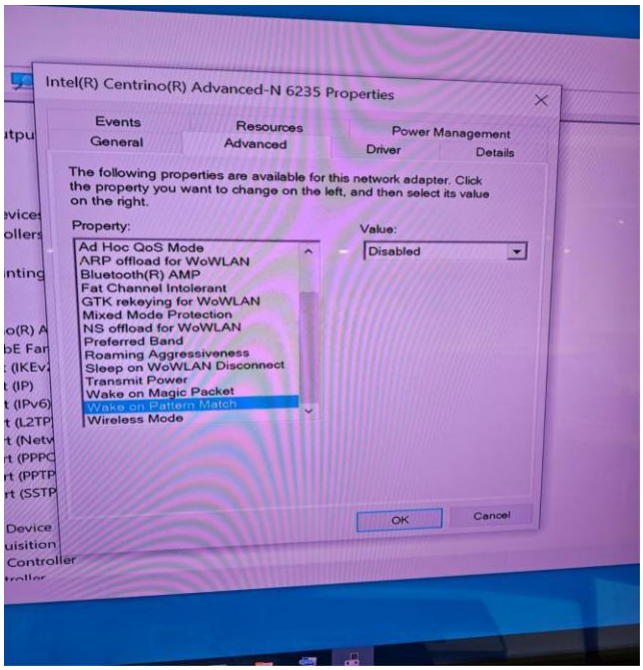
7. For wakeonlan settings, go to device manager and look for a wireless adapter (usually named intel….)



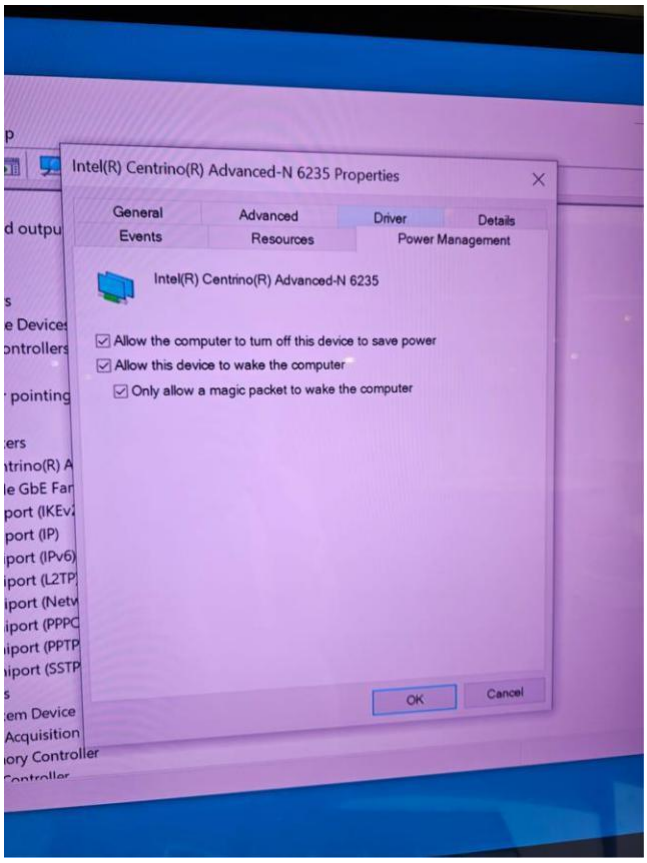
- click the wireless adapter > ‘Advanced’ > scroll down to ‘Wake on magic packet’ and make sure its ‘Enabled’



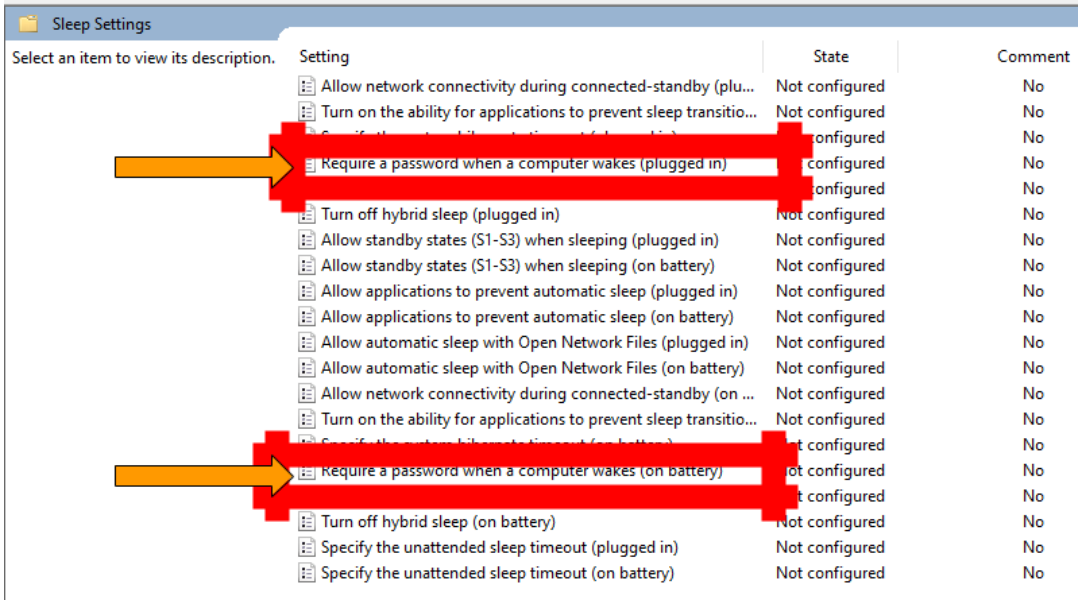
- Right below ‘Wake on magic packet’, click ‘Wake on pattern match’ and make sure its ‘Disabled’



- go to ‘Power Management’ tab and ensure everything is ticked



8. To remove lock screen when computers wake up
   - Search ‘Local Group Policy Editor’ in windows search bar
   - go to Administrative Templates > System > Power management > Sleep settings



- Click the highlighted settings and select the ‘disabled’ options

To run the code(on your own laptop)

1. Download VsCode on your laptop
2. Open the folder provided(sharker folder)to Vscode
3. Make sure your laptop is connected to C4AI
4. pip install the libraries below into CMD or

   venv: pip install selenium

   pip install json pip

   install time pip

   install hashlib pip

   install hmac pip

   install base64 pip

   install uuid pip

   install requests

   pip install socket

   pip install asyncio

   pip install websockets

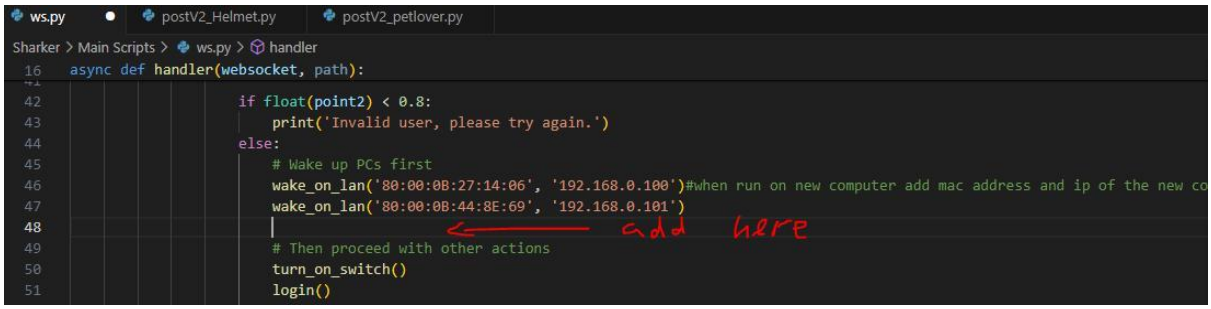
5. Run Ws.py (Script has function to auto retrieve IP address don't need to change anything)

To run Post code on New TV screens

In ws.py,

If the mac address of the new Tv screen is '00:1A:2B:3C:4D:5E' and ip address is 192.168.0.103

1.Add the code wake_on_lan('00:1A:2B:3C:4D:5E','192.168.0.103') below wake_on_lan('80:00:0B:44:8E:69', '192.168.0.101')



2. add the code r = requests.post("http://192.168.0.103:5000", data=name) below

r = requests.post("http://192.168.0.101:5000", data=name)

```
            # Then proceed with other actions
            turn_on_switch()
            login()
            name = {"name": "username"}
            r = requests.post("http://192.168.0.100:5000", data=name)#when run on new computer add ip of the new computer
            print('middle pc', r.text)
            r = requests.post("http://192.168.0.101:5000", data=name)
            print('right pc', r.text)
            print("success")
                                                    add here
    else:
        print("Received old syncTime, skipping this event.")
```

3.In postV2_Helmet or postV2_Petlover change the filename to the directory of html or link of the html you want to play for example if you want it to open youtube(link)

filename = 'file:///C:/Users/C4AI/Desktop/New folder/demo1.html' To filename = 'https://www.youtube.com'

```
import socket
import wakeonlan

x_time = 18  # time that the pc will go to sleep in 24hour format
y_time = 2 * 3600  # time that the pc will go to sleep after waking up in seconds
reset_hour = 8
app = Flask(__name__)
filename = 'file:///C:/Users/C4AI/Desktop/New folder/demo1.html'
last_sleep_time = time.time()
sleeping = False  # Flag to track if the computer is sleeping
                                                    change
```

```
import socket
import wakeonlan

x_time = 18  # time that the pc will go to sleep in 24hour format
y_time = 2 * 3600  # time that the pc will go to sleep after waking up in seconds
reset_hour = 8
app = Flask(__name__)
filename = 'https://www.youtube.com' #can be replaced with any link/file directory
last_sleep_time = time.time()
sleeping = False  # Flag to track if the computer is sleeping
```

Raspberry Pi setup & how to run

This documentation outlines the step-by-step process to install essential libraries on a Raspberry Pi 4. These libraries are crucial for various development tasks. that is use to install libraries in the Terminal of raspberry pi4

Steps for formatting SD card:

1.Install Raspberry Pi Imager:

Begin by downloading and installing the Raspberry Pi Imager software from the official Raspberry Pi website.

2.Open Raspberry Pi Imager:

Launch the Raspberry Pi Imager software on your computer.

3.Select Raspberry Pi Device:

Under the "Raspberry Pi" tab in the Imager, choose the appropriate Raspberry Pi model you are using. For example, select "Raspberry Pi 4".

4.Select Operating System:

Navigate to the "Operating System" section and choose "Raspberry Pi OS 64-bit" or the desired OS for your project.

5.Select Storage:

Insert your SD card into your computer's card reader and select it from the list of available storage devices in the Imager.

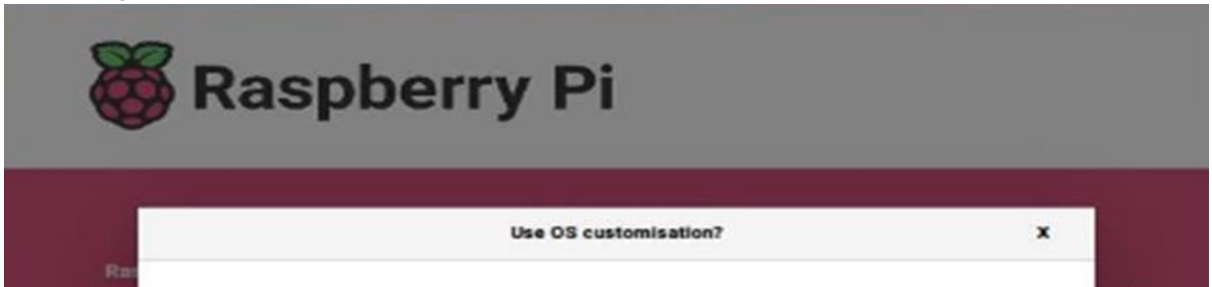
6.Click Next:

Proceed to the next step once you have selected the SD card.

7.Edit settings:

Click on the "Edit settings" button to configure additional settings.

8.Change Pi Username and Password:



In the advanced options, locate the fields for changing the default Pi username and password. Set them to your preferred values for security.

9.Write the SD Card:

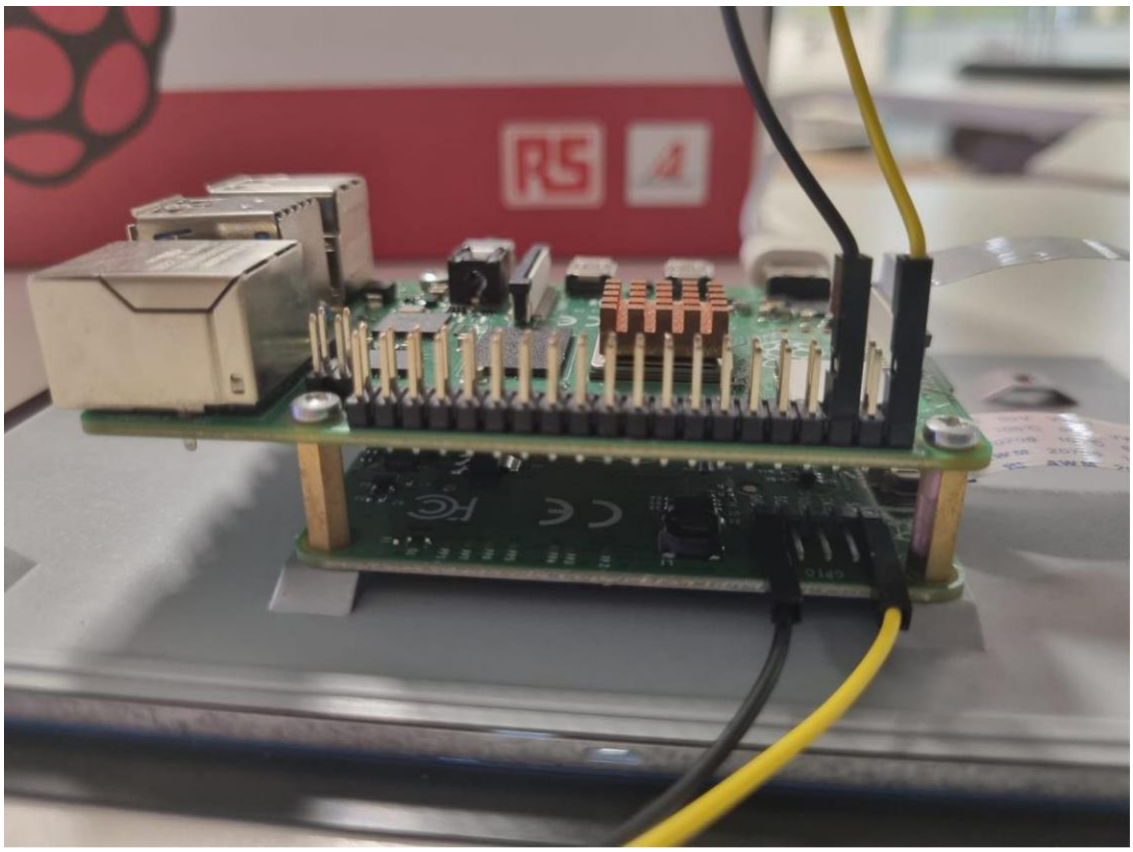
After configuring all the settings, click on the "Write" button to begin formatting and writing the operating system to the SD card.

Conclusion:

Following these steps ensures that your SD card is correctly formatted and configured for your Raspberry Pi project. It's important to pay attention to details like the Raspberry Pi model, operating system, and advanced options to tailor the setup to your specific requirements. Once the SD card is written, you can insert it into your Raspberry Pi and power it on to start using your customized setup.

Connection of the Raspberry PI Touchscreen Monitor

Make sure you connect the raspberry pi 4 as shown in the pictures below



Setting up Libraries on Raspberry Pi 4(The Word in Red are the codes needed to be type in the Terminal to install the python libraries needed for the Raspberry Pi 4 to run the code)

Before proceeding with the installation, ensure that the Raspberry Pi 4 is powered on and connected to the internet.

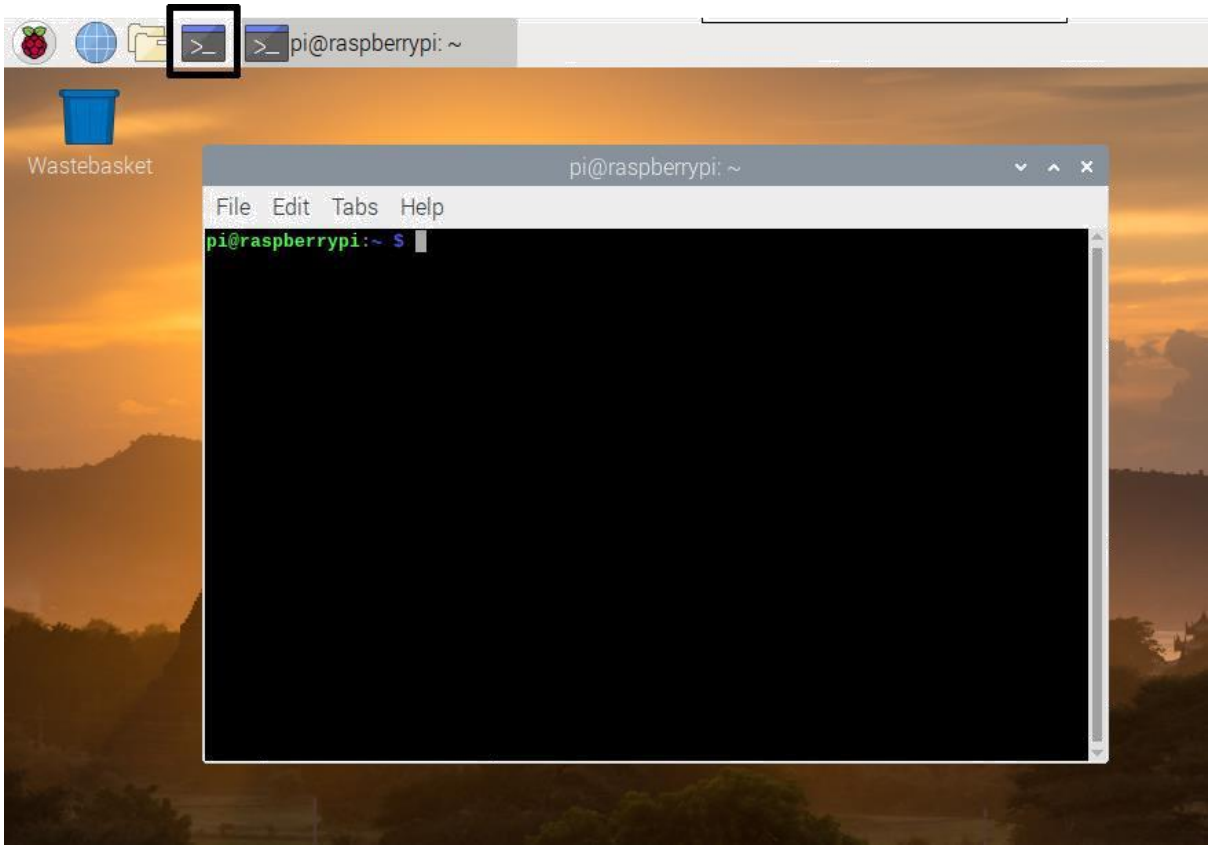
Installation Steps (To run code on Raspberry pi 4)

1. Opening the Raspberry Pi

Ensure that your Raspberry Pi 4 is powered on and connected to a display on a monitor or accessed remotely using a VNC viewer.

2. Opening Terminal

Navigate to the terminal on your Raspberry Pi 4 by pressing the Terminal logo or “**Ctrl + Alt + T’** on the keyboard. This is where you will execute the installation commands.



3. Creating a Directory

Use the ‘mkdir’ command followed by the desired directory name to create a new directory where you want to set up your project files.

mkdir <directory_name>

4. Changing Directory

Use the cd command followed by the directory name to change your current working directory to the newly created directory so that you will be able to install the libraries into the directory by creating a virtual environment.

cd <directory_name>

5. Setting up a Virtual Environment

Create a virtual environment named myenv using Python's venv module

python3 -m venv myenv

6. Activating the Virtual Environment

Activate the virtual environment to isolate your project dependencies.

source myenv/bin/activate

7. Installing asyncio

Install the asyncio library using pip, Python's package manager.

pip install asyncio

8. Updating System Packages

Update the package lists for upgrades and new installations.

sudo apt update

9. Installing libjson-c-dev

Install libjson-c-dev for JSON parsing capabilities.

sudo apt install libjson-c-dev

10. Installing python3-websockets

Install the python3-websockets package for WebSocket

communication. sudo apt install python3-websockets

11. Installing Requests

Install the requests library for making HTTP requests.

pip install requests

12. Installing Chromium Driver

Install chromium-chromedriver for browser automation tasks.

sudo apt-get update

sudo apt-get install chromium-chromedriver

13. Installing Python Selenium

Finally, install python3-selenium for web automation using

Selenium. sudo apt-get install python3-selenium

14.Run the code on Raspberry Pi

Click on the Folder name “Projects” in the “Projects” folder click on “Sharker” Folder

and click on “Ws.py” and run the code

Conclusion

By following the steps outlined in this documentation, you have successfully installed essential libraries on your Raspberry Pi 4