Configuring Raspian buster to run Quang Thanh’s voice control software

1. Load NOOBS onto a micro SD card using your Windows PC.
   1. Insert a blank micro SD card into the card reader on your PC.
   2. Format the micro SD card with **SD Card Formatter** or other formatting software.
   3. Download the latest zipped version of **NOOBS offline and network install** from <https://www.raspberrypi.org/downloads/noobs/>
   4. Unpack the zipped NOOBS file into a folder of your choice.
   5. Copy all of the NOOBS files from that folder and paste them onto the micro SD card.
   6. Eject the micro sd card and remove it from the PC.
2. Install Raspian Buster onto the micro SD card and configure it to run properly.
   1. Connect your raspberry pi to a wired connection, if possible.
   2. Insert the micro SD card into your raspberry pi and power it up. The installation screen will display and you’ll be prompted to select the operating system you want to install.
   3. At the bottom of the screen, change the Language from English (UK) to English (US).
   4. Click on the Raspberry PI OS Full (32-bit) [RECOMMENDED] check box to select it and then click on the Install ICON at the top left corner of the screen. The NOOBS installer will begin the raspbian install and the progress bar will begin to expand from left to right.
   5. When the install is complete, the **OS(es) Installed Successfully** dialog box will display. Click on the **OK** button to boot into raspbian. The system will reboot and the **Welcome to raspberry Pi screen** will display.
   6. Click on the **Next** button. The **Set Country** dialog box will display.
   7. Select your country, language, and time zone that matches your preferences and then click the **Next** button. The setting location notification screen will briefly display, and then the Change Password screen will display.
   8. Enter the password of your choice in both the **Enter new password** and **Confirm new password** text boxes and then click on the Next button. The **Set Up Screen** dialog box will display.
   9. Click on the **This screen shows a black border around the desktop** checkbox to select it and then click on the **Next** button. The **Select Wireless Network** dialog box will display.
   10. If you are connected to a wired network, you can click on the **Skip** button to continue. If you are on a wireless network, click on the network name to select it and then click on the Next button. When prompted, enter the passphrase for your wireless connection and press the Next button. In either case, the Update Software dialog box will display. **Please note that a wired network will give you faster download speeds during the updating process.**
   11. Click on the Next button. Raspbian will begin the update process. During this process, progress boxes will display to notify you of the steps it is taking. When it is complete, **the System is up to date** progress box will display.
   12. Click on the OK button. The Setup Complete dialog box will display.
   13. Click on the Restart button. Raspbian will restart.
3. Download and configure voice recognition software.
   1. Navigate to <https://github.com/quangthanh010290/voice_control_using_raspberry>. A list of files will appear.
   2. Click on the green **Code** button and select **Download Zip** from the pop-up menu that appears.
   3. Using the File Manager, navigate to /home/pi/downloads and open the voice\_control\_using\_raspberry-master.zip file by double clicking on it. The xarchiver will display the contents of the folder.
   4. Click on the **Extract files** icon (looks like a file with a right arrow attached to it.) The Extract files dialog box will open.
   5. Enter **/home/pi** in the **Extract to:** text box, remove the check box from the **Extract files with full path** option, and then click on the **Extract** button. The files will be extracted to the /home/pi directory.
   6. Open a command prompt and enter the following command:

**sudo ./setup.sh**

The setup script will execute and then return to the command prompt after successfully installing **SpeechRecognition-3.8.1**.

* 1. At the command prompt, enter the following command and press Enter:

**sudo pip install pyaudio**

The python installer will install the **pyaudio** module.

* 1. Plug your microphone into a free USB port and reboot your Pi.
  2. Open a command prompt and edit the **rpi\_voice\_control.py** file using nano. Replace the name of the **mic** in line 10 **(“USB Audio Device”)** with **“USB PnP Sound Device”**. Save the changes and exit nano.

1. At the command prompt, enter the following command and press Enter:

**python3 ./rpi\_voice\_control.py**

The rpi\_voice\_control program will execute under the python interpreter, and the screen will display a number of error messages as python tries to locate various devices. You may safely ignore these messages. After the program has initialized, it will begin to prompt you to speak into the microphone.

1. Speak into the microphone. The program will convert your speech to text and display it on the monitor. If you say one of the following five phrases, the program will respond with the appropriate action:

**Turn on light**

**Turn off light**

**Turn on fan**

**Turn off fan**

**Goodbye**

Current Problems.

1. Trying to run the program with other versions of python. Python seems to have difficulty locating modules with versions other than python3. I’m attempting to find out why, but I’m not there yet.
2. The program won’t initialize because it can’t find the microphone. Different mics have different names. As part of program initialization, the speech recognition module searches for any microphone devices and lists them among the other messages. If you search carefully, you’ll find the ones you want. they will look something like this:

mic: **USB PnP Sound Device**: Audio (hw:2,0)

USB Audio Device **USB PnP Sound Device**: Audio (hw:2,0)

Compare the name in the first line with the device in Line 10 of **rpi\_voice\_control.py**. If it is different, change it to match the one you want.

1. Alsa reports numerous error messages when the text-to-speech module (pyttsx3) is called. The text-to-speech module is used to notify you that it is taking an action based on voice input. When running the program as root using sudo, text-to-speech doesn’t work, and alsa will produce numerous error messages. Again, I am attempting to find out why this happens.

Troubleshooting: These techniques may help you if you have problems running the program.

1. Pip is a utility that adds modules to python. To add modules to python3, you use pip3. The command to install a module is sudo pip3 install <module name goes here>.
2. The env command shows environment variables for the currently active shell.
3. The **sudo bash** command can be used to open a bash shell as root.