# Install the Raspberry Pi Operating System, Gugusse Roller 2.0 Software, and Program your Arduino

This manual will get your Raspberry Pi and Control board up and running. It was current as of 6/2023. Items might change outside of our control.
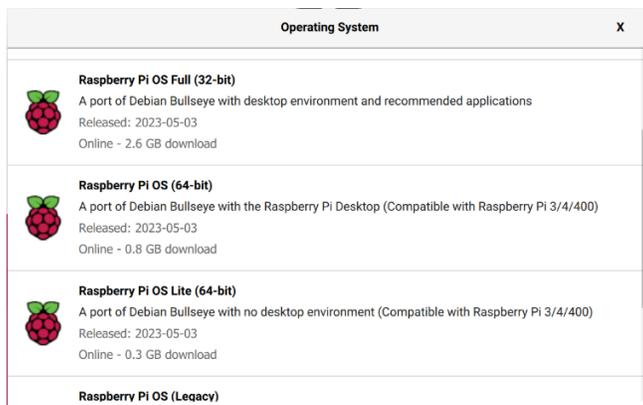
Step 1 - Install the Raspberry Pi Operating System

Download and install the Raspberry Pi Imager from **https://www.raspberrypi.com/software/**.
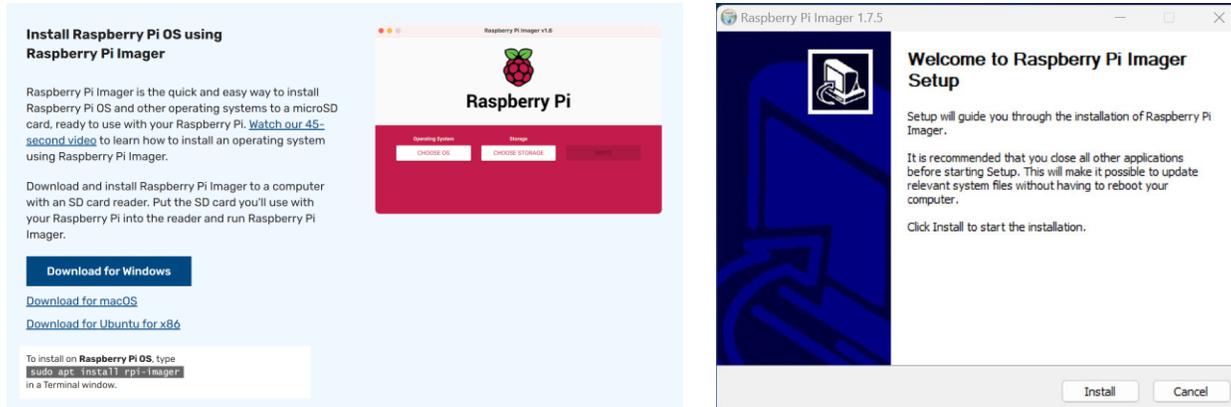

Run the Raspberry Pi Imager. Click on CHOOSE OS. Choose "Raspberry Pi OS (other)" which is probably the second item.
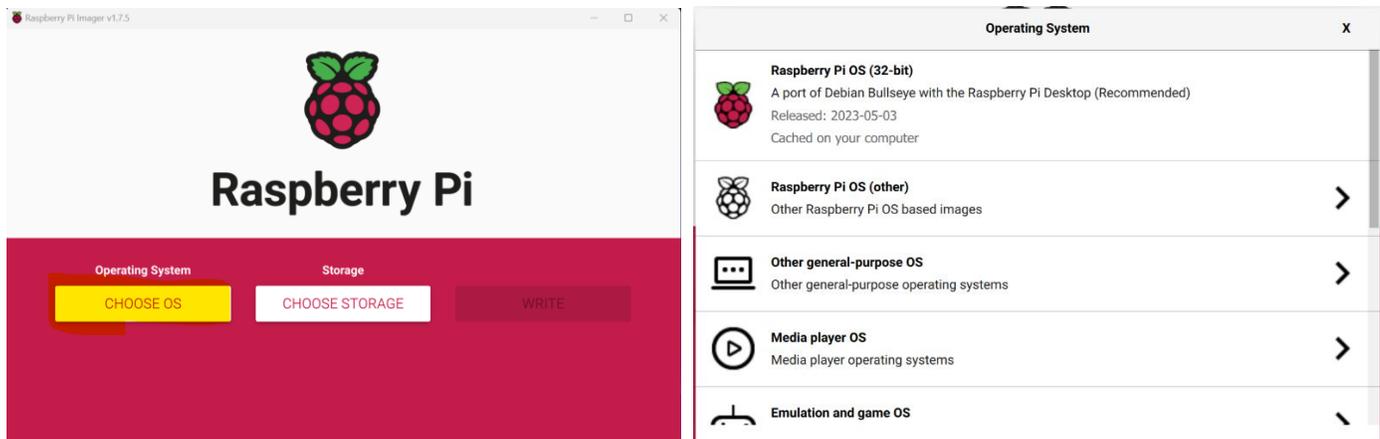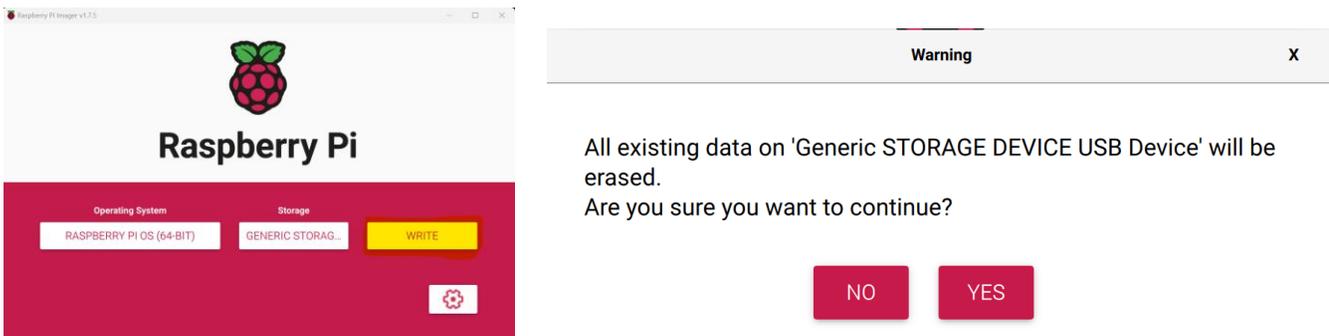

Next choose "Raspberry Pi OS (64-Bit)" (probably the 3rd option):

Insert a SD card that is compatible with your Raspberry Pi in your computer. 16GB should be plenty. Click on CHOOSE STORAGE. Then click on your SD card. TIP: Remove all other USB Hard Drives and USB Thumb Drives from your PC prior to avoid confusion.
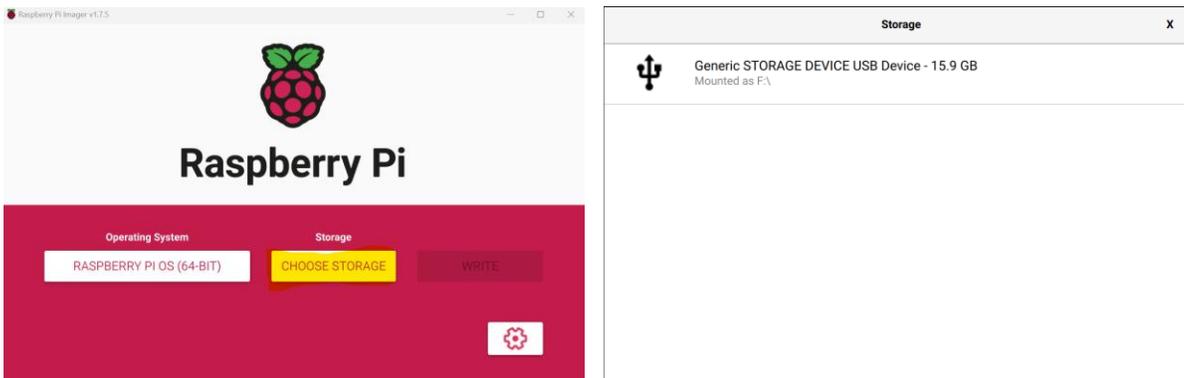

Choose WRITE and accept the Warning:

You will be informed when it completes and you can remove the SD card from your computer.
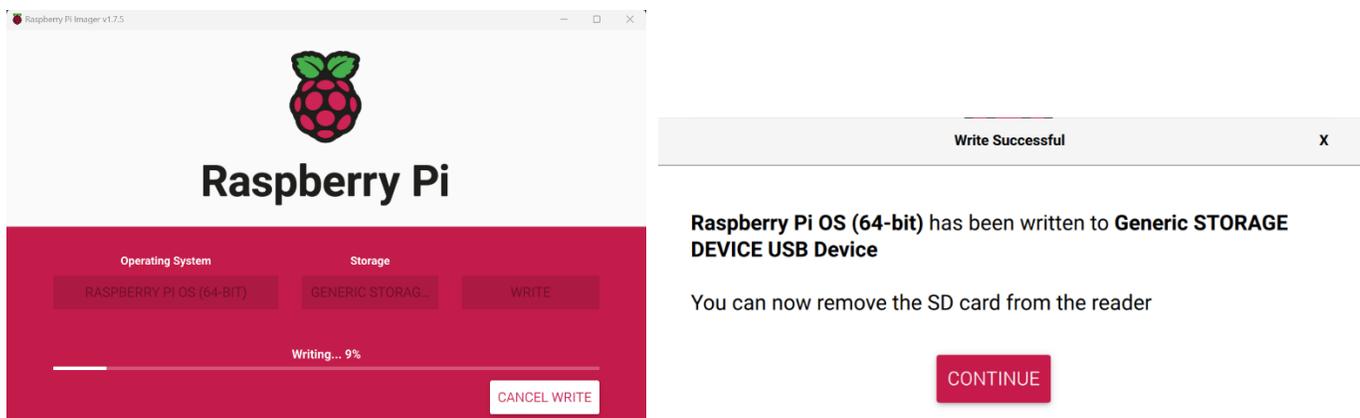

Insert your SD card in your Raspberry Pi and connect it to Power, Keyboard, Mouse, Monitor, and Optionally Network (If not using Wi-Fi). Upon first boot, you will be asked a series of questions about Country and Time Zone, Default User Password (use the username of "pi" and a password of "Raspberry"), Screen Size, WiFi Network Connectivity, and System Update. Reboot to make the changes effective.
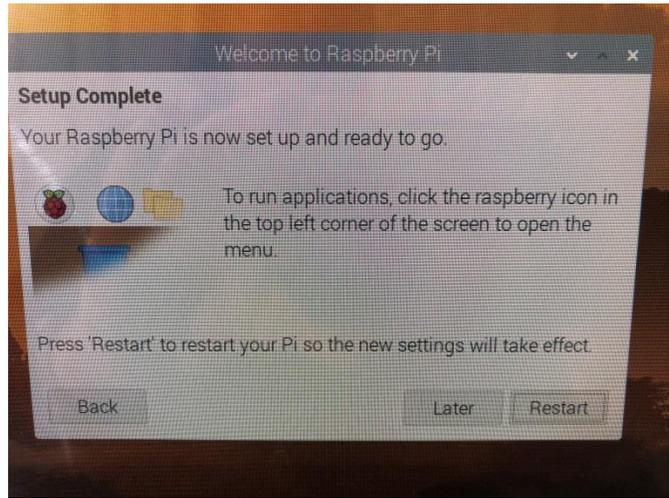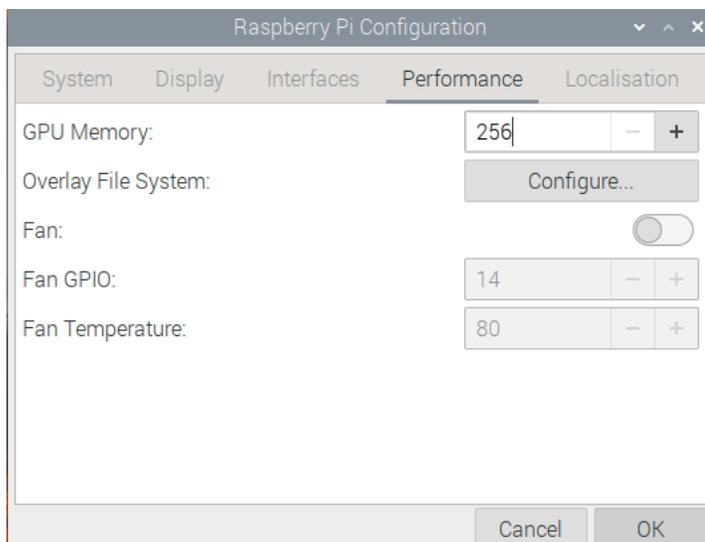
Allocate 256M of System Memory to Video on your Raspberry Pi

Open the Raspberry Pi Configuration utility from the Preferences menu.:
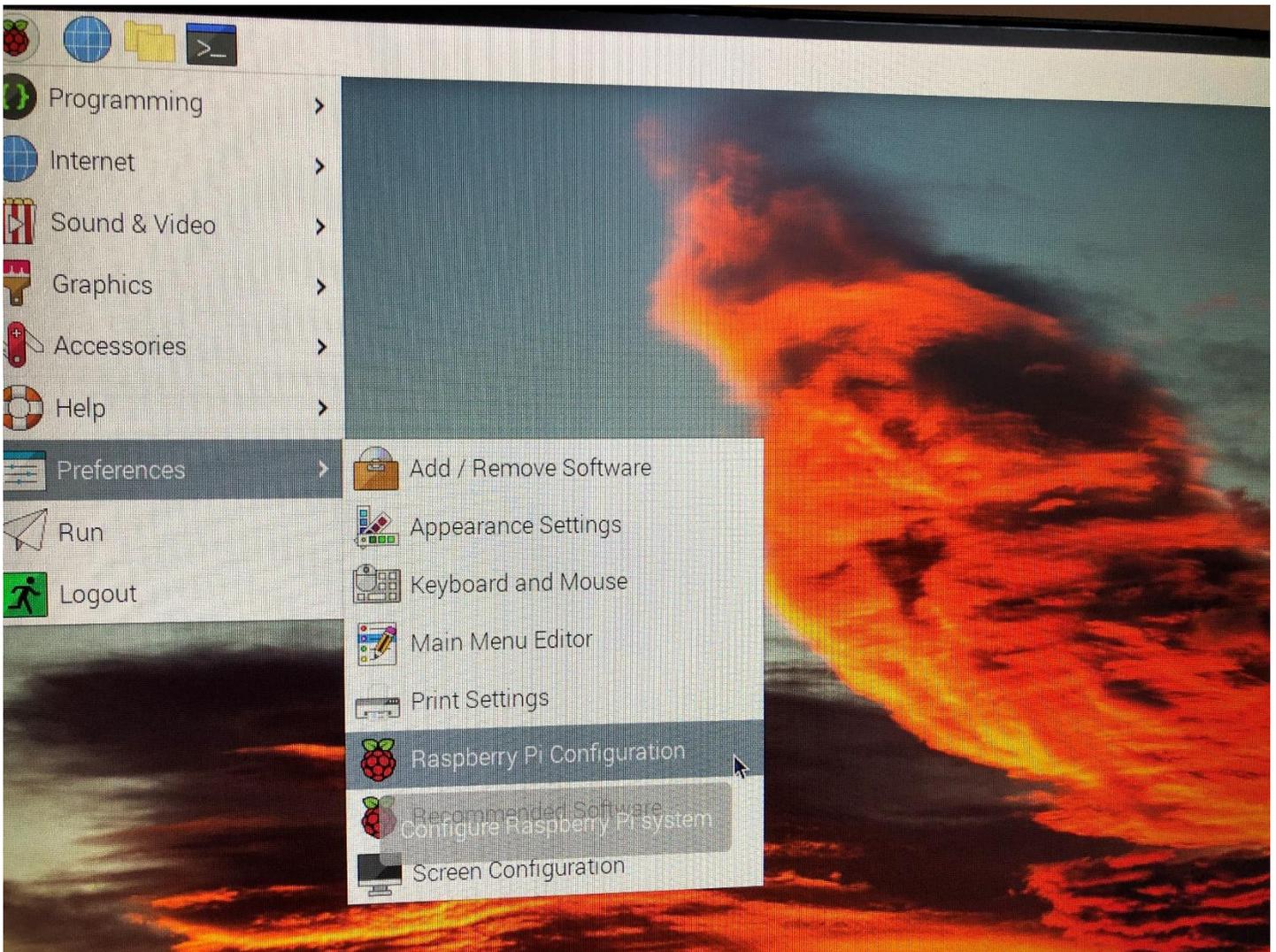
Click on the top Performance Tab and set "GPU Memory" to 256 and click [OK]. Reboot when prompted.

Step 2 – Clone the Gugusse Roller source repository

Click the Terminal Window icon on the top bar; it is the one on the right in the picture below.

Execute the following commands (commands are case sensitive):

```
cd
git clone https://github.com/meantux/GugusseRoller.git
```


Step 3 - Configure Gugusse Roller for your FTP server

The Gugusse Roller software was designed to send the captured pictures directly to a FTP server of your choice.
A FTP server could easily be configured on your main workstation or on any type of file server. Shared storage systems like the Netgear ReadyNAS, Synology DS, and Drobo N editions provide a way to configure an FTP service. There are literally thousands of ways to install a FTP server at home. Apparently Windows 10 offers it natively as described here.

Once you have configured your FTP server you will need to figure out its IP address (or hostname), the credentials (user and password) and the file path that the Gugusse Roller should use. Execute the following command:

```
cd ~/GugusseRoller
python3 MotorsAndFtpSetup.py
```

Change the information in the GUI to your information and click *Test FTP settings* to test it.
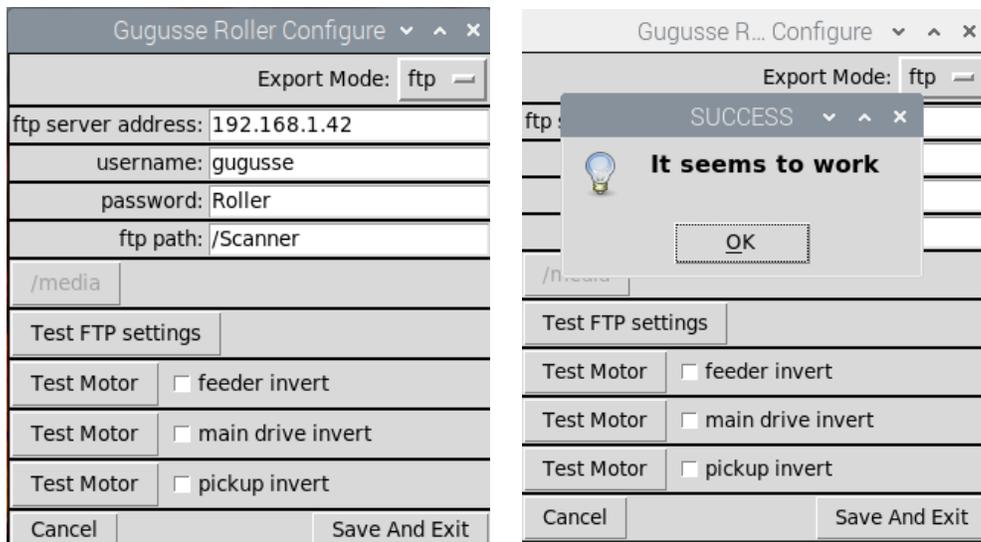
Step 4 - Test the Install (Load the software)

Load the Gugusse Roller Software by running these commands:

```
cd ~/GugusseRoller
python3 GugusseGUI.py
```

Step 5 – Install the Arduino Software

The Arduino on your board is a separate computer that is running a program of its own to accurately provide Hole Detection. You need to install the program onto the computer. The Arduino's program has been included in the Gugusse Roller software package that you previously installed.

We'll start by installing the Arduino configuration program on your Raspberry Pi. At a Terminal Window, type:

```
sudo apt-get install arduino
```

Connect the Arduino to the Raspberry Pi by USB using a Micro-USB cable (Lights should flash when you connect it):
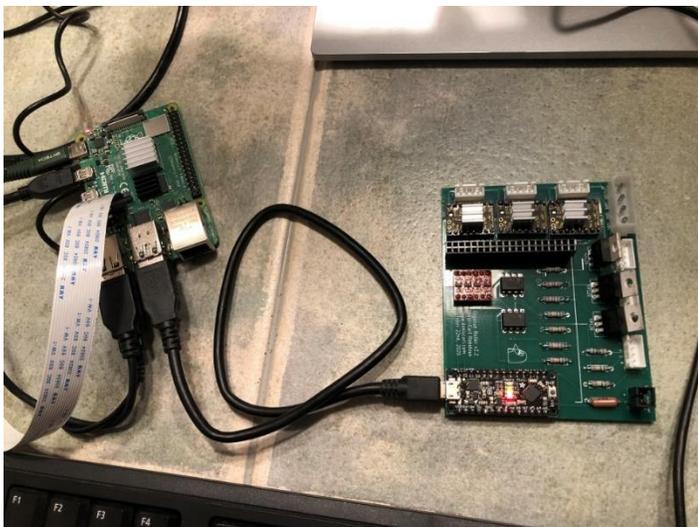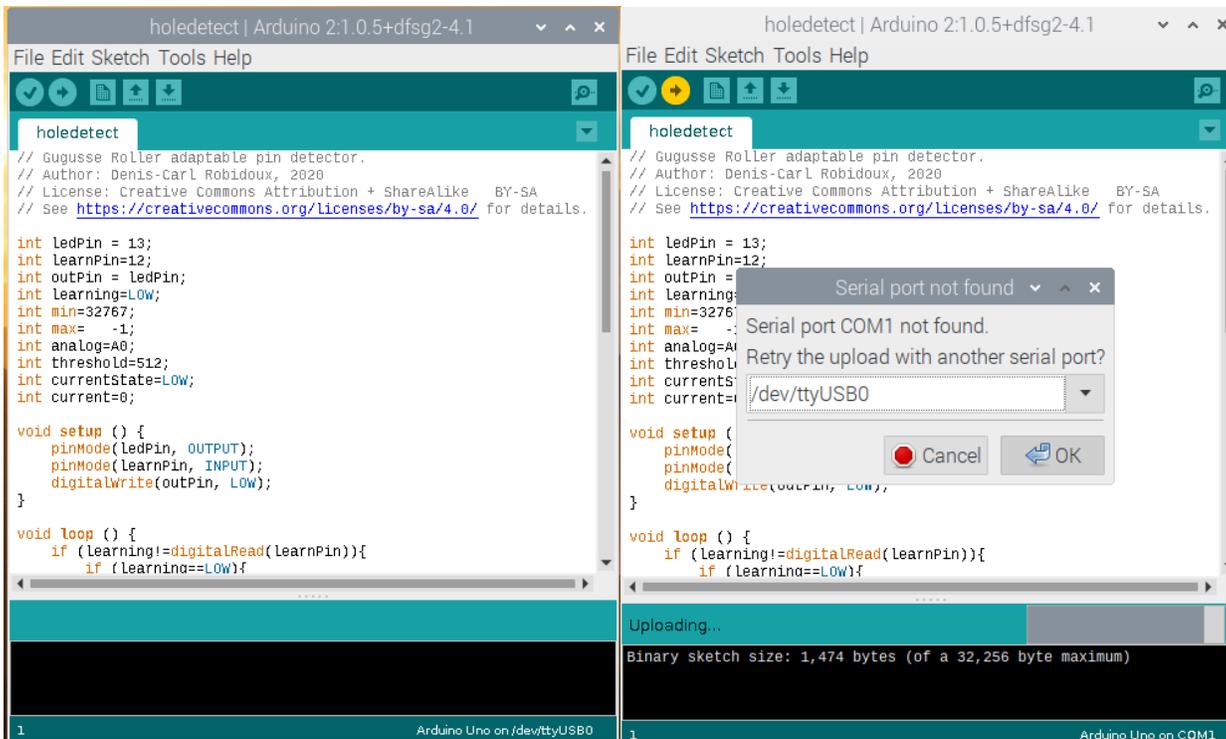
Start the Arduino software by typing:

```
arduino
```

Choose *File* from the top menu of the application and then *Open.* Click on *pi* in the left window and then *GugusseRoller* in the main window. Then choose *Arduino*, then *v2.2*, then *holedetect.* Then click on *holedetect.ino* and click the [Open] button.
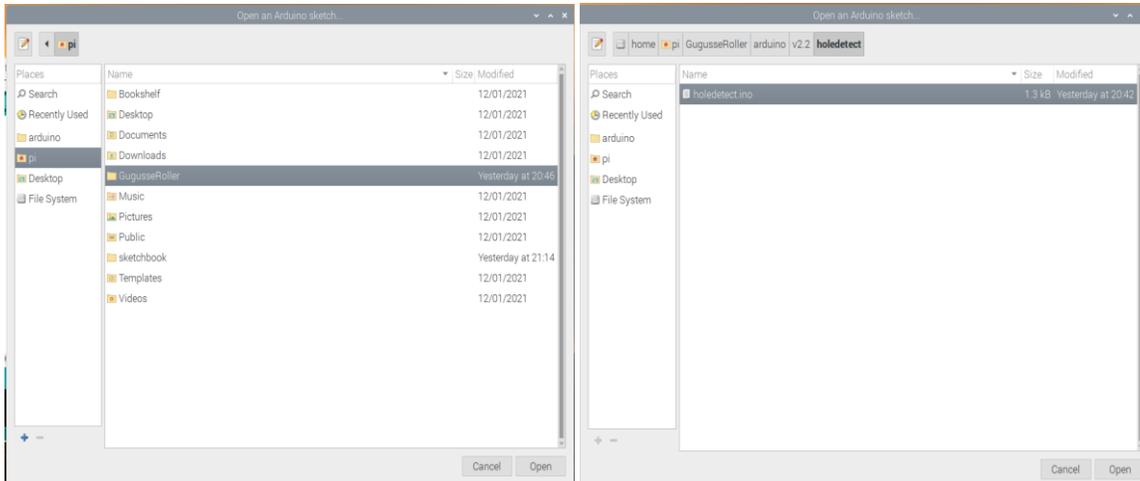
The software is ready to be installed on the Arduino. Start at the *Tools* top menu, choose *Board*, then *Arduino Uno* (probably at the top). Then *File* and then *Upload*. You might need to select the USB port but there will probably only be one choice.

The Arduino will report that it is done uploading.

Your system is now ready to be connected to your Gugusse and start scanning.

Step 6 – Updating the Gugusse Roller Software

When updates come out for your Gugusse, you can easily download them by running the following commands in a terminal window:

```
cd ~/GugusseRoller
git pull origin master
```

Note: The updates may overwrite your FTP and Motor settings so make sure you take note of the details before updating.