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Installation manual

Researchproject

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HOWEST

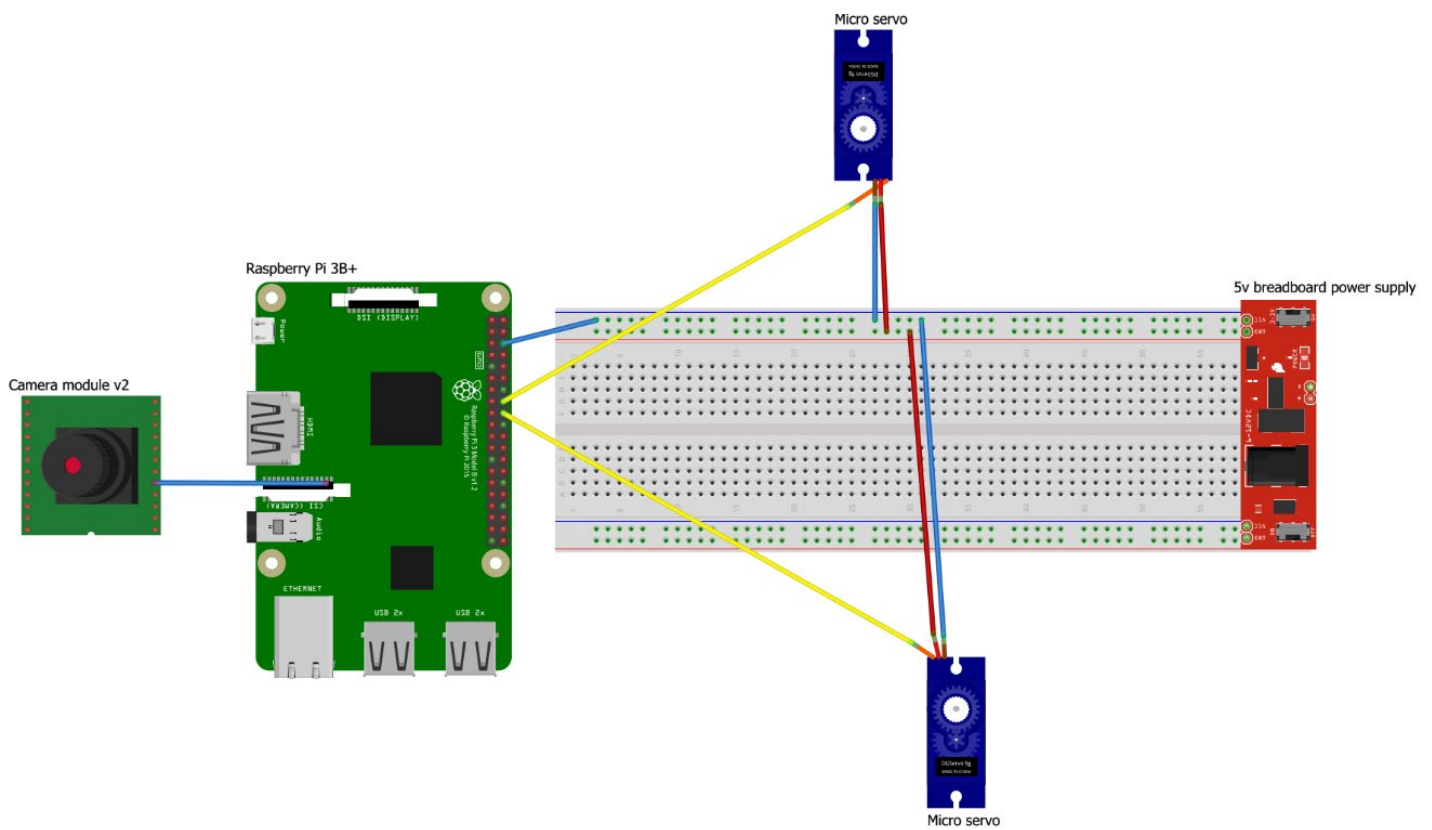
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2 HARDWARE:

- Raspberry pi 3B+ or Raspberry pi 4
- Raspberry Pi Camera Module 2
- Micro sd card 16gb minimum
- 2 micro servo motors
- Suitable power supply (I used 5v breadboard power supply)

2.1 TECHNICAL SCHEME:



3 RASPBERRY PI IMAGE SETUP:

This manual uses [Raspberry Pi imager](#) for simplicity and configurability

Insert your micro SD card into the SD card slot of a computer, then launch the Raspberry Pi Imager. Note that using this tool will erase any existing data on the SD card.

Choose following operating system:



Raspberry Pi OS (32-bit)

A port of Debian Bullseye with the Raspberry Pi Desktop (Recommended)

Released: 2022-09-22

Cached on your computer

Once the Raspberry Pi Imager is open, select your SD card from the list of available devices. Then, click on the settings gear icon to access additional options.

It is crucial to enable SSH by checking the corresponding box as we will need it shortly. Additionally, set a new username and password for your device.

You may also choose to add a wifi connection or change the hostname if desired. Once you have made your selections, proceed to write the image to your SD card by clicking on the "Write" button.

☒ Set hostname: .local

☒ Enable SSH

☒ Use password authentication

☐ Allow public-key authentication only

Set authorized_keys for 'pi':

☒ Set username and password

Username:

Password:

☒ Configure wireless LAN

SSID:

☐ Hidden SSID

Password:

☐ Show password

Wireless LAN country:

☐ Set locale settings

Time zone:

Keyboard layout:

4 RASPBERRY PI SETUP:

Before proceeding with the connection, it is important to ensure that certain functionality is enabled on your Raspberry Pi. To do this follow next steps.

1. Connect an Ethernet cable from your computer to the Raspberry Pi.
2. Log in to the device using the following command in windows command prompt:

```
ssh <username>@<hostname>.local -p 22
```

Make sure to replace username with the correct username and hostname.local with the correct hostname of your Raspberry Pi.

3. Once logged in, enter the command:

```
sudo raspi-config
```

This will open the Raspberry Pi Configuration tool.

4. Go to the "Interfacing Options" and select the "Camera" and "VNC" options. Make sure to enable both.

```
I1 Legacy Camera Enable/disable legacy camera support
I2 SSH          Enable/disable remote command line access using SSH
I3 VNC          Enable/disable graphical remote access using RealVNC
```

5. After enabling the options, reboot your device for the changes to take effect. Now you can use the camera and vnc on your raspberry pi.

To connect to your Raspberry Pi, you have two options:

- Use [VNC viewer](#) to remotely access the Pi's desktop.
- Connect the Pi to a screen using an HDMI cable to access the desktop directly.

Once you have access to the desktop, open the terminal and proceed with the next set of commands.

1. Update the pi:

```
sudo apt-get update
sudo apt-get dist-upgrade
```

2. clone needed code and files:

```
git clone https://github.com/BenjaminVierstraete2/DogDoor\_Pi.git
```

3. if u want u can rename it for easy typing:

```
mv DogDoor_Pi <newname>
```

4. go to folder:

```
cd DogDoor_pi
```

4.1 OPTIONAL:

install virtual env to allow the project to run in its own environment, will reduce chances of package conflicts if u have anything else on your pi, if not installing venv skip over next 3 commands.

```
sudo pip3 install virtualenv  
python3 -m venv venv  
source venv/bin/activate
```

install all needed packages:

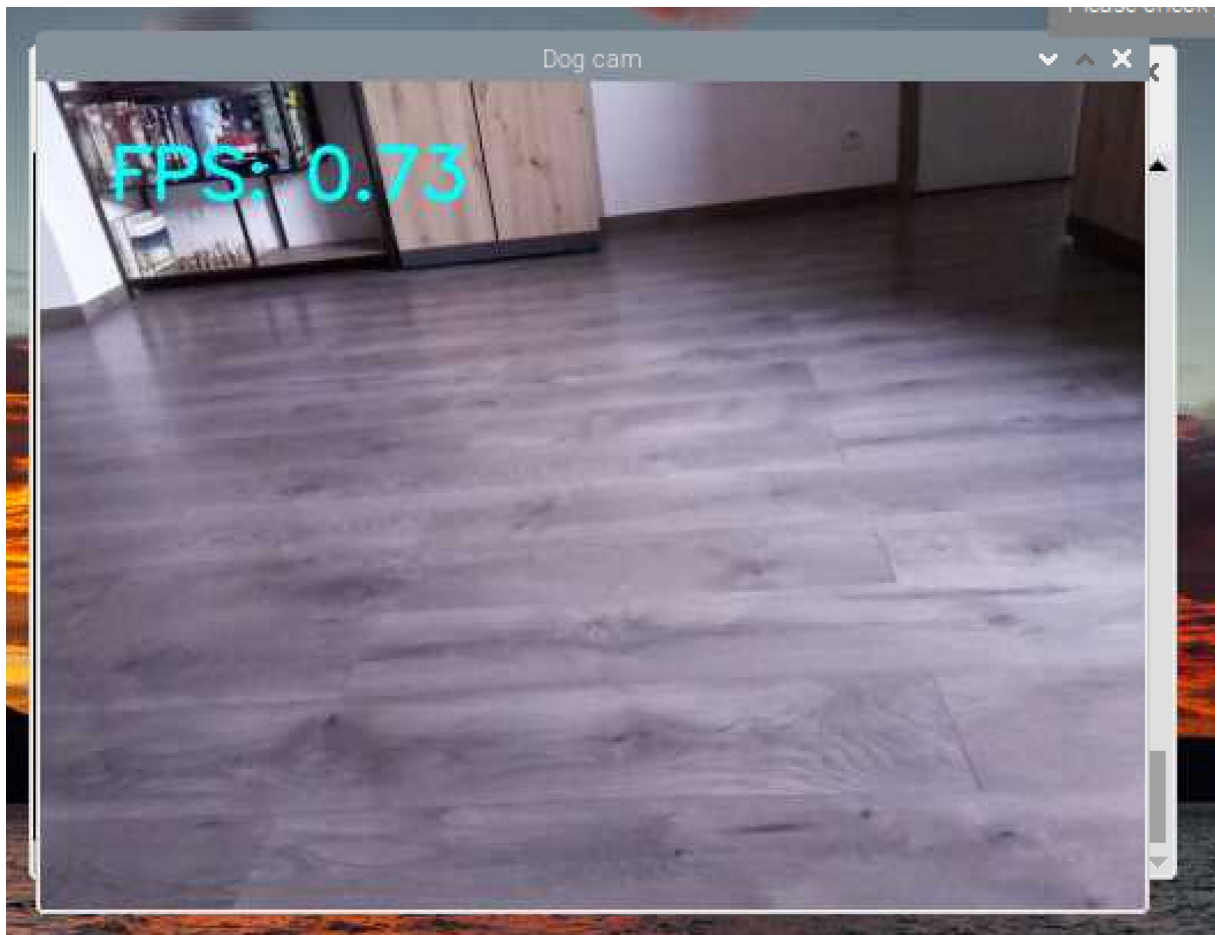
```
bash requirements.sh
```

4.2 Test setup :

Run model to see if there are no errors:

```
python3 detect.py --view
```

this should give u a popup window like this:



5 AUTOMATE:

To make it truly embedded we need to automate it, meaning when u plug in your pi the detection starts.

We will do this by creating a service that will start on bootup

1. Open the terminal and enter the following command to create a service called "detect.service":

```
sudo nano /etc/systemd/system/detect.service
```

2. Next, add the following code to the file, then save it:

```
[Unit]  
Description=Runs detection script on boot  
  
[Service]  
Type=simple  
User=<username pi>  
WorkingDirectory=/home/<username>/DogDoor_Pi  
ExecStart=/bin/bash -c "source venv/bin/activate && python3 detect.py"  
Restart=always  
  
[Install]  
WantedBy=multi-user.target
```

Remember to change "username" to your own username. If you did not create a virtual environment, you can remove the **source venv/bin/activate &&** part of the ExecStart line.

3. Now simply reload systemctl

```
sudo systemctl daemon-reload
```

4. enable to run on boot:

```
sudo systemctl enable my-script.service
```

5. test by either rebooting or running following:

```
sudo systemctl start detect.service
```


5.1 DISABLE AUTOMATION:

The service you created will start a no view version of the detect script that will run in the background of your pi.

if u want to view the detections live u can boot the pi and run following in terminal to stop the service:

```
sudo systemctl stop detect.service
```

then run it manually using the --view argument

```
python3 detect.py --view
```

6 STATIC IP

To remotely access the Raspberry Pi after the detection script has been installed, you will need to set a static IP address. This will allow you to connect to the Pi via SSH without the need for a HDMI or Ethernet cable. Setting a static IP address will ensure that the Pi always has the same IP address, making it easier to connect to it remotely.

Note: u will need to add a Wi-Fi network if not done in the image setup fase.

1. first we need to know your routers ip address open terminal and enter:

```
ip r
```

```
benj@benj:~ $ ip r
default via 192.168.0.1
```

2. next we need to know our dns address:

```
cat /etc/resolv.conf
```

```
benj@benj:~ $ cat /etc/resolv.conf
# Generated by resolvconf
search telenet.be
nameserver 195.130.130.5
```

3. go to the DHCP client configuration file using next command:

```
sudo nano /etc/dhcpd.conf
```

4. add following lines to the bottom of the file

```
interface wlan0  
static ip_address=<ip address of choice>/24  
static routers=<routers adress>  
static domain_name_servers=<dns address>
```

change the values in <> to the your values.

5. Reboot to apply changes