

# Fun Raspberry Pi Projects

**Scott Winterroth**



# What is a Raspberry Pi?

Credit card size computer that runs open source operating systems.

- Raspberry Pi 4 Model B (2|4|8GB RAM)
- Raspberry Pi 400
- Raspberry Pi W 2 ~ \$15!
- Raspberry Pi Pico ~ \$5
- Raspberry Pi Compute Module
- Others?

**\$5 - \$50\* bucks!**  
**Plus Accessories**

<https://www.raspberrypi.com/>



# Hardware

Good to know information regarding common hardware elements

- **GPIO & HAT**
- **USB 3.0**
- **Ethernet on 4B**
- **Pi Camera**
- **Micro SD Cards (Min 8GB)**
- **Micro HDMI/Mini HDMI**
- **Power Supplies (5V) Not uniform**
- **Plenty of 3D printable cases, etc.**



**RPI 400**

## RPI 4 B



More powerful processor

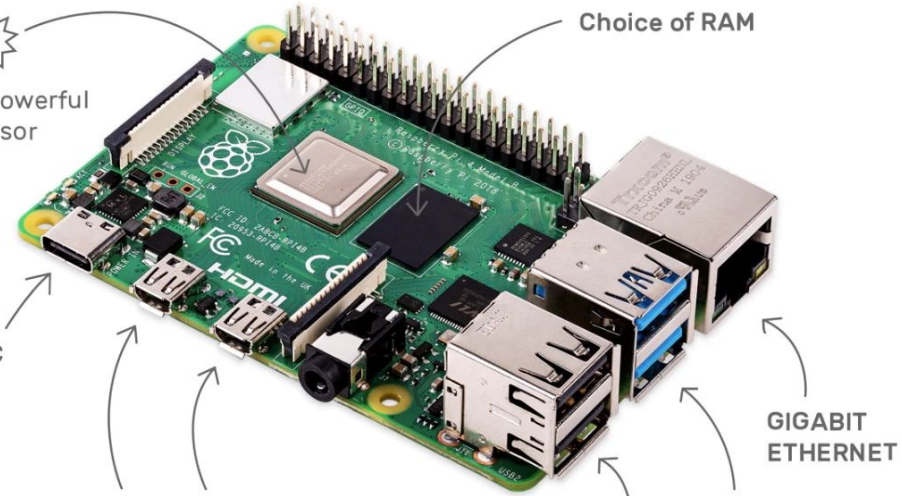
Choice of RAM

USB-C Power supply

MICRO HDMI PORTS  
Supporting 2 x 4K displays

USB 2  
USB 3

GIGABIT  
ETHERNET



## RPI Zero W

40 PIN GPIO HEADER

RP3A0 - AU

MICRO SD SLOT

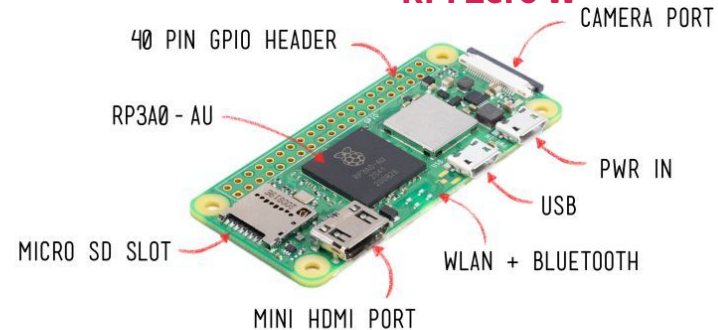
MINI HDMI PORT

CAMERA PORT

PWR IN

USB

WLAN + BLUETOOTH



# Operating Systems

Good to know information regarding common hardware elements

- **Linux**
- **Python**
- **MQTT**
- **Raspbian (Desktop/Lite)**
- **Chromium OS**
- **Others!**



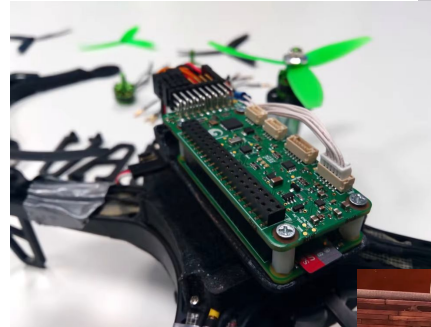
## Installation of OS:

- Raspberry Pi Image to SD card
- Command Line:
- SSH via Terminal (Mac) or Putty (PC)
- Belena Etcher

# Fun Pi Projects

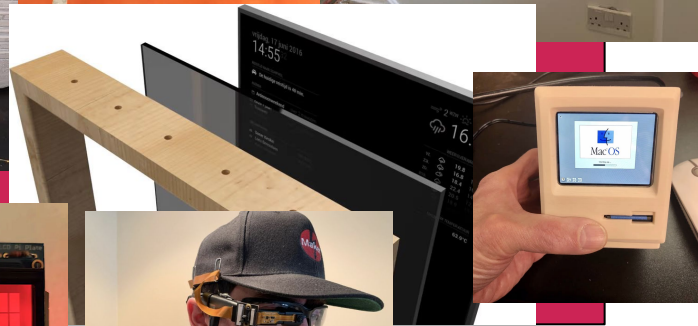
Too many to list, let your creativity and skills run wild!

- **Business**
- **Art & Photography**
- **Science/Medical**
- **Home Automation**
- **Signage/Menu Boards**
- **Weather Stations**
- **Robotics & Drones**
- **Education STEM**
- **Agriculture**
- **Analog to Digital Conversion**



**DAK Board**

<https://dakboard.com/site>

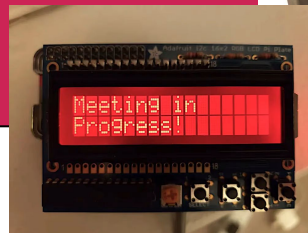


**PiGlass**

<https://www.mrdcreations.org/>

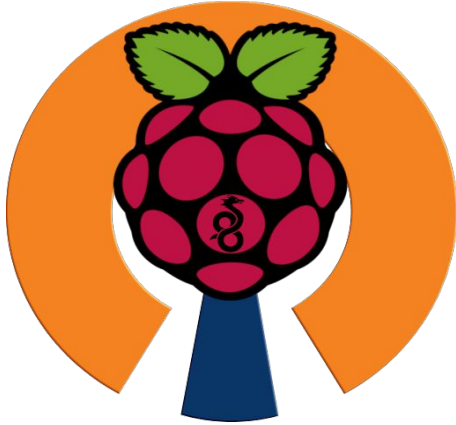
<https://all3dp.com/1/best-raspberry-pi-projects/>

<https://www.facebook.com/groups/1396784783796037>



# Projects I want to share:

**Pi VPN**  
(With Wireguard)



<https://www.pivpn.io/>

**OpenMediaVault**



<https://www.openmediavault.org/>

**Homebridge**



<https://homebridge.io/>

# Additional Projects... if we have time?

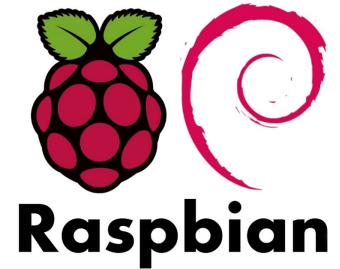
OctoPrint



RetroPie



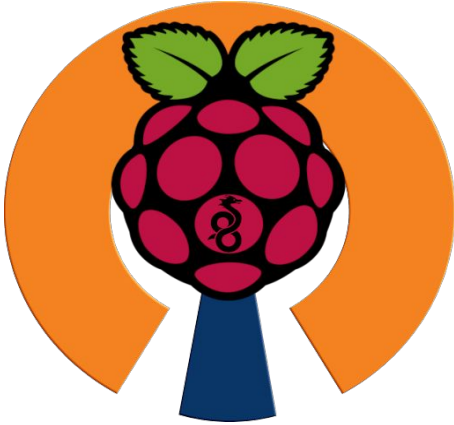
Raspbian OS



# PIVPN

## PiVPN

(With Wireguard)



<https://www.pivpn.io/>

Scott's Notes:

- PiVPN works on a Raspberry Pi W or as a secondary OS install
- Wireguard is an open source app for connecting to your vpn network
- No-IP will create a public network from your ISP's public IP address
- DUC IP:  
<https://www.noip.com/support/knowledgebase/install-ip-duc-onto-raspberry-pi/>



# OpenMediaVault (OMV)



<https://www.openmediavault.org/>

## Scott's Notes:

- Could work on a Pi W2 or as a secondary OS install but recommend something more powerful like Pi 4 B with ethernet
- Works great with PiVPN!
- Must format drives with ExtFS OpenMediaVault before using so empty drives works best!  
Possible compatibility with Mac issues.
- Works with Mac Time Machine
- Setup SMB Network
- Check out the Argon 40 NAS Enclosure

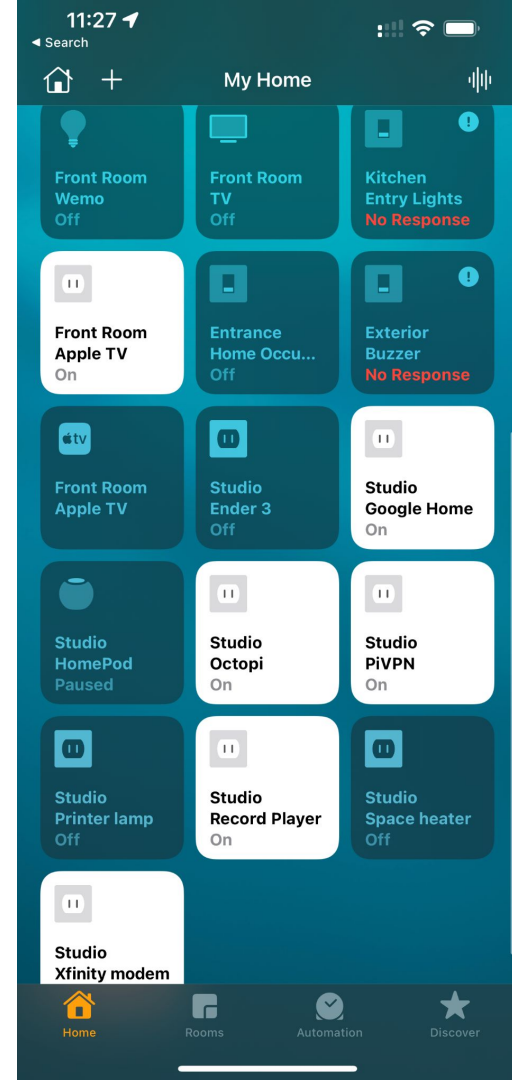
# Homebridge



<https://homebridge.io/>

Scott's Notes:

- Works on a Pi W2 or as a secondary OS install but recommend something a bit more dedicated/powerful like Pi4B with ethernet
- HomeKit on iPhone needed
- Alternatives would be Home Assistant
- Helps you connect less expensive home automation devices and zigbee etc.
- Caution with non UL devices



# Octoprint



Scott's Notes:

- Of course, specific to 3D printing
- Becoming a widely used tool
- Works great with Ultimaker Cura software
- Great way to get started
- Simply just plugged into my Creality printer

<https://octoprint.org/>