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Setup guide

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What parts are needed for federated learning on Raspberry Pi?

Minimal Raspberry Pi set

Raspberry Pi

For the project the version 4 B+ was used, but the version 3 B can be used.

Power adapter

From the 4th version a special power adapter is needed.

MicroSD

For the Project MicroSD 32 GB used with pre-installed NOOBS 3.1.0, but it can be 16 GB.

SD-Adapter

The SD-slot and SD-Adapter were used to get access to raspberry Pi console.

It's also a good idea to buy a Raspberry Pi box to keep it clean. And a fan to keep it cool, because Raspberry Pi 4 tends to get hot.

An example of Raspberry Pi set for the project.

| Artikelnummer	Bezeichnung	Anzahl
RPI PS 15W WT EU	Raspberry Pi - Netzteil, 5,1 V, 3,0 A, USB Type-C, EU-Stecker, w	1
RASP PI 4 B 2GB	Raspberry Pi 4 B, 4x 1,5 GHz, 2 GB RAM, WLAN, BT	1
RASP OS 32GB	Raspberry Pi - OS 3.1 32GB microSD-Karte, vorinstalliert	1

Minimal environment set

Hardware

- **Laptop or computer** with installed PySyft, PyTorch, Python.

- **Connection to the internet**. In the project we will use a router and the Raspberry Pi will be connected with network cable to it.

Software

- On the laptop open working **jupyter notebook "Federated Recurrent Neural Network"** from PySyft/examples/tutorials/advanced/

- At the Raspberry Pi you will need to start **run_websocket_server.py** with the ip adresse, port, id.

Finally, all components are displayed together on the following diagram.
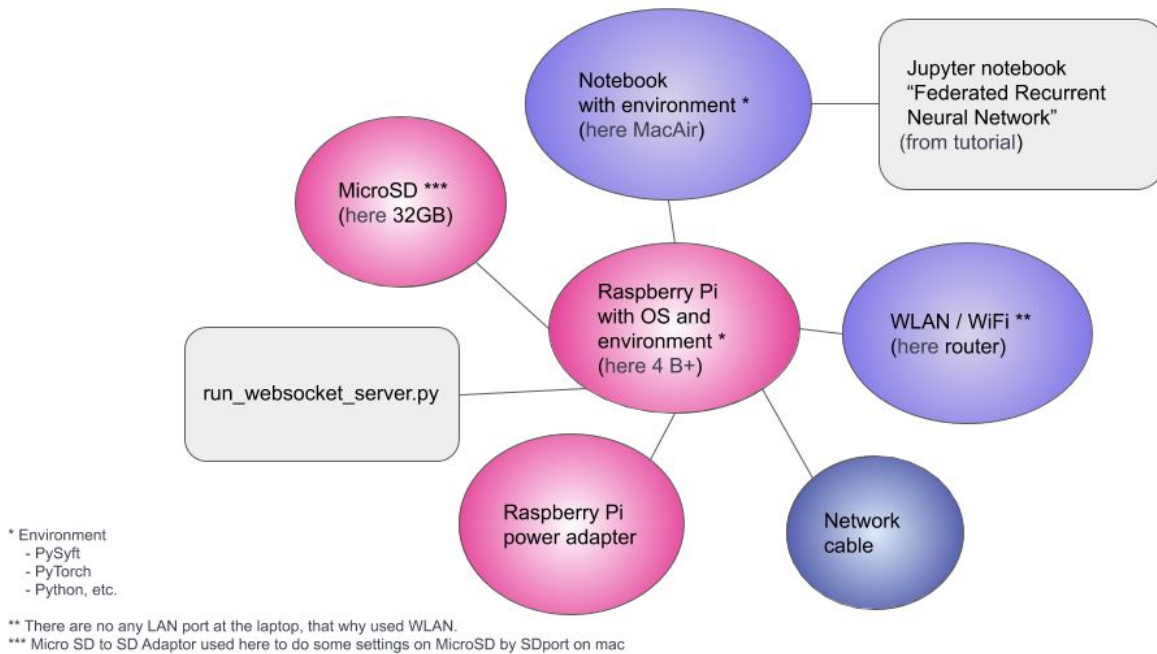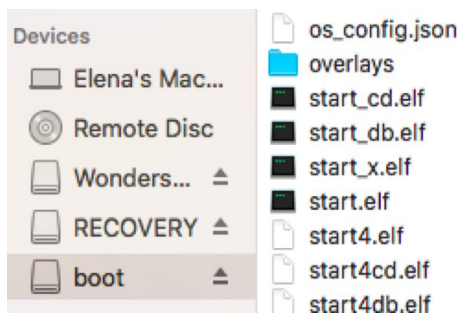

Remotely access the command line

To access the command line of a Raspberry Pi remotely in the same network with SSH, you have to activate it.

For the SSH activation take the microSD from Raspberry Pi and place it into SD-reader.

To be able to work with microSD on the mac, you will need an SD-Adapter as in the photo.

To enable SSH on raspberry Pi just place a file named "**ssh**" on the card.

More details in [SSH(Secure Shell)](#).

Resources

[SSH (Secure Shell)](#)

[Federated learning of a recurrent neural network on Raspberry Pis](#)