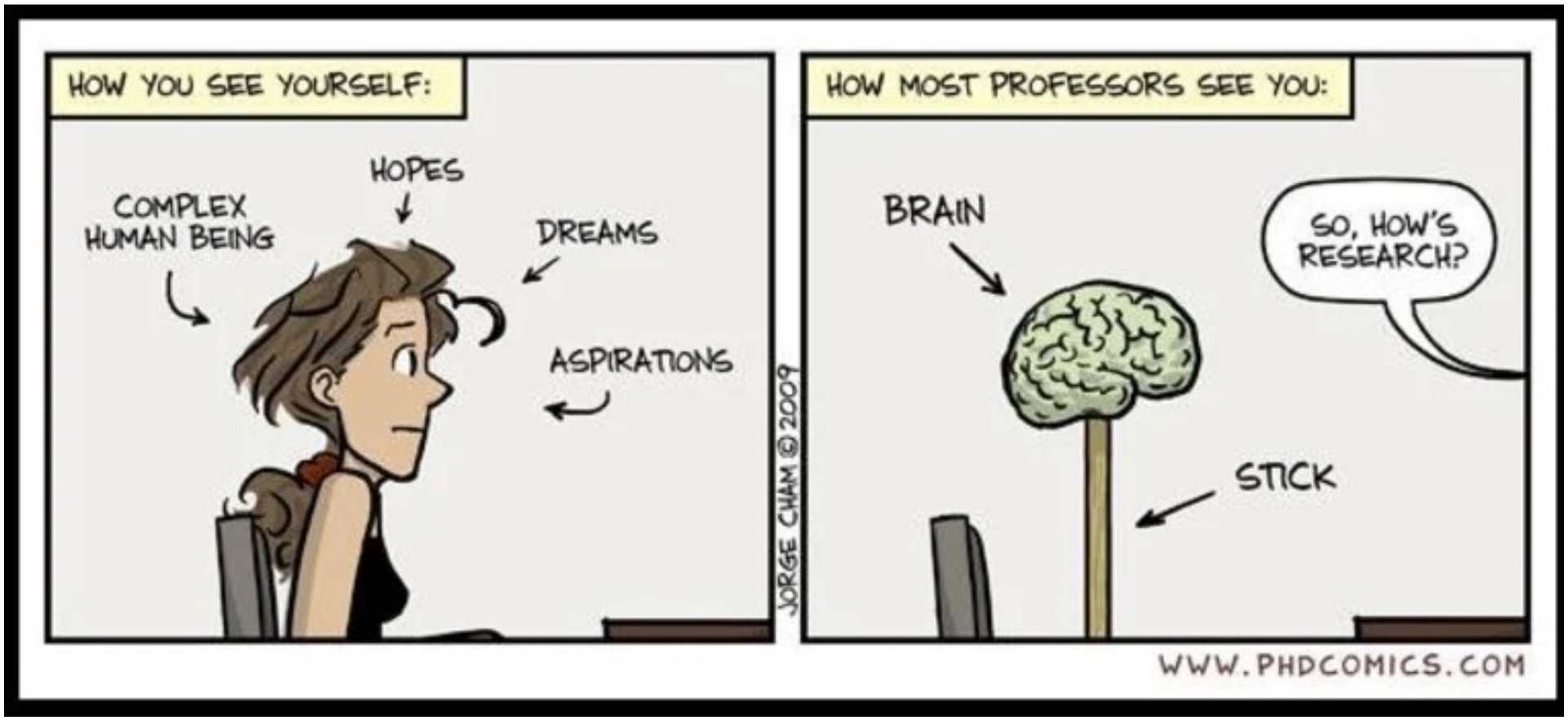
Embedded Systems For Developing Biomedical Applications

Summer School in Biomedical Engineering

Prof. Dr. Gerardo Marx Chávez-Campos

Students: Introduce yourself

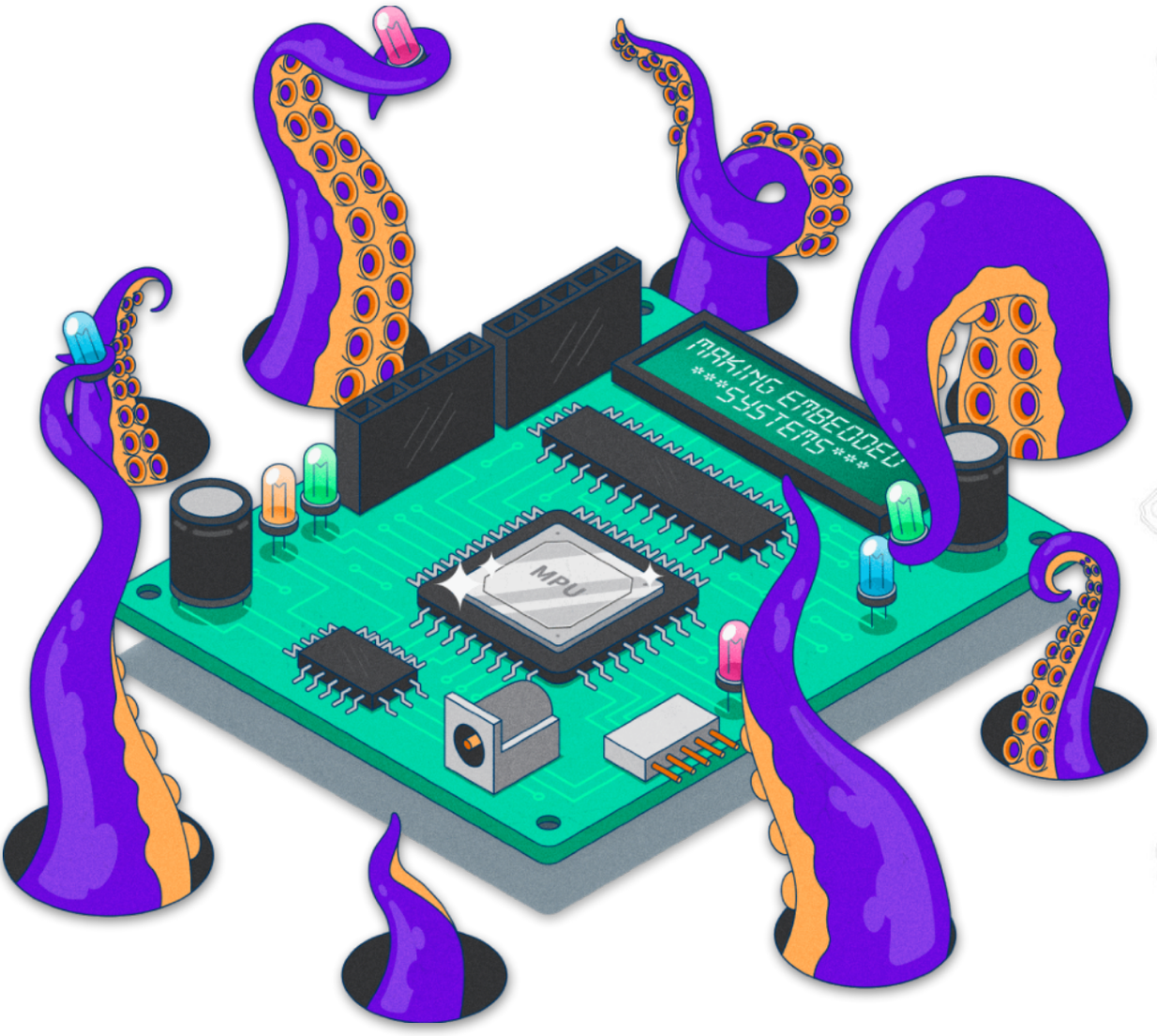


What is an embedded system?

- A system is an arrangement in which all its units assemble and work together by following a set of rules.

- An embedded system is an uC or uP-based system that is designed to perform a specific task(s); and can be part of a larger system.

Where can we find the Embedded Systems?



AUDIO-VISUAL EQUIPMENT

MANUFACTURING EQUIPMENT

GAMING CONSOLES

MOTION SENSORS

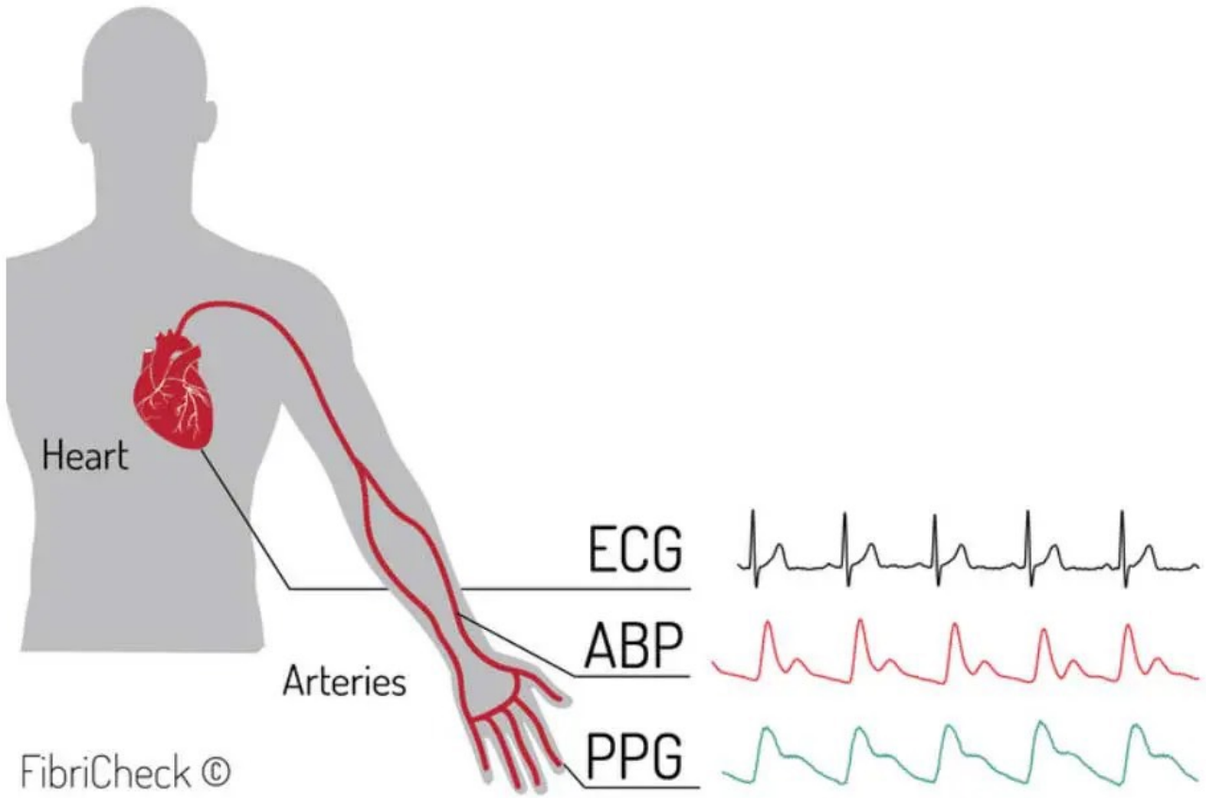
EMBEDDED SYSTEMS

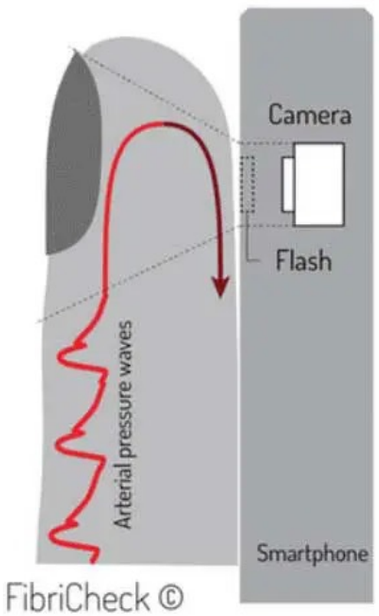
DOMESTIC APPLIANCES

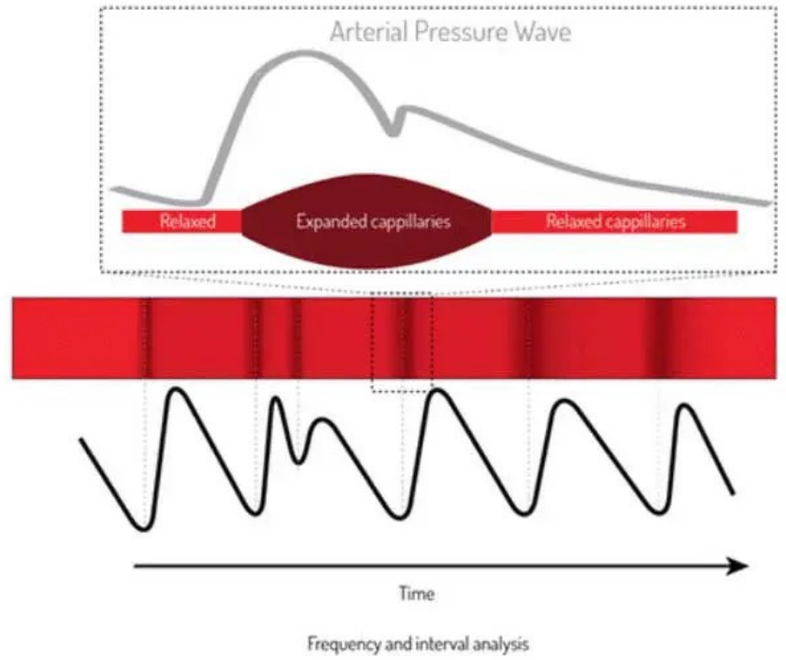
MEDICAL DEVICES

TELECOMMUNICATION EQUIPMENT

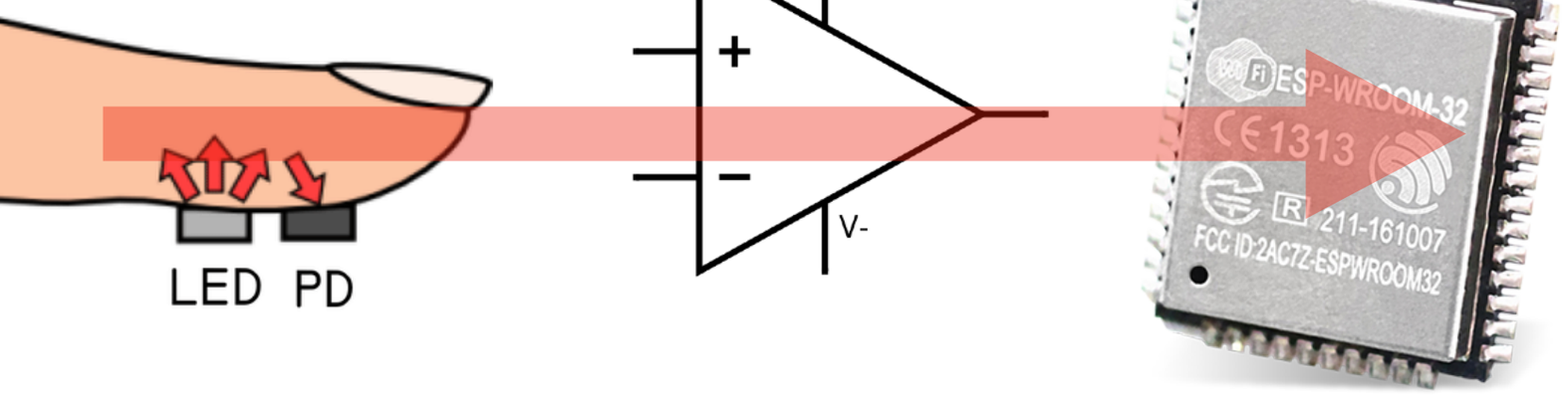
CARS AND VEHICLES


Heart
Arteries
ECG
ABP
PPG
FibriCheck ©

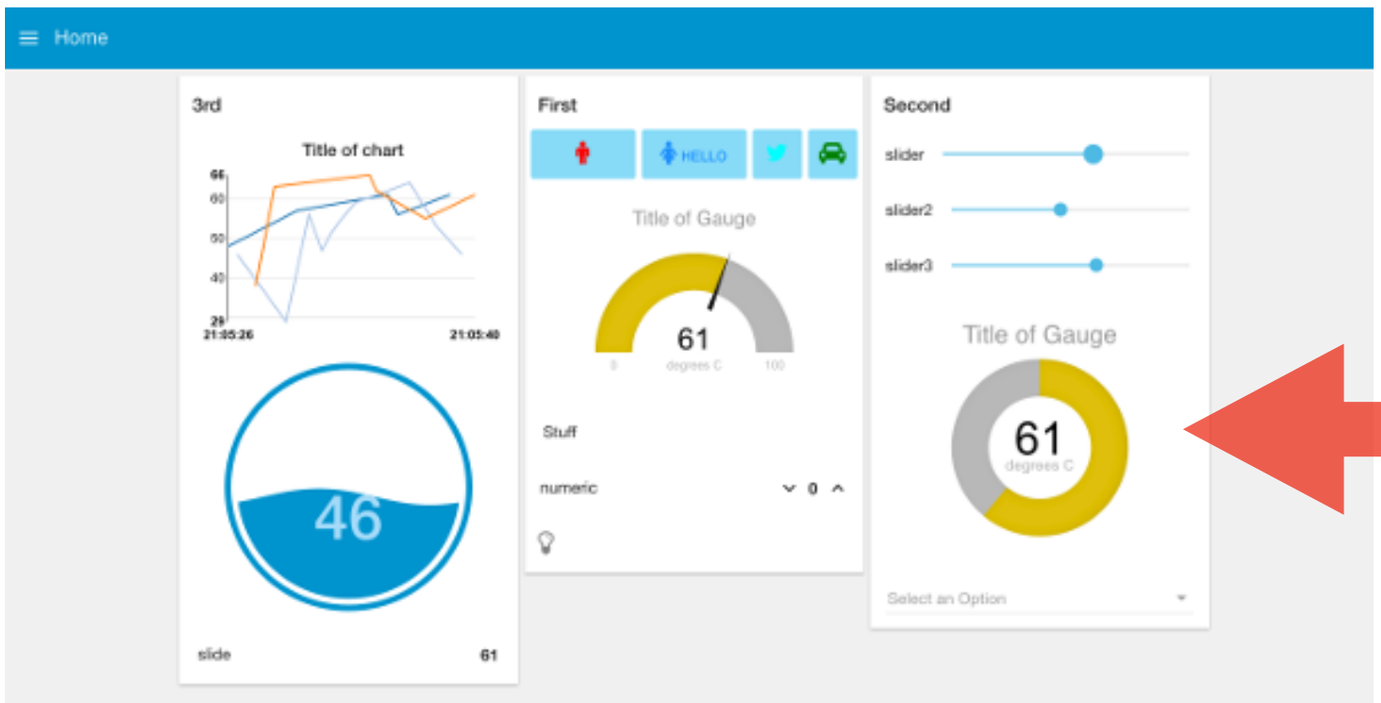

Camera
Flash
Arterial pressure waves
Smartphone
FibriCheck ©

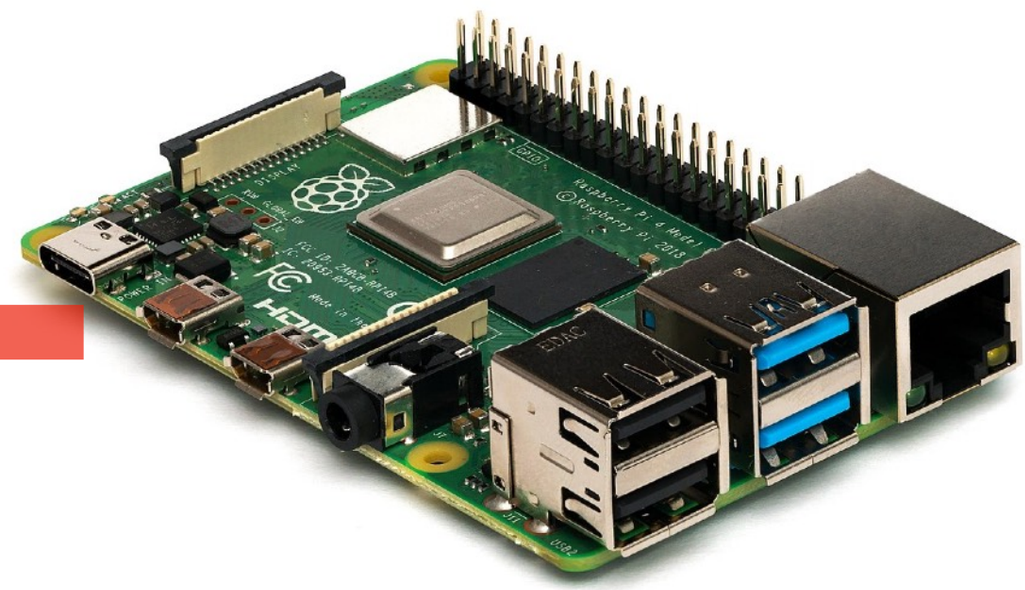

Arterial Pressure Wave
Relaxed
Expanded cappillaries
Relaxed cappillaries
Time
Frequency and interval analysis

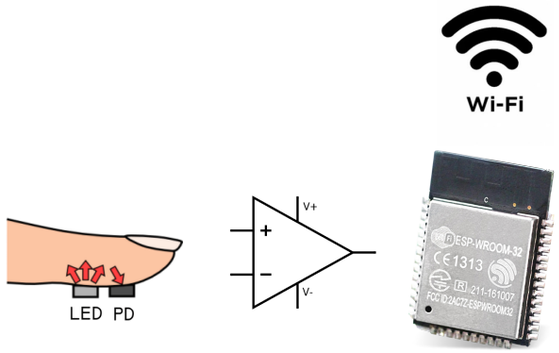
Wi-Fi



mosquitto






Wi-Fi
LED PD
V+
V-
ESP-WROOM-32
CE 1313
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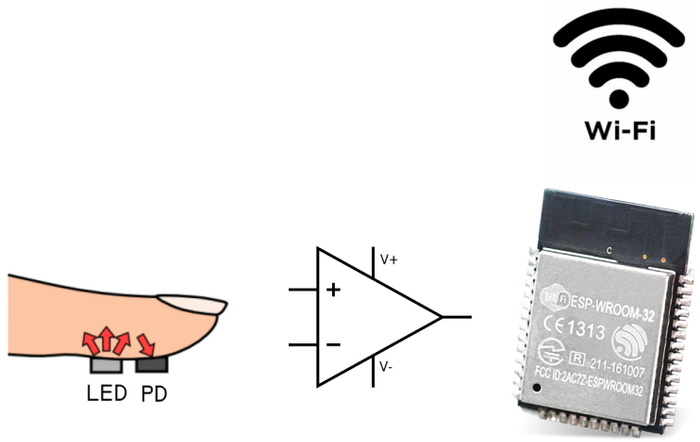
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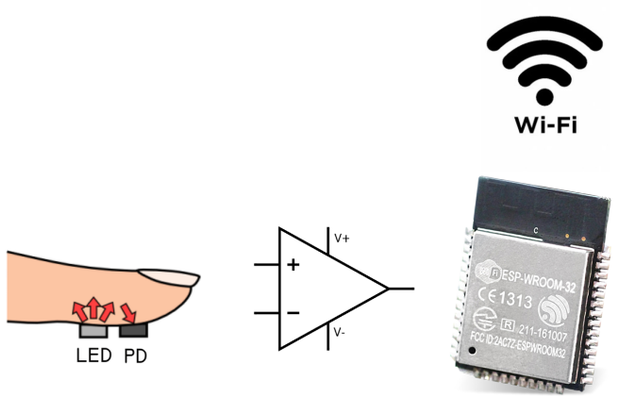
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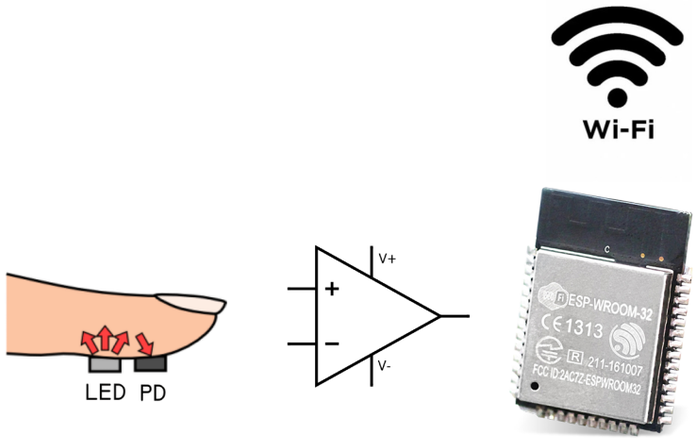
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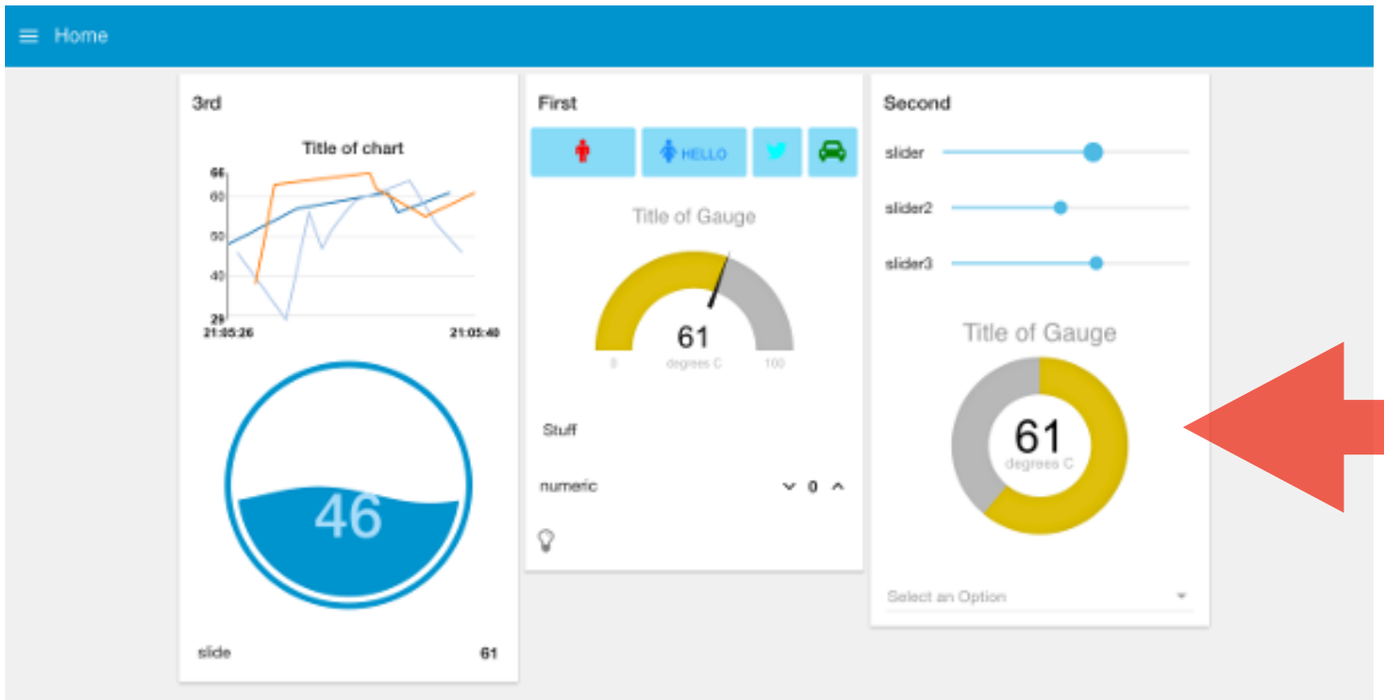
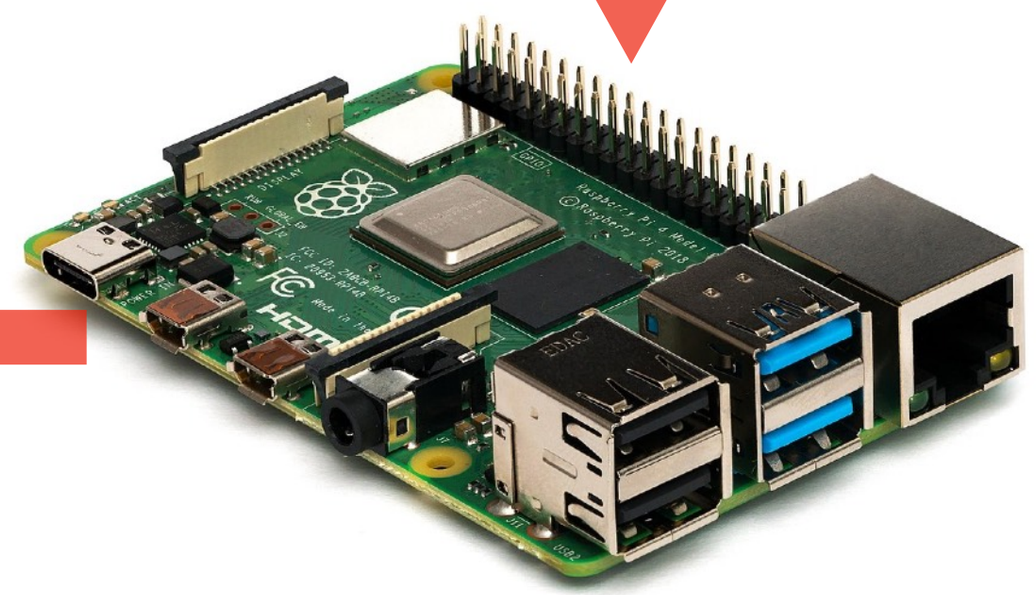

Home
3rd
Title of chart
66
60
50
40
30
21:05:26
21:05:40
46
slide
61
First
HELLO
Title of Gauge
61
0
degrees C
100
Stuff
numeric
0
Second
slider
slider2
slider3
Title of Gauge
61
degrees C
Select an Option



Let us build our Application from scratch

Raspberry Pi Imager v1.6
Raspberry Pi
Operating System
CHOOSE OS
Storage
CHOOSE STORAGE
WRITE

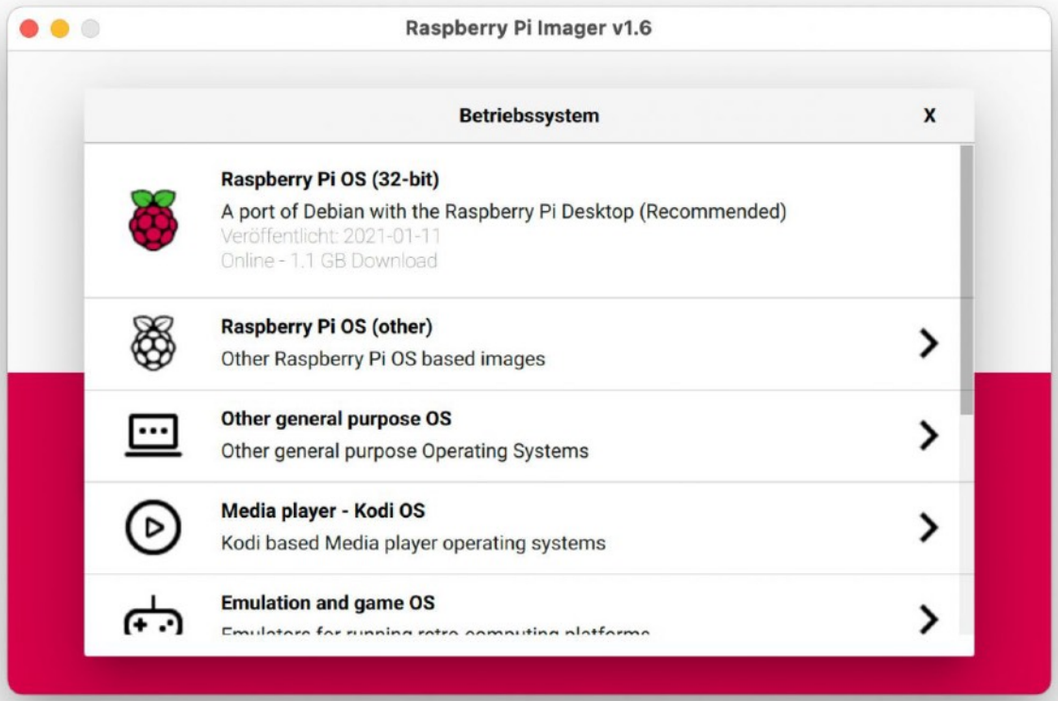
Image customization options: for this session only

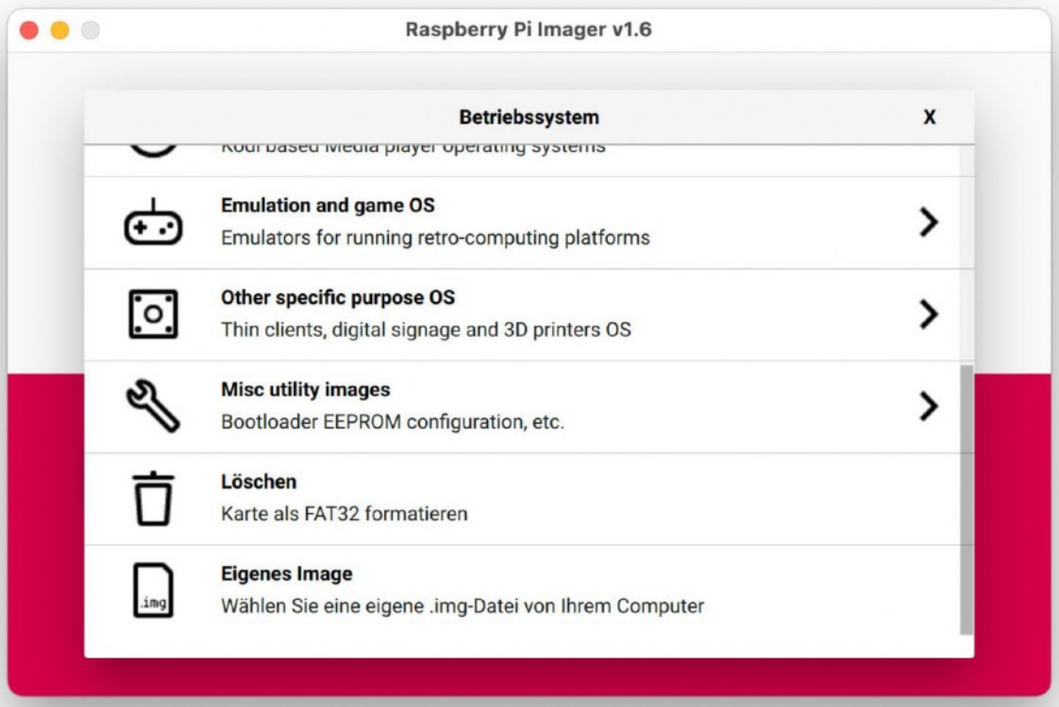
- [ ] Disable overscan
- [ ] Set hostname: raspberrypi .local
- [ ] Enable SSH
  - ( ) Use password authentication
    - Set password for 'pi' user:
  - ( ) Allow public-key authentication only
    - Set authorized_keys for 'pi':
- [ ] Configure wifi
  - SSID:
  - Password:
  - [x] Show password
  - Wifi country: GB
- [ ] Set locale settings
  - Time zone: Europe/London
  - Keyboard layout: gb
  - [ ] Skip first-run wizard

Persistent settings

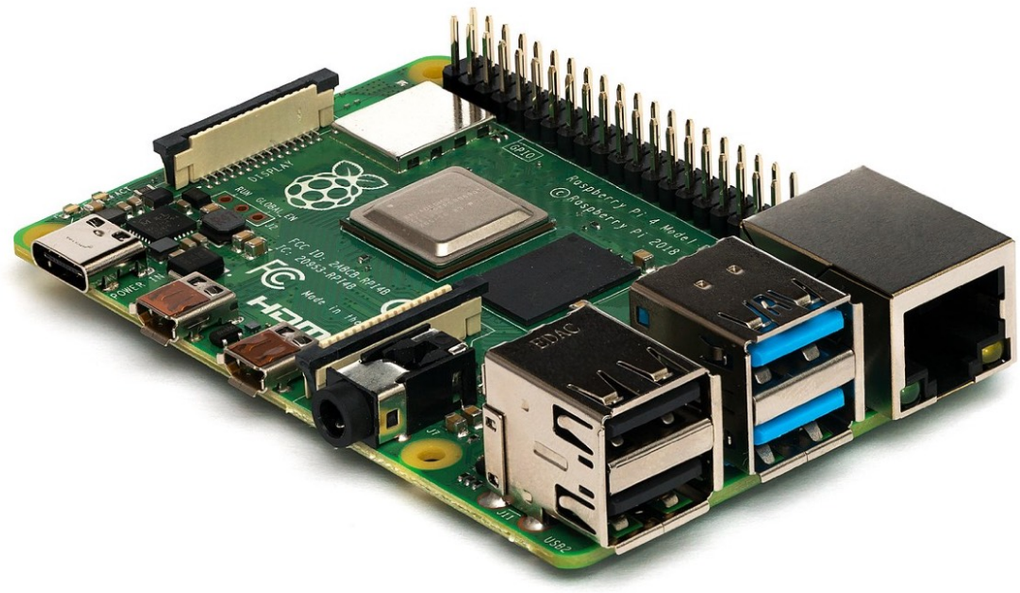
- [x] Play sound when finished
- [x] Eject media when finished
- [x] Enable telemetry

SAVE





SSH



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