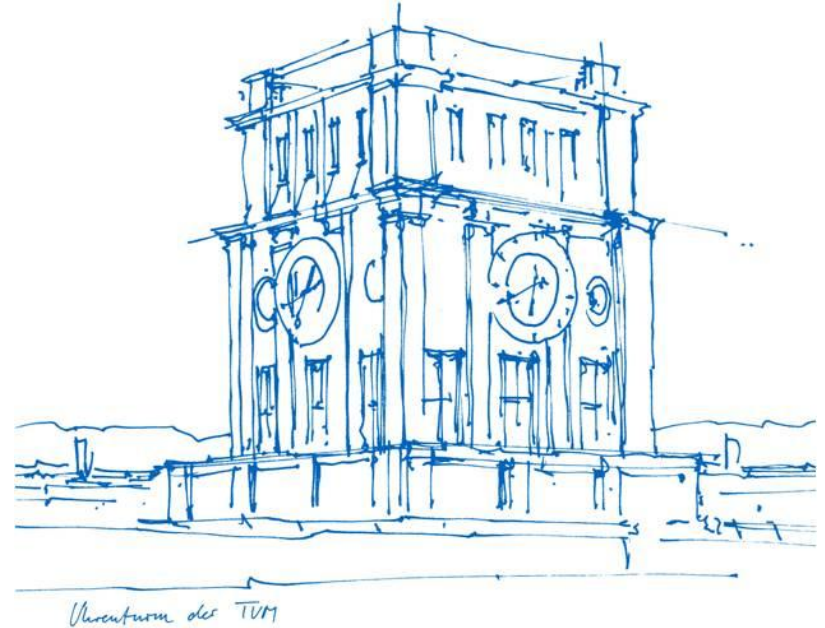


Mobile Solar Panels

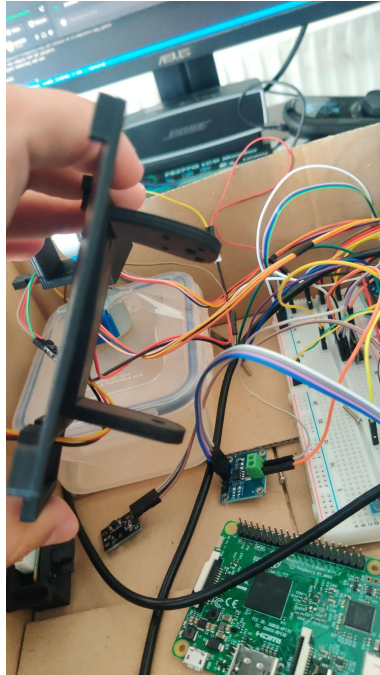
Sprint 3

Eric Armbruster, Florian Freund, Sebastian Klinke

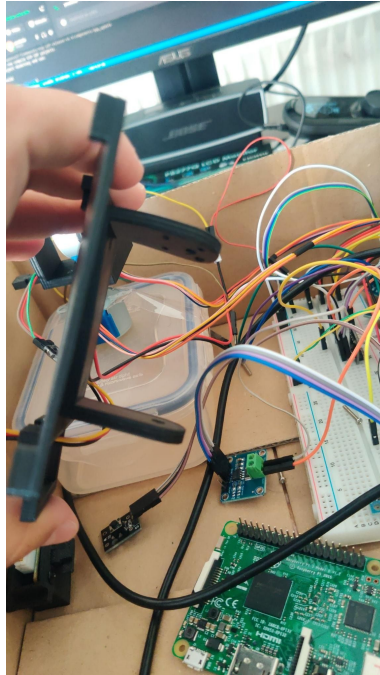
Garching, 08.07.2022



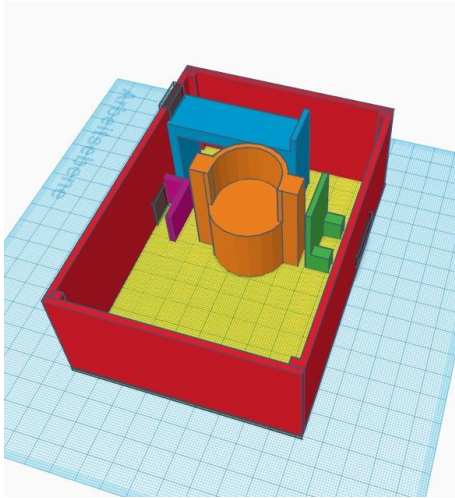
Heat Stability...



Heat Stability... and Cooking Up Solutions



Lower Platform Design



Power sensor

- Power sensor worked accidentally during demo
- First time usage between 06:00 and 21:00

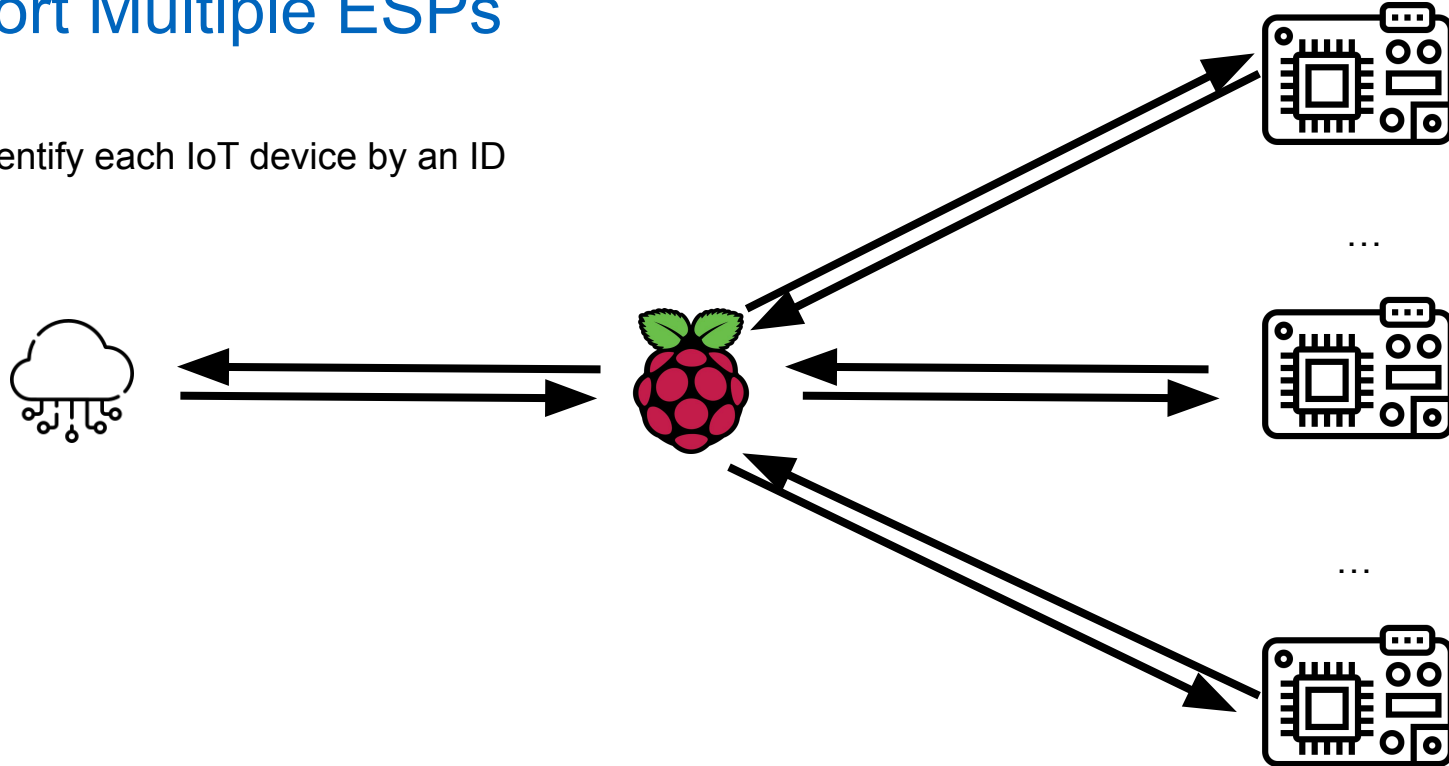
Power sensor

- Power sensor worked accidentally during demo
- First time usage between 06:00 and 21:00
- Tests have shown:

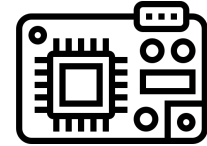
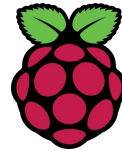


Support Multiple ESPs

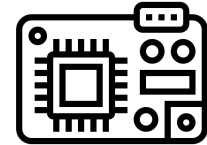
- Identify each IoT device by an ID



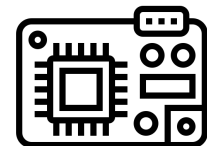
Leader Follower Reuse



...

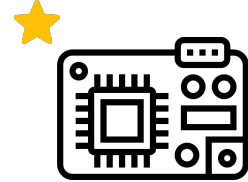
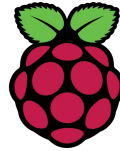


...

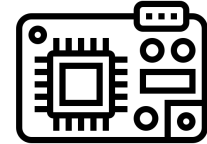


Leader Follower Reuse

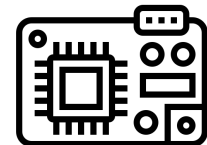
1. Every iot device
 - is assigned a role
 - initializes its rotation



...

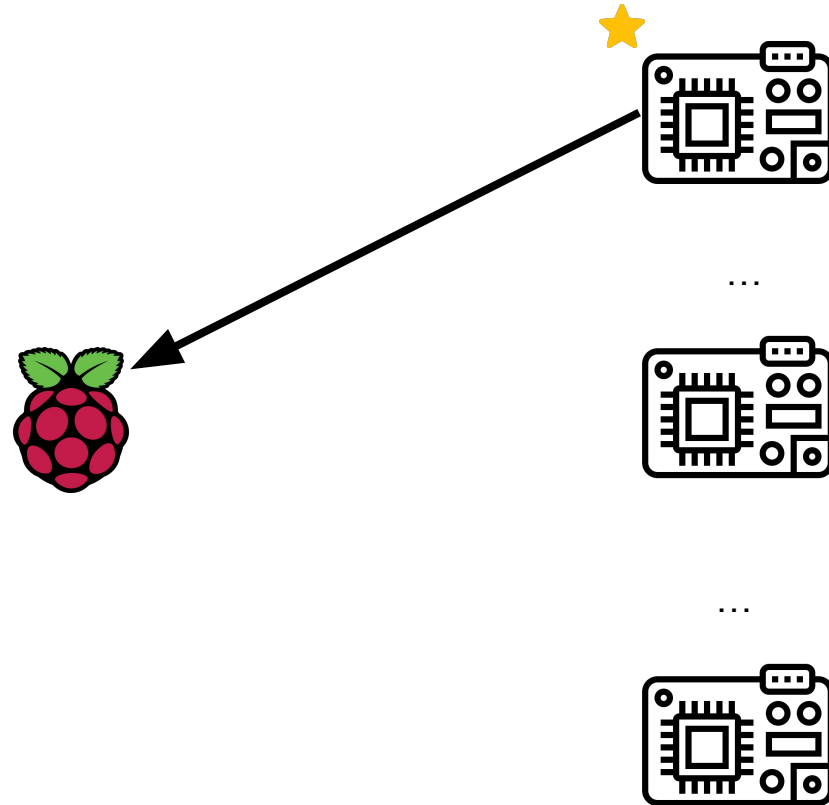


...



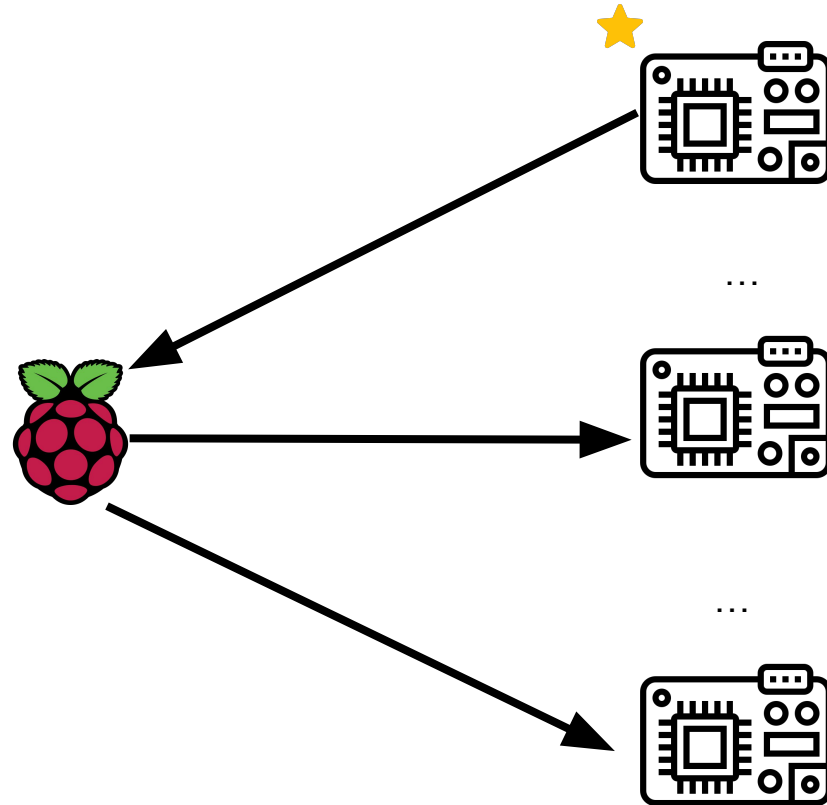
Leader Follower Reuse

1. Every iot device
 - is assigned a role
 - initializes its rotation
2. Leader
 - Probes next rotation offset
 - Leader forwards rotation offset to edge



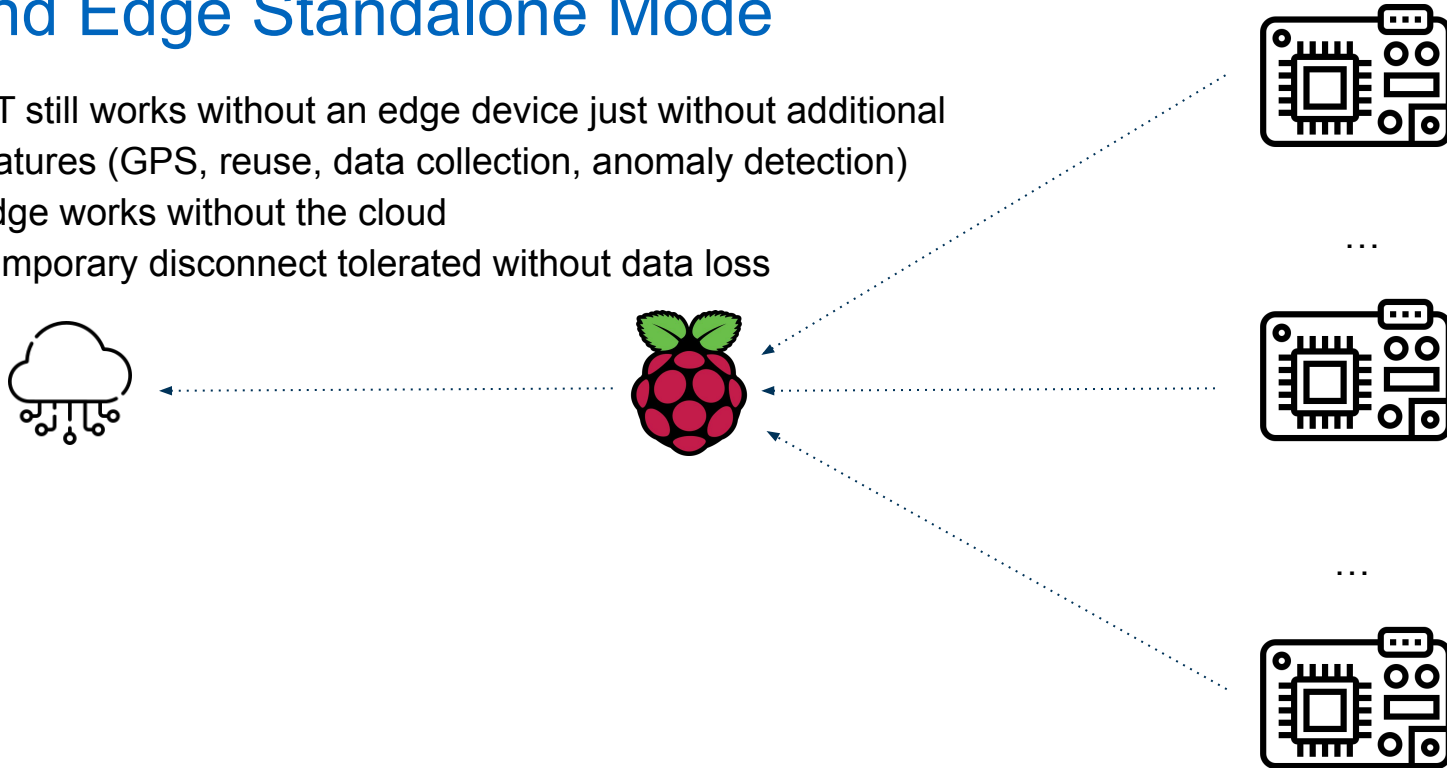
Leader Follower Reuse

1. Every IoT device
 - is assigned a role
 - initializes its rotation
2. Leader
 - Probes next rotation offset
 - Leader forwards rotation offset to edge
3. Edge device forwards to followers



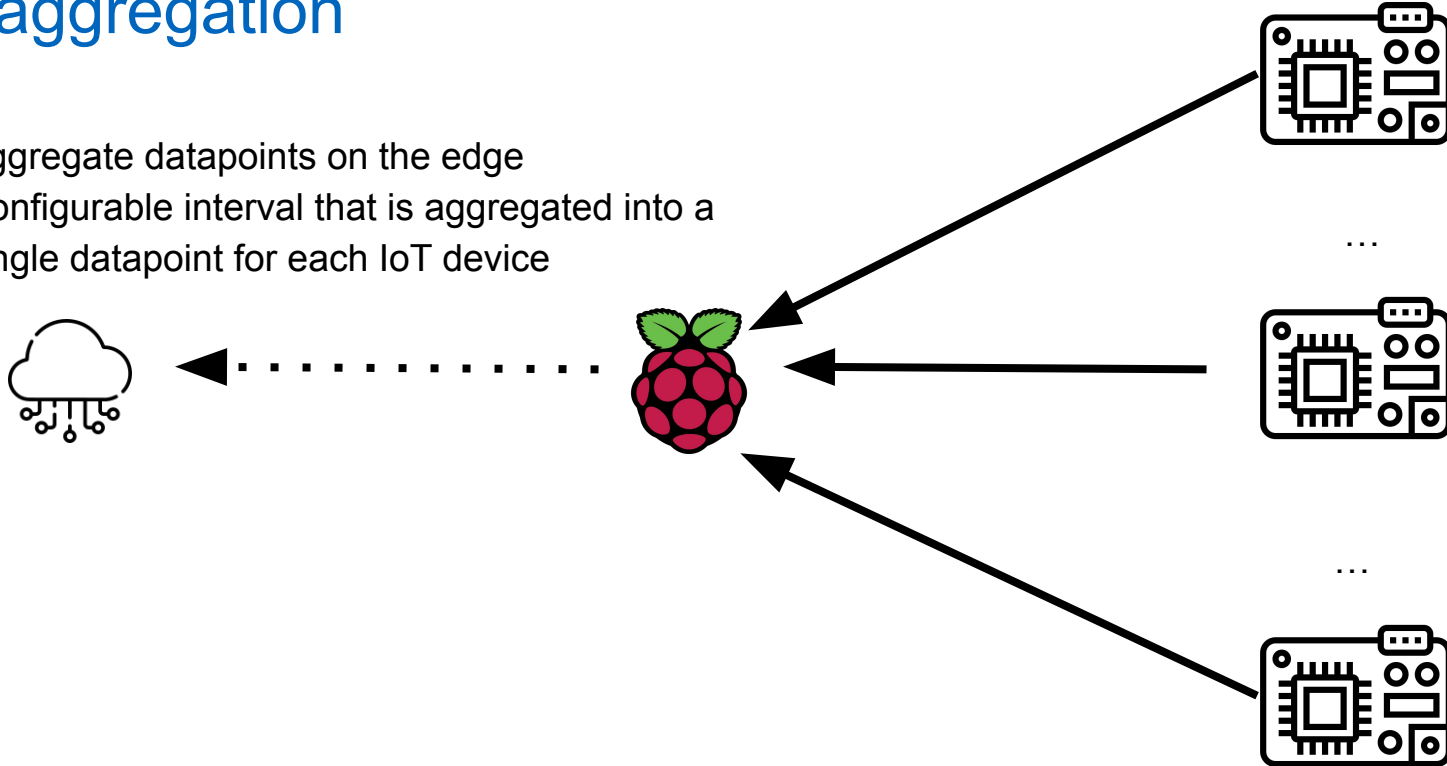
IoT and Edge Standalone Mode

- IoT still works without an edge device just without additional features (GPS, reuse, data collection, anomaly detection)
- Edge works without the cloud
- Temporary disconnect tolerated without data loss

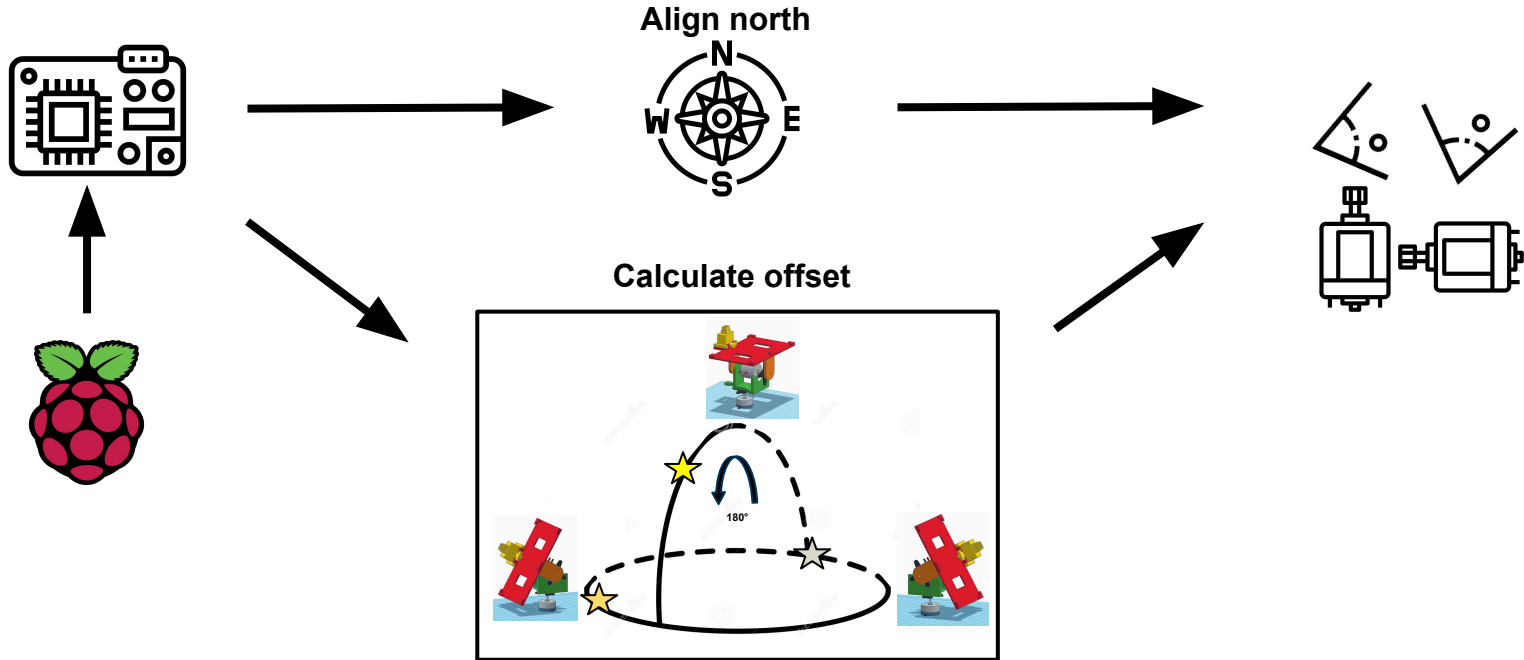


Data aggregation

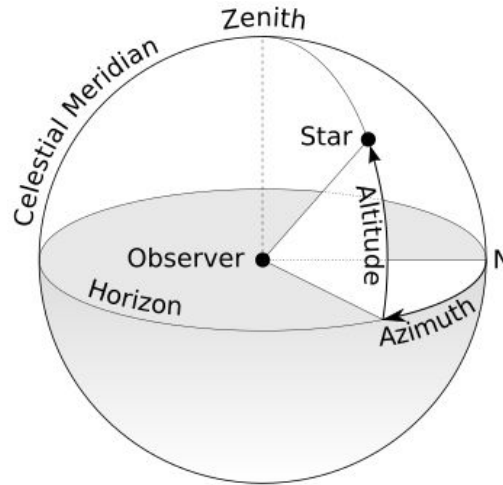
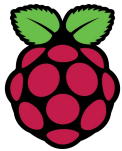
- Aggregate datapoints on the edge
- Configurable interval that is aggregated into a single datapoint for each IoT device



GPS



GPS



Equatorial
coordinate system



Horizontal
coordinate system

GPS Implementation

Click one of the buttons to start the Mobile Solar Panels with or without your current coordinates or stop it for now.

Start using current location

Start without location

Stop

GPS Implementation

Click one of the buttons to start the Mobile Solar Panels with or without your current coordinates or stop it for now.



aiohttp

GPS Implementation

Click one of the buttons to start the Mobile Solar Panels with or without your current coordinates or stop it for now.

Start using current location

Start without location

Stop



aiohttp

NGINX

Edge GPS Implementation

- Calculate azimuth and altitude from longitude and latitude
- CoAP API for polling angles

Next Sprint

- Anomaly detection
- Build second platform
- Better adjustments to sun rotation speed