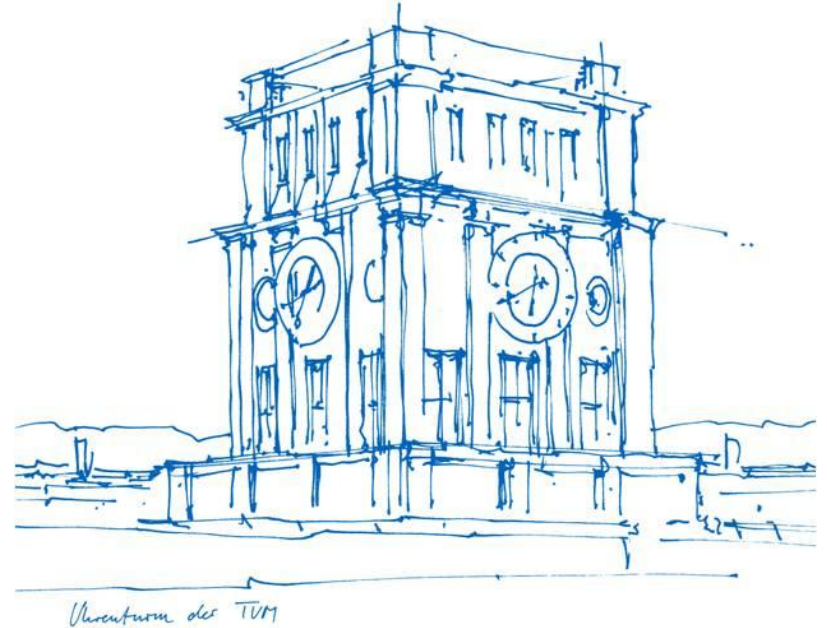


Mobile Solar Panels

Eric Armbruster, Florian Freund, Sebastian Klinko
Garching, 13.05.2022



Motivation

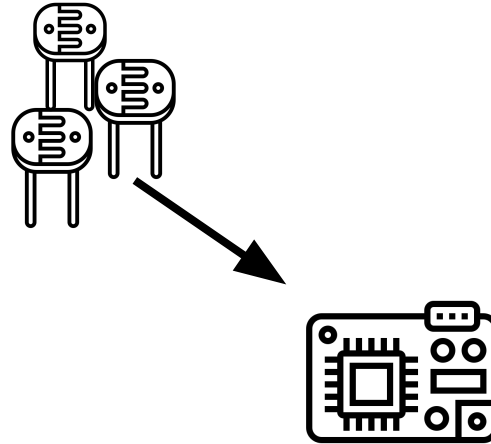
- Mobile solar panel
 - No manual adjustments depending on daytime
 - No dependency on mobile vehicle location and angle



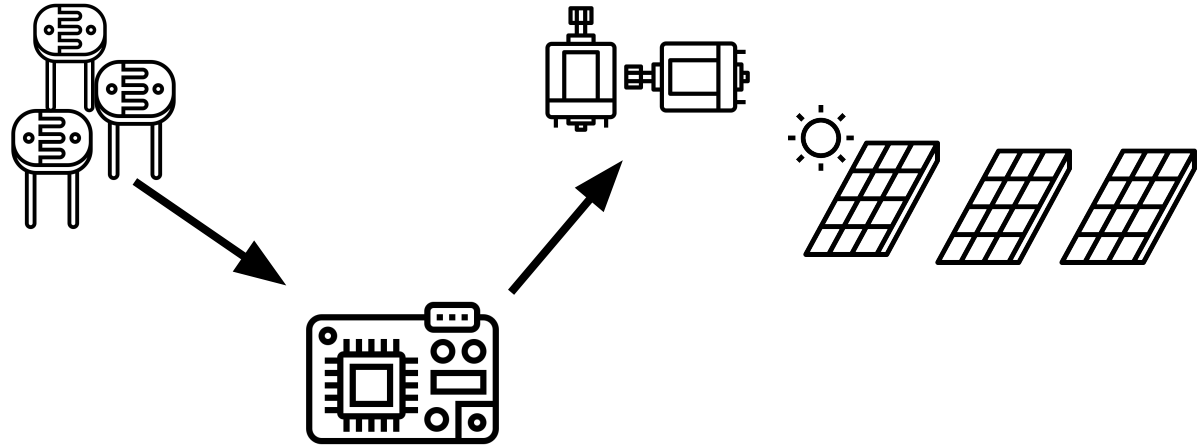
Source:
<https://www.istockphoto.com/de/foto/tragbare-solar-panels-gm676339804-124095973>

Setup

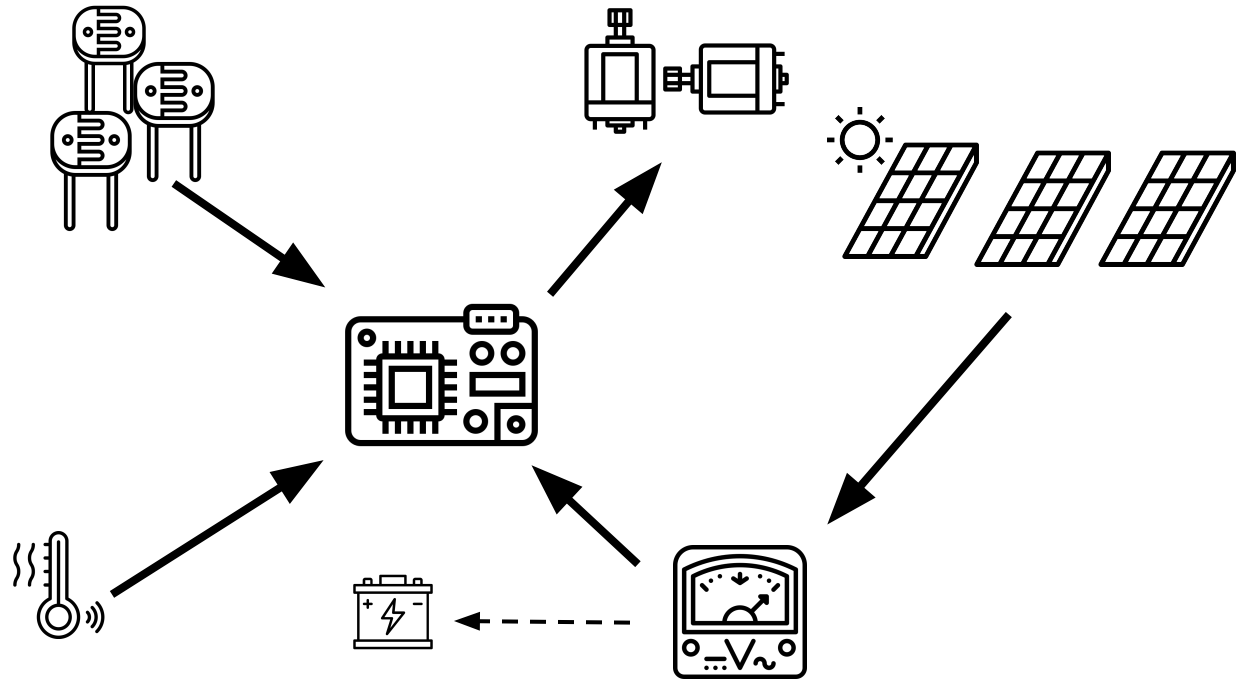
Setup



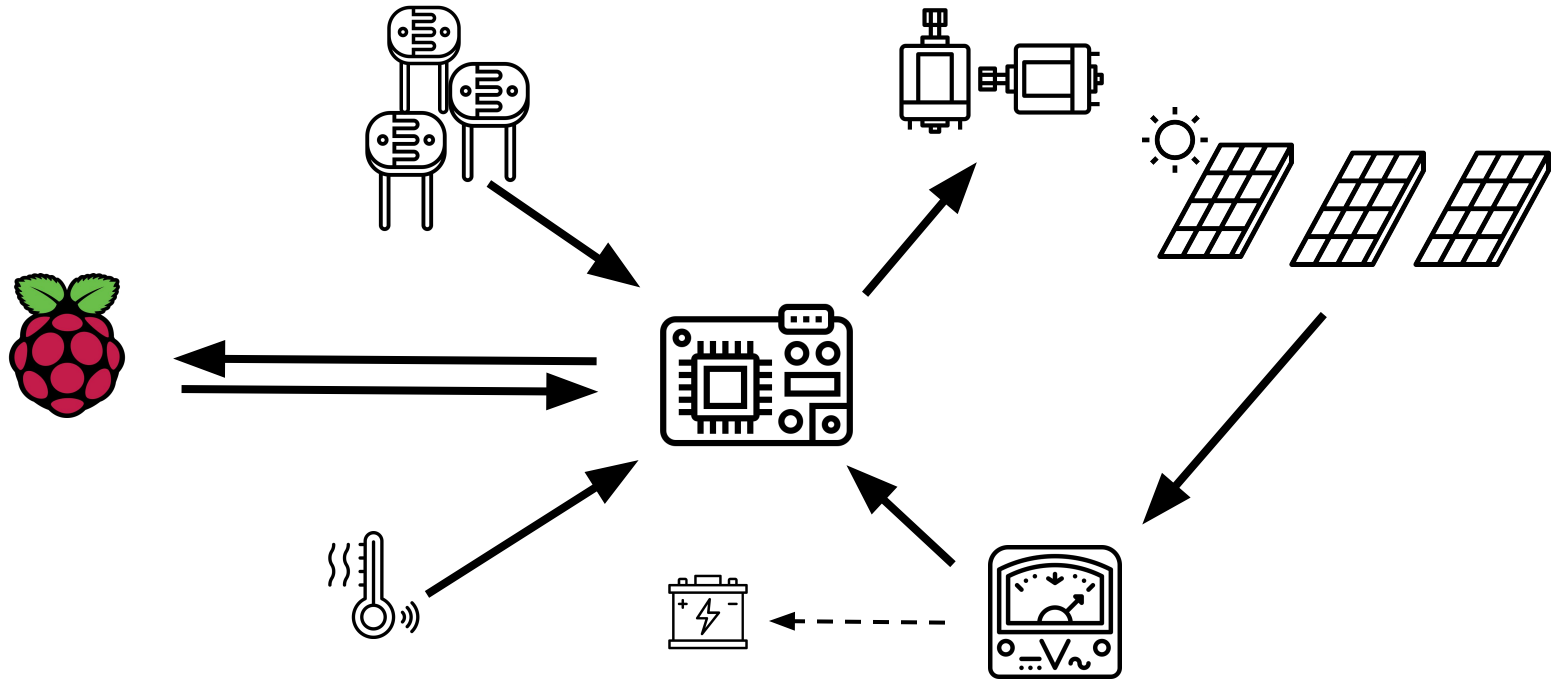
Setup



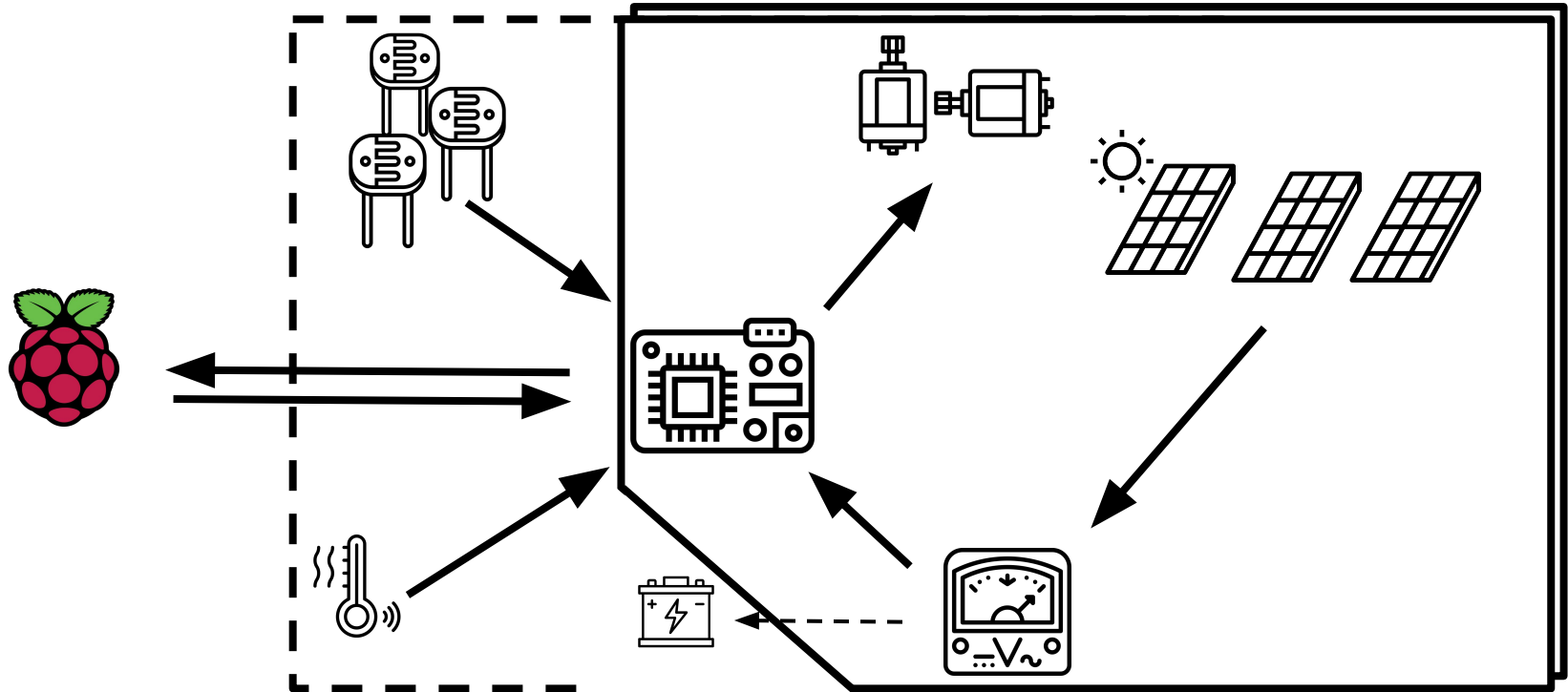
Setup



Setup



Setup



Evaluation

- Light sensor, either on the rotatable board with the solar panel or at a stationary board (on the ground)
- Decide on motor control entity (IoT node or Edge node)
- Light sensor vs GPS and compass with angle measurement

Side Objectives

- Minimize network traffic
 - 6LowPan
 - CoAP
- Minimize power usage
 - Stepper motors
 - ESP sleep when not needed

Hardware List

- Mini solar panels
- 2x stepper motor per solar panel platform
- 1x microcontroller (ESP) per solar panel platform
- Raspberry Pi 3 (a Zero would be preferable)
- Photo resistor
- Temperature sensor
- Current and voltage sensor
- Battery

Feedback from Tutors

- Evaluate setup GPS vs photo sensor via research paper
- Use Raspberry as much as possible, where sensible
- Reuse sensor information if possible
- Aggregate data before sending it to the cloud