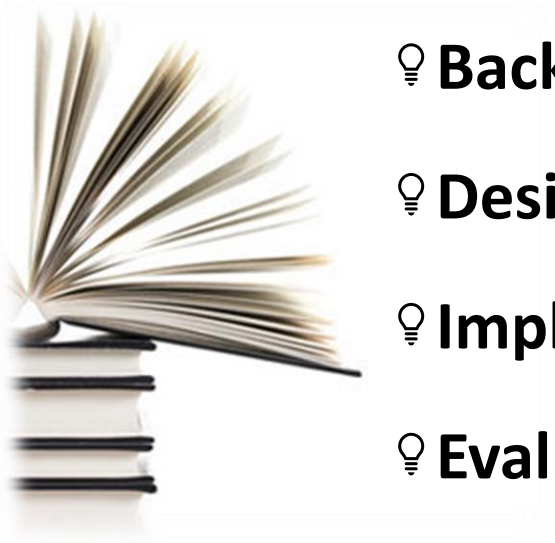
Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

Tiny Smart Door (t-SM)

Mobile Systems and Terminals (BTI7251a)
05/2020

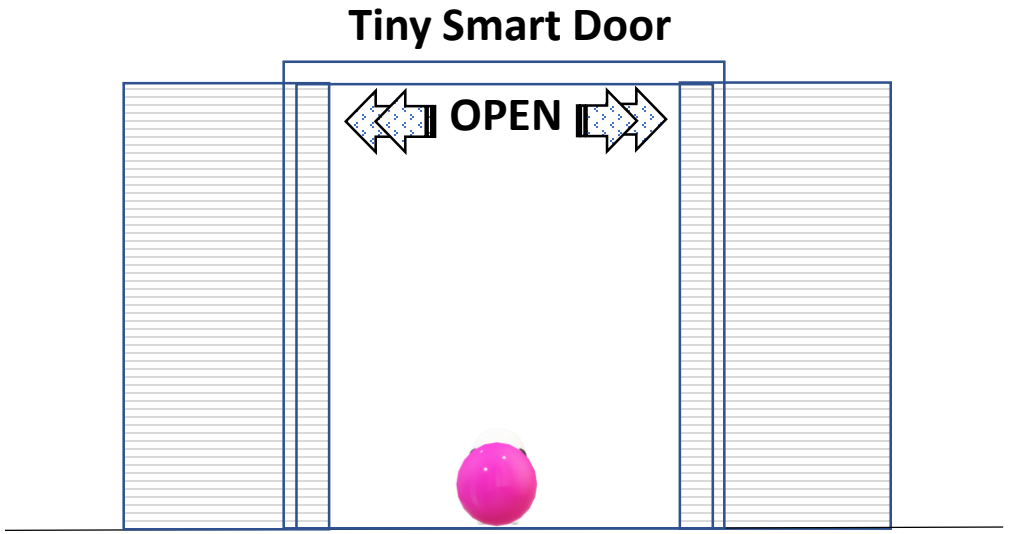
Inhalt



- Introduction
- Background
- Design
- Implementation
- Evaluation & Testing
- Demo
- Discussion

Introduction: Tiny Smart Door (t-SM)

- **Goals**
  - **Automated door**
  - **Accessible via app**
- **Motivation**
  - **Learning new skills**



Introduction: Tiny Smart Door (t-SM)

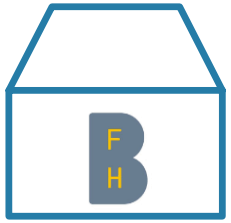
- **Organization**
  - **Divide up work**
  - **Hardware setup**
  - **Definition of microservices**
- **Customer Benefits**
  - **Hygiene**

Background

2 Distance US 2.0

2 Motorisiertes Linearpotentiometers

Master Brick

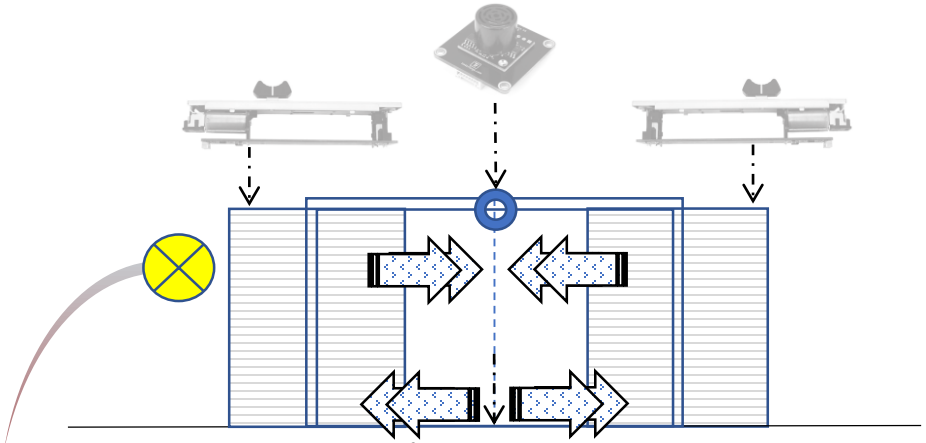


Virtual Machine

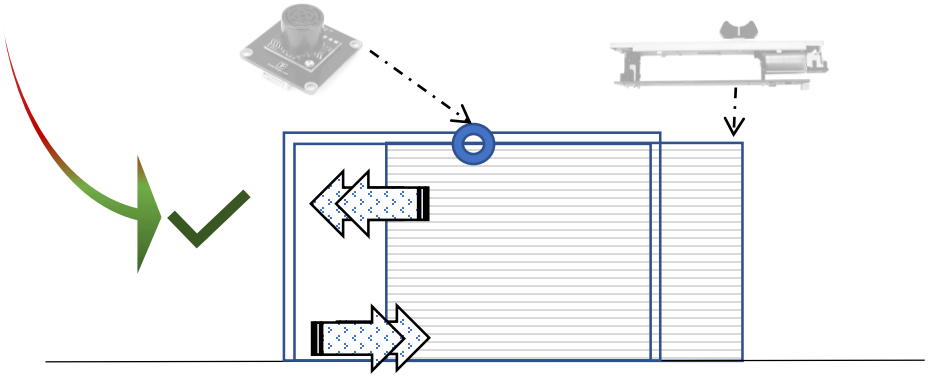
FoG Computer
(Raspberry Pi 4)

Smart phone

2 Laptops
for programming



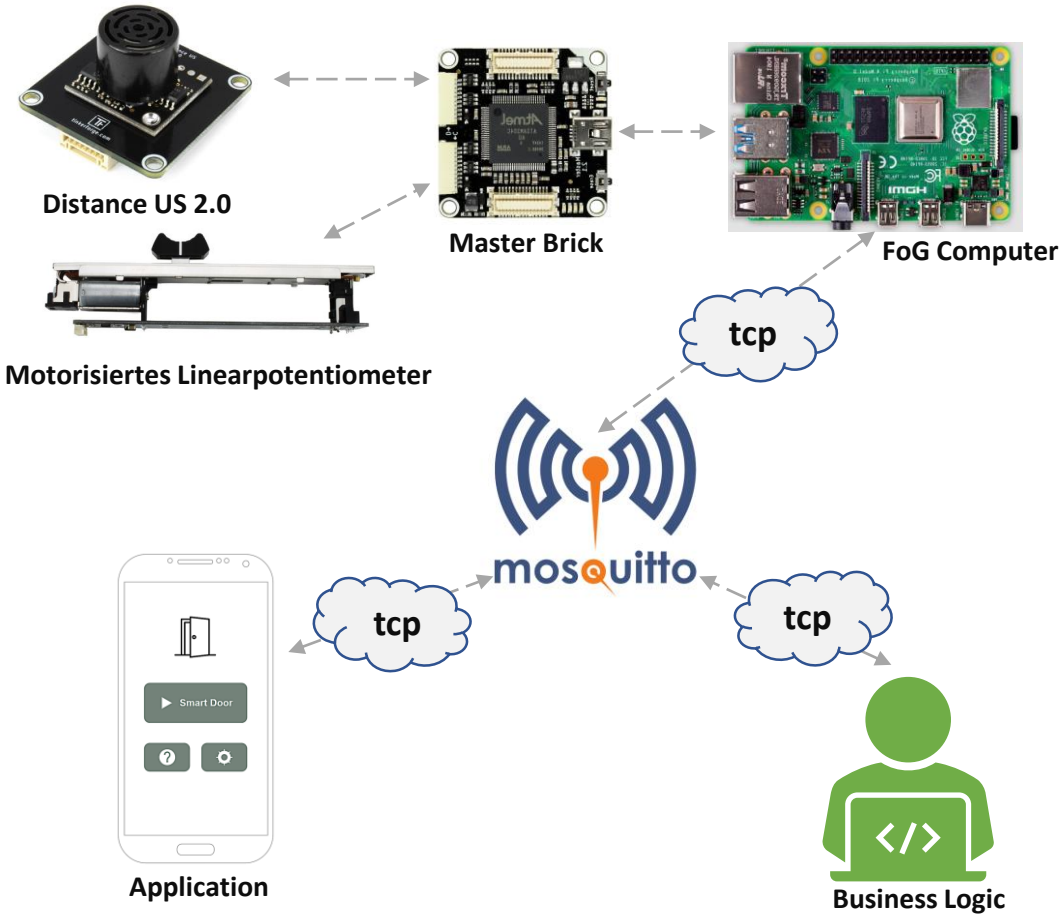
Tiny Smart Door



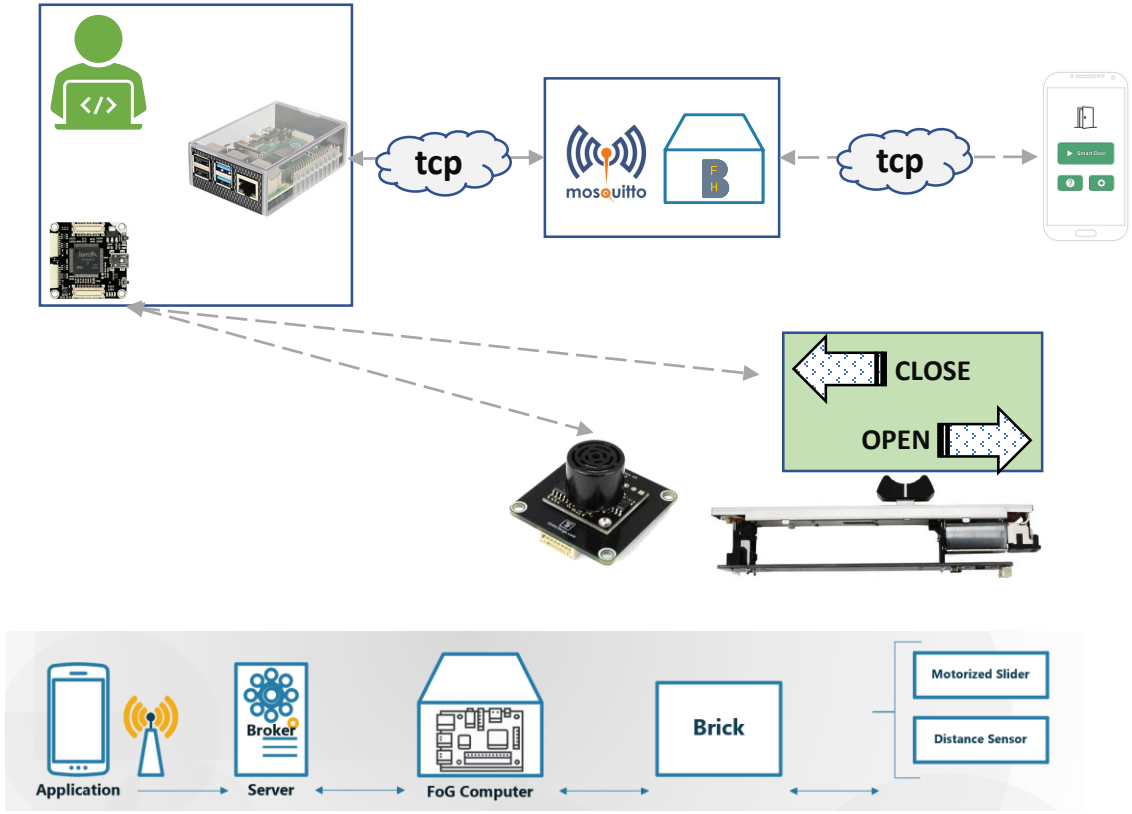
Tiny Smart Door (minimal system)

Design: System

Topology

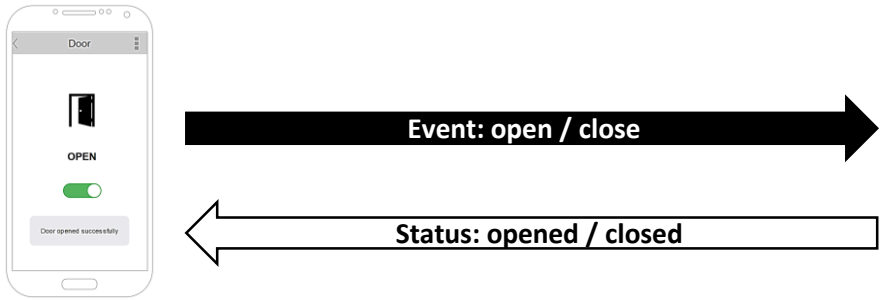


Design for implementation



Design: Data flow

Data flow



Event: open / close

Status: opened / closed

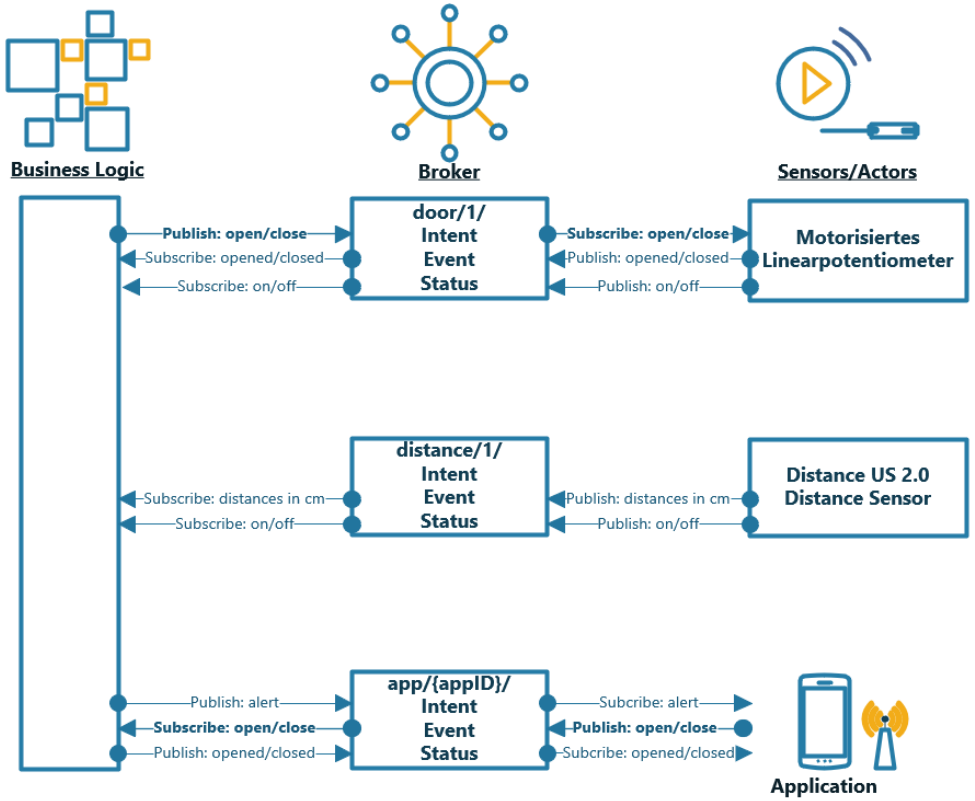
Motorisiertes Linearpotentiometer

Intent: open / close

Event: opened / closed

Event: distances in cm

Data flow with Broker

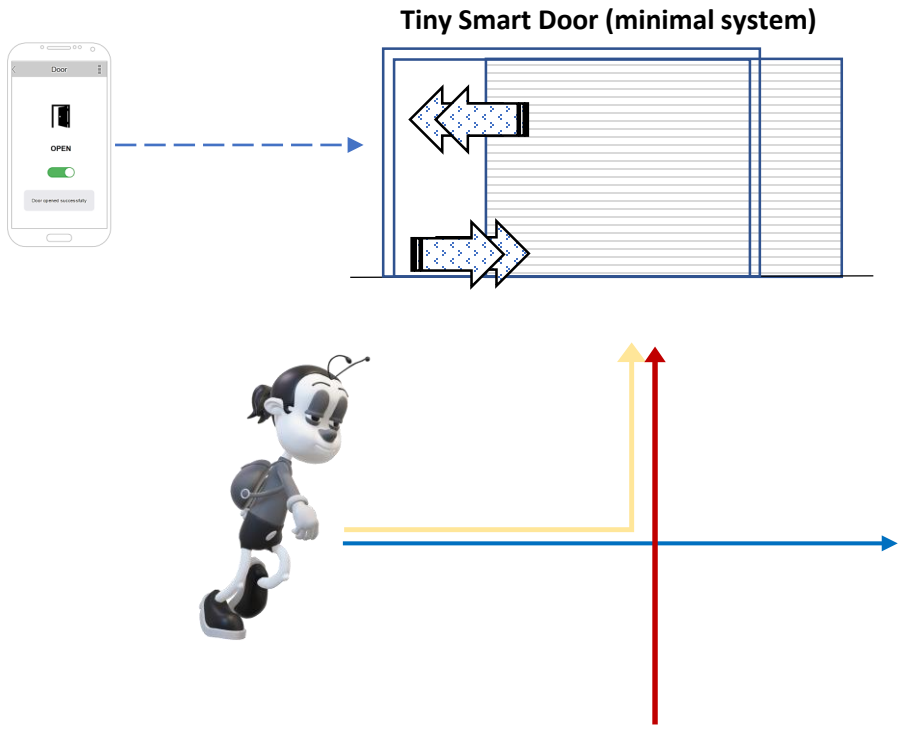


Implementation

1. Tasks assignment
2. Broker installation
3. Application programming
4. Door programming
5. Distance sensor programming
6. Business Logic programming
7. Testing
8. Project presentation

Evaluation & Testing

- **Manual tests**
  - **Application**
    - **Broker (MQTT Explorer)**
  - **Sensor test**
    - **Moving test**
    - **Brick viewer**



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Demo

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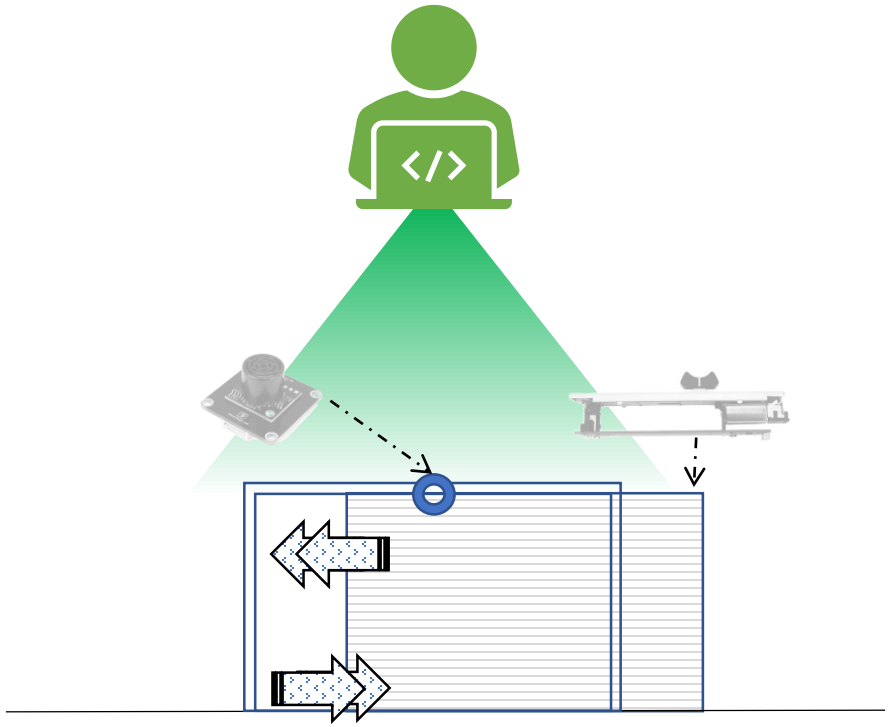

Tiny Smart Door (minimal system)

Discussion

- What we learned
  - Technical
    - Tinkerforge
    - MQTT Protocol
    - Android App
  - Organizational
    - Agreement of Objective
- What we could improve
  - Time managment

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Thank you for your attention!

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