Presentation

15 minutes presentation (strict)

Slides (5 minutes)

- Outline the goals of your project
- Provide suitable background information

Technical Demo (10 minutes)

- Showcase your prototype
- We can only judge what we have seen

Q & A (5 minutes)

- Other participants are encouraged to ask questions

Grading

60 points in total

- 30 points for the implementation
- 20 points for the presentation
- 10 points for individual accomplishments.

Lab Topics

- Topic A: Sensor Data Integration
- Topic B: Blockchain-based Sensor Data Integration
- Topic C: Big Data Processing

Topic A – Sensor Data Integration

Set up an IoT testbed and connect the devices to the cloud for data visualization purposes

Challenges

Stage 1

- Integrate two Raspberry PIs as data sources
- Design an architecture for the integration middleware

Stage 2

- Implement a user interface
- Realize filtering functionalities

Topic B – Blockchain-based Sensor Data Integration

Implement a solution which shares IoT data via the Ethereum blockchain

Challenges

Stage 1

- Get familiar with how to interact with Ethereum-based blockchains
- Implement a streaming data provider and integrate first data items on the blockchain

Stage 2

- Provide a user interface, which provides notifications, filtering functionalities, etc.
- Implement a smart contract for user notifications

Topic C – Big Data Processing

Implement a solution which processes large amounts of IoT (here: sensor) data

Challenges

Stage 1

- Implement a streaming data provider and implement one data stream operator

Stage 2

- Provide a user interface showing a World map and the sensor readings
- Implement additional stream processing operators

Hints - Implementation

Unless specifically told otherwise, you are free to select whatever tools you deem suitable

- If there are doubts, contact the tutor
- Focus on open source tools

You may use any (main stream) programming language, i.e., Java, Python, JavaScript

- Ensure that the language is suited for the topic

Hints – System Design

- Aim for a clean and solid software architecture
- Check your system design at least once with the tutor to ensure that you have completely understood your task