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DAT300: LECTURE 2
ABOUT PROJECTS & PRESENTATIONS

Passing the course

- Seminars & Reading papers:
http://www.cse.chalmers.se/edu/course/DAT300/papers.html
  - Reading list
    - Each person chooses one paper (approved by us)
Easy paper ➜ take two
    - All people in the course read all these papers
  - Presentation
    - Each person presents their paper
    - Another team actively prepares questions to "oppose"
- Participation for all lectures and course activities.
- Projects
  - Successfully completed project
  - Written report

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  - Planning report, written report + demo.

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- Participation for all lectures and course activities.
- Projects (cf also email + Babis'instructions for git-repo)
  - Successfully completed project
  - Planning report, written report + demo.

Some example project possibilities

- Paper needs to have some technical depth
- You need to work on understanding and explaining about it + discussion

(1) A simple demand-response service

- Build on a communication node (eg on an ARM-based platform) capable to **interface with off-the-shelf** equipment (smart sockets), to
    - monitor consumption and **control** electrical appliances

- implement intelligent **scheduling** algorithms that
    - Can reduce peaks/meet constraints
    - Can possibly allow for cooperation between communication nodes in a way that reduces the total energy consumption of the system
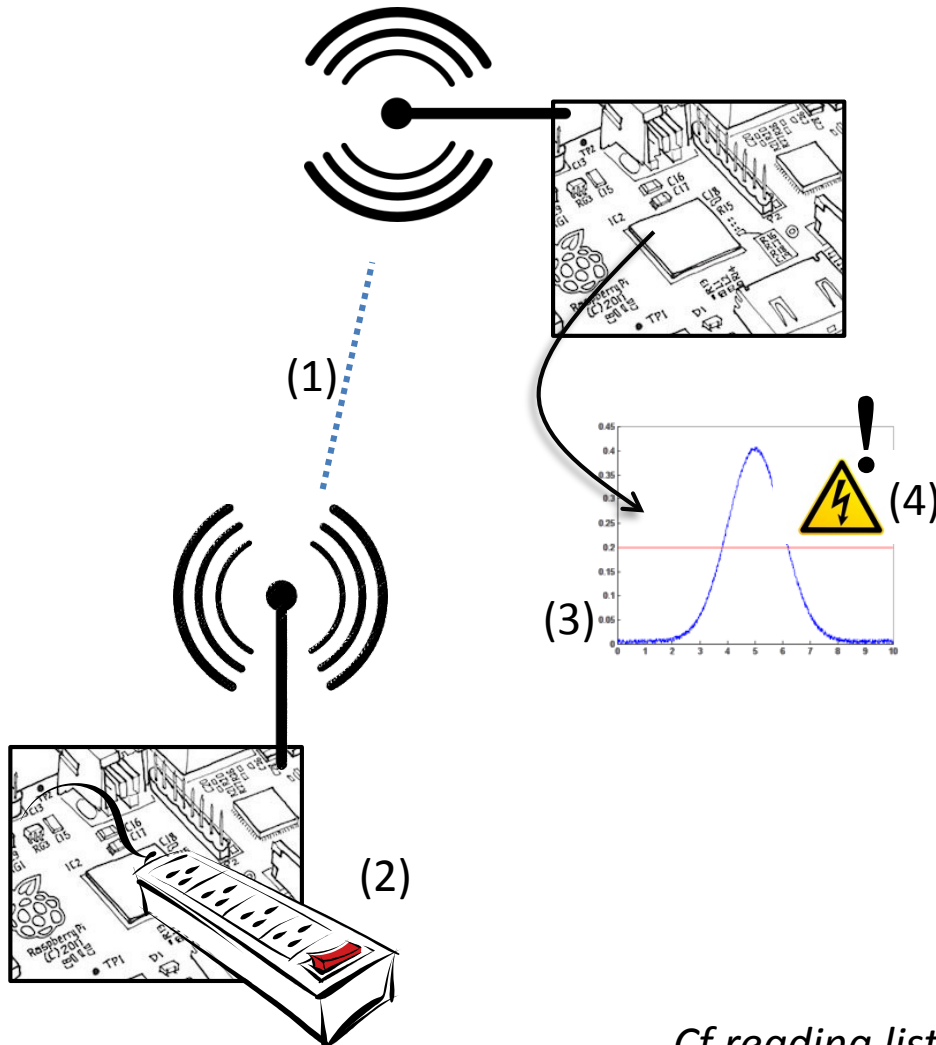
… to eg ARM-platform (eg odroid device)

cf reading list on Adaptiveness & resources

# (2) Continuous monitoring of energy data

(1)

(2)

(3)

(4)

1. Forward energy consumption readings
   – through ZigBee (or other protocol) network
   – or use open-source data sets
2. Process information with **Stream Processing Engine** (eg apache flink/storm/spark)
3. Generate summaries and "alerts" if needed

Example
- send an "alarm" message each time the last period's average consumption exceeds a threshold.

Cf reading list on streaming

(3) Comparison of open-source big data analysis tools on single-board devices
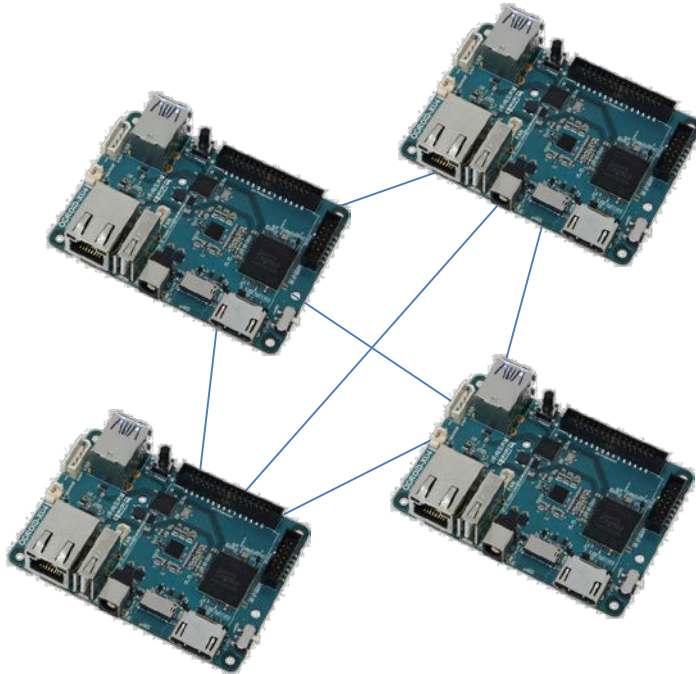
Given a small network of single-board devices and a benchmark analysis application (focusing on AMI data) study and compare:

- Memory, CPU and network footprints "at rest" for popular frameworks such as Apache Storm, Apache Spark and Apache Flink
- Memory, CPU and network footprints and latency for a benchmark application and different injection loads

Projects, ideas continued

4. **Intrusion detection**
   - How can a de facto IDS such as snort be adapted for protocols found in the smart grid.

5. Electricity/energy data correlated with other sources
   - Many government agencies and other organizations provide open datasets. How can such datasets be used to extend our understanding of energy consumption, or other patterns in the smart grid datasets?

6. New services in the smart grid
   - What services would be useful for consumers and companies to have in the smart grid? What data would be needed to create such services?

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Example of a good paper-presentation