
DTU

Networked Embedded Systems

Week 1: Introduction to 02226

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Course Focus

- Networked Embedded Systems
  - Connected Embedded Systems (Wired/Wireless)

- Practical approach
  - Learn how to design, develop, program, deploy networked embedded systems

Course Structure: Learning Activities

- What
  - Weekly lectures
    - Opportunity for questions, feedback, discussions at the end of each lecture
  - Mandatory Project (more on that later)

- When
  - Thursday 13-17, unless otherwise announced

- Where
  - B303A/aud.49

Background Knowledge

- I always try to keep my courses as much self-contained as possible
  - Catch up slides/lectures on background knowledge
  - Happy to spend time explaining more a topic/concept
  - Not any required background knowledge

- Recommended/Nice-to-have background knowledge
  - Basic Electronics and/or Digital Electronics
  - Computer Networking and Communications
  - Operating Systems, Linux
  - C Programming Language

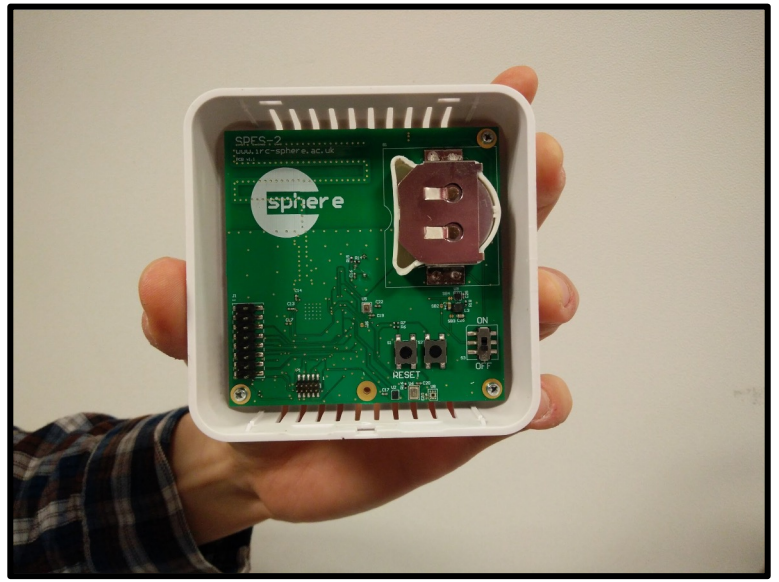
Tentative Time Plan

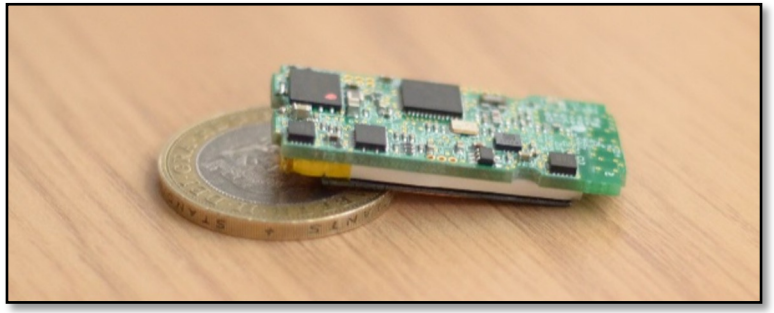
- **This plan is tentative and might change**

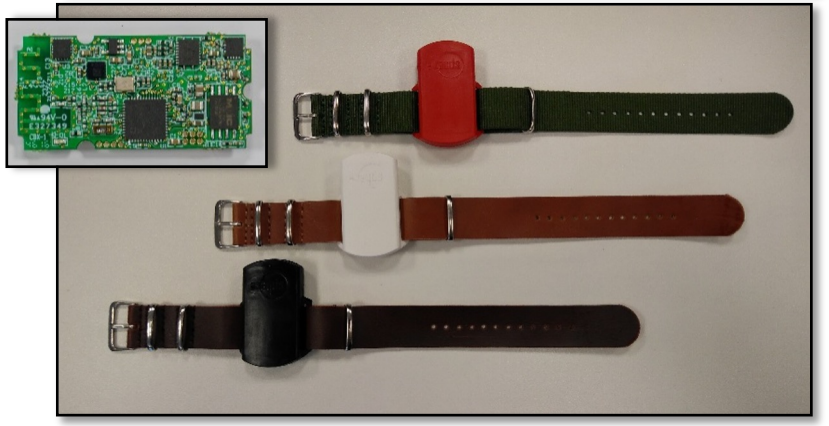
- Tentative Plan
  - Week 1 (today): Introduction to Networked Embedded Systems
  - Week 2: Practical Electronics for Embedded Systems
  - Week 3: Microcontrollers: Input/Output
  - Week 4: Serial Communication
  - Week 5: Wired Networked Embedded Systems
  - Week 6: Wireless Embedded Systems
  - Week 7: Embedded Software
  - Week 8: Performance Evaluation and Benchmarking
  - Week 9: TBC
  - Week 10: Time Synchronisation
  - Week 11: Embedded Data Processing and Embedded AI
  - Week 12: Industrial Embedded Networking Protocols
  - Week 13: LPWAN and Battery-Free Systems (guest lecture)

Xenofon (Fontas) Fafoutis

- Originally from Greece, I got my PhD from DTU Compute in 2014
- Researcher at Bristol, UK, for over 4 years
- Faculty at DTU Compute (since Aug 2018)
  - Embedded Systems Engineering section
- Research Interests
  - Wireless Embedded Systems, Low-Power Networks, Embedded ML, Internet of Things
- Interested in final year projects?
  - Check: www.compute.dtu.dk/~xefa







Teaching Team

- Xenofon (Fontas) Fafoutis, xefa@dtu.dk

- Teaching Assistants:
  - Harald Ledertoug Lissau, s204436@student.dtu.dk
  - Nojan Rezvani, s204426@student.dtu.dk

Communication

- Announcements via DTU Learn
  - Please, check your email regularly to get informed for last-minute changes (e.g. illness)

- How to contact me
  - In our normal teaching slot after the end of lecture
  - By Teams or email (xefa@dtu.dk)
  - Zoom meeting or face-to-face meeting possible by appointment

Language

- English (only)
- Includes lectures, activities, and exam

Reading Material

- No particular textbook
- Lectures hopefully can serve as reference reading material
- Open sources from the internet including
  - Academic Papers
  - Application Notes from electronics manufacturers
  - Chapters from open books
- Do your own investigation

Assessment

- Overall assessment based on
  - Written Exam
  - Mandatory project

- Written exam is with all aids allowed (no Internet)

Project

- Pick one of two options

- Literature Project (individual project)
  - Investigate a topic within Networked Embedded Systems
  - Study in depth 3 research papers
  - Write report that critical discusses the topic

More details on the project specification document on DTU Learn!

- Practical Project (group project, 2-4 members)
  - Program and deploy a network of embedded systems
  - Conduct an experiment on the deployed network
  - Write report that presents the deployed technology and the experiment

- Deadlines
  - Project Proposal: September 21, 2023
  - Final Project Report: November 30, 2023