Semester Project 3
Kickoff Meeting

Semester project: Distributed Software Systems with Embedded Elements

Krzysztof Sierszecki
Project Coordinator

SDU

Semester Project 3

Overview

→ Linak presentation

→ Semester project case study

→ Group formation & supervision

→ Project rooms

→ Semester plan

→ Project proposal

→ Peer review

→ Project submission, report and exam

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Welcome to the Semester Project 3

Project Purpose

→The purpose of the project is to have students gather knowledge on practical application of the concepts that they have been taught in the following courses:

→ **Data Management** (Sadok Ben Yahia)
→ **Web Technologies** (Mubashrah Saddiqa)
→ **Operating Systems and Distributed Systems** (Gaurav Choudhary)
→ **Programming for Hardware Constrained Environments** (Tommy Bjerre Nielsen)

3	5 ECTS	5 ECTS	5 ECTS	5 ECTS	10 ECTS
	Data Management	Web Technologies	Operating Systems and	Programming for Hardware	Semesterproject: Distributed Software Systems with Embedded

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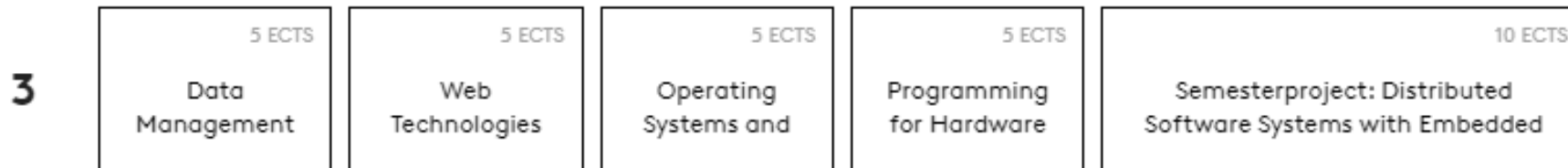
Semester Project Objectives

→ In the project the students shall develop a distributed system with embedded elements that incorporates knowledge provided during the 3rd semester courses

→ Learning objectives
  → Analyze requirements for a **distributed software system** with embedded element
  → Design, implement and validate a distributed software system with **embedded elements**
  → Test and verify that the implemented system fulfills the **requirements**
  → Collaborate in **teams** using **modern tools** for software engineering
  → Disseminate **knowledge** in the group and in writing

  - The state or fact of knowing
  - Familiarity, awareness, or understanding gained through experience or study
  - The sum or range of what has been perceived, discovered, or learned

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Generated by AI

Project Case Study: Desk Usage Supervision

→ Obtain, visualize and analyze desk usage data for health, occupancy and maintenance

→ Motorized desks are commonly used in office spaces as they can improve user working comfort

→ Greater gains could be achieved by learning from the desk data, for example about the desk moving distance and frequency

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Desk System Operation

→ Desks columns are controlled by the intelligent Control Box that is connected to the Desk Panel

→ The desk panel accepts user commands to adjust desk height up and down

→ The WiFi2BLE box exposes desk information over a Wi-Fi by translating the desk Bluetooth Low Energy (BLE) protocol to a Web API

→ This allows for monitoring and controlling desks remotely

→ Desk Panel has as built-in anti-collision sensor, display, and storage of favorite positions 🤯

Control Box

WiFi2BLE Box

Desk Panel with BLE

Desk frame with 2 adjustable columns

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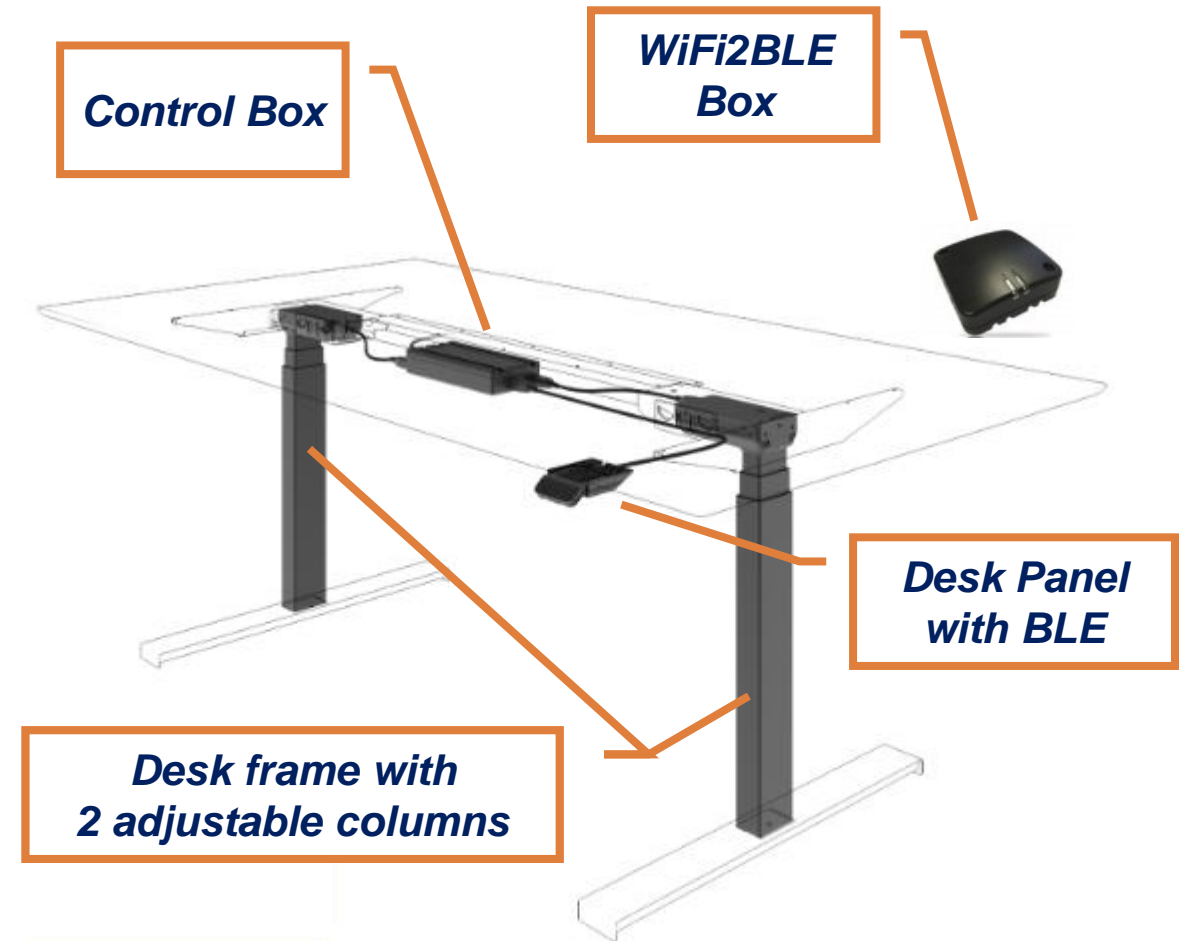
Scenarios

→ **Well-being of office users**: Monitoring users' behaviors and suggesting healthy habits

→ **Usage reporting**: Visualization of desk data, reporting faulty operation and predicting failures

→ **Office cleaning**: Bringing desktop to upright position temporarily

→ **Uniform desk arrangement**: Setting desks to the same height for within given time frame

→ **Office space rearrangements**: Reconfiguration of life system

Suggested Project Realizations

→ Main subsystems
  → Services: data collection, analysis, office & desk management, visualization, reporting
  → Storage: data persistence, data manipulation
  → User interface: user interaction with the system, responsive, desktop & mobile, embedded

→ Use the power of knowledge 💪
  → Data modeling & management, database design
  → Distributed web applications & technology
  → Containers, deployments, micro-services, networking, REST
  → Embedded systems, constrained programming, product integration

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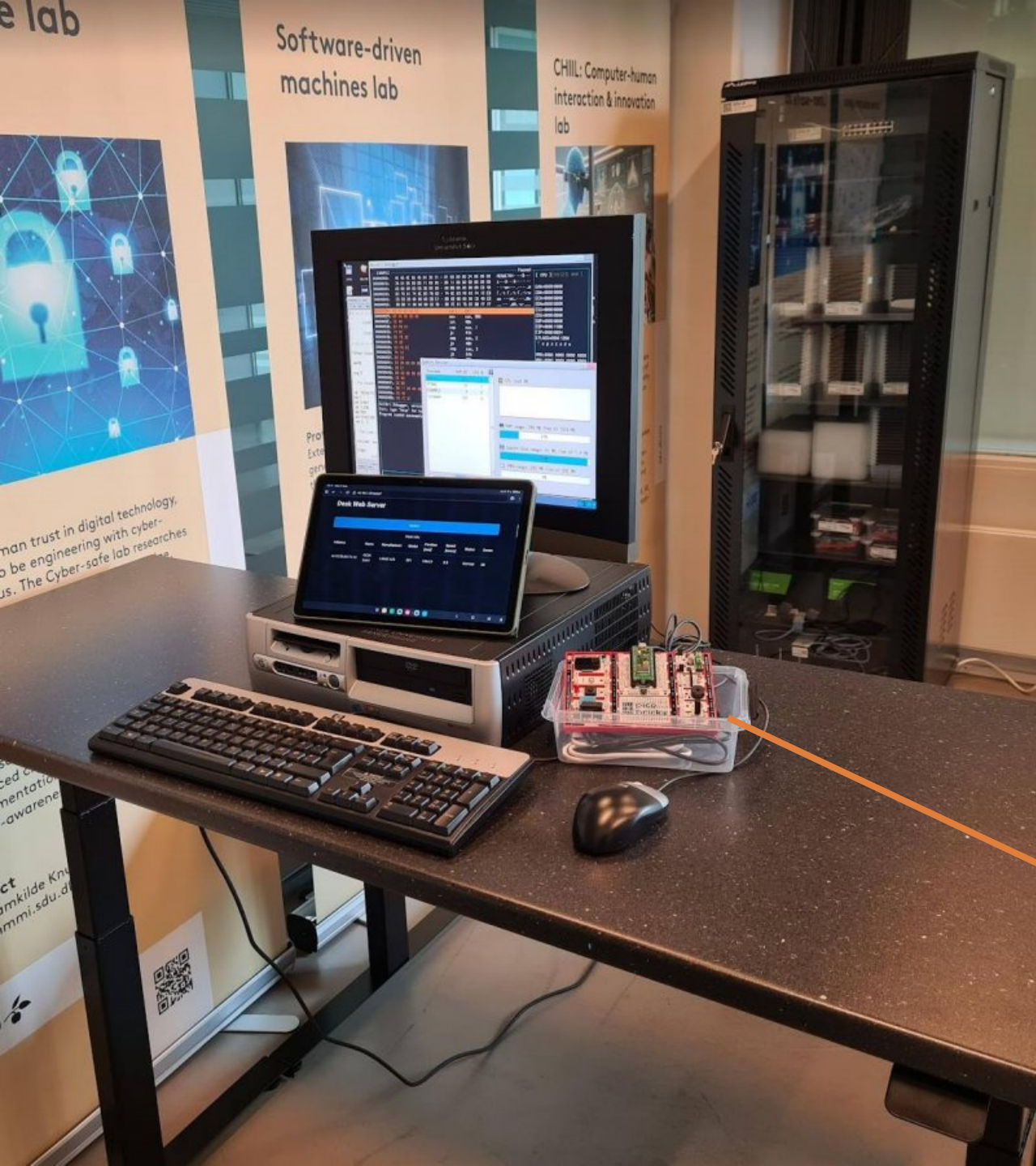
The test system

→ Two desks from Linak are still in the A1.07
→ The desks will be available in J-block in the teaching lab soon
→ Web API spec will be available too

→ Waiting to resolve technical and IT issues

→ Contact the project coordinator

Embedded elements 😊

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Semester Project 3

Problem-oriented Project Work

→ The project work is problem-oriented, which means that it is guided by a problem that the project groups themselves choose and formulates within the framework provided by the project case

→ It is expected that different project groups will have different views and target different problems since certain needs and solutions are unknown in the original case study

→ Thus, the common case study leads to different project results

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Project Groups

→ The semester project is carried out in groups and each group has a supervisor assigned
→ It is a requirement that students work with their project group

→ You can choose your group in itslearning
→ A group can have a maximum of 6 students
→ Total 15 groups with 6 group members

Semester Project Supervisors

→ The supervisors are responsible for the project framework, supervision, and exam
→ The project supervisors are not experts in all disciplines of the projects but have the necessary insight to provide professional and interdisciplinary guidance on the projects

Devender Kumar   Gaurav Choudhary   Jukka Ruohonen   Krzysztof Sierszecki

Project Supervision

→ The project groups will attend regular meetings with their assigned supervisor
  → Weekly meetings highly recommended

→ In order to conduct meetings effectively and efficiently, each group must prepare an agenda in advance of the meeting and have the meeting confirmed with supervisor through email
→ Please also book a calendar slot in the SDU Outlook calendar and remember to include your supervisor

→ A supervision meeting is expected to take at most 30 minutes unless otherwise is agreed upon

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Project Rooms

→ [Guidelines for booking of project rooms for Engineering Students](#)

→ Software students have 1.5 days blocked for them as 'Self study' in their schedule, where they have a project room prebooked

→ Software students can search for '**Software**' or '**J1.xx**' and their rooms will appear

Location	Students	Groups
Alsion J1.21 – a, b, c	Software	3
Alsion J1.14 – a, b	Software	2
Alsion J1.11 – a, b	Software	2
Alsion J1.08 – a, b	Software	2
Alsion J1.03 – a	Software	1
Alsion J1.01 – a, b, c, d, e, f, g, h	Software	8
Alsion J1.06 - a	Software	1
Alsion J1.10 - a	Software	1
Alsion J1.17	Software	1
Alsion J1.19	Software	1

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Project Plan

Week	Scope	Description	Date	Responsible
Project Kickoff (Weeks 36-37)				
36	3rd Semester	Semester kickoff meeting with Linak	04-09-24	Semester coordinator, Linak representatives
37	Project group	Group forming & work agreement	11-09-24	Groups, supervisors
Project Analysis (Weeks 38-41)				
38	Project group	Drafting project ideas		Groups, supervisors
39	Project group	Project proposal ready for peer review	25-09-24	Groups, supervisors
40	Project group	Peer review feedback	02-10-24	Groups, supervisors
41	3rd Semester	Midterm Seminar: presentation of project proposals	09-10-24	Groups, supervisors, semester coordinator
41	Project group	Proposal submission to itslearning	11-10-24	Groups

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Work Agreement

Please consider:
→ Group communication: emails, chat group, …
→ Communication with supervisors
→ Roles and responsibilities
→ Decision making
→ Work and meeting plans
→ Methods and tools
→ …

Please make your way of working clear to the supervisor

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Project Proposal (1)

→ The key goal of the project proposal is to ensure that you know what you will be doing in your project

→ The following elements are useful to include:

    → **Background / Motivation**: Why is this project relevant?

    → **Aim**: Short description of what you plan to achieve

    → **Objectives**: Specific technical objectives that you wish to achieve

    → **Solutions**: Detail different elements that are part of a software solution

    → **Initial requirements analysis**: Provide an initial analysis of the requirements, prioritization of the requirements

    → **Methods**: What will your approach be? e.g., Scrum. What technologies are you going to use?

    → **Risks**: What poses a risk to the success of your project? What can you do to mitigate these risks?

    → **Project Organization**: How is work distributed across the team and how do you organize your project work? Is there a project leader? Does anyone assume a special Scrum role?

    → **Project plan**: How do you divide your work into iterations to help you achieve the milestones? What are the deliverables for each milestone?

    → **Tentative outline for project report**: How will you structure your report?

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Project Proposal (2)

→ A project proposal should be no more than 10 pages (excluding front page, table of contents and appendices)

→ Bear in mind that the project proposal feeds into your project or can be used in your report, so this is essential preparatory work

→ Your project proposal draft will be peer reviewed to provide feedback before the final approval by your supervisor

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Peer Review of Proposals

→ Each project proposal draft must be reviewed by the assigned supervisor and one other project group (reviewing group)

→ The project group (producing the project proposal draft) decides the review criterion and sends a review invitation to the reviewing group (with cc: to the group supervisor)

→ Both the supervisor and the reviewing group must provide feedback to allow time for the producing group to improve/amend the proposal draft and submit the final version on itslearning

→ The project proposal may require changes prior to the final deadline, these changes are then approved by the group supervisor

→ At the discretion of the group supervisor, the project proposal can also be conditionally approved, meaning no further changes are required at that time.

→ The pairing of reviewing groups is as follows: 1⇨2, 2⇨3, … , 14⇨15, 15⇨1

Project Plan

Project Development (Weeks 43-50)				
43	3rd Semester	Midterm Evaluation	23-10-24	Semester coordinator, group representatives
43	3rd Semester	TEK EXPO: deadline registration for selected projects	25-10-24	Semester coordinator
43-	Project group	Weekly sprints		Groups, supervisors
48	3rd Semester	General seminar: presentation of project statuses, exam info	27-11-24	Groups, supervisors, semester coordinator
-50	Project group	Weekly development sprints		Groups, supervisors
Completion & Submission (Weeks 51-01)				
51	Project group	Report completion	18-12-24	Groups, supervisors
51	Project group	TEX EXPO: public presentation of semester projects	19-12-24 11 - 14	Groups, semester coordinator
01	Project group	Code submission to Digital Exam	02-01-25	Groups
01	Project group	Report submission to Digital Exam	02-01-25	Groups
Examination (Week 04)				
04	Project group	Group presentation + individual examination		Groups, supervisors

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TEK EXPO

Invitation to all engineering students

It's a tradition!
Each year, the Faculty of Engineering invites all engineering students from SDU Sønderborg to put their semester projects on display at the TEK EXPO.

This year it takes place on **December 19 from 11-14**.

We take over Alsion's entrance hall and café with moving, sound-making, blinking and in many other ways innovative projects. All student projects are eligible – also master student projects.

Participation is not mandatory, but it's a great event and opportunity to show off your semester project (and get it ready for exam)! Not to mention a fun way to send your fellow students off on a nice break.

We encourage everybody to attend, and you can invite your family, friends and cooperation partners from industry. We will supply a formal invitation in October, which you can use.

But it's also a competition!
A team of judges, three representatives from the industry, will inspect all projects and rate them based on three **criteria: functionality, design and innovation/ wow.** There will be prizes for the best projects in three categories: 1st, 3rd and 5th semester / master.
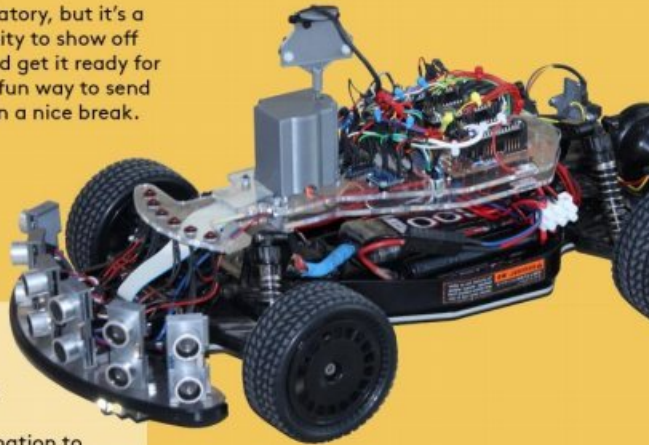
Register your project NO LATER THAN OCTOBER 25!

by sending the following information to Lise Kanstrup, lise@tek.sdu.dk:

→ **Name of project**
→ **Short description of project** (1-2 sentences)
→ **Study programme and semester**
→ **Name/number/ID of group +** names of students
→ **Desired need for M²**
→ **TV screen** (limited amount, allocated on a first-come, first-served basis)

In December, we will get back with the practical details (floor plan, allocated equipment etc).

If you have any questions, please contact your project supervisor or Lise Kanstrup at lise@tek.sdu.dk.

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Semester Project 3

TEK EXPO

→ For selected project groups based on the proposal evaluation by supervisors and semester coordinator

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Final Report

You must deliver a final PDF (max. 40 pages) including the following contents:
→ Cover page
→ Table of contents (with page numbers)
→ Introduction
→ Methodology
→ Problem analysis
→ Requirements
→ Design
→ Implementation
→ Validation
→ Conclusion
Excluding:
→ Appendices

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Examination

→ Project report with oral defense

→ 7-point grading scale

→ The examination is based on an overall assessment of:
  → A short group presentation of the project
  → An individual examination of each group member based on a project report

→ The exam starts with a 10-minute group presentation, and the oral exam lasts 15 minutes per students, i.e. 100 minutes for a group of 6 students, 55 minutes for a group of 3 students, and so on

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Thank you 🤗