.

DESIGN AND EVALUATION OF USER INTERFACES

Short name: DEB

Teacher: Anders Bruun

Description
The aim of the course is to give students knowledge about design and evaluation of user interfaces. This includes knowledge about human-computer interaction and usability as well as hands-on experiences with design and evaluation through exercises, and individual and group challenges during lectures.

Learning Objectives:

Skills:
The student should achieve the following skills:
• understand basic and advanced concepts and theories of human-computer interaction
• be able to explain the activities in the design of an interactive system
• be able to explain the activities of evaluation of interactive systems

Competencies:
The student should be able to apply concepts, techniques and methods to design and evaluate a specific system that solves a well-defined task

 Purpose, content and evaluation - E18

 General Course Materials

 Text Book

 Link to Bookshop to order book (choose your education and semester)

 Announcements

Participants: DAT3/SW3 (169), iDA7 (42)

Study Secretary: Lene Even (DAT3/SW3) & Ulla Øland (iDA7)

Semester coordinators: Christian Thomsen (SW3/DAT3), Jan Stage (iDA7)

Teacher: Anders Bruun

Teaching assistants: Panagiota Vangeli, Marija Dolgova, Marie Jirícková and Peter Haahr Taankvist.

Description
The aim of the course is to give students knowledge about design and evaluation of user interfaces. This includes knowledge about human-computer interaction and usability as well as hands-on experiences with design and evaluation through exercises, and individual and group challenges during lectures.

Learning Objectives:

Skills:
The student should achieve the following skills:
• understand basic and advanced concepts and theories of human-computer interaction
• be able to explain the activities in the design of an interactive system
• be able to explain the activities of evaluation of interactive systems

Competencies:
The student should be able to apply concepts, techniques and methods to design and evaluate a specific system that solves a well-defined task

Text Book

Link to Bookshop to order book (choose your education and semester)

Study regulations/Participants: DAT3 (?), SW3 (?), iDA7 (?)

Study Secretary: Lene Even (DAT3/SW3) & Ulla Øland (iDA7)

Semester coordinators: Christian Thomsen (SW3/DAT3), Jan Stage (iDA7)

Group Exercises

To complement the lectures, students will have an exercise period of 4 hours. This will be done in group rooms. In addition to lecture and reading materials supporting each stage, Teaching Assistants will give guidance on which design techniques and tools should be used to complete these tasks.

The exercises represent important parts of the practical experience of designing and evaluating interactive systems - learning the process of going from an idea to a designed product.

Each exercise should be assessed by a Teaching Assistant at the end of that exercise period, or as soon as possible (ie. during the next exercise) if you need the extra time to finish it off during the week between exercise sessions.

Exam

Written, 2 hour exam.

All aids allowed (notes, textbooks, research papers and other curricula related materials)

Internet connection allowed for **Digital Exam system and Moodle Quiz only!**

7-point scale

Date: January 17th 2019

Time: 10:00-12:00

Example questions (last years exam): PDF

Example questions, with answers (last years exam): PDF

DEB exam - E18

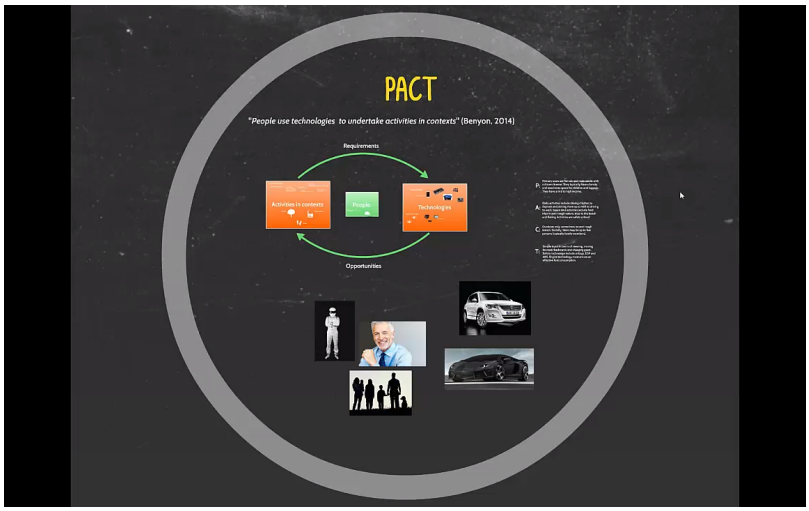
Begrænset Tilgængelig fra **17. January 2019, 10:00**

DEB1: Course Introduction (25/9, Aud. NOVI8)

Reading: Benyon, D. (3rd ed)

- Chapter 1, sections 1.1, 1.2, 1.4 and 1.5
- Chapter 2, sections 2.1 - 2.6
- Chapter 3, sections 3.1 - 3.3
- Chapter 4, section 4.3
- Chapter 5, section 5.1

08:45-10:00: Lecture



- Slides (Prezi -online)
- Slides (PDF)

10:15-12:00: Exercises

For this session, select one system with which you have had a poor experience (web application, desktop application, mobile app etc.) and consider the following:

- What is the aim of the system?
- Who are the target users?
- What activities is the system supposed to support, and in which context(s)?
- Why did the use of the system lead to a poor experience?
- How would you improve this?

Note your findings on the blackboard/whiteboards in the group room.

DEB 2: Understanding and data collection techniques (2/10, group rooms)

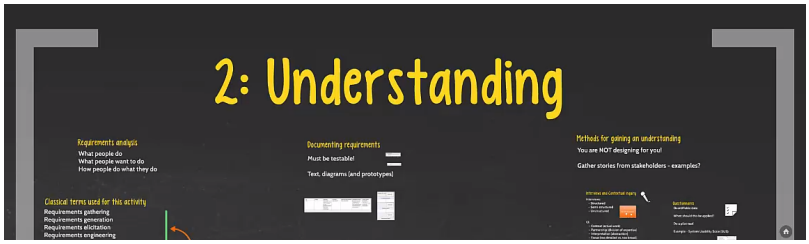
Reading: Benyon, D. (3rd ed)

- Chapter 7
- From 2nd ed: Chapter 12, section 12.2 on contextual inquiry (PDF)

Supplementary reading (interviews):

Chapter 7 in Preece, Rogers & Sharp (PDF)

Preece, Rogers & Sharp (2007). Interaction Design - Byond Human-Computer Interaction (2nd ed). Wiley, ISBN: 9780470018668



- **Slides (Prezi - online)**
- **Slides (PDF)**

12:30:-16:15: Exercises

For this session, make an initial PACT analysis of your P3 (DAT/SW) or P7 (IDA) project cases.

Consider the following:

- People: Physiological differences, Psychological differences, Social differences, Domain Expertise
- Activities: Purpose of activities to be supported by the system, Temporal aspects, Collaboration, Complexity, Safety criticality, Nature of system content
- Contexts: Physical, Social, Organizational
- Technologies that could support users in the domain

Note that, since you are in an early stage in your projects, this may very well change over time. This is perfectly normal, but at some point you will need to consider PACT aspects anyway. Start now!

For this session you should also start to plan data gathering to obtain an understanding:

- Discuss methods for collecting data (to obtain understanding) in the domain of your semester project. Which are you considering to apply? Why? Discuss pros and cons.
- Consider the data gathering method "contextual inquiry" (from Benyon). In relation to your semester project, list which people you would interview and what aspects of their jobs you would focus upon and observe.
- Consider the data gathering method "Artefact collection" (from Benyon). In relation to your semester project, list the artefacts that are relevant to collect from - or study in - the domain?
- Discuss what characterizes a "good" requirement? How should a good requirement be phrased?

Note your findings on the blackboard/whiteboards in the group room.

NOTE: Before the next exercise session you need to gather data from relevant project stakeholders in order to:

1) Evolve your PACT analysis beyond initial assumptions

2) Provide an empirical basis for requirements elicitation

DEB 3: Envisionment (8/10, group rooms)

Reading:

- Benyon, D. (3rd ed): Chapter 8
- Tohidi et al. (2006): User Sketches: A Quick, Inexpensive, and Effective way to Elicit More Reflective User Feedback (PDF)

- Slides (Prezi - online)
- Slides (PDF)

Sketching/Prototyping software:

- Balsamiq
- AXURE (educational edition)

License info for Balsamiq (license ending Jan 31st 2019):

- License name: Design and Evaluation of User Interfaces 2018
- License: key: eJzzzU/OLi0odswsqnFJLc5Mz1NIzEtRcC1LzClNLMnMz1PIT1MILU4tUvDMK0ktSktMTi1WMDIwtKgxNDUxMzY3sjA

Please keep in mind that this trial license should only be shared with other Faculty Members and Students, and should not be posted publicly. You can also use the license to register Mockups 3 for Desktop on computer lab machines.

Product: Mockups 3 for Desktop
License End Date: Jan 31, 2019

If you haven't already, you can download it here: https://balsamiq.com/download/
Be sure to copy and paste the License Name and License Key exactly as shown above.
Here is an FAQ to get you started using Balsamiq in the classroom:
https://support.balsamiq.com/desktop/classroom
And a free resource that may be useful to you: a user-contributed collection of ready-to-use UI components and design patterns built using Balsamiq: https://wireframestogo.com/

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

For this session, formulate requirements based on your empirical data:

- List at least 10 functional and 10 non-functional requirements for the system of your semester projects (based on the empirical data collected)
- Prioritize these requirements. Discuss why they are prioritized in that order

Discuss techniques to envision the requirements:

- Which are you considering to apply? Why? Discuss pros and cons
- Select the most appropriate envisionment technique at this stage in your project and envision the most highly prioritized requirements.

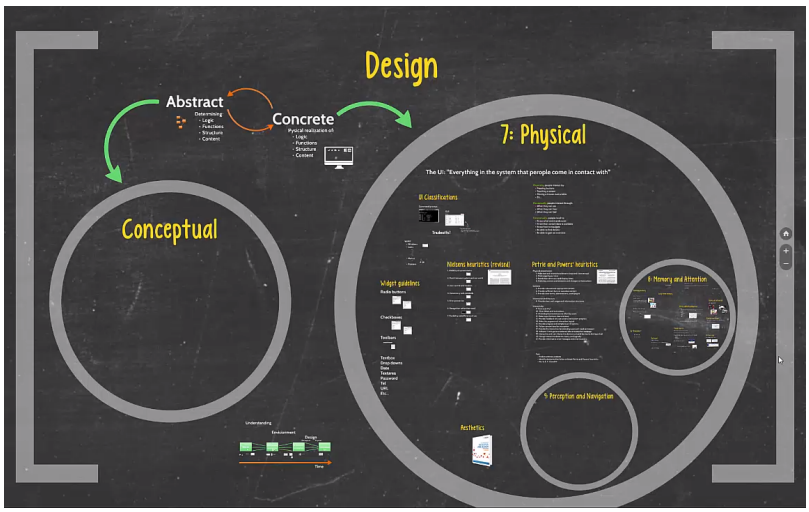
Note your findings on the blackboard/whiteboards in the group room.

DEB 4: Physical Design - General Guidelines and Widgets (11/10, group rooms)

Reading:

- Benyon, D. (3rd edition): Chapter 4, section 4.5 + Chapter 9, sections 9.5 and 9.6 + Chapter 12, sections 12.1-12.3.
- Nielsen (1994): Enhancing the Explanatory Power of Usability Heuristics (PDF)

- Petrie (2012): What do users really care about?: a comparison of usability problems found by users and experts on highly interactive websites (PDF)



- **Slides (Prezi - online)**
- **Slides (PDF)**

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

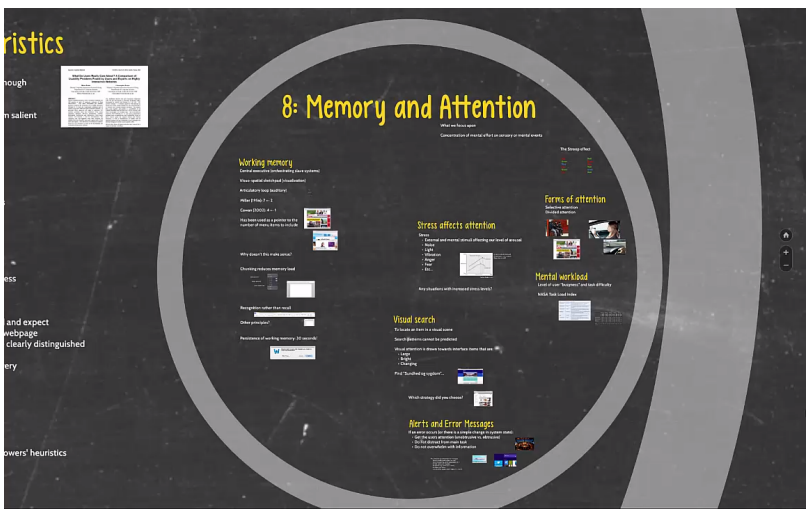
For this session, you should further develop the design made during the previous session:

- Design an icon illustrating the core functionality within your semester project system (to be used for activating this functionality). Apply Hortons icon checklist to inform your design and discuss why you use particular items on the checklist while other may be less prioritized.
- In the physical design you are making now, consider how you will design for all of Nielsens heuristics, e.g. “recognition rather than recall”, “visibility of system status” etc.

DEB 5: Physical Design - Memory & Attention (23/10, group rooms)

Reading: Benyon, D. (3rd ed)

- Chapter 21
- Chapter 12, pages 272-279 - "Principles from memory and attention"



- **Slides (Prezi - online)**
- **Slides (PDF)**

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

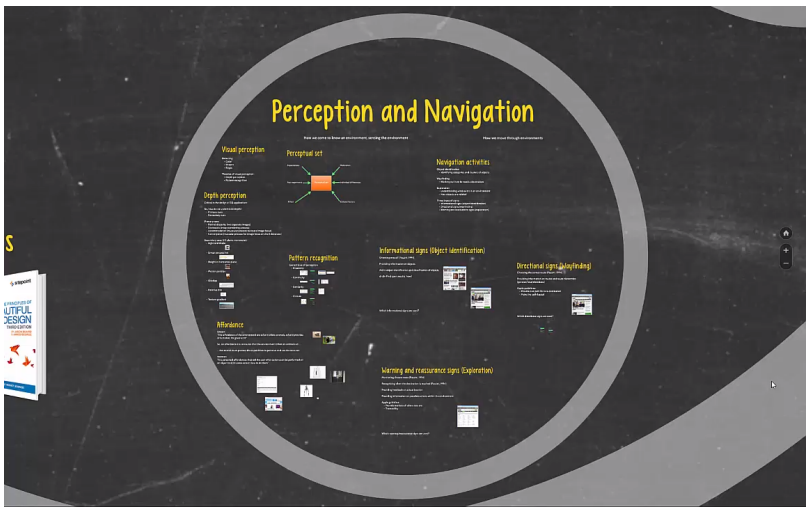
For this session, you should further develop the design made during the previous session:

- (Re-)Design your user interface to support the users' working memory. Describe how will you did this and the considerations made.
- (Re-)Design visuals direct users' attention at relevant information and functions. Describe how you did this and the considerations made in terms of striking the right balance between "having the right amount of visuals for attentions" vs. "overloading with visual attention".

DEB 6 - Physical Design - Perception & Navigation (25/10, group rooms)

Reading: Benyon, D. (3rd ed)

- Chapter 25
- Chapter 12, pages 270-272 - "Guidelines from perception", page 278 "Principles from navigation"
- Chapter 23, section 23.4 "Embodied cognition"



- **Slides (Prezi - online)**
- **Slides (PDF)**

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

For this session, you should further develop the design made during the previous session:

- (Re-)Design your user interface to support the patterns related to user perception. Describe which patterns you used and the considerations made.
- (Re-)Design your user interface to include navigation signs. Describe which signs you used and the considerations made.

DEB 7: Evaluation - What is Usability and Usability Testing (30/10, group rooms)

Reading:

- Benyon - Designing Interactive Systems (chap. 4 section 4.3 + chap. 10)
- Rubin & Chisnell - Handbook of Usability Testing (chap. 3) (PDF)
- Rubin & Chisnell - Handbook of Usability Testing (chap. 5) (PDF)
- Nielsen & Molich - Heuristic Evaluation of User Interfaces (PDF)
- Nielsen and Molic's heuristics (PDF)

- **Slides (Prezi - online)**
- **Slides (PDF)**

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

For this session, you should plan to evaluate your current design. Therefore, start making a test plan for a usability evaluation of your design. In the next session you will be asked to conduct a pilot test in your group rooms, i.e. a rehearsal of a real usability evaluation.

Consider the following:

- Who are the users?
- What are the tasks they do?
- Formulate tasks to solve during a usability test
- What are you going to measure? How?
- What data are you going to collect durng the evaluation? And how?
- Who will take on what role(s) during the test?

NOTE: Before the next exercise session you need to find 1 test participant, who have not seen your design before (I suggest using participants from your "neighbour" groups, even though this may not be fully realistic for your case).

DEB 8: Evaluation - Identifying Problems (1/11, group rooms)

Reading:

- Rubin & Chisnell - Handbook of Usability Testing (chap. 11) (PDF)
- Rubin & Chisnell - Handbook of Usability Testing (chap. 12) (PDF)

- **Slides (Prezi - online)**
- **Slides (PDF)**

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

For this session, you should make a pilot test. **Consent form (in danish):** MS Word

Make a pilot test of your setup to make sure this works as intended.

During the pilot test you should take note of this:

- Do the tasks make sense for an "outsider", i.e. a person not involved in phrasing these?
- How long time do the tasks take to complete?
- Can they be completed within a time frame of 45 min. per participant?
- Does the introduction script make sense for outsiders?
- Are you sure you have all necessary questions for the debriefing and demographics?
- Other matters?

NOTE: Before the next exercise session you need to find at least 2 test participants, who have not seen your design before (I suggest using participants from your "neighbour" groups, even though this may not be fully realistic for your case).

DEB 9: Evaluation - Alternative methods and UX (8/11, group rooms)

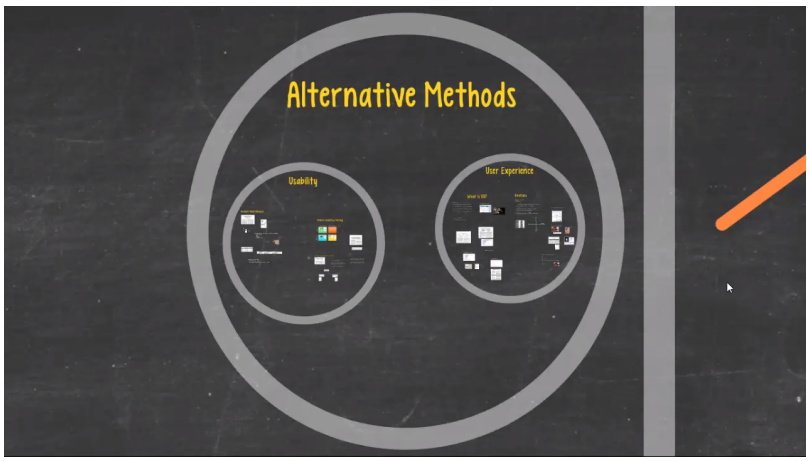
Alternative usability evaluation methods and UX

Reading:

- Bargas-Avila and Hornbæk - Old wine in new bottles or novel challenges? (PDF)
- Kjeldskov et al. - Instant Data Analysis (PDF)

Supplementary reading:

- Andreassen et al. - Remote usability testing (PDF)
- Bruun & Stage - The effect of Task Assignments and Instruction Types (PDF)
- Bruun & Ahm - Mind the Gap! Comparing Retrospective and Concurrent Ratings of Emotion in User Experience Evaluation (PDF)



- Slides (Prezi - online)
- Slides (PDF)

08:15-12:00: Exercises

If you were unable to finish the exercises from the last session, please continue working on these.

For this session, you should make another evaluation (correcting the mistakes identified during the previous session and with more participants).

- Conduct an evaluation with 2 test participants. The purpose is for some of you to gain experience in acting as the test moderator and data loggers. Those of you acting in the role of data loggers should primarily focus on noting good/bad behavior of the test moderator (and secondarily on usability problems). You must record the test sessions (use e.g. Camtasia).

NOTE: Before the next exercise session you need to analyze the video data from this exercise. Make a transcription of log files and a ranked list of usability problems.

DEB 10: Q&A session (15/11, group rooms)

Reading: None required

08:15-12:00:

The teaching assistants and I will walk around to answer whatever questions you may have. These questions may cover the entire curriculum.
