IDG1362

NTNU

Introduction to User-Centered Design

Lecture 1

Eleftherios Papachristos
Associate Professor at the Department of Design (NTNU)

About us

Getting to know each other

NTNU

What do I know (assume) about you:

Bachelor students:

- Interaction Design - Bachelor's Programme (BIXD)
- Bachelor in Web Development (BWU)
- Web Design - One-year programme (ÅRWEB)
- Graphic Design - Bachelor's Programme (BMED)
- Bachelor in Programming (BPROG)
- Bachelor of Engineering in Computer Science (BIDATA)
- Bachelor of Science in Digital Infrastructure and Cyber Security (BDIGSEC)

Variability in interest in the subject?

But: you are all eager to learn about the importance of considering human factors in your work

What I also assume

Getting to know each other

NTNU

- Predominately Norwegian
- Just finished school
  - A lot are away from home for the first time
- Between 18-22
- Most of you like Computer Games, Music and US TV series
- Most of you like skiing/winter sports (since you are Norwegian)

Is it possible that some of you felt misrepresented by these assumptions?

The problem with assumptions

Getting to know each other

NTNU

- Based on our own lived experience
- Implicit bias
- Confirmation bias
- Cultural associations

Principles

Of HCD

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Lessons learned from this example

- Know your audience/users
- Don’t assume that your own experience will always be helpful
- Test – Fail –Adapt – Try again
- Iterate
- Fail fast and iterate

Example

Previous years examples

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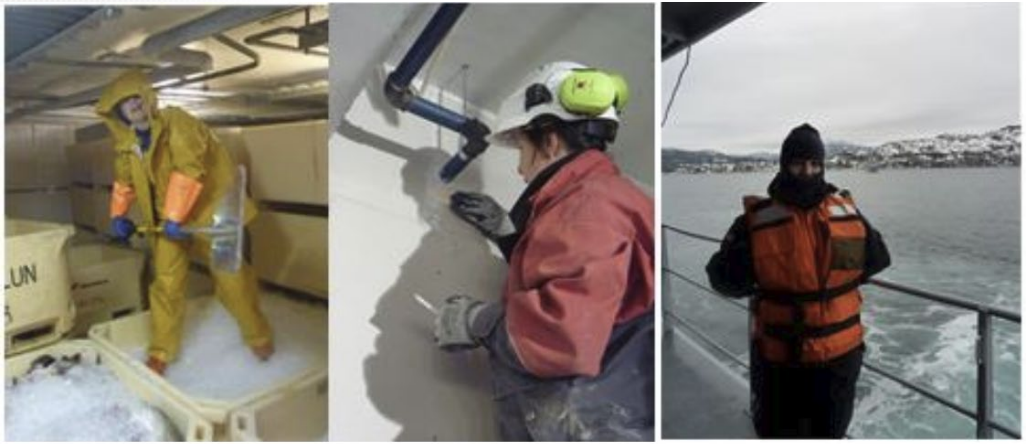
A story of solving real problems for real people



Pictures 3, 4, 5. Participant fieldwork in three occupations: industrial fishing, construction and the Navy.

Mari Bjerck
Associate Professor

Lecturer IDG1362, Fall 2020

Example

Previous years examples

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Ashis Jalote Parmar
Associate Professor

Lecturer IDG1362, Fall 2021

My Example (medical ward)

Example from my research

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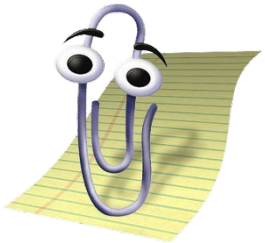
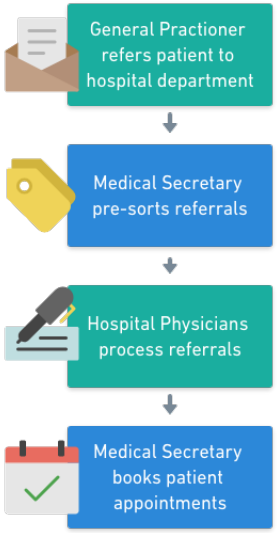
Design of the user interface of ML-system designed to augment the work process of medical secretaries in regard to patient referrals and allocating patients to a hospital ward

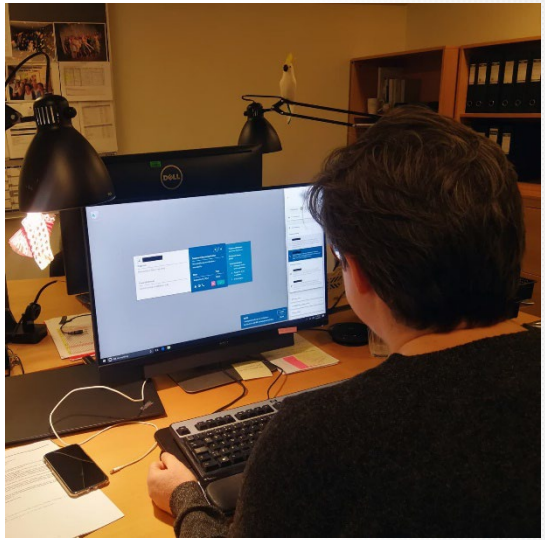
ENVERSION

Collaboration with a company that designed a ML algorithm to automate the referral process and wanted as to design the UI

Companies initial idea:
Something like Clippy



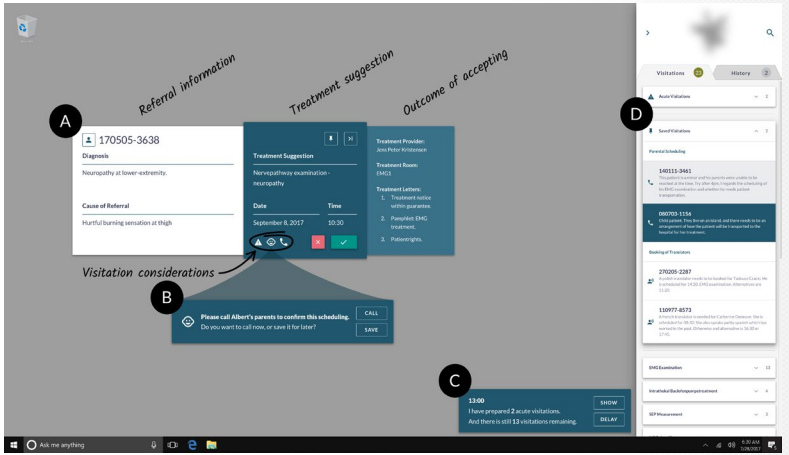




Johansen, P. S., Jacobsen, R. M., Bysted, L. B., Skov, M. B., & Papachristos, E. (2019). Designing a Machine Learning-based System to Augment the Work Processes of Medical Secretaries. *Human Computer Interaction and Emerging Technologies*

My Example (medical ward)

Example from my research



1. Semi-structured interviews to understand responsibilities and tasks
2. Contextual inquiry to gain insights into the context
3. Card sorting activity for information prioritization
4. Prototype design and evaluation

Helped us understand what info is needed to flag exceptions that needed human attention

Johansen, P. S., Jacobsen, R. M., Bysted, L. B., Skov, M. B., & Papachristos, E. (2019). Designing a Machine Learning-based System to Augment the Work Processes of Medical Secretaries. *Human Computer Interaction and Emerging Technologies*

Example summery

Of HCD

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Lessons learned from all examples

- Know your audience/users
- Observe and interview people (domain experts)
- Try to understand their needs
- Test – Fail –Adapt – Try again
- Iterate

What is the course about?

Goals of This Lecture

Goals Lecture 1

NTNU

Part 1: General Course information

- What will you learn?
- How will you learn?
- Procedure and course specifics

Part 2: Introduction to course concepts

- What is design? Why should you care?
- Good and bad design
- The process of HCD

Part 1

1 General Course information

Course objective

What is are the learning goals

NTNU

Goal :

... introduction to User-Centered Design. You will learn to use the HCD process by identifying a problem or a need for a defined group of users. You learn how to create requirements, ideate, develop alternative prototypes, evaluate them and iterate.

At the end I want you to be able:

- Understand fundamental principles and concepts of HCD
- to analyse end-users needs, map out problems and create requirements
- to make sketches and prototypes of alternative solutions
- develop functional prototypes and evaluate them

Learning Activities

General introduction

- Lectures
- Challenges
- Lab exercises
- Obligatories
- Reading
- Individual study
- exam preparation

Learning Activities

How will you learn

Teaching	Lectures Group-Based Tutoring
Self Learning	Taking notes, Reading, Group Discussions, Work on a problem-based project
Evaluation	Mandatory Obligs Written Exam

Lectures

How will you learn

Lectures will be physical (mainly Wednesdays)

- Will be interactive. You will be able to ask questions and discuss anything that you want better explained
- Interrupt me anytime
- There are no stupid questions
- There will be challenges

Highly recommended that you attend

	date	day	hour	content
1st lecture	24-Aug	Wednesday	12:15-14:00	intro
2nd lecture	29-Aug	Monday	16:15-18:00	Understanding
3rd lecture	07-Sep	Wednesday	12:15-14:00	Understanding
4th lecture	14-Sep	Wednesday	12:15-14:00	Understanding
5th lecture	21-Sep	Wednesday	12:15-14:00	ideation
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7th lecture	03-Oct	Monday	16:15-18:00	prototyping
8th lecture	19-Oct	Wednesday	12:15-14:00	prototyping
9th lecture	24-Oct	Monday	16:15-18:00	evaluation
10th lecture	03-Nov	Thursday	12:15-14:00	evaluation

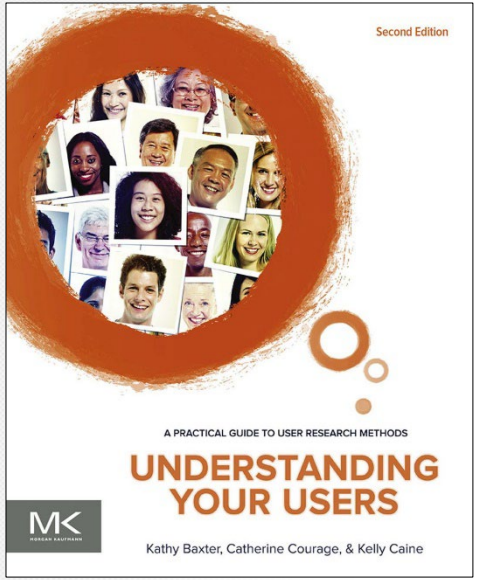
What to bring to lectures

General introduction

Preferable no Laptops

Course Material

Book and other resources

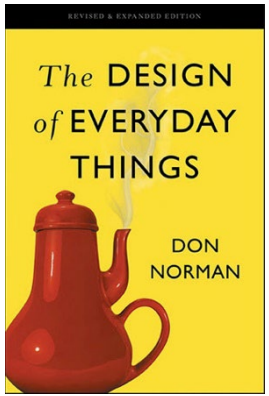


Authors:

Kathy Baxter, Catherine Courage, Kelly Caine

Second edition

- Practical Guide to User Research Methods
- Main reading textbook



Authors:

Don Norman

Second edition

- Reference Book
- Aside reading

Lab sessions

Info about group work

NTNU

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1st lecture	24-Aug	Wednesday	12:15-14:00	intro
2nd lecture	29-Aug	Monday	16:15-18:00	Understanding
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	date	day	hour
1st Lab-session	24-Aug	Wednesday	16:15-18:00
2nd Lab-session	01-Sep	Thursday	16:15-18:00
3rd Lab-session	08-Sep	Thursday	16:15-18:00
4th Lab-session	14-Sep	Wednesday	16:15-18:00
5th Lab-session	21-Sep	Wednesday	16:15-18:00
6th Lab-session	28-Sep	Wednesday	16:15-18:00
7th Lab-session	05-Oct	Wednesday	16:15-18:00
8th Lab-session	19-Oct	Wednesday	16:15-18:00
9th Lab-session	27-Oct	Thursday	16:15-18:00
10th Lab-session	03-Nov	Thursday	16:15-18:00

- Bring paper and pencils, sticky notes, and your laptops
- Try to self-organise but ask the TA’s for help and assistance

Working in Groups

Info about group work

NTNU

- The groups have been set by me randomly
- Groups members are from the same education (some exceptions)
- Each group has 4-6 members (usually 5)
- Find your group in Blackboard
- Each group has a TA assigned to them
- You can meet and work whenever you want, but there will be help from the TA's and me during the Lab session (dates and rooms are in Blackboard)
- Create a "Group contract"

Working in Groups

Info about group work

NTNU

- Group work can be challenging (but also enjoyable)
- Students struggle each year for a variety of reasons
- Working in a group will be a recurring part of your academic and later work life

- GET USED TO IT!

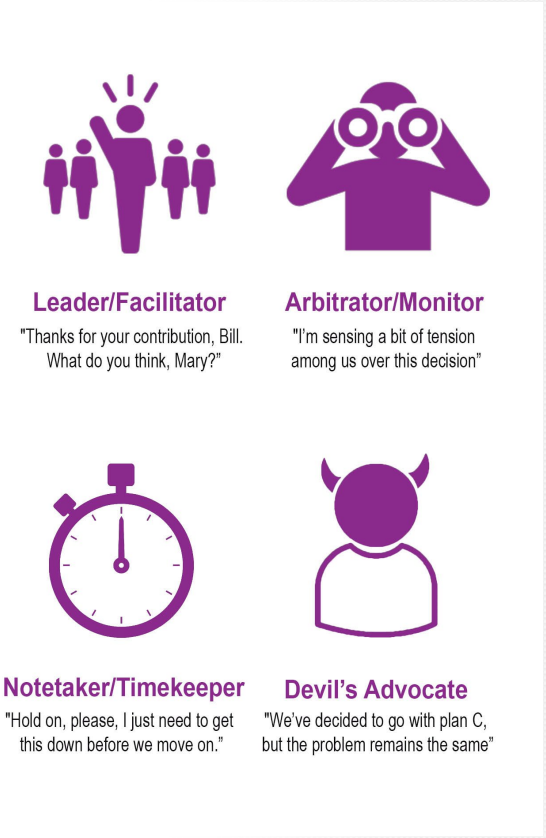
Test – Fail –Adapt – Try again

Working in Groups

Info about group work

NTNU

- Diversity of skills and ideas within a group is a great resource.
- However, working with others different from ourselves can be a challenge.
- We suggest structuring the group with different roles, either based on individuals' strengths or rotated periodically



Leader/facilitator

Info about group work

NTNU

- Not a boss
- Clarifies the aims of the group and helps the group to set sub-goals at the beginning of each meeting. (daily agenda)
- Makes sure that all group members are "on the same page".
- Starts the meetings, introduces each topic, and keeps the group on task and oriented towards its goals.
- Ensures that the group completes its tasks before deadlines.

Leader/Facilitator

"Thanks for your contribution, Bill. What do you think, Mary?"

Arbitrator/monitor

Info about group work

NTNU

- Observes group functioning carefully and initiates regular discussions on group climate and process, especially if he or she senses tension or conflict brewing. Clarifies the aims of the group and helps the group to set sub-goals at the beginning of each meeting. (daily agenda)
- During disagreements or conflicts, clarifies the arguments and proposed suggestions for resolving a dispute,
- Ensures that all group members have a chance to participate; should actively involve members if they are not participating.

Arbitrator/Monitor

"I'm sensing a bit of tension among us over this decision"

Notetaker/time keeper

Info about group work

NTNU

- Takes notes during meetings to keep a record of what has been decided, tasks that have been assigned, when meetings are scheduled, etc.
- Summarizes discussions and decisions for the rest of the group. Distributes a summary of each meeting to all group members.
- Presents group material to the rest of the class/supervisor.
- Keeps track of time during meetings to avoid spending excessive time on one topic.

Notetaker/Timekeeper

"Hold on, please, I just need to get this down before we move on."

Important tips

Info about group work

- The load should be shared, but this doesn't mean everyone should do everything together.
- Divide the tasks so you can do parallel work alone or in smaller groups.
- Rotate tasks
- Don’t fall in love with your personal ideas; your goal is to succeed as a group, not as an individual

Teaching Assistants

People involved in ID2

Thomas B. Fjellestad
BPROG, BDIGSEC
thomabfj@stud.ntnu.no

Lilian F. A. van den Bos
BWU, ÅRWEB, BIDATA
lfvanden@stud.ntnu.no

Magdalena M. Miazga
BIXD,PSPL
magdalmm@stud.ntnu.no

Linn Moløkken
BWU, ÅRWEB, BIDATA
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Ruth Elise Henden
BMED, EMNE
rutheh@stud.ntnu.no

Muhammad Hossen Ali
BPROG, BDIGSEC
mdhal@stud.ntnu.no

About Teaching Assistants

People involved in ID2

They are design students at the Department of Design (Bachelor level, Master level). The TA's have been where you are but are much more experienced now.

- You will meet them in your Lab sessions regularly
- There is one or two TA's for each education (Learn who they are)
- They will help if you ask them
- They will deal with any group issues (allocation, missing students etc.)

They will NOT necessarily just give you the correct answer to your questions but nudge towards a solution

Group Rooms

Allocation

Study programme	group	Teaching Assistants	Room
Bachelor in Programming (**BPROG**)	group 1 -10	Thomas Fjellestad, Muhammad Hossen Ali	GJ-S S411
Bachelor in Web Development (**BWU**) & Web Design (**ÅRWEB**)	group 11 -19	Linn Moløkken, Lilian van den Bos	GJ-S S410
Interaction Design - Bachelor's Programme (**BIXD**)	group 20 -24	Magdalena Miazga	GJ-S S410
Graphic Design - Bachelor's Programme (**BMED**)	group 25 - 30	Ruth Elise Henden	GJ-S S415
Miscellaneous Courses - (**EMNE/AD**) (**EMNE/IE**), Introductory Programme for Foreign Students (**NFUT**)	group 31	Ruth Elise Henden	GJ-S S415
Bachelor of Engineering in Computer Science (**BIDATA**)	group 32 -34	Linn Moløkken, Lilian van den Bos	GJ-S S410
Bachelor of Science in Digital Infrastructure and Cyber Security (**BDIGSEC**)	group 35 -37	Thomas Fjellestad, Muhammad Hossen Ali	GJ-S S415

Group Contract

Info about group work

NTNU

- 1-2 pages max
- Group members' names, contact information, and signature
- **Expectations** (attendance, frequency and duration of meetings, workload)
- Assignment of specific tasks, roles, and responsibilities.
- Outline the specific process for dealing with unmet expectations or other problems that might arise.
- **Indicate choice of project** (Problem statement)

Reference Group

project

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Choose one representative from each study program

– Will meet with us twice in the semester (one at the end and one in the middle)

– Will write a short reference group report

It is important because

- It will help us improve the course.
- It will make sure your voices as students are heard

Project Catalogue

project

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Explore and investigate new interaction designs that enable and support people in

- **Being more physically active** (Health and Wellbeing)
- **Recycle more** (Environmental Sustainability) **or be better at it**
- **Be more connected** (Mental Health and Wellbeing) **in the real world**

Choose one topic in your group. You will work on it throughout the course

Why those topics

projects

3. Good Health and Wellbeing :
   Ensure healthy lives and promote wellbeing for all at all ages
12. Responsible Consumption

Being more physically active

project

NTNU

Examples

Figure 14: Tiger on paper and as cut out.

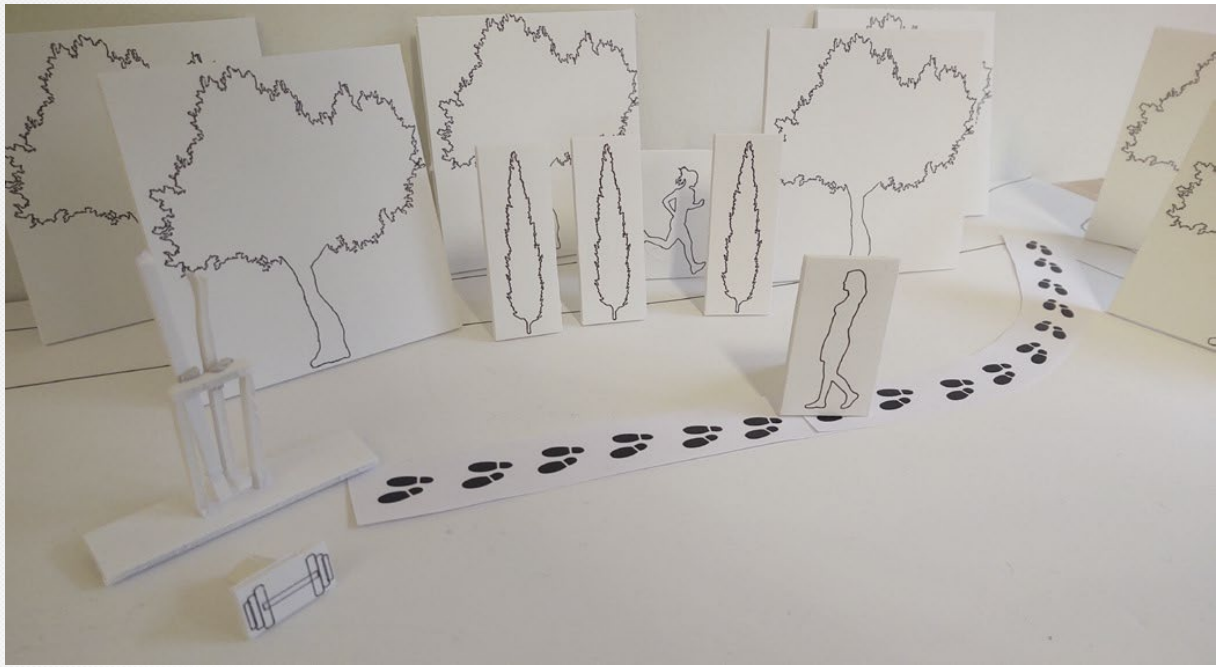
Figure 15: Clip from a concept video, showcasing an animal chasing a participant, after he has started the activity.

Being more physically active

project

NTNU

Examples

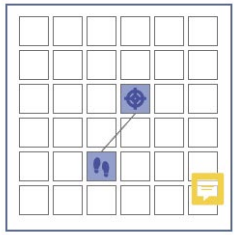


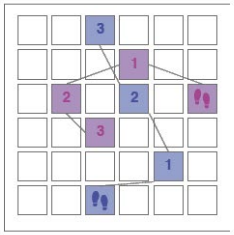
Being more physically active

project

NTNU

Examples



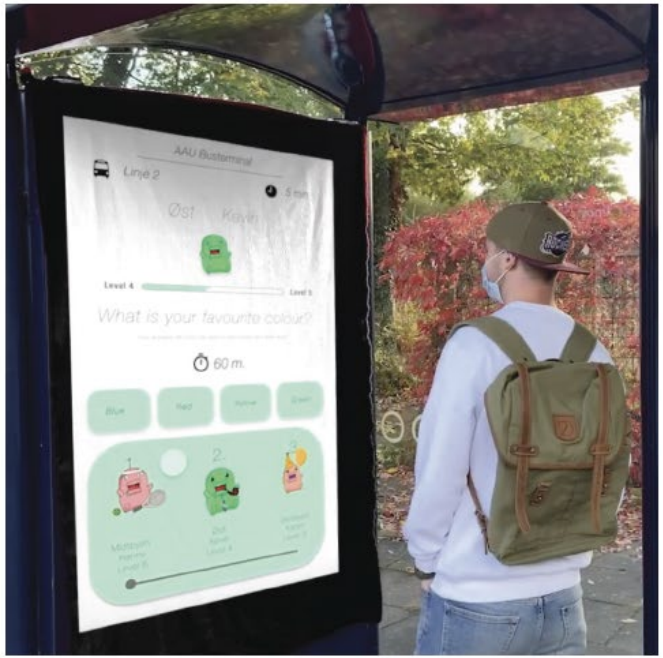


Be more connected in the real world

project

NTNU

Examples



Be more connected in the real world

project

NTNU

MeteorQuest - Bringing Families Together Through Proxemics Play In A Mobile Social Game

Rasmus Rosenqvist, Jannik Boldsen, Eleftherios Papachristos, Timothy Merritt
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Aalborg, Denmark
rasmuslundrosenqvist, jannikboldsen{@gmail.com}, papachristos, merritt{@cs.aau.dk}

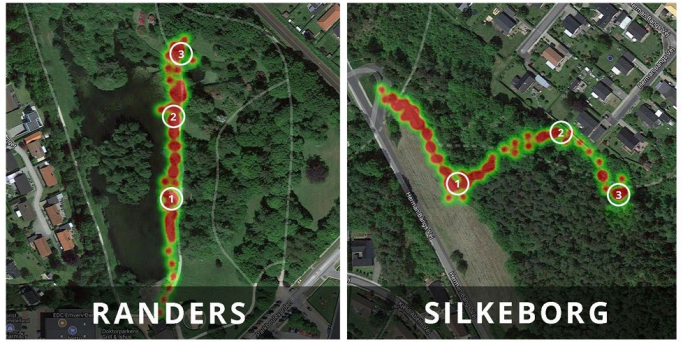
ABSTRACT
Smartphones support gaming, social networking, real-time communication, and individualized experiences. Children and parents often take part in digital experiences with distant friends while isolating themselves from co-present family members. We present MeteorQuest, which is a mobile social game system aimed to bring the family together for location specific game experiences through physical play. The system supports group navigation by mapping screen brightness to the proximity to various in-game targets. Mini-game stages were designed together with interaction designers to encourage physical and social interaction between the players through group puzzles, physical challenges of dexterity and proxemics play. We conducted an exploratory study with three families to gain insights into how families respond to mobile social game features. We studied their socio-spatial arrangements during play and navigation using the lens of proxemics play and provide implications for the design of proxemic interactions and play experiences with families.

Author Keywords
F-formations, Proxemics, Proxemics play, Forced-collaboration, Competitiveness, Intergenerational play, Location-based games.

INTRODUCTION
With the rise of personal communication technologies such as smartphones, tablets and social media, family members are offered many ways to stay in touch and communicate

world. This isolation in the digital experiences can have negative repercussions for the family with members feeling "alone together" [50]. In light of the concerns for social isolation, some parents wish to monitor and control their children's experience with media and screen time [30]. Aside from directly limiting exposure to digital experiences, there have been increasing examples of games designed to bring players together for rewarding shared experiences. Pokémon Go [35] brought many people out into the world to specific locations, and while players often reflected on the enjoyment of the physical activity involved in walking together, the play was largely an individual activity [43].

In recent research on intergenerational family entertainment, [8] various strategies for designing technology for the family suggest various techniques that have led to positive social experiences. There have been recent examples of mobile social games attempting to elevate the social experiences through the gameplay [18,19] and play experiences focused on the physical environment and co-players enabled through innovative uses of the sensors and actuators available in smartphones and other mobile devices [32]. We took inspiration from GlowPhones [32] which utilized smartphones in non-traditional ways to move focus away from the high resolution screen and out into the players' surroundings. That game system encouraged proxemics play with teams of two co-players with findings that suggest simple techniques to encourage



Recycle more or be better at it

project

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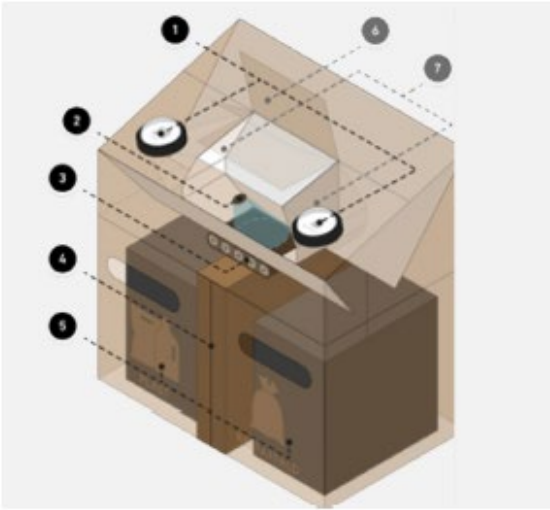
Examples



The work ahead

project

1. Find some people that could be potential users of your design. Find out what their needs are and how they are related to the problem **[Empathy]**

2. After you have collected input from potential end-users— what are the most significant challenges? What is the core of the problem? **[Define]**

3. What solutions can you come up with to try to solve some of the most significant challenges? **[Ideate]**

4. What does a solution look like and how does it work? **[Prototype]**

5. What do end-users think about your solution? **[Evaluate]**

The work ahead

project

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Oblig 1

Oblig 2

Oblig 3

Oblig 4

Group assignments
All have to be passed

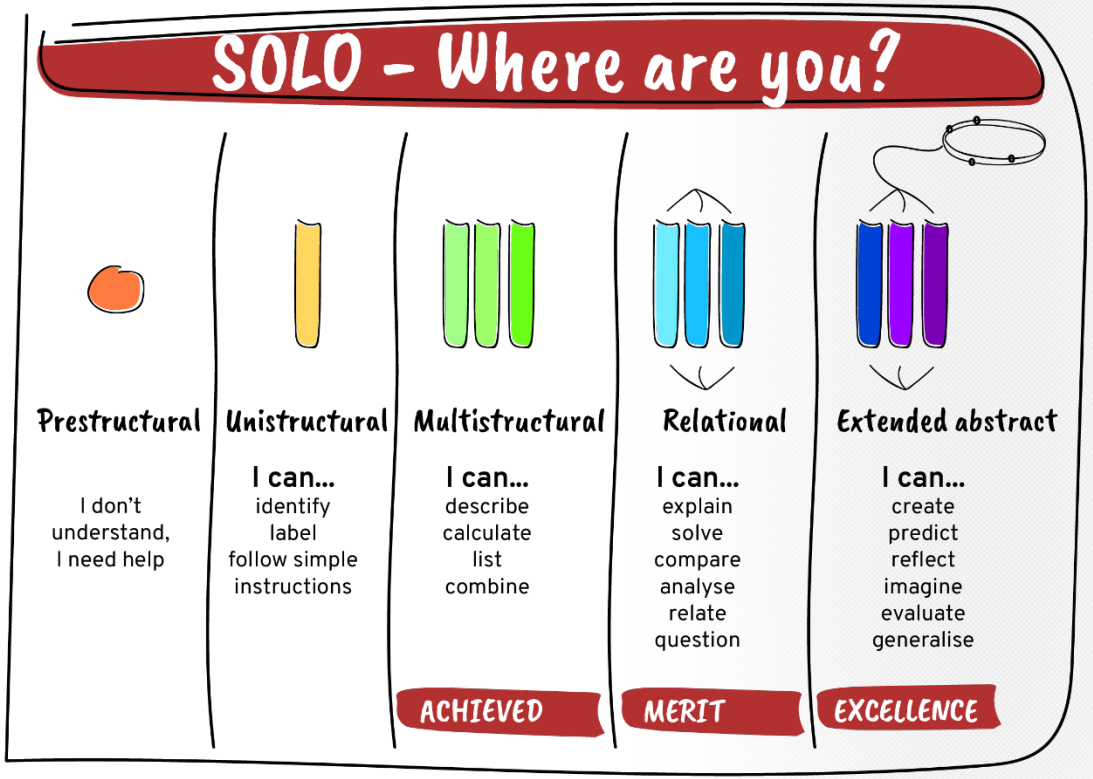
Final exam

Individual
written

Learning

How will you learn

- Lectures, taking notes
  Participate, ask questions
- Reading, preparing for class
- Working and discussing in groups
  Learning by doing
- Project work in groups
  Learning by doing



Part 2

2 Introduction to course concepts

What is Design?

Do or plan (something) with a specific purpose or intention in mind.

Oxford Dictionaries

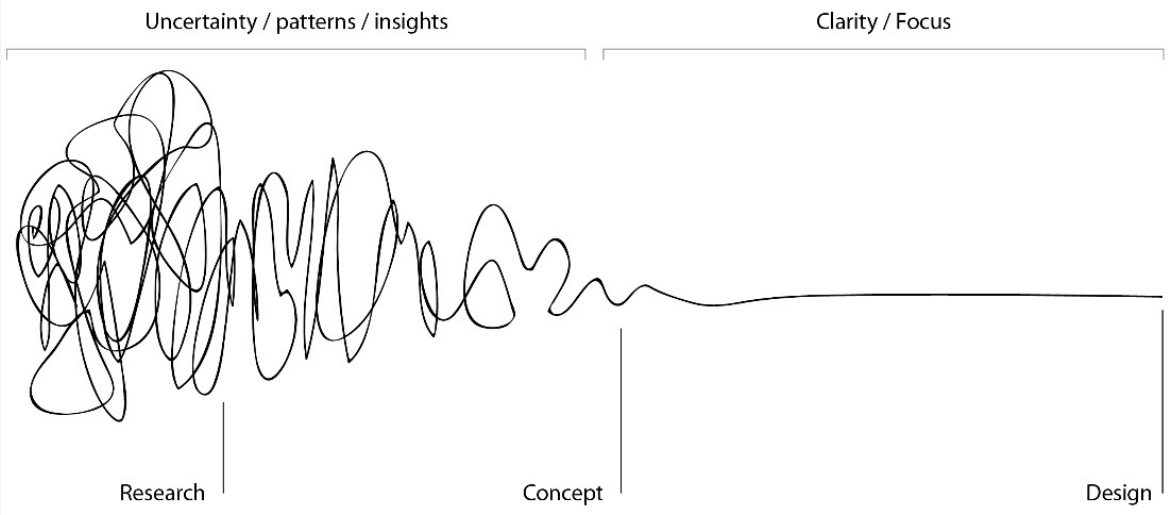
Design is what a designer does to design a design

It is a process

It is way of thinking

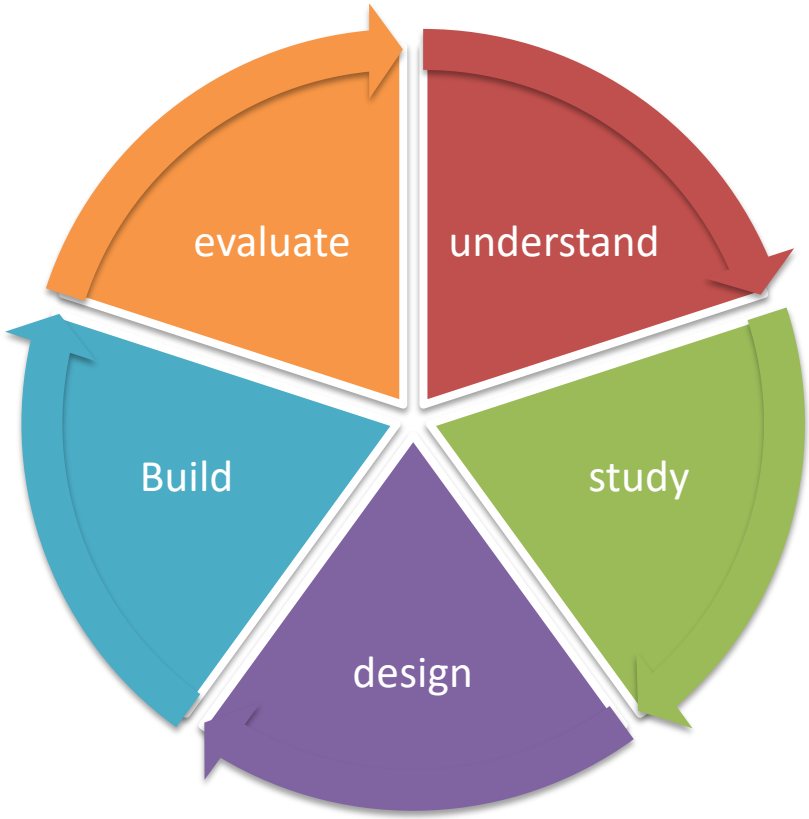
What is Design

General introduction



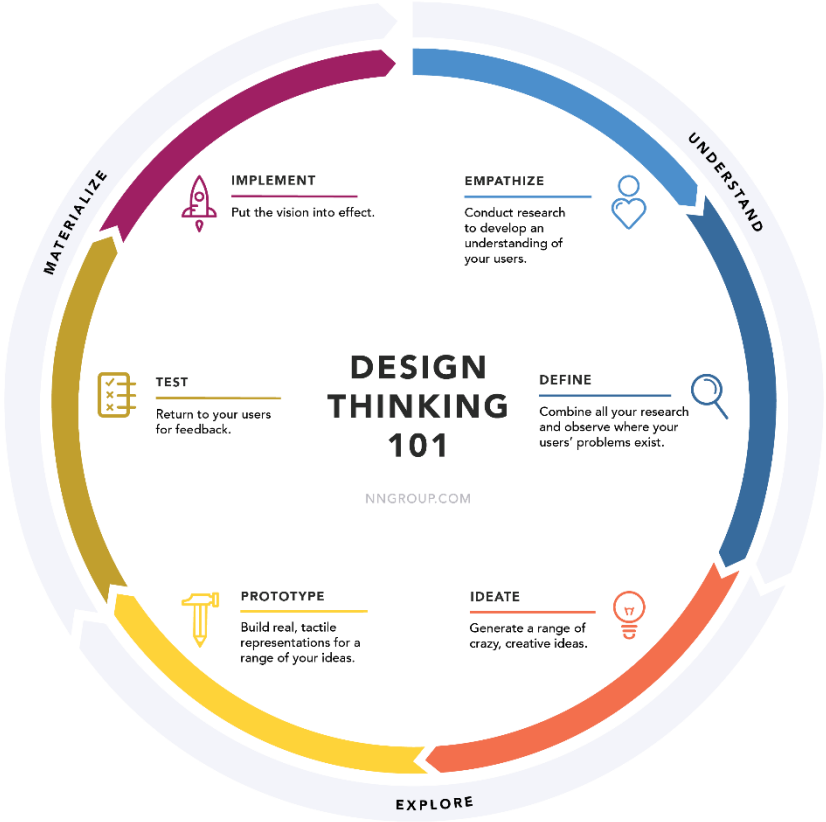
Iteration

General introduction



Design thinking

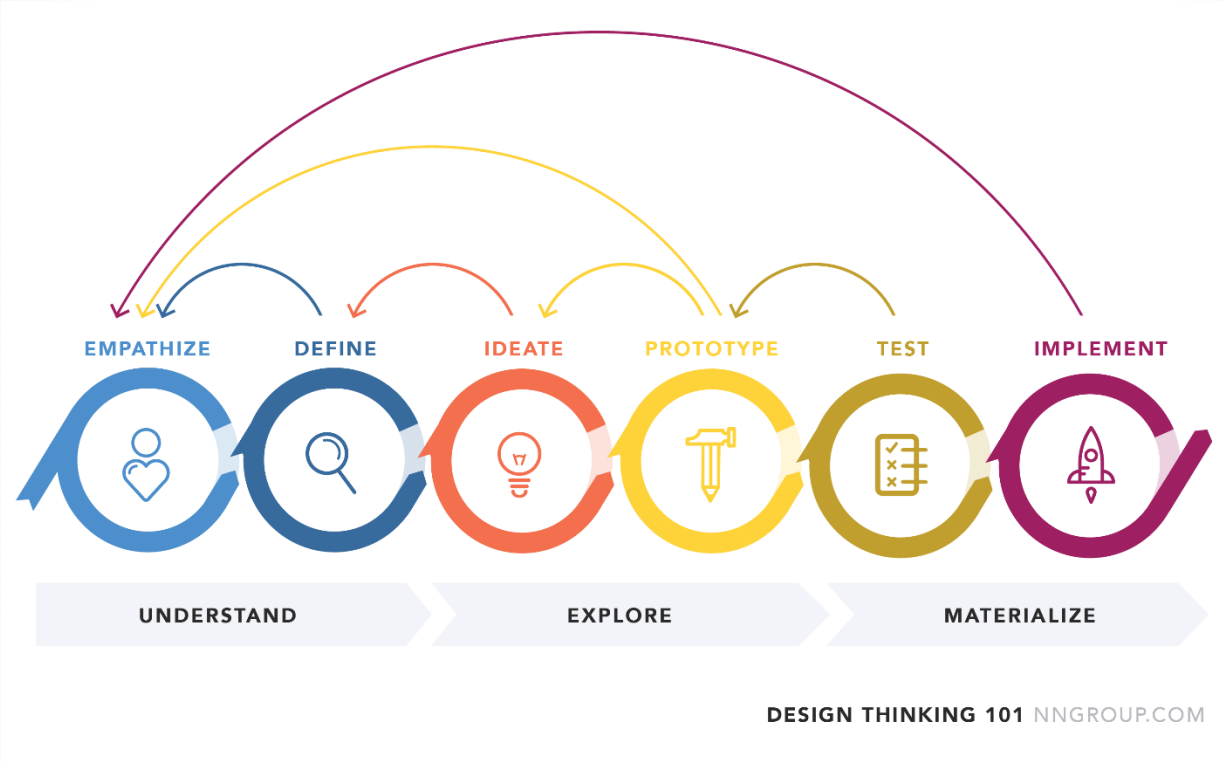
General introduction



https://www.nngroup.com/articles/design-thinking/

Design thinking

General introduction



https://www.nngroup.com/articles/design-thinking/

What is Design?

Do or plan (something) with a specific purpose or intention in mind.

Oxford Dictionaries

Design is what a designer does to design a design

It is a process

It is way of thinking

It is problem solving

Challenge 1

Challenge 1 The Tower

instructions

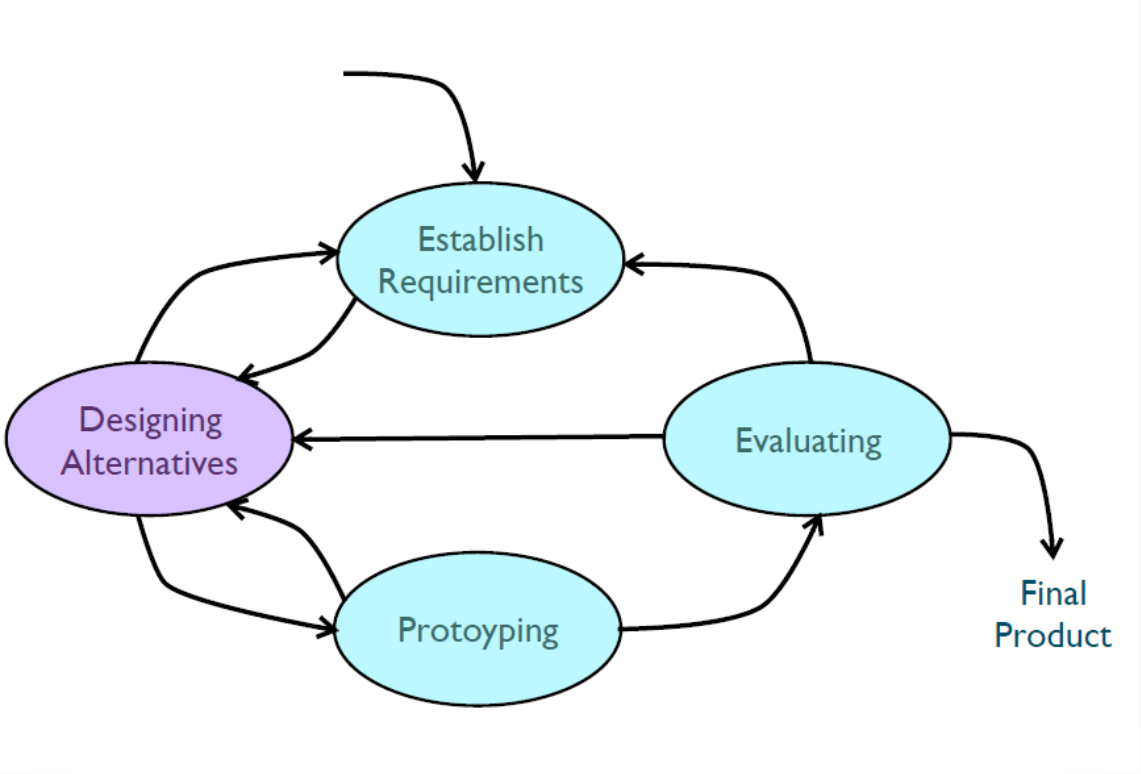
1. Take 3 sheets of paper

2. Build the tallest tower

3. You have 5 min

Process of Design

The design process



What is Design?

Engineering or Art?

What is Design?

Craft or Science?

Craft: is a profession that requires particular skills and knowledge of skilled work (e.g. wood, jewelry, leather, pottery).

Usually small scale production of goods and their maintenance. Todays artisan.

Scientific method:

1. Make an observation
2. Conduct research
3. Create a hypothesis
4. Test your hypothesis (experiment)
5. Analyze data
6. Replicate
7. Share results

Design process

lecture overview

- Ideation
- Iteration
- Prototyping

Why should you care about design ?

General introduction

Good design can bring Joy

– Can help us do things we care about

– Can help as engage and connect with people

Bad design can cost time, money and even lives

Examples.

- Nuclear disasters, airplane accidents can be cased by bad design

- Medical devices, cars etc. must be well designed do not lead to injury

Why should you care about design ?

General introduction

Technology is not neutral

Netflix documentary

Why should you care about design ?

General introduction

I am not an Interaction Designer. Why should I care?

- The term Design does not belong to the filed of IxD
- The approach is applicable to most problems
- You will have to collaborate with IxD, Graphic designers in the future
- Design affect all of as and it is not neutral

For next week

project

- Meet up in the Lab rooms and choose a project
- Discuss your ambitions
- Discuss ROLES and if you want to use them
- Write/sign a group “contract”
- Select a group contact person that will upload the group contract for the group in BB before the next class (Wednesday 11:55)
- Meet the Teaching Assistant assigned to you

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Thank you

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