Aalto University
School of Arts, Design
and Architecture

Course introduction

MUO-E3036 Interaction Design (IxD)

1st lecture 10 January 2022

Antti Salovaara

Contents of the day

Morning 9:15 – 12:00:

- Course basics (S/L split, schedule, contents, workload, grading)
- Group creation (pre-selected teams, team rules, getting to know eacht other)
- Introductions within the entire “S” split
- Introduction to IxD: what is it?

Afternoon 13:15 ~ 17:00

- Introduction to F-formations (together with the “L” split)
- Discussion about group task: data collection, choice of topic, …
- Readings for this week
- Planning within groups + selection of the tutoring time
- Closing discussion about open issues

Course basics

S/L split

The course is split in two equally-sized splits:

- ”S” (Salovaara) and “L” (Lucero)
- The splits make contact teaching sessions more interactive and improve teachers’ attention to each project group’s matters

Learning contents, schedules, grading principles etc. are the same in both groups

Our split: “S”

- Zoom: https://aalto.zoom.us/j/67936150621
- MyCourses: https://mycourses.aalto.fi/course/view.php?id=33919&section=3
- Discussion group: https://mycourses.aalto.fi/mod/forum/view.php?id=832058
- Contact: antti.salovaara@aalto.fi

Schedule

Week 1	User research
Week 2	Google Design Sprint *
Week 3	Interaction prototyping pt. 1
Week 4	Interaction prototyping pt. 2
Week 5	User evaluation (small A/B test)
Week 6	Wrapping up
Week 7	– No teaching –

* IMPORTANT: Week 2 has group work every day, and a daily kickoff at 9:15-9:30

Weekly schedule

Mondays 9:15-17:00:

- lecture-focused
- discussions on reading materials
- starting points for the week's activities + small in-class exercises

Tuesdays–Fridays:

- group work.
- 30-minute group tutoring session each week

Fridays 13:15-17:00

- discussions on reading materials
- short group presentations
- joint discussions and reflections

Week 2:

- Meeting at 9:15-9:30 every day from Tuesday to Friday

What this course teaches you

How to involve users into a design process

To inform and inspire design, and to evaluate it

How to design interactive digital products

That provide good user experience and usability

Concept design	Week 1	User research
	Week 2	Google Design Sprint
	Week 3	Interaction prototyping pt. 1
IX design	Week 4	Interaction prototyping pt. 2
	Week 5	User evaluation (small A/B test)
	Week 6	Wrapping up

Workload

8 credits = 216 h

Week	Contact teaching	Individual work	Group work	Reflection (20%)	Week total
1	Lectures 9 Tutoring 0.5	Lecture preparation, reading 4	Varying activity 14	8	35.5
2	Lectures (incl. morning meetings Thu-Fri) 9 Tutoring (daily brief meetings) 3.5	Lecture preparation, reading 0	Varying activity **24**	3	**39.5**
3	Lectures 9 Tutoring 0.5	Lecture preparation, reading 4	Varying activity 14	8	35.5
4	Lectures 9 Tutoring 0.5	Lecture preparation, reading 4	Varying activity 14	8	35.5
5	Lectures 9 Tutoring 0.5	Lecture preparation, reading 4	Varying activity 14	8	35.5
6	Lectures 9 Tutoring 0.5	Lecture preparation, reading 4	Varying activity 13	8	34.5
Total	60	20	93	43	216

Grading

No mid-term presentations or weekly submissions

The following factors determine the grade:

Group work:

Weekly progress (based on tutor meetings and Friday presentations)

Quality and insightfulness of work, justifications for design choices

Individual work:

Positive activeness during lectures and tutor meetings

Participation in contact teaching (min. 80% attendance)

Thoughtfulness of answers to simple quizzes about the reading materials

Break (10 minutes)

Division into groups

Groups

11:

12:

13:

14:

15:

16:

Team building exercise

Some principles of good teamwork:*

- Team members understand that they are positively co-dependent
- Face-to-face interaction
- Each member carries their personal responsibilities
- Team reflects on their ongoing work by talking and evaluating it

Exercise in teams (**20 minutes**):

- Introduce yourselves to each other
- 3 things that you have in common in your group
- Discuss in your team: what are your opinions about good team work principles => how do you want to work together?

Write down your group's principles

Create communication channels for team communication

- Messaging, meetings

* Johnson, D.W. & Johnson, R.T. (2002). Yhdessä oppiminen [Learning together]. In P. Sahlberg & S. Sharan (eds.), Yhteistoiminnallisen oppimisen käsikirja [Handbook of cooperative learning], pp. 101–118.

Discussion

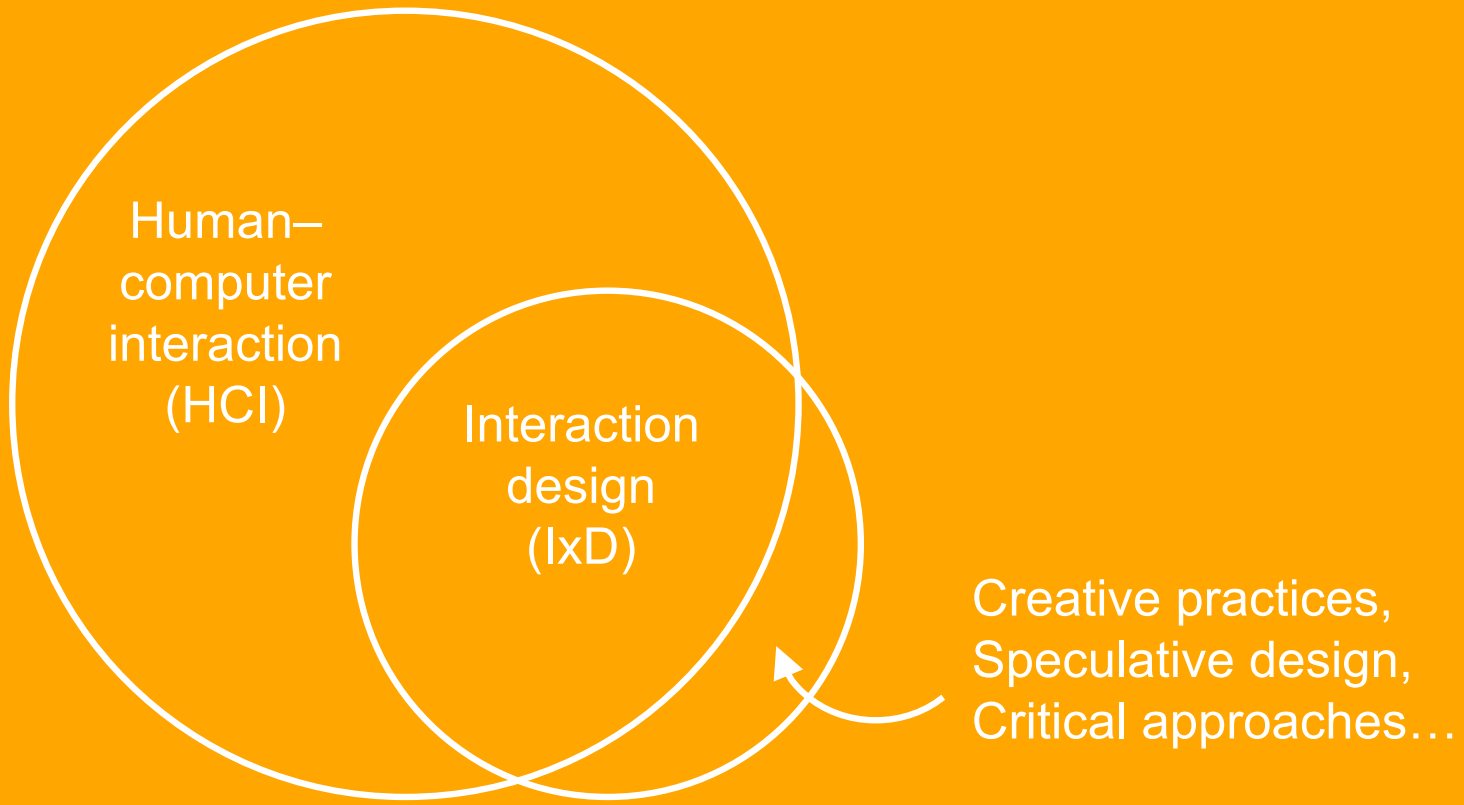
What were the 3 things that were common in your group?

What team work principle did you identify for your team?

If you encounter problems in teamwork, and if there are special needs:

Send email to me

Introduction to IxD



What is Human–Computer Interaction (HCI)?

HCI is a field that **researches the design and use** of computer technology, focused on the interfaces between people (users) and computers.

Researchers in the field of HCI both **observe** the ways in which humans interact with computers and **design** technologies that let humans interact with computers in novel ways.

(from Wikipedia)

Goals of HCI research

Basic goal:

Understanding human–technology interactions and relationships

Applied goal:

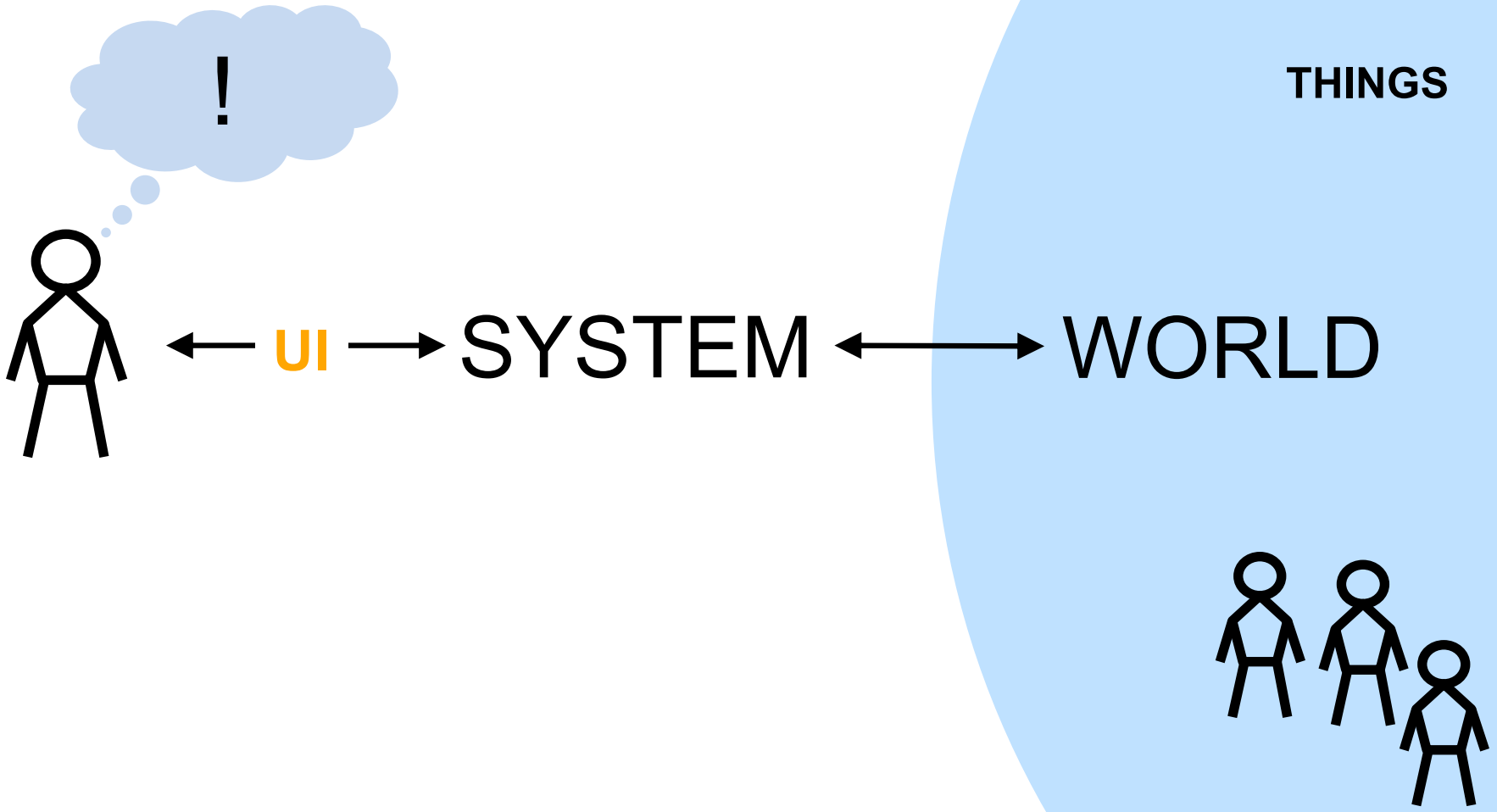
Informing better design of technologies (i.e., their usability)

Speculation:

Building and studying on “what might be”

= What is the future of human–computer interactions?

User interface (UI) and interaction design



Some IxD examples

Warm-up excercise

Create a list in your group:

- Which systems, apps, and digital services you may interact with during your everyday life?
- Consider different times of the day, different acitivities

Aim for heterogeneity:

- Direct vs. indirect interaction
- Single user vs. cooperative settings
- Voice, touch, visual
- Conflicts, opportunities

Write your list down

- We'll return to it later
- Be ready to discuss it

Compare the list contents and the following slide contents:
Is something forgotten in your list of in the presentation?

https://youtu.be/I9FIXMPrjF8

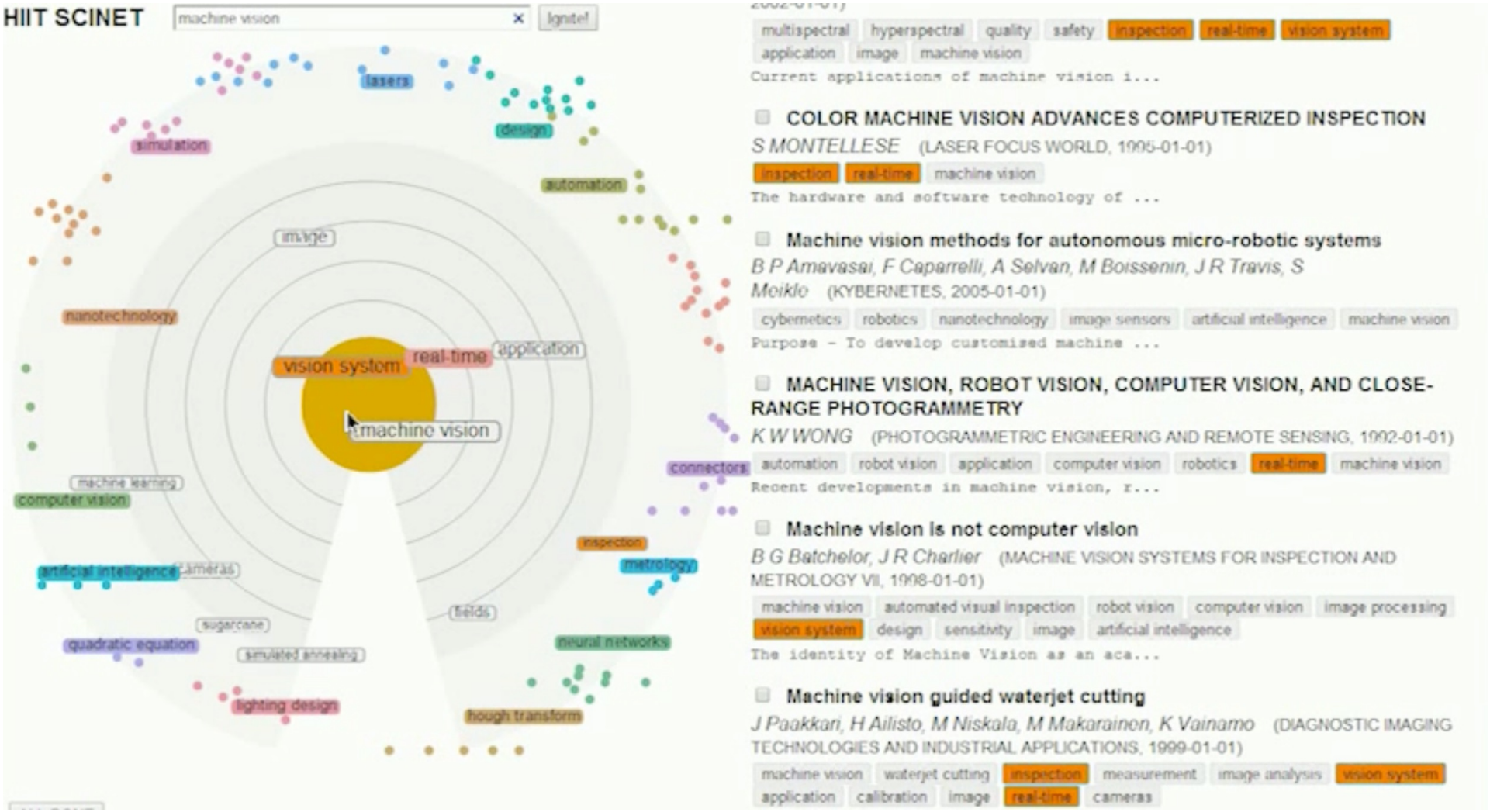
Walhström, Salovaara, Oulasvirta & Salo (HCIJ 2011): Resolving Safety-Critical Incidents in a Rally Control Center.

11	9:35:32	DOC: **Then uhm, make the Ambuheco (4 s) make the Ambuheco ready.**	
13	9:35:48	DO1: **Ok.** (8 s) **Ambuheco RCC, other units wait a second.** (10 s) **and make yourself ready. At SS 12 ouninpohja, closer to the goal than the start, that is over halfway, car number 74 driven out, driver is out of the car, co-driver still in the car, awake, moans his back and side. Units along the stage have been informed.**	Speech to A-net
20	9:36:35	DO1: **Well can I (.) ask if they can take off.**	
21		DOC: **Uhmm, they can you know take off.**	
22		DO1: **And Ambuheco go ahead ( )**	
23	9:36:42	DO4: ((moves eyes from folder's map to look at the GPS map)) (2 s) **What was that car number?**	Folder's map, GPS map
25		DO1: **74**	
26		DO4: **Can you see it there** ((looks at GPS map)) (3 s) **could we search that seventyfour from there**	GPS map
29		DO3: **Joo (yes)** ((turns to look at GPS map, points with right hand to map))	GPS map
31	9:36:54	DOC: **{DO3}.**	
32		DO3: ((Turns head to DOC, hand remains raised))	
33		DOC: **Tell that FIV and ambuheco that it is close to control point five that incident.**	
35		DO3: **And now, also the Ambuheco**	
36		DO4: ((puts finger on folder's map))	Folder's map
37	9:37:03	DO3: [**have you already hear-**]	
38		DO4: [**close to control point five yeah**]	
39	9:37:05	DOC: **Yeah, so send some info down to the units**	

Part of a transcript from the previous slide's video

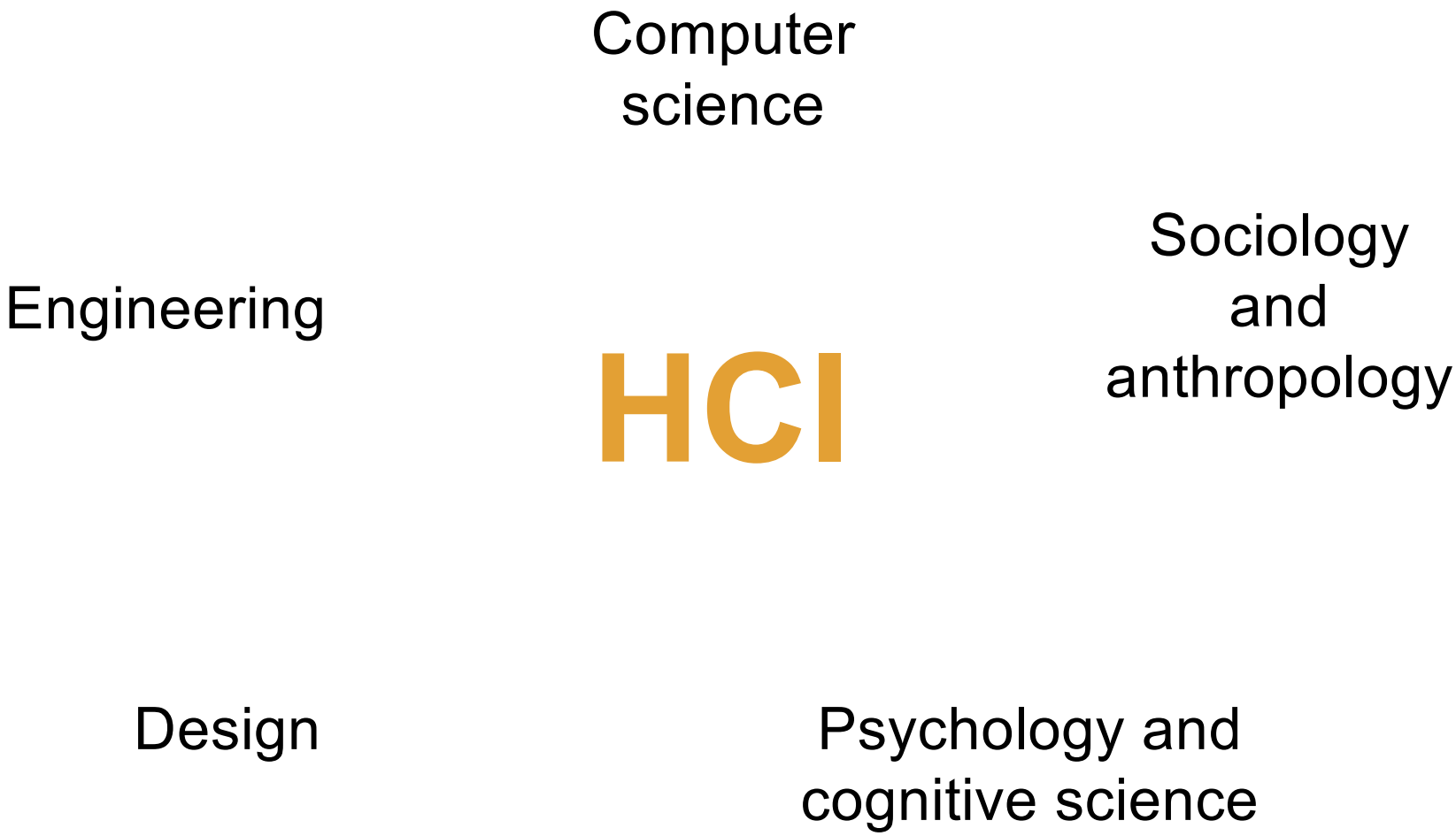
Kim, Kim & Nam (CHI2016): miniStudio: Designers' Tool for Prototyping Ubicomp Space with Interactive Miniature. https://youtu.be/OARXoG6EIbY

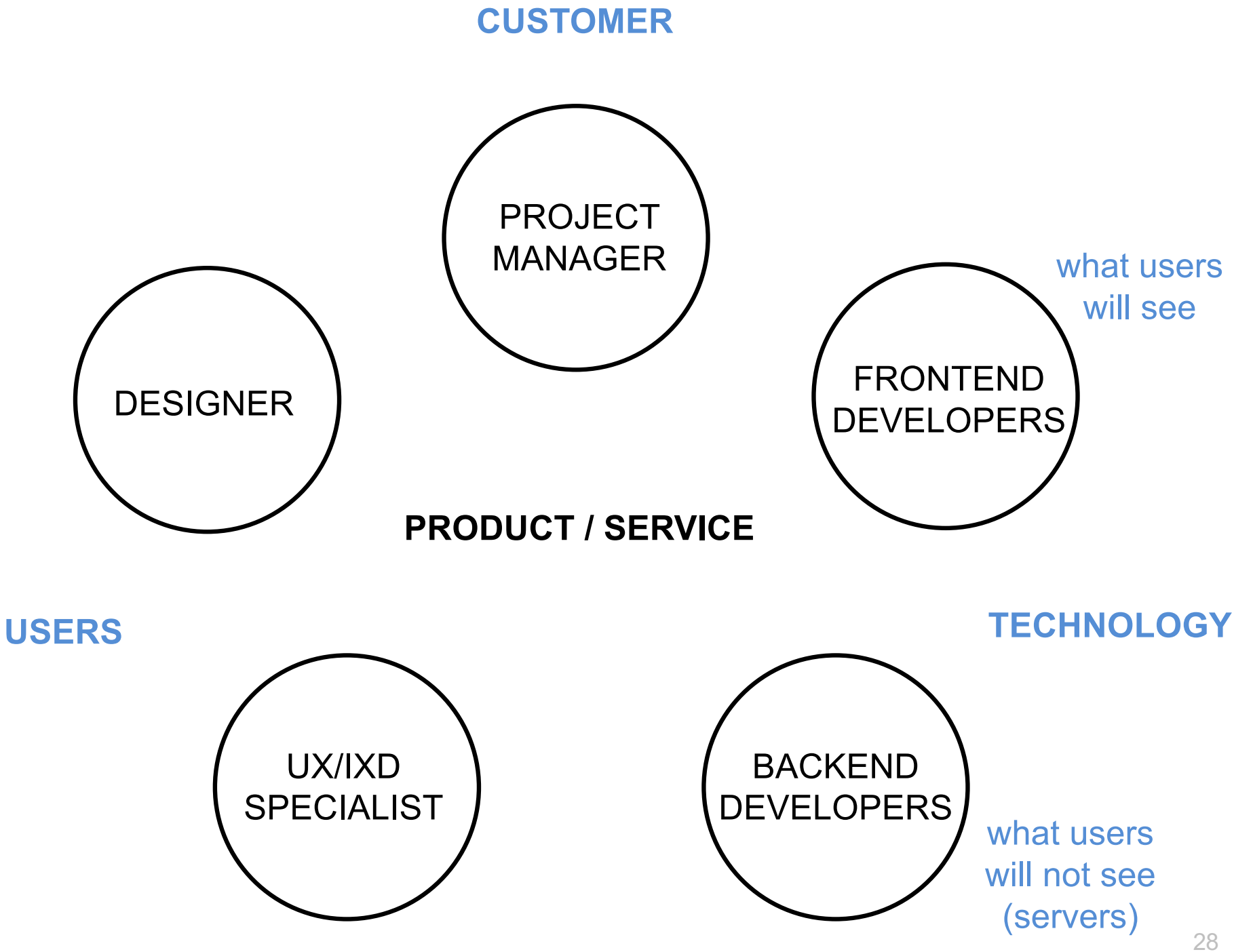
Kajastila, Holsti, Hämäläinen (CHI2016): The Augmented Climbing Wall: High-Exertion Proximity Interaction on a Wall-Sized Interactive Surface.
https://youtu.be/QJCTSbTEK-Y



Ruotsalo et al. IntentRadar: A search engine that anticipates and predicts user's search intents. https://youtu.be/zOoFNpF6eFk

Multi-disciplinarity of HCI




CUSTOMER
PROJECT MANAGER
DESIGNER
FRONTEND DEVELOPERS
what users will see
PRODUCT / SERVICE
USERS
TECHNOLOGY
UX/IXD SPECIALIST
BACKEND DEVELOPERS
what users will not see (servers)

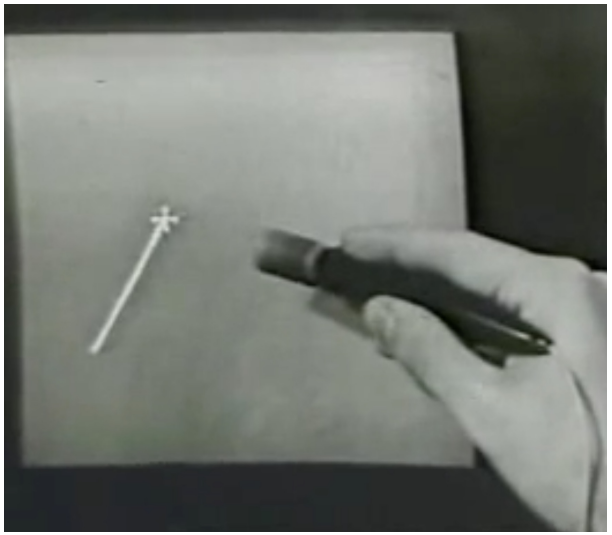
Selective history of HCI

1940s: Human factors & ergonomics

World War II and the aircraft controls: Interior of B-17

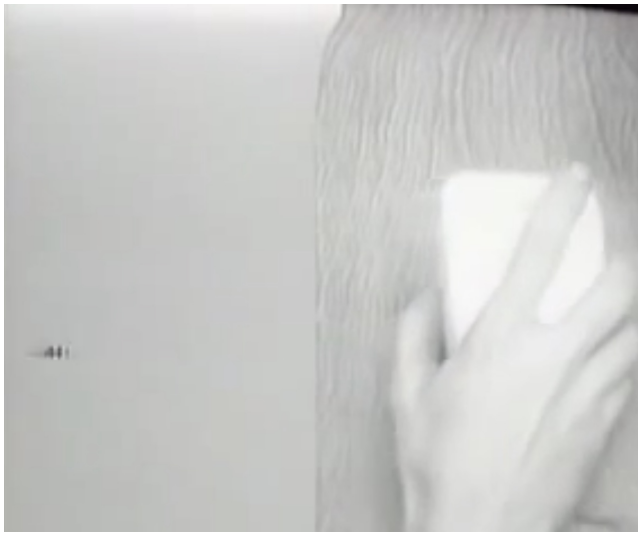
1960s: Direct manipulation, mouse, screen windowing

Direct manipulation:
Ivan Sutherland 1963



https://youtu.be/USyoT_Ha_bA?t=296

Mouse and screen windowing:
Douglas Engelbart 1967



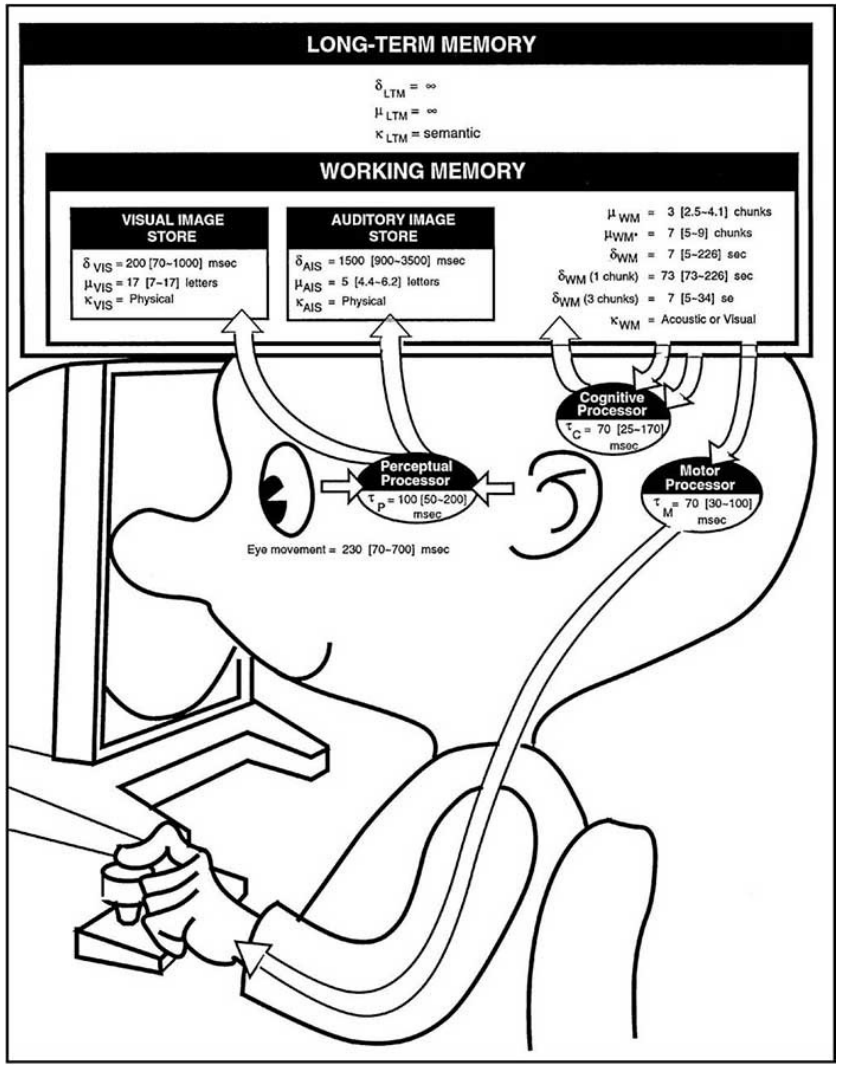
https://youtu.be/hRYnloqYKGY

1970s: Xerox ALTO

First to use “desktop metaphor” and graphical user interface (GUI).

https://www.youtube.com/watch?v=AYlYSzMqGR8

1980s: Psychology



Input-output loop between computer and the user

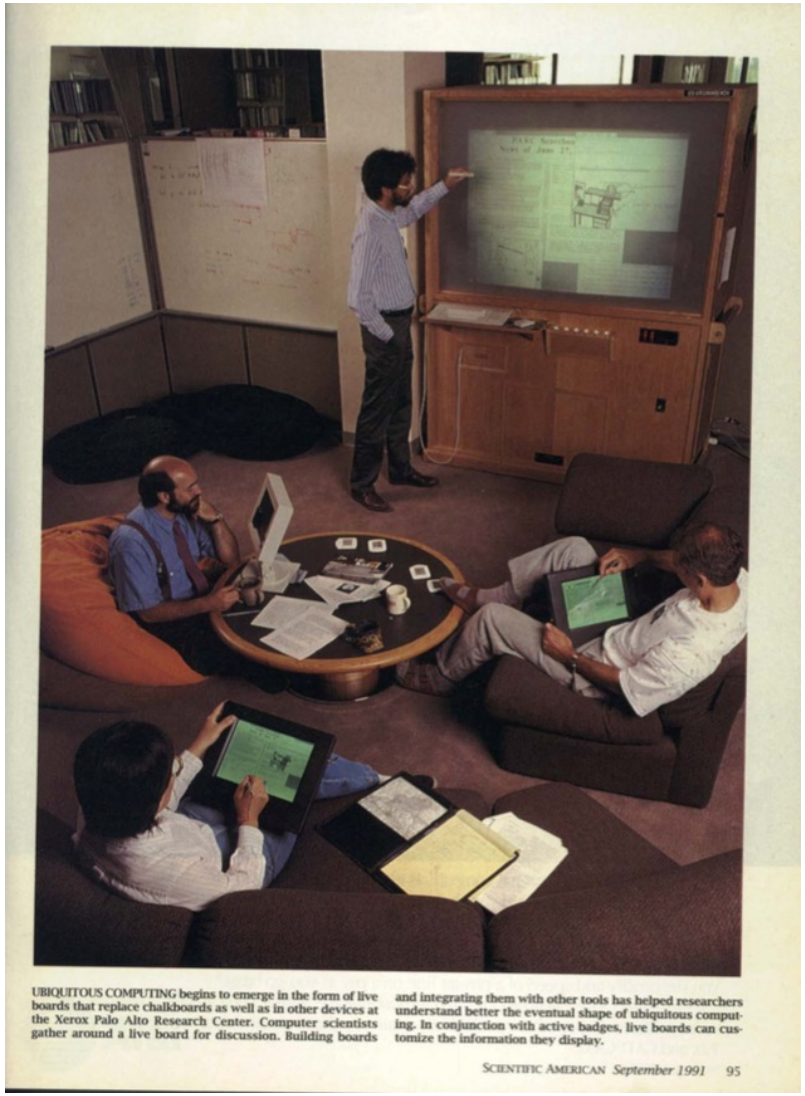
Predictive models of user behaviour:

- Keystroke-level model (KLM)
- Fitt's law for predicting time to point accurately at a target:

$$\mathrm{MT} = a + b \cdot \mathrm{ID} = a + b \cdot \log_2\left(\frac{2D}{W}\right)$$

First CHI conference

1990s: Collaborative environments & Ubicomp



UBIQUITOUS COMPUTING begins to emerge in the form of live boards that replace chalkboards as well as in other devices at the Xerox Palo Alto Research Center. Computer scientists gather around a live board for discussion. Building boards and integrating them with other tools has helped researchers understand better the eventual shape of ubiquitous computing. In conjunction with active badges, live boards can customize the information they display.

SCIENTIFIC AMERICAN *September 1991* 95

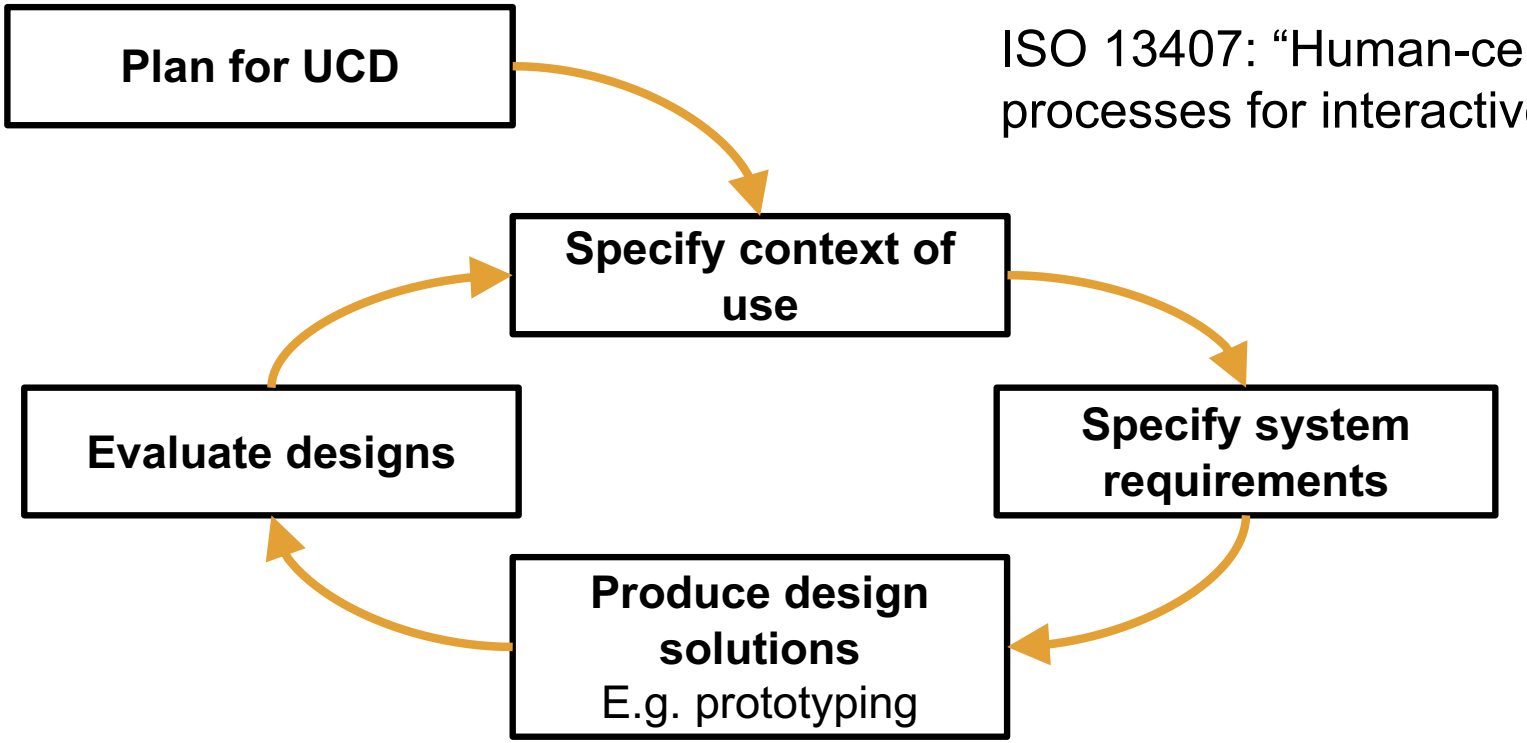
Collaborative environments:

- Multiple users instead of just one
- ShrEdit shareable text editor (Dourish & Bellotti 1992), precursor to Google Docs

Weiser 1991: Ubiquitous computing:

- Computers disappear literally and conceptually from our attention

1990s: Usability engineering & User-centred design (UCD)



ISO 13407: “Human-centred design processes for interactive systems”

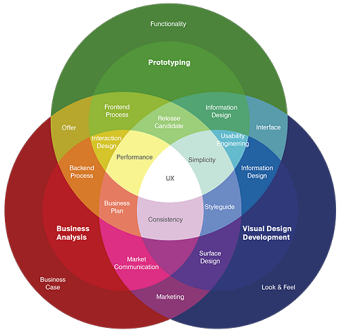
ISO 9241-11: Usability = satisfaction, efficiency, effectiveness

Nielsen: Learnability, efficiency, memorability, errors, satisfaction

2000s: Mobile interaction, social media, mixed reality, UX, AI, ethics, …

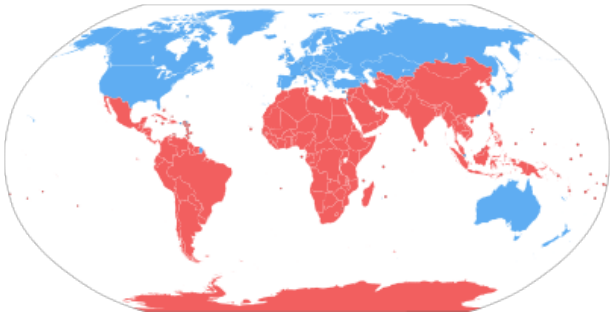
Mobile interaction

Social media

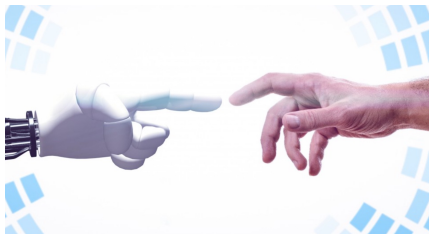


User experience

New forms of interaction
(e.g., mixed reality)



Ethics and values



Humans and AI

Revisit to the warm-up exercise

Create a list in your group:

- Which systems, apps, and digital services you may interact with during your everyday life?
- Consider different times of the day, different acitivities

Aim for heterogeneity:

- Direct vs. indirect interaction
- Single user vs. cooperative settings
- Voice, touch, visual
- Conflicts, opportunities

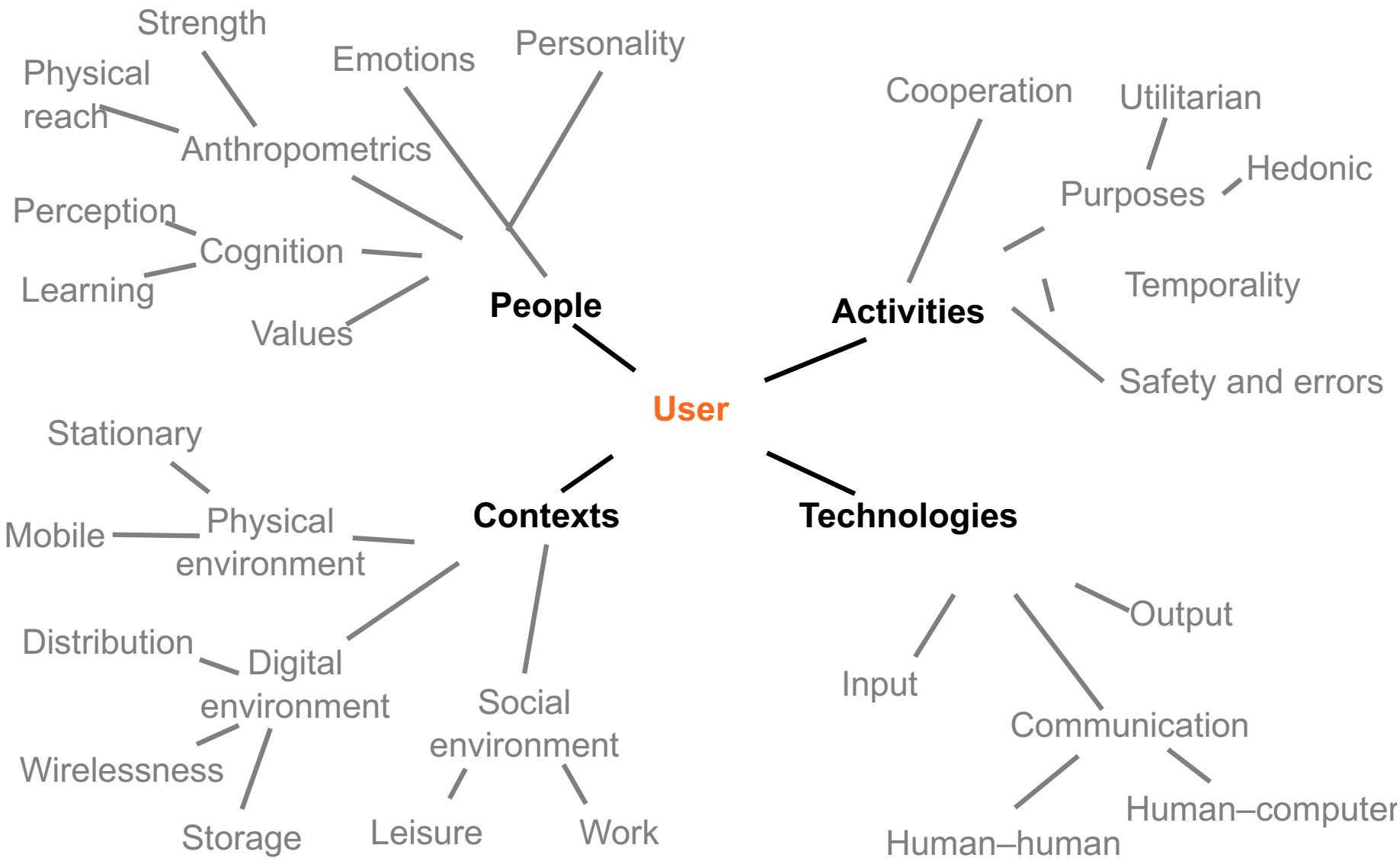
Write your list down

- We'll return to it later
- Be ready to discuss it

Compare the list contents and the following slide contents:
Is something forgotten in your list of in the presentation?

Did you find anything that is missing?

Multi-disciplinarity of human-centred approach



The ”PACT” framework (Benyon: Designing interactive systems)

Requirements from an IxD expert

There is need for both generalists and specialists

- Product concept design, user studies in a lab / in the wild, UI/UX design, management, …
- Graphic design, prototyping, gesture recognition, computer vision, user's intention prediction, …

Attitude and mindset:

- Appreciation of users
- Toleration of open-endedness
- Grounding of decisions on knowledge and empirical data
- Solution-orientedness
- Cooperation and appreciation of multi-disciplinarity

Discussion before lunch

Your interests in IxD

Questions

Any other matters

After lunch:

- Introduction to F-formations by Andrés Lucero (together with the other Split: https://aalto.zoom.us/j/69634488002)
- Brainstorming about your group's project topic + discussion
- More detailed orientation to this week's task

[F-formations lecture]

This week’s group project task

F-formations based analysis of a chosen context

Discussion within groups

What context would you like to research?

You'll use this week's work as the starting point for the following weeks

- 1 User research
- 2 Google Design Sprint
- 3 Interaction prototyping pt. 1
- 4 Interaction prototyping pt. 2
- 5 User evaluation (small A/B test)
- 6 Wrapping up

15 minutes discussion

- What activities or contexts interest you?
- Can you find one that interests everyone in your group?
- If you cannot find one context, what are the top 2 contexts?

Joint discussion about the topics

From every group:

1. Summarize your discussion
2. Which contexts and activities did you talk about?
3. Do you have a decision, or do you have two alternatives?

Topics selected/mentioned:

11:

12:

13:

14:

15:

16:

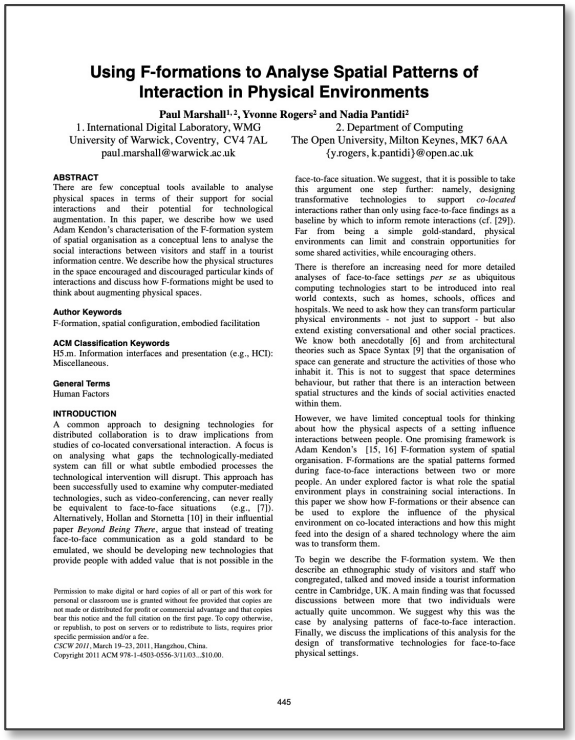
To-dos for Friday

User research:

1. Make a plan for field visits to your chosen context:
   e.g. who goes where, how do you gather data, how do you go through your data
2. Carry out the observations.
   Every group member needs to participate.
3. When you go through the data, you can search for e.g.
   a) things that make you curious or interested,
   b) things that happen repeatedly,
   c) things where people have problems or show clever solutions
   d) things where people differ in the same task
4. Present your observations on Friday (10 minutes)

Read the background material (see the next slide)

This week's reading material



Using F-formations to Analyse Spatial Patterns of Interaction in Physical Environments

Paul Marshall[1, 2], Yvonne Rogers[2] and Nadia Pantidi[2]

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ABSTRACT
There are few conceptual tools available to analyse physical spaces in terms of their support for social interactions and their potential for technological augmentation. In this paper, we describe how we used Adam Kendon's characterisation of the F-formation system of spatial organisation as a conceptual lens to analyse the social interactions between visitors and staff in a tourist information centre. We describe how the physical structures in the space encouraged and discouraged particular kinds of interactions and discuss how F-formations might be used to think about augmenting physical spaces.

Author Keywords
F-formation, spatial configuration, embodied facilitation

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Human Factors

INTRODUCTION
A common approach to designing technologies for distributed collaboration is to draw implications from studies of co-located conversational interaction. A focus is on analysing what gaps the technologically-mediated system can fill or what subtle embodied processes the technological intervention will disrupt. This approach has been successfully used to examine why computer-mediated technologies, such as video-conferencing, can never really be equivalent to face-to-face situations (e.g., [7]). Alternatively, Hollan and Stornetta [10] in their influential paper *Beyond Being There*, argue that instead of treating face-to-face communication as a gold standard to be emulated, we should be developing new technologies that provide people with added value that is not possible in the face-to-face situation. We suggest, that it is possible to take this argument one step further: namely, designing transformative technologies to support *co-located* interactions rather than only using face-to-face findings as a baseline by which to inform remote interactions (cf. [29]). Far from being a simple gold-standard, physical environments can limit and constrain opportunities for some shared activities, while encouraging others.

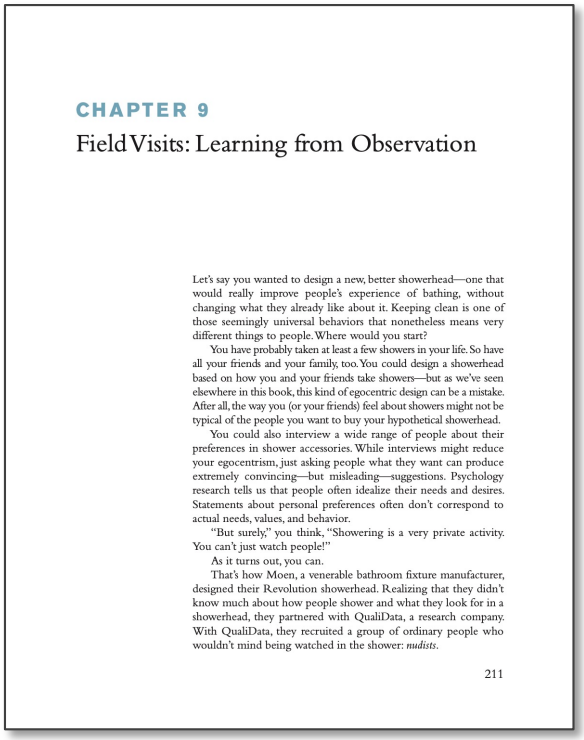
There is therefore an increasing need for more detailed analyses of face-to-face settings *per se* as ubiquitous computing technologies start to be introduced into real world contexts, such as homes, schools, offices and hospitals. We need to ask how they can transform particular physical environments - not just to support - but also extend existing conversational and other social practices. We know both anecdotally [6] and from architectural theories such as Space Syntax [9] that the organisation of space can generate and structure the activities of those who inhabit it. This is not to suggest that space determines behaviour, but rather that there is an interaction between spatial structures and the kinds of social activities enacted within them.

However, we have limited conceptual tools for thinking about how the physical aspects of a setting influence interactions between people. One promising framework is Adam Kendon's [15, 16] F-formation system of spatial organisation. F-formations are the spatial patterns formed during face-to-face interactions between two or more people. An under explored factor is what role the spatial environment plays in constraining social interactions. In this paper we show how F-formations or their absence can be used to explore the influence of the physical environment on co-located interactions and how this might feed into the design of a shared technology where the aim was to transform them.

To begin we describe the F-formation system. We then describe an ethnographic study of visitors and staff who congregated, talked and moved inside a tourist information centre in Cambridge, UK. A main finding was that focussed discussions between more that two individuals were actually quite uncommon. We suggest why this was the case by analysing patterns of face-to-face interaction. Finally, we discuss the implications of this analysis for the design of transformative technologies for face-to-face physical settings.

CSCW 2011, March 19–23, 2011, Hangzhou, China.

Marshall et al. (CSCW 2011)



CHAPTER 9

Field Visits: Learning from Observation

Let's say you wanted to design a new, better showerhead—one that would really improve people's experience of bathing, without changing what they already like about it. Keeping clean is one of those seemingly universal behaviors that nonetheless means very different things to people. Where would you start?

You have probably taken at least a few showers in your life. So have all your friends and your family, too. You could design a showerhead based on how you and your friends take showers—but as we've seen elsewhere in this book, this kind of egocentric design can be a mistake. After all, the way you (or your friends) feel about showers might not be typical of the people you want to buy your hypothetical showerhead.

You could also interview a wide range of people about their preferences in shower accessories. While interviews might reduce your egocentrism, just asking people what they want can produce extremely convincing—but misleading—suggestions. Psychology research tells us that people often idealize their needs and desires. Statements about personal preferences often don't correspond to actual needs, values, and behavior.

"But surely," you think, "Showering is a very private activity. You can't just watch people!"

As it turns out, you can.

That's how Moen, a venerable bathroom fixture manufacturer, designed their Revolution showerhead. Realizing that they didn't know much about how people shower and what they look for in a showerhead, they partnered with QualiData, a research company. With QualiData, they recruited a group of ordinary people who wouldn't mind being watched in the shower: *nudists*.

Goodman et al. Observing the User Experience (2nd ed.), Ch. 9

Guide for accessing publications:
https://blogs.aalto.fi/writingaboutdesign/2020/12/11/how-to-get-access-to-articles-that-are-not-open-access/

Tutor meetings

Book a time that suits everyone in you group:

https://doodle.com/poll/wyykzxbe7ubhbci4?utm_source=poll&utm_medium=link

“First come, first serve”

Where is it permitted to photograph people?

What does the law say?

https://www.minilex.fi/a/rikoslaki-ja-kuvaaminen :

“As a general rule, permission is not required in public places, but in all private places one must always have permission.”

“Filming is considered permitted on streets, squares, forests, or other similar public places. Common places include schools, libraries, shopping malls, as well as lobby and waiting areas at metro stations and airports.”

(English translations courtesy of Google Translate)

Open discussion

Are there unclear issues?

Do you wish to know more about something?

See you in the tutor meetings and on Friday!

And enjoy the user research in the wild!