



Human-Computer Interaction

2024/2025

Lecture Class 1

Introduction to HCI
Course Information

Outline

- Introduction to HCI
- Course Information
- Assessment
- Bibliography

...and we need to talk about Assignment 3!

Let's talk about serious things...

Let's talk about **stoves...**

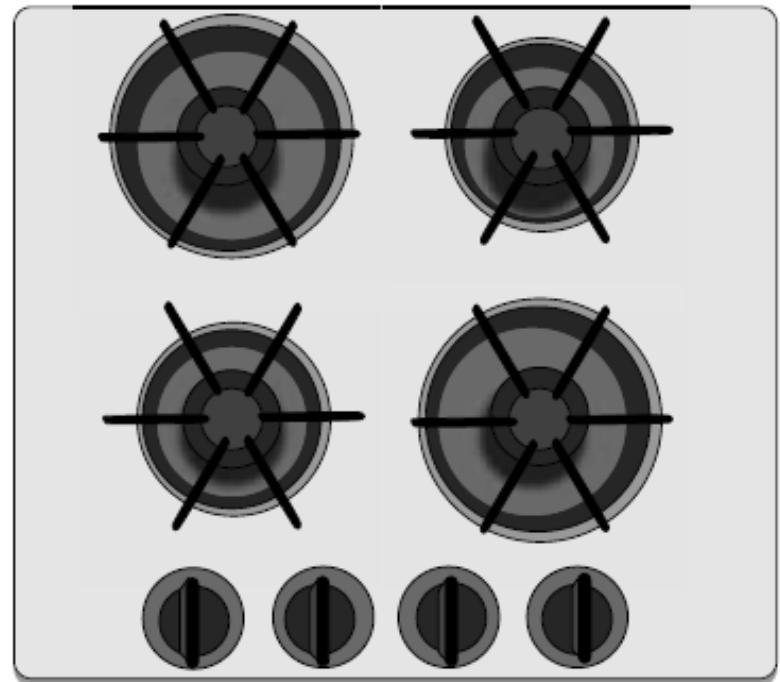
Stoves are for cooking,
boiling, frying, baking,
heating, simmering,
grilling, roasting, ...

We need to: Turn burner
on, turn burner off, adjust
burner intensity. The end.



But...

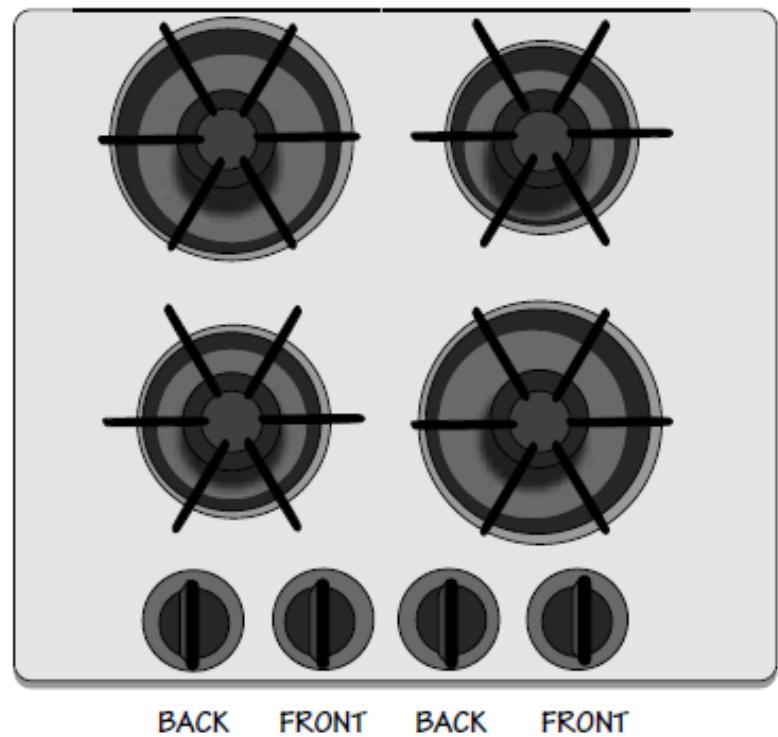
What dial corresponds to what burner?



But...

What dial corresponds to what burner?

We can add labels to them

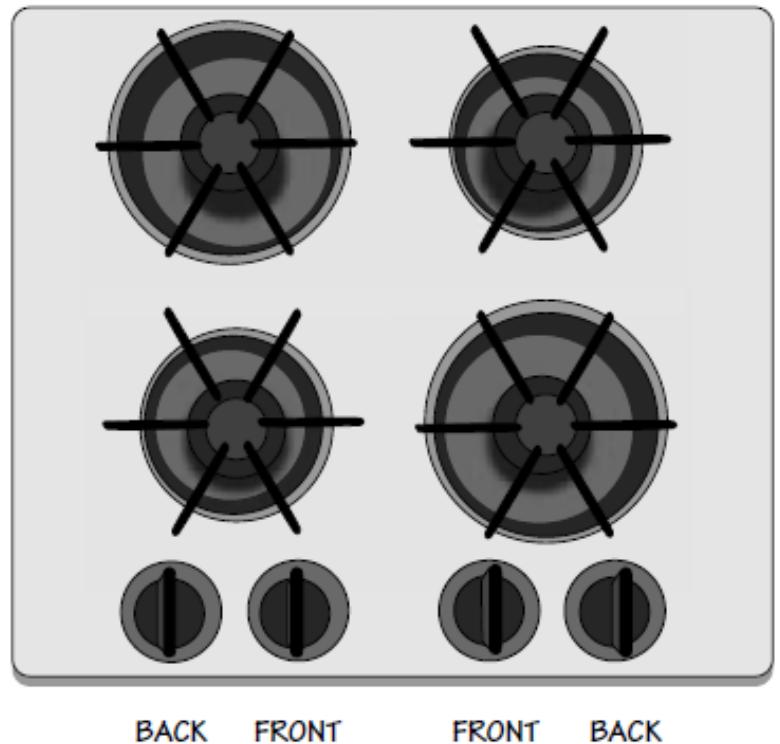


But...

What dial corresponds to what burner?

We can add labels to them

We can even make it slightly easier to understand



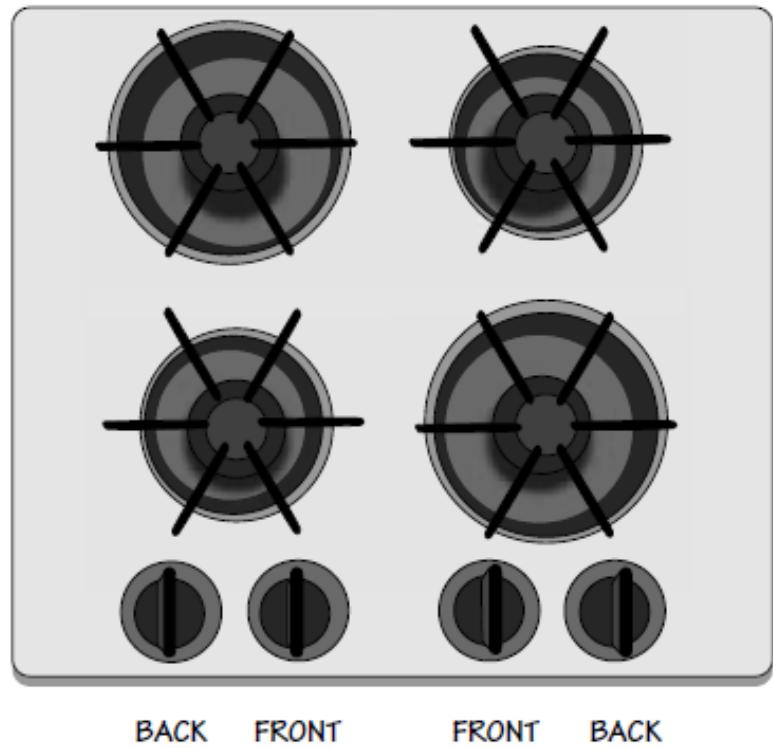
But...

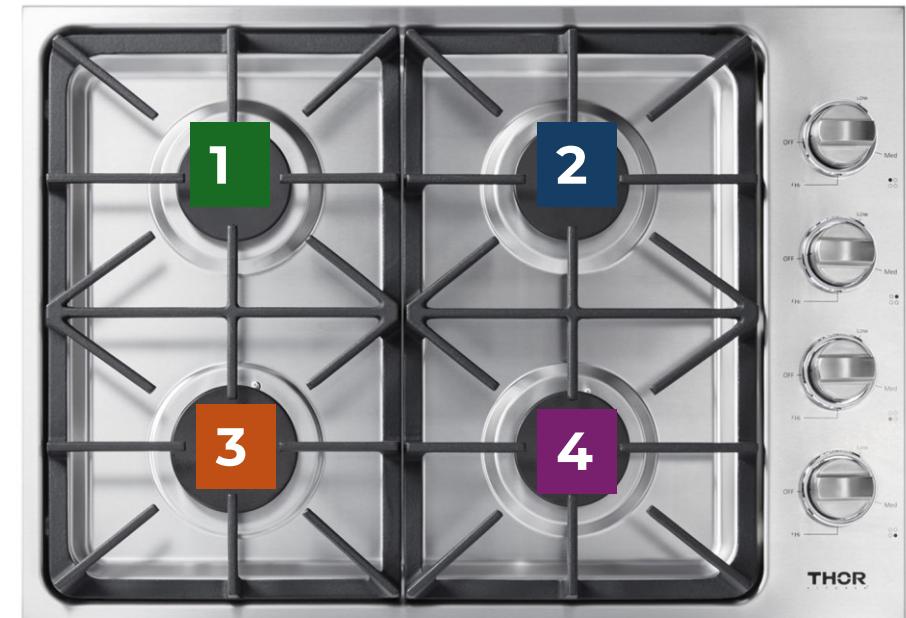
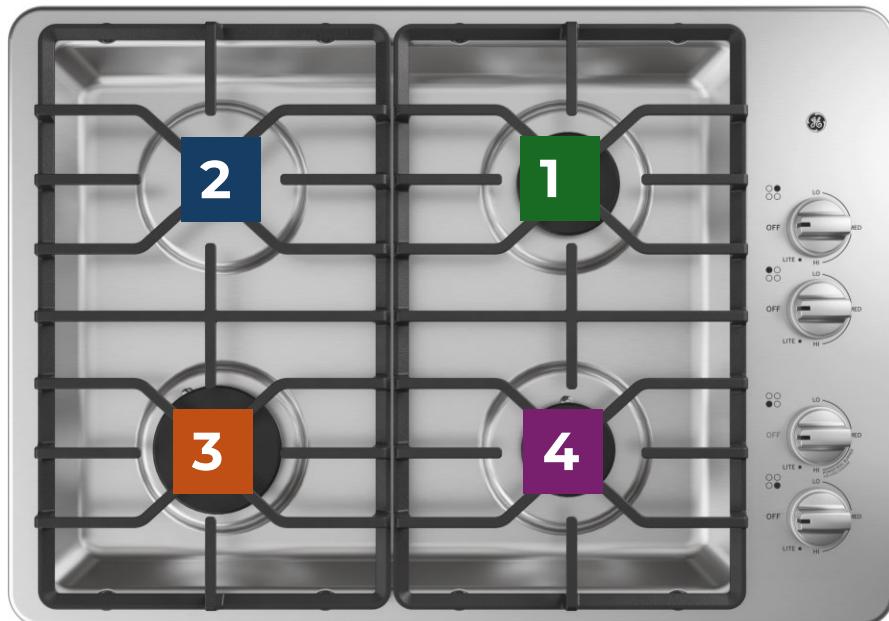
What dial corresponds to what burner?

We can add labels to them

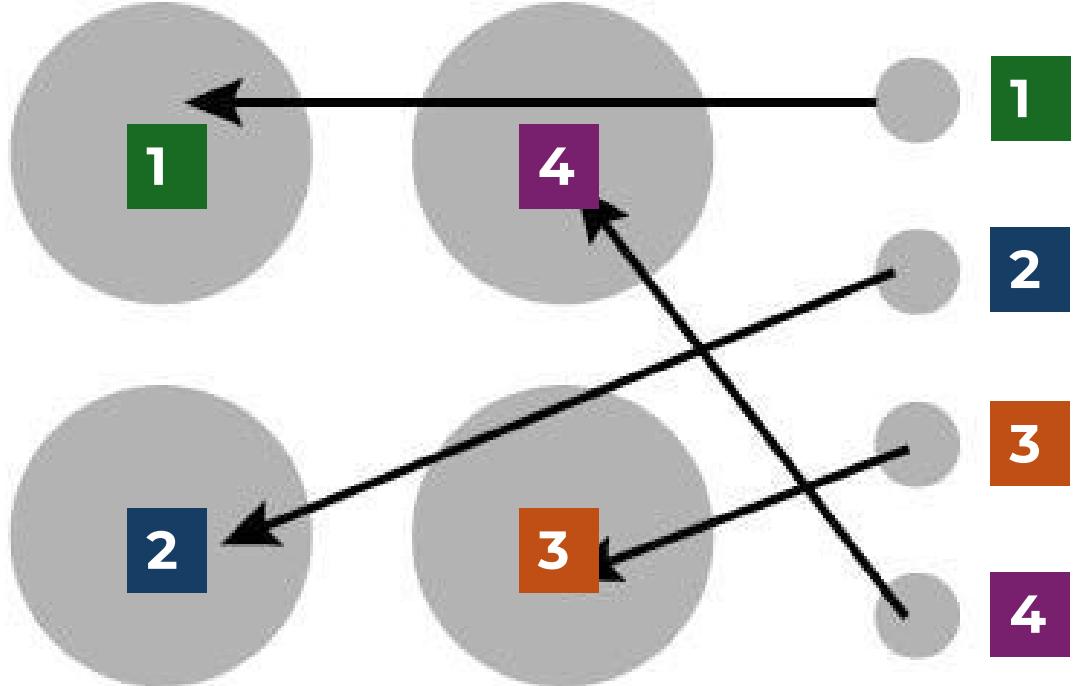
We can even make it slightly easier to understand

Not perfect, but we can manage





Oh, it is not a standard...



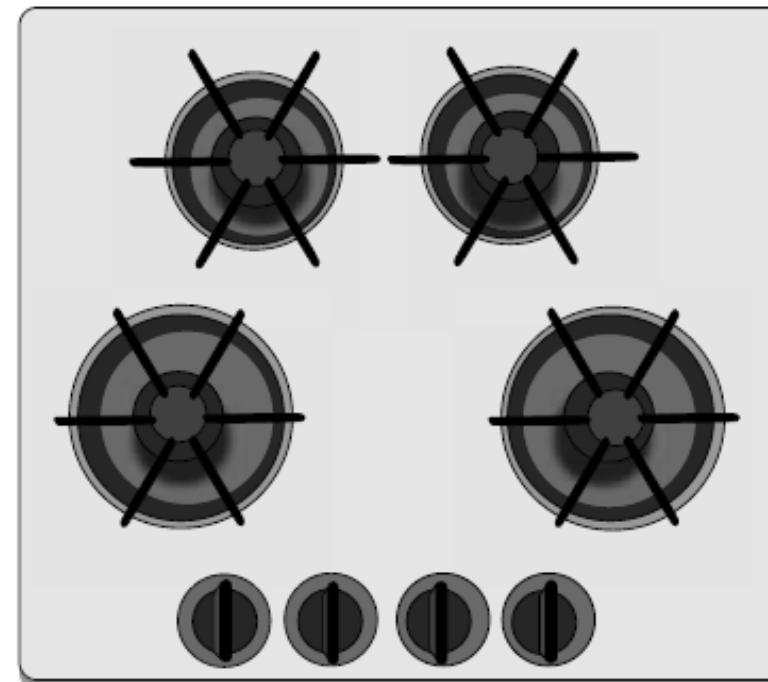
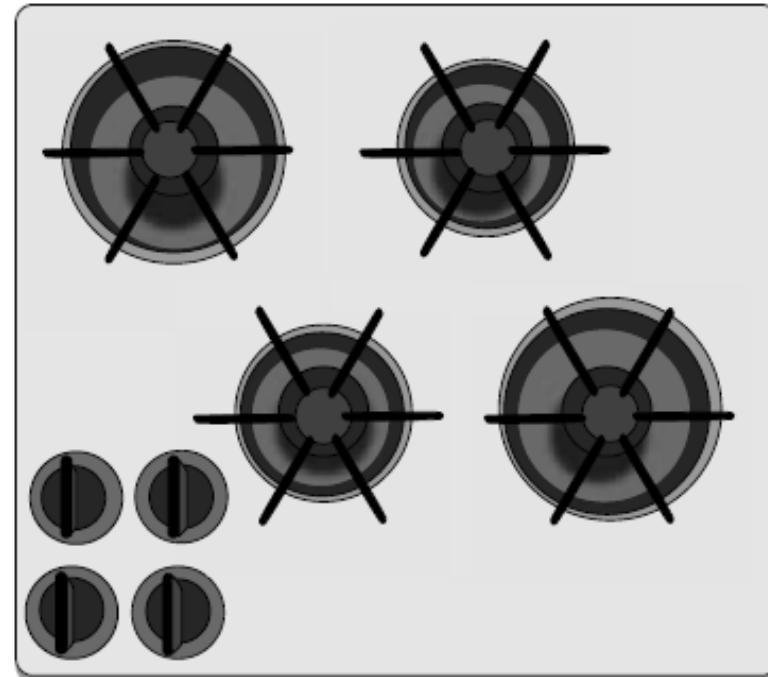
Ok, It is not easy, but we can read the labels



The Labels

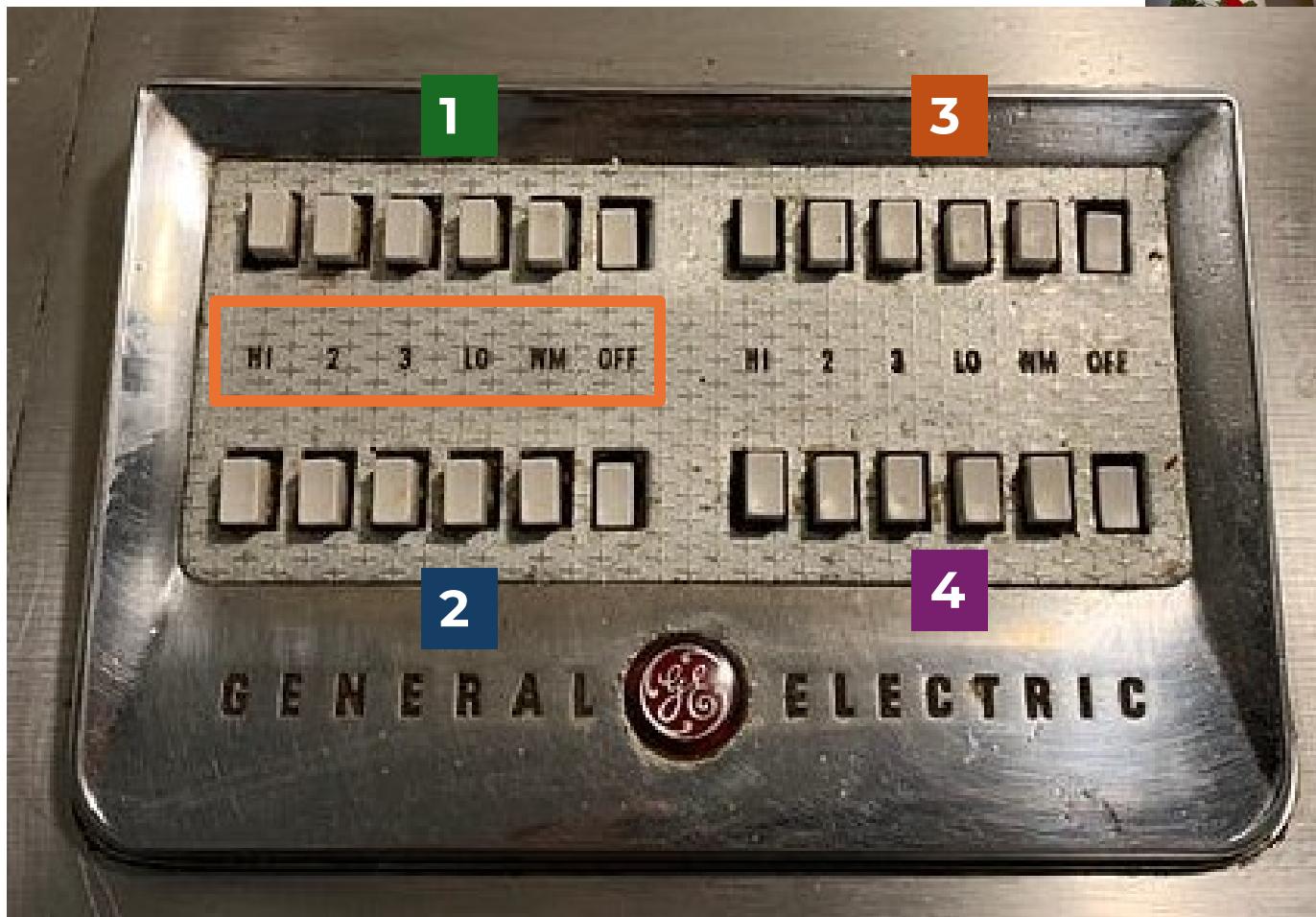


We can help the user
make the mapping





Proper mapping is such a simple approach with a strong impact on ease of use



With proper mapping
nothing can go... hmm
Hi, 2, 3, Lo, hm, off ??

My dog can turn on the stove and has started two fires. I created these to keep her from turning them



https://www.reddit.com/r/functionalprint/comments/yp4vgo/my_dog_can_turn_on_the_stove_and_has_started_two/

A **stove** is a rather **simple equipment**, it has been **around for decades**, and its interaction design **keeps failing**.

You know (or can imagine) what happens with computer applications...

That is why studying human-computer* interaction
makes sense for an engineer!

So, where do we start?

* yes, we will move away from stoves...

From problems to solutions

Instead of focusing on the technology, we first properly define the **problem and context**.

A solution is not good because it is very sophisticated. It is good when it solves the **problem in the required context***

So, where does it start?

Users

* Yes, I said this before but it's important.

Is it the same to develop for any user?



Human Factors

Human senses and cognition have characteristics that determine or limit what we can perceive and process





Users have different
abilities and motivations

We need to know who are the **users**, their characteristics, and what motivates them

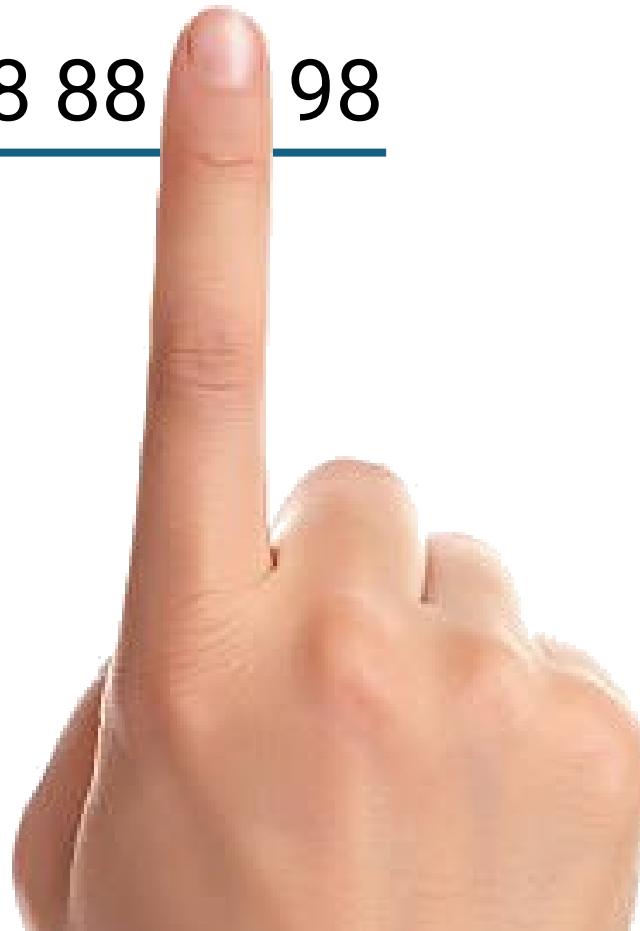
Is it the same to use a system
in a train station or at home?



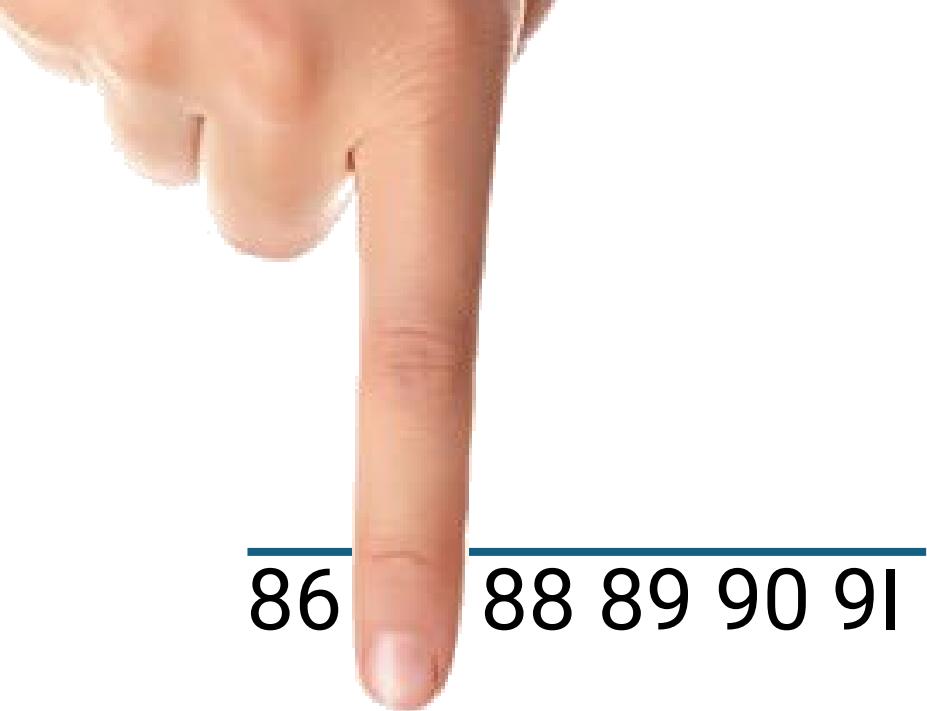
Sometimes...

16 06 68 88

98 ?



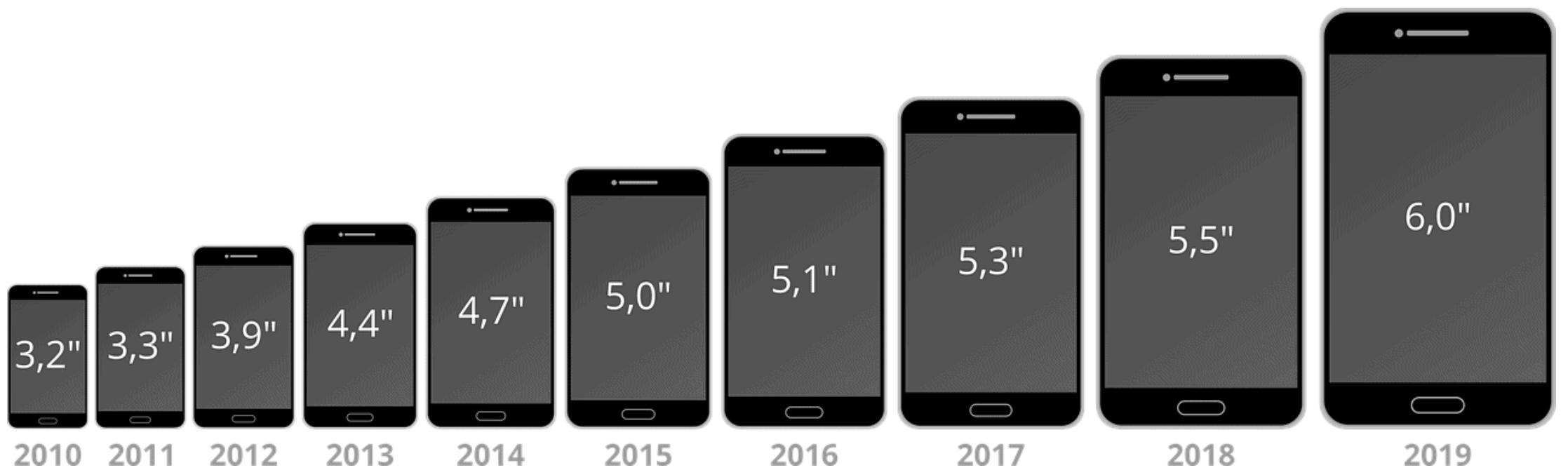
... problems don't seem to
have an immediate
solution...



... but a change in perspective may provide a better grasp of what is needed.

We need to understand the **contexts/scenarios** where our system will be used

And after understanding the context, how do we choose the technologies?





Gestures





Conversational User Interfaces

Immersive Environments



We need to choose **the platform and modalities** that best adapt to the task and contexts

...not just because they are trendy



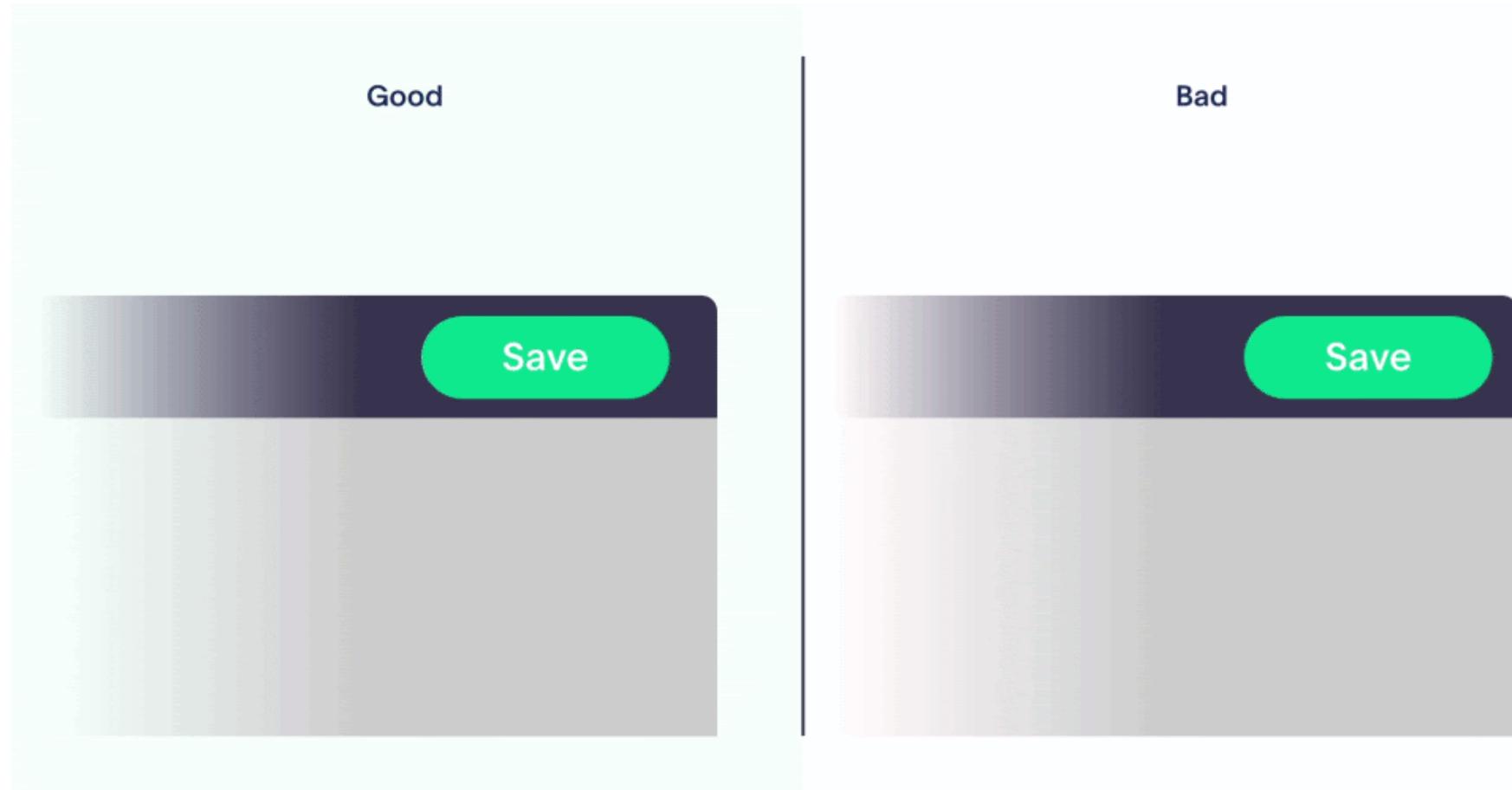
Now we just need to design the interface.
What can go wrong?

Everything

But some mistakes can be avoided by looking into good practices



Simple design rules can make a difference



Moving forward, moving backwards



<https://ellis.fyi/>

Following simple design guidelines can make a difference



Material You

A screenshot of the Interaction Design Foundation website. The header includes the foundation's logo, a tree icon, and the text "INTERACTION DESIGN FOUNDATION". The top right corner shows the time (9:41 AM), battery level (100%), and signal strength. Below the header, there is a section titled "ABOUT US" with the text: "The Interaction Design Foundation is a 14-year old non-profit community founded in Denmark. Learn [more about our community](#), become a [personal coach](#), or [come work with us](#). CONNECT WITH US! Send us an email at hello@interaction-design.org or through our [online contact form](#). Or find us on: [Facebook](#) [Twitter](#) [Google+](#) [LinkedIn](#). STAY IN TOUCH Join 48,605 designers and get our [weekly design tips](#) in your inbox." A circular seal for the Interaction Design Foundation is visible in the bottom right corner.

Friction

We need to understand the **design principles** that make good interfaces and apply them

Is my system good?

- When is my system good?
- How do I measure this?
- When do I check it?



Is the system usable*?

Do users understand it?

How can it be better?

* You will learn about what this means, in this course.



We need to work with users to **evaluate** and improve our designs



I will take care of it. I'll build you just the right thing!

I would like to have a sofa where I can sit comfortably, at night, to read and rest.





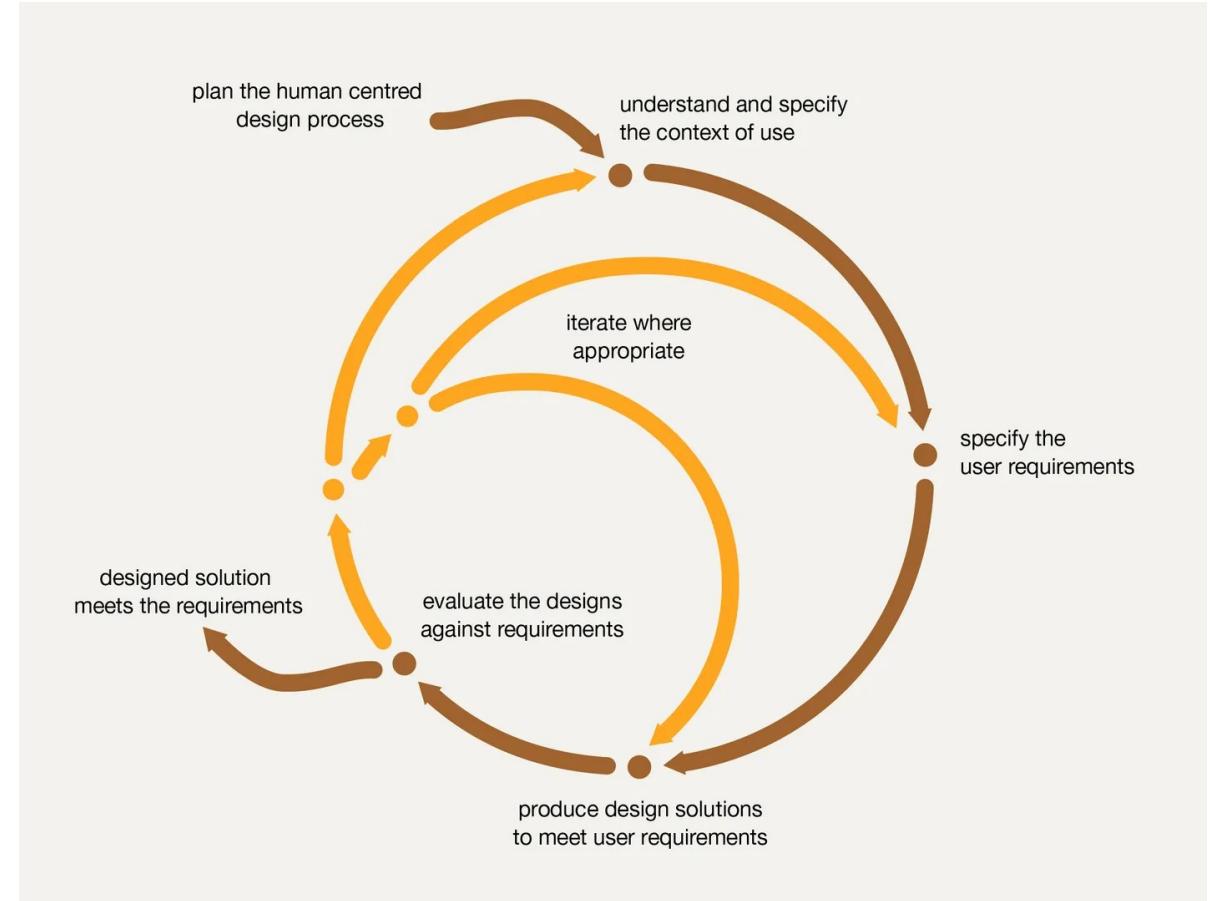
Here! Test it to
check if anything is
missing!



We should not design a complete solution in one go. We need to **iterate** and adjust development based on feedback

And doing all this has a name

Iterative Human-centred Design and Development



Human-Centred Design

Human-Centred Design is an iterative problem-solving approach that **prioritizes user needs, behaviours, and experiences**. It involves **research, ideation, prototyping, and testing** to create intuitive, accessible, and effective solutions, while considering real-world contexts and constraints.

The Human-Computer Interaction Course

or how you will start caring and love interaction design



“the HCI discipline investigates and tackles **all issues related to the design and implementation** of the interface between humans and computers. “

“It expanded from early graphical user interfaces to include **myriad interaction techniques and devices**, multi modal interactions, ..., and a host of emerging ubiquitous, handheld and context aware interactions”

Carroll, John M., “[Human Computer Interaction - brief intro](#)”. In: Soegaard, Mads and Dam, Rikke Friis (eds.). "The Encyclopedia of Human-Computer Interaction, 2nd Ed.". Aarhus, Denmark: The Interaction Design Foundation.

Interaction and Interface

“**interaction** refers to an abstract model by which humans interact with the computing device for a given task”

“**interface** is a choice of technical realization (hardware or software) of such a given interaction model”

Kim, 2015

Goals

Understand what is the Human-Computer Interaction field

Recognize the importance of the User Interface (UI) of an interactive system;

Acquire knowledge of the fundamental concepts, methods and techniques for the:

- design
- implementation
- evaluation of Interactive Computer Systems

Team

- Beatriz Sousa Santos
 - bss@ua.pt
- Bernardo Marques
 - bernardo.marques@ua.pt
- Paulo Dias
 - paulo.dias@ua.pt
- Samuel Silva
 - sss@ua.pt - coordinator

Classes

Lectures

fundamental concepts; methods to support practical assignments; article presentation and discussion

Lab classes

design, implementation and evaluation of user interfaces (UIs) and interactive systems; participation in user studies (if possible)

Attending Lectures and Lab Classes

Attending lectures will help you in several ways as addressed topics will support practical assignments

Attending lab classes is mandatory and presences will be registered formally. If you don't have the minimum required presences, you will not pass the course

Working Students must contact sss@ua.pt during the first two weeks of the semester

		weekdays					
#	date	M	T	W	T	F	class topic / task
1	10 feb			TP1	TP1		The HCD lifecycle
			P0		P0		Intro + Groups + Project ideas
2	17 feb			TP2	TP2		The User
			P1		P1		Competitors + Heuristic Eval. + HCI SWOT
3	24 feb			TP3	TP3		Mental and Conceptual Model + Other methods for Design and Evaluation
			P2		P2		The Users and Context: Personas + Scenarios + HTA
4	3 mar			TP4	TP4		From scenarios to requirements
			P3		P3		Requirement analysis
5	10 mar			TP5	TP5		Prototyping
			P4		P4		Presentations
6	17 mar			TP6	TP6		Usability principles and paradigms
			P5		P5		Presentations

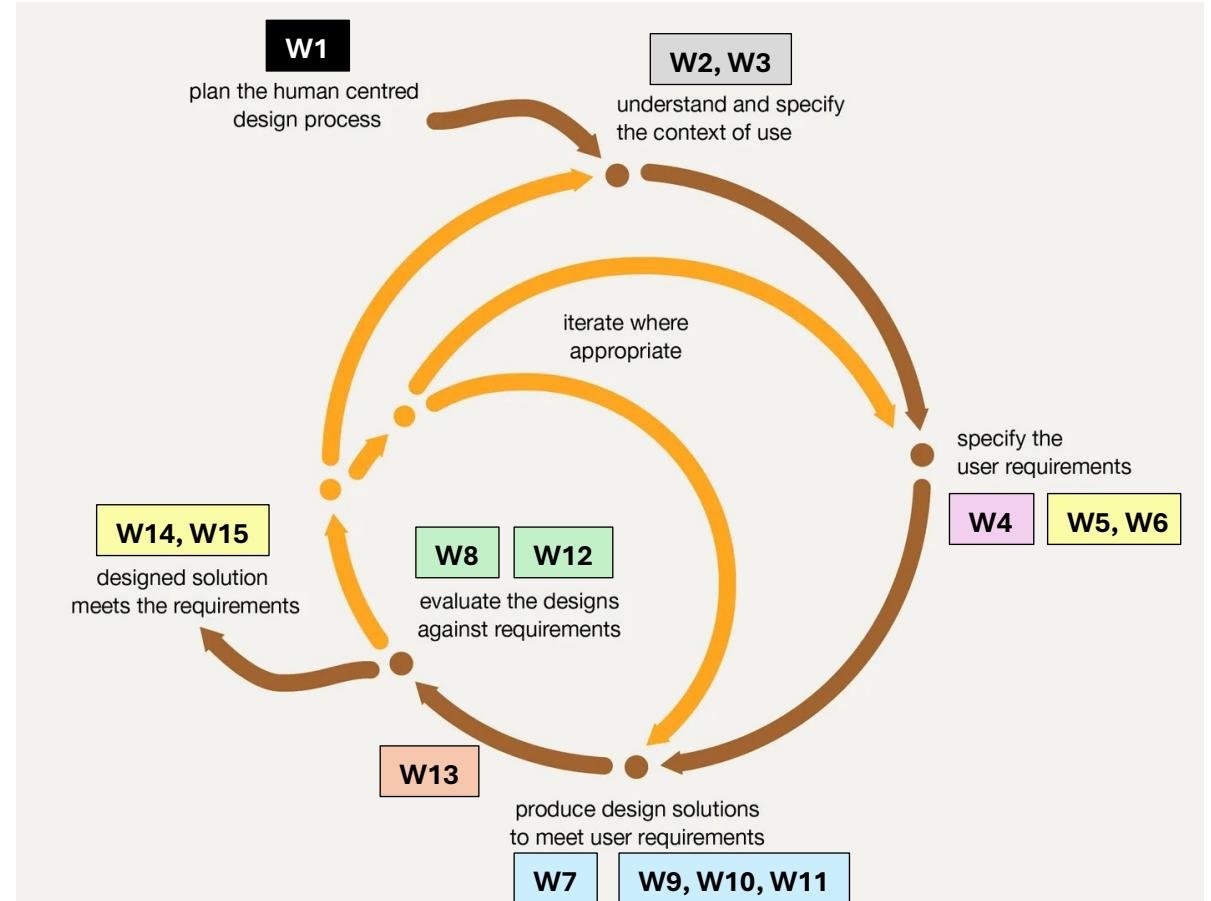
		weekdays							
#	date	M	T	W	T	F	class topic / task		
7	24 mar			TP7	TP7		Interaction styles and menus	2 articles	
			P6		P6		Desing low fidelity prototype + evaluation protocol		
8	31 mar			TP8	TP8		Screen layout and colour	2 articles	
			P7		P7		Low fidelity prototype evaluation		
9	7 apr			TP9	TP9		Input devices	3 articles	
			P8		P8		Project development		
10	14 apr			TP9b	N.C.		6 articles		
			P8b		N.C.		Project development		
11	5 may			TP10	TP10		Usability evaluation	2 articles	
			P9		P9		Project development		
12	12 may			TP11	TP11		Interaction Styles - Direct Manipulation + Touch + Gestures		
			P10		P10		Functional prototype evaluation		

		weekdays					
#	date	M	T	W	T	F	class topic / task
13	19 may			TP12	TP12		3D User Interfaces
			P11		P11		Analyse, refine, report

14	26 may			TP13	TP13		Voice User Interfaces	2 articles
			P0		P0		Final Presentations	
15	2 jun			TP14	TP14		4 articles	Wrap-up
			P13		P13		Final Presentations	

Around the Semester in HCD

- The semester weeks map onto the iterative HCD approach
- TP classes will give you the concepts; you will apply them in labs





Assessment

Assessment

TP

- Exam (45%)
- Article Presentation (10%)

P

- 1st assignment (15%)
- 2nd assignment (30%)

Minimum mark in each component (TP / P): 7.5 / 20

Assessment TP

- **Exam** (45%)
 - Exam season
 - Multiple choice + true/false
- **Article Presentation** (10%)
 - Chosen from suggested conferences
 - **10 min.** presentation
 - Groups of **2** students

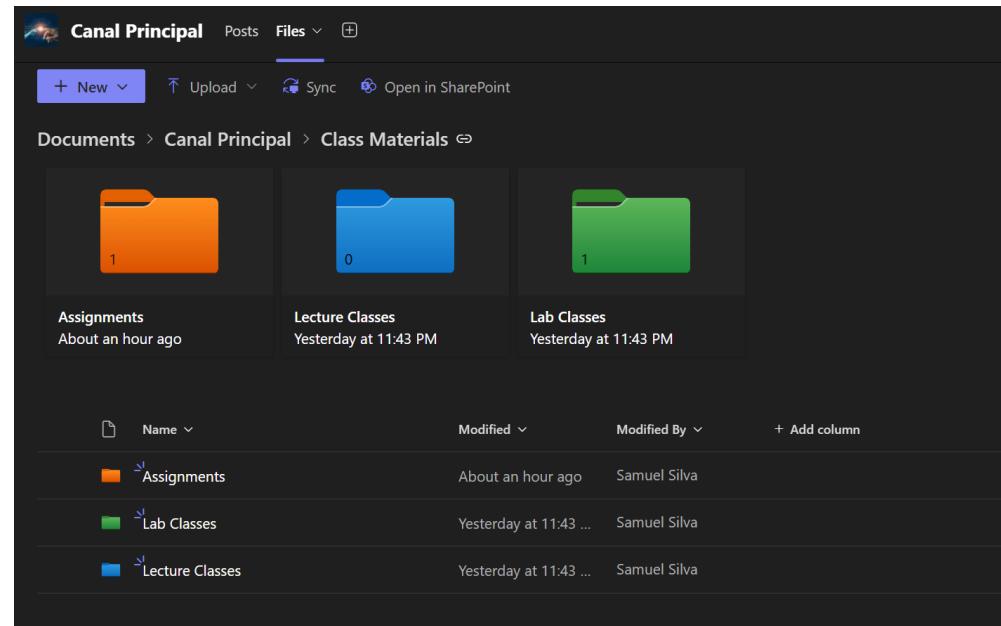
Assessment P

- **Assignment 1 (15%)**
 - Requirement Analysis for practical project
 - Adopting a HCD approach
 - Presented and discussed in-class
 - Groups of 3
- **Assignment 2 (30%)**
 - Design, development, and evaluation of practical project
 - Presented and discussed in-class
 - Same groups of 3

Class Materials

All materials will be made available in Teams

Teams Group



The screenshot shows a Microsoft Teams document library interface. At the top, there's a header with a profile picture, the team name "Canal Principal", navigation links for "Posts" and "Files", and a search bar. Below the header are buttons for "+ New", "Upload", "Sync", and "Open in SharePoint". The breadcrumb navigation shows "Documents > Canal Principal > Class Materials". The main area displays three folder icons: an orange folder labeled "Assignments" (1 item, modified "About an hour ago"), a blue folder labeled "Lecture Classes" (0 items, modified "Yesterday at 11:43 PM"), and a green folder labeled "Lab Classes" (1 item, modified "Yesterday at 11:43 PM"). Below these, a table lists the folder details with columns for Name, Modified, and Modified By. The table shows three rows corresponding to the folders above.

Name	Modified	Modified By
Assignments	About an hour ago	Samuel Silva
Lab Classes	Yesterday at 11:43 ...	Samuel Silva
Lecture Classes	Yesterday at 11:43 ...	Samuel Silva

Bibliography



Bibliography

List of recommended bibliography can be found in Teams

Includes many entries with content available online or in electronic format



Bibliography (selected)

- Jennifer Preece, Helen Sharp, Yvonne Rogers, Interaction Design : Beyond Human-Computer Interaction, John Wiley & Sons Inc, 2019 [[oreilly](#)]
- Alan Cooper, About Face: The Essentials of Interaction Design, 4rd Edition, John Wiley and Sons, 2017 [in Teams]
- The Encyclopedia of Human-Computer Interaction, 2nd Ed. [[online](#)]
- Nielsen Norman Group – articles [[online](#)]

Assignment 3

Article
Presentation



Selecting an article

Go into Teams, to the Assignments folder, enter folder for

Assignment 3

Go to the folder

Conference Proceedings

There is a PDF for each of the conferences
with all articles inside

Available Conferences

- Automotive User Interfaces and Interactive Vehicular Applications '24
- CHI-PLAY Companion '24
- ACM Conversational User Interfaces
- Human-Robot Interaction 24
- IEEE VR 24 Workshops
- Interactive Media Experiences 24
- ISMAR-adjunct '24
- Interactive Surfaces and Spaces '24
- Mobile CHI 24



ISS Companion '24

Companion Proceedings of the Conference on

Interactive Surfaces and Spaces

Until March 7th for everyone!

- Select article + spare (in case first was already chosen)
article should have **more than 4 pages and less than 7**
- Take note of each article's **DOI** (e.g., 10.1109/TVCG.2021.3101545)
- Register choice in a form using article DOIs
Links will be available shortly

You need to choose up to this date even if you present at the end of the semester

Afterwards

- Read the paper presentation guidelines (available in Teams, **Assignment 3** folder)
- Prepare a 10 min presentation (~10 slides)
- Submit the slides in Teams before presenting!



Now, let's talk about dates

- Volunteers to present a paper in three weeks (**5th-6th March**)?
- Volunteers will have top priority in selecting the paper
- And will have 10% of the course done soon in the semester