

Human-Computer Interaction

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Technology is everywhere



It plays important roles



Interaction failures
can have a strong impact...



Interaction can be performed
in a wide range of ways



Interacting with technology
that is hidden in our homes

The Human Computer Interaction Discipline

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





The Witchcraft of Cooking an Interactive System

- ▶ How is it like to design and develop a novel interactive system?
- ▶ What do you think?
Where do we start?

Two ideas: What's the difference?

- ▶ “Frank’s new smartphone supports gesture recognition, so he is going to make a system for his mom to send him messages with gestures when she is riding her bike.”
- ▶ Peter often visits new cities and needs some guidance. For that, he uses maps on is smartphone. But, last week, he was in London following a map and almost was hit by a car. John made a system that provides Peter instructions by vibrating the phone.

Human Centred Technologies

- ▶ **It should not** be the technology that first drives the design. Having a new technology cannot be the reason to develop an interactive system
- ▶ **We need to focus on the needs** of those using the interactive system
- ▶ **This is how we will do it, in this module: humans first!**

Users

Is it the same to
develop for any user?



Human Factors



The human senses have properties and limitations



Users are not all the same
They have different abilities

“

We need to know who are
the users and their
characteristics

”

How many apps do you have installed
that you don't use?



Why?

A photograph of a man in a striped shirt sitting at a desk. He has two white sticky notes with black eye icons covering his eyes. He is resting his chin on his hand, looking down thoughtfully. On the desk in front of him is an open laptop and a small lamp. The background is dark.

What do Users Want?
What is their motivation?

What do Users Need?

“

**We need to understand
what motivates the user**

”

Where and How is the System Used?

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



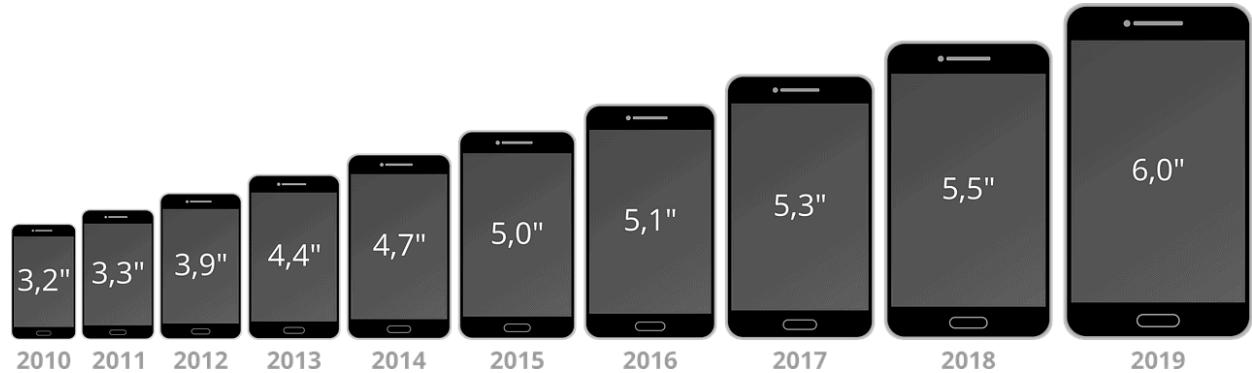
“

We need to know the
scenarios where our
system will be used

”

Device Characteristics

- ▶ Is it the same to use a map application in your car, on a smartphone, or on a desktop computer?
Why?
- ▶ **Interaction is not just for smartphones and computers!**



Interaction Modalities

- ▶ Are all forms of interaction good for all contexts?
- ▶ Can modalities be combined?



**“We need to know what are
the characteristics of the
platform to adopt and how
they influence design ”**



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

Everything

But some mistakes can be avoided by looking into good practises



Usability Principles

Good

Select an action

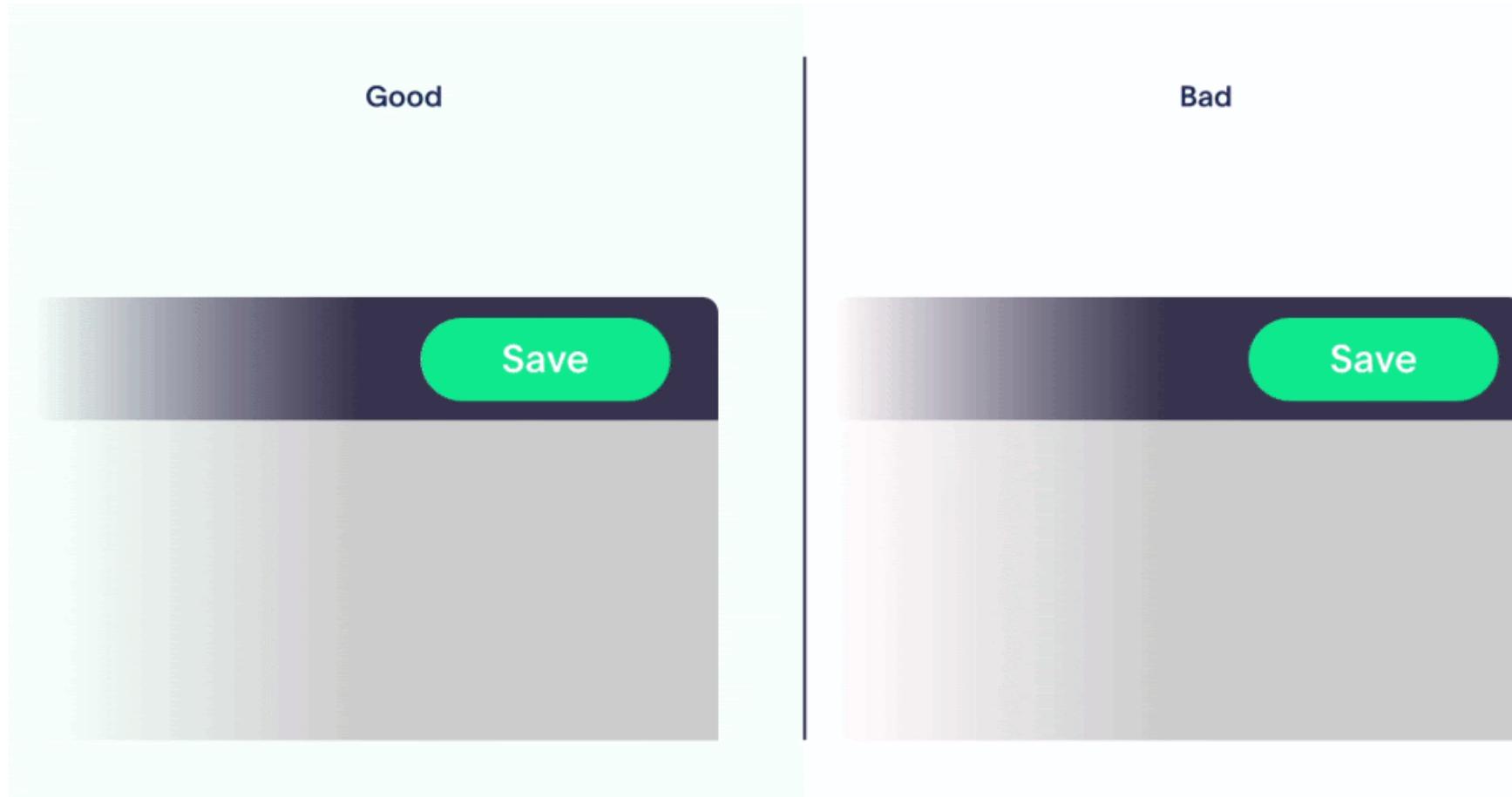
- Available Actions
- Load
- Send to Location
- Turn Off
- Raise Lift

Bad

Select an action

- Load
- Unload
- Send to Location
- Turn On
- Turn Off
- Raise Lift

Usability Principles



Usability Principles

Good

First Name

Caitlynn

First Name

Haapala

Email

cait48gmail.com



Oops! This doesn't look like a valid email address. Try adding '@' before the domain name. [Accepted email formats](#)

Bad

validation fault - format does not match database.
Invalid entry.

First Name

Caitlynn

First Name

Haapala

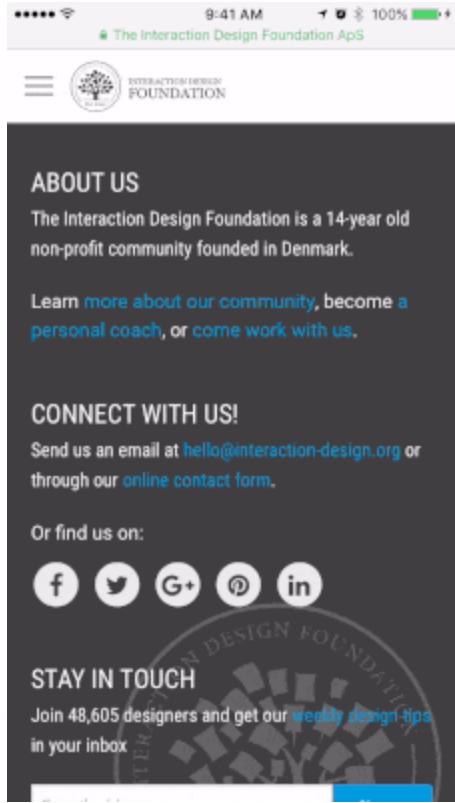
Email

cait48gmail.com

Sometimes, evolving is getting back to basics



We can learn a lot from simple details



Friction



Material You

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

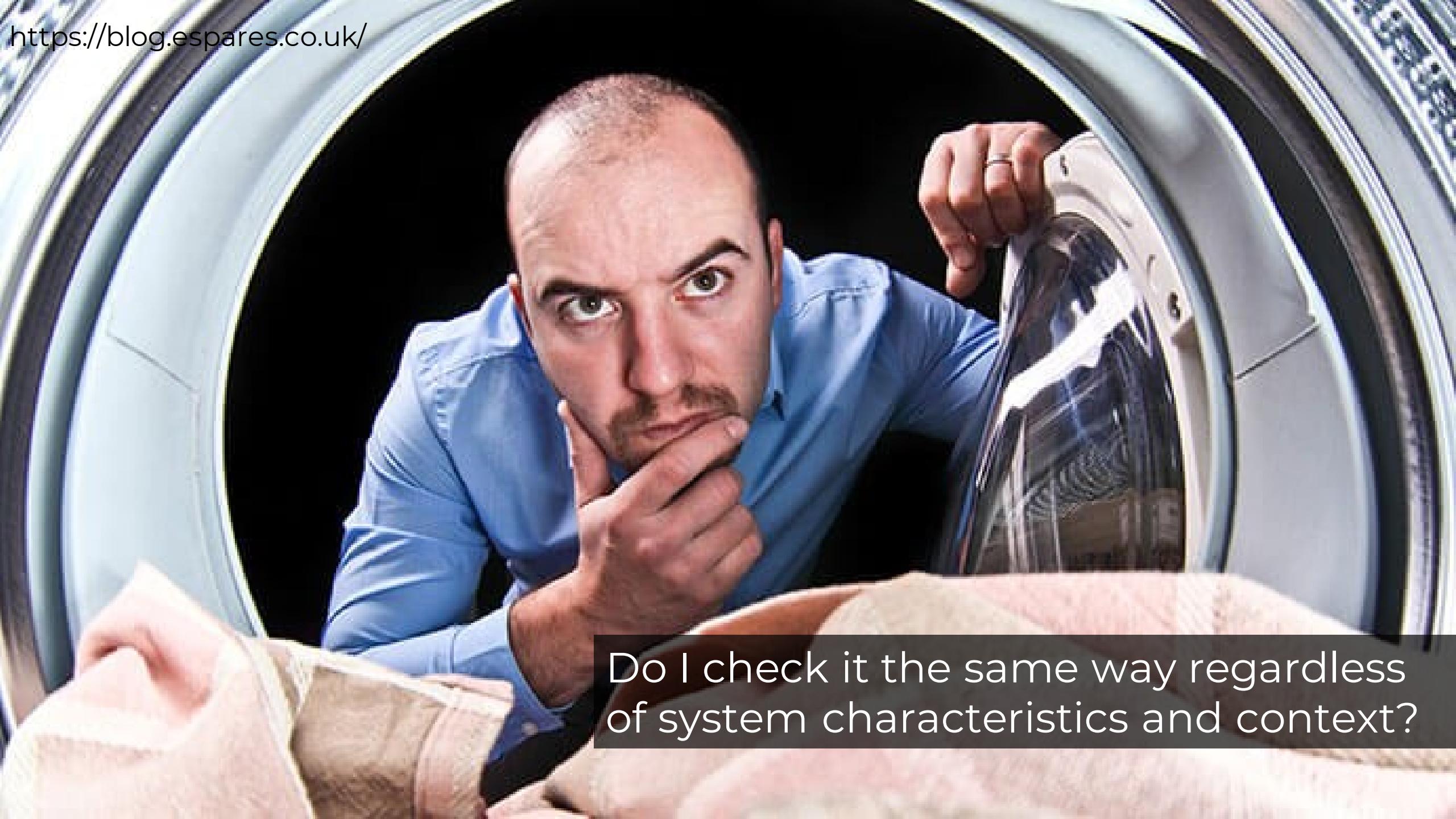
Is my System Good?

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



**Is the system usable?
Do users understand it?**





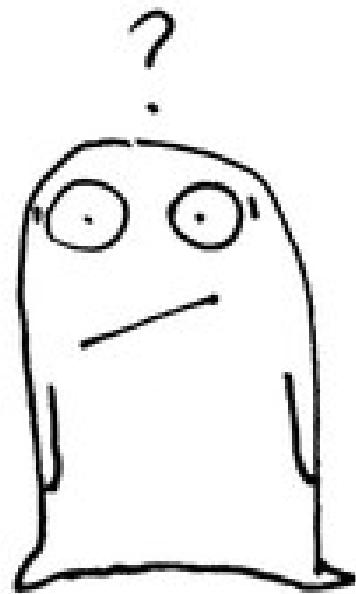
Do I check it the same way regardless
of system characteristics and context?

“

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

”

WHAT AM I
DOING HERE...



What will we be doing
for the next month?

A Month Spent on

- ▶ **Understanding the basic ideas and principles of Human-Computer Interaction**
- ▶ Get an understanding about the **importance of designing good user interfaces**
- ▶ Having a **hands-on contact with the different stages of designing, developing, and evaluating** an interactive system
- ▶ Take the opportunity to **be creative and have fun!**

A photograph of a long, straight asphalt road stretching into the distance under a dramatic sunset sky. The sky is filled with wispy clouds colored in shades of orange, pink, and purple. The road has a double yellow line down the center. In the background, there's a fence on the left and some low hills or fields on the right.

In groups of **5** people,
develop a **small project** where you propose an **idea** for a
novel interactive system and follow the steps up to
having a **validated** non-functional version of your interface

HCI Module

- ▶ **Experiment** with methods that will help you in **several stages** of interactive system design and development:
 - ▶ Characterize your users
 - ▶ Explore how your new system will be used
 - ▶ Define what features the system needs to provide
 - ▶ Know about basic usability principles
 - ▶ Apply methods to have first prototypes
 - ▶ Evaluate how the system serves the users

Lectures

- ▶ **Presentation and discussion of key concepts** and information that will help you complete one more step of your project (~30-40 min.)
- ▶ **Hands-on work**, whether for discussing what you have and/or start your next task (~30-40 min.)

Materials for the Module

► eLearning

- ▶ **Slides** used in class
- ▶ **To do list** until next class
- ▶ **Additional readings** that may help you improve your knowledge and perform your weekly tasks better
- ▶ **Bibliography** (many available online)

elearning.ua.pt



Course Evaluation

Evaluation

- ▶ Each group will have a **logbook** for their project
 - ▶ **Template** provided soon in **eLearning**
- ▶ **Each stage** of the work has a **corresponding section in the log book**
- ▶ The logbook **can be improved** throughout the module
- ▶ **Deliver project logbook for assessment** at the end of the module

Work Outside Class

The goal is that you **learn by making something real**

- ▶ You **MUST** devote some time to this module **outside the class**
- ▶ **3-4h**, per week (each element of the group)

Presence in Classes

- ▶ I strongly advise you to be present during the lectures
- ▶ I will reserve **10% of the evaluation for your participation during discussions** of the work (short moments, every class, when I go by your group)

Task 01

- ▶ Gather in **5-person groups**
- ▶ What is your **idea** for a new interactive system? This will be your **HCI project!**

