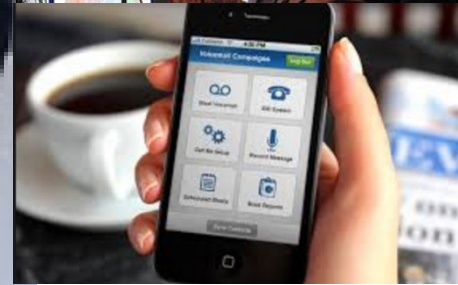**Universidade de Aveiro**
Departamento de Electrónica,
Telecomunicações e Informática

Human-Computer Interaction
2020/21

Beatriz Sousa Santos

Outline

- Introduction

- Course Information

- Lectures and lab classes organization

- Lectures and lab classes schedule

- Assessment

- Bibliography

" 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.
https://www.interaction-design.org/encyclopedia/human_computer_interaction_hci.html

Interaction and Interface

"Roughly speaking, **interaction** refers to an **abstract model** by which humans interact with the computing device for a given task, and an **interface** is a choice of **technical realization (hardware or software)** of such a given interaction model."

(Kim, 2015)

"The interface between humans and computers is harder than ever to define, we can interact with computers just by walking through a public space."

Sellen, A., Rogers, Y., Harper, R., & Rodden, T., "Human Values in the Digital Age", *Communications of the ACM*, *52*(3), March 2009, pp. 58–66

- "What will Human - Computer Interaction (HCI) be like in 20 years?

- "That question is important because HCI ... has a pivotal part to play in the 21st, when computers will become so pervasive that how humans interact with them will be a crucial issue for society"

http://research.microsoft.com/en-us/um/cambridge/projects/hci2020/reading.html

About this course:

Main objectives you should attain:

- understanding of what is the Human-Computer Interaction field

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

- knowledge of the fundamental concepts, methods and techniques for the:
- design
- implementation
- evaluation of Interactive Computer Systems

Course information

- Web
  - http://sweet.ua.pt/bss
  - More materials in moodle.ua.pt

- Team:
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    - pma@ua.pt
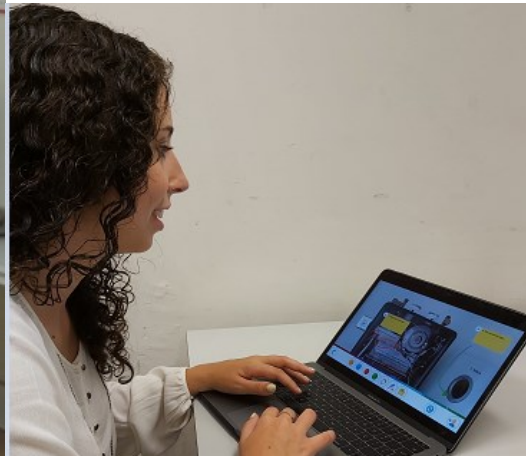 - Fábio Barros
    - fabiodaniel@ua.pt

Lectures and Lab classes

Lectures - slides, discussion and paper presentation

Lab classes – design, implementation and evaluation of User Interfaces (UIs) and interactive systems

- participation in user studies (if possible …)

You will have the opportunity to:

Learn the fundamentals of this pivotal field

Attend the presentation of cutting edge research

Test and use new interaction and display equipment

Develop for various platforms

Perhaps participate in user studies

Attending lectures and lab classes

- Attending lectures will help you in several ways.

- Attending face-to-face lab classes is mandatory, will be registered formally and you cannot pass if you do not have the minimum required (80%).

- Working students must contact faculty members during the two first weeks of the semester

Lectures (subject to minor changes)
Wednesdays

- **1-** Introduction to the course
- **2-** Definition of HCI, User Interface (UI), Usability and UX principles and paradigms
- **3-** The user: the Human Information Processing System (HIPS)
- **4-** The user (cont). Mental models and conceptual models
- **5-** Interaction Styles: Menus and direct manipulation
- **6-** Other Interaction styles
- **7-** Introduction to User-Centered Design and S/W patterns for UIs
- **8-** Models for UI design (user models, task analysis)
- **9-** Models for UI design (cont)
- **10-** Screen layout. Color models and color usage
- **11-** Evaluation methods (more detailed study)
- **12-** Input devices
- **13-** Output devices
- **14-** Introduction to 3DUI: Mixed, Virtual and Augmented Reality
- **15-** Paper presentation

Lab classes (subjected to minor changes)

- Introduction to the Lab classes.

- **Assignment n.1 (evaluate an interactive system) (groups of 3 students)**

- Evaluation of UIs/Interactive systems using analytical methods

- **Presentation and discussion of assignment n. 1.**

- **Assignment n.2 (develop a prototype of an interactive system) (3 students)**

- Human-Centered approach to design and develop interactive systems: requirements analysis; prototyping and evaluation; prototyping and evaluation

- Introduction to Android Studio

- Introduction to Web programming

- **Presentation and discussion of assignment n. 2**

Lectures – online all semester
Lab Classes – online + face to face

Terça	Quarta	Quinta	
		IHC ANF. V P4 (P)	IHC ANF. V P7 (P)
	IHC E@D-4 TP2 (TP)		
		IHC ANF. V P2 (P)	IHC ANF. V P7 (P)
	IHC E@D-4 TP1 (TP)		
IHC 04.2.03 04.2.07 P3 (P)		IHC ANF. V P1 (P)	IHC ANF. V P6 (P)
IHC E@D-4 OT1 (OT)			

Pandemic situation

Zoom sessions:

- Configure your zoom name
- If possible associate a photo to your profile

- If the zoom session end after 40 min, use the same link …

Volunteers for a "IHC students Committee" ?

Devices that can be used in the lab classes

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Assessment

Final Mark -> Exam (50%) + group assignments (50%)

Minimum mark in each component – 7.5/20

- paper presentation (10%) + assignment n. 1 (10%) + assignment n.2 (30%)

- paper from a conference -> 15 min presentation (grous of 2 students)

- assignment n. 1: **evaluation with analytic methods** -> presentation and discussion (groups of 3 students)

- assignment n. 2: design, implementation and test of a interactive prototype following **User Centered Design** -> presentation, demo, discussion
      (groups of 3 students)

Bibliography

- Sharp, H., Preece, J., and Rogers, Y., Interaction Design- beyond Human-Computer Interaction, Wiley, 2019

- Dix, A., J. Finley, G. Abowd, B. Russell, *Human Computer Interaction*, 3rd. ed., Prentice Hall, 2004

- Kim, G. J., Human–Computer Interaction-Fundamentals and Practice, CRC Press, 2015

- Cooper, A. et al.., About Face 4: The Essentials of Interaction Design, 4th ed., Wiley, 2014

- Shneidermen, B., *Designing the User Interface, Strategies for Effective Human-Computer Interaction*, 6th ed., Addison Wesley, 2016

- Soegaard, M. and, Rikke Friis, D.(eds.). "The Encyclopedia of Human-Computer Interaction, 2nd Ed.". Aarhus, Denmark: The Interaction Design Foundation. https://www.interaction-design.org/encyclopedia/interaction_design.html

- Mitchell, P., *A Step-by-step Guide to Usability Testing*, iUniverse, 2007

- Nielsen, J., *Usability Engineering*, Academic Press, 1993

Portuguese bibliography

- Manuel J. Fonseca, Pedro Campos, Daniel Gonçalves, *Introdução ao Design de Interfaces*, FCA, 2012

Moodle Walkthrough

Interacção Humano-Computador

👥 News forum

🔗 Course web page

Zoom links

🔗 TP1 - Wednesday - 13h00-15h00

🔗 TP2 - Wednesday- 9h00-11h00

🔗 OT sessions - Tuesday 19h00-20h00

Assessment

Não disponível

Paper Presentation

📄 Paper selection and presentation guidelines

📄 Suggestions on where to select a paper

🔗 Select a date for Paper Presentation TP1 - Wednesday 13h00-15h00

Select only one time slot and indicate the names of both students

Paper presentation assignment (groups of two students)

- Wednesday 9h-11h – 35 paper presentations

- Wednesday 13h -15h - 35 paper presentations

This year you may read and present papers from one of these conferences

ACM/IEEE International Confer-
ence on Human-Robot Interaction

http://humanrobotinteraction.org/2020/

22nd International Conference on
Human-Computer Interaction with
Mobile Devices and Services

https://mobilehci.acm.org/2020/

March 22nd - 26th

http://ieeevr.org/2020/

- Volunteers to present a paper next week?

Note that:

- Volunteers have absolute priority in selecting the paper

- And will have this assignment done (10% of final mark) soon in the semester !

Until March 18

Each group of two students should:

- select paper (with >=8 pages) from the conference proceedings
        (HRI2020, MobileCHI2020 IEEEVR2020, ISMAR2020)

- indicate the preferred paper via a form and select the date via doodle

- wait for approval of the paper and date (posted on Moodle)

- read the paper presentation guidelines (available at the course web page)

- prepare a 15 min presentation (~15 slides)

- submit the slides to bss@ua.pt before the lecture at the defined date

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

Some Present and Future trends:

Gesture interfaces

Virtual and augmented reality, Mixed reality

Large public displays

Brain-computer interfaces

Human-Robot interfaces

Natural Conversational Speech Interfaces

Affective States and Human-Computer Interactions

...

P Montuschi, P., Sanna, A., Lamberti, L, and Paravati, G., "Human-Computer Interaction: Present and Future Trends," *Computing Now*, vol. 7, no. 9, September 2014
http://www.computer.org/web/computingnow/archive/september2014

Interesting books

- Donald Norman, The design of everyday things, Basic Books, Revised Edition, 2013

- Donald Norman, Emotional Design: Why We Love (or Hate) Everyday Things, Basic Books, 2010
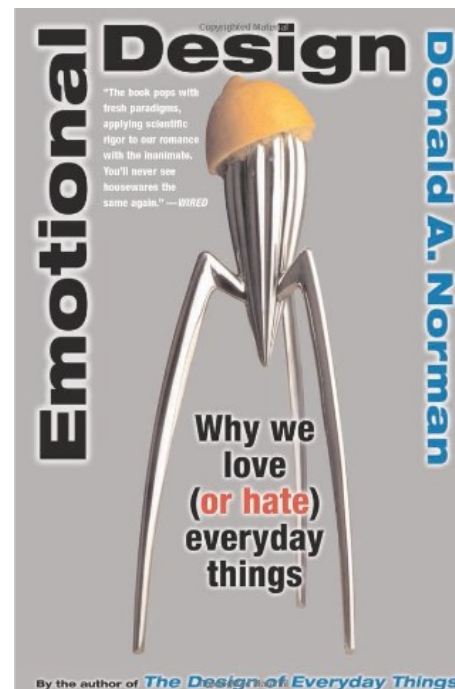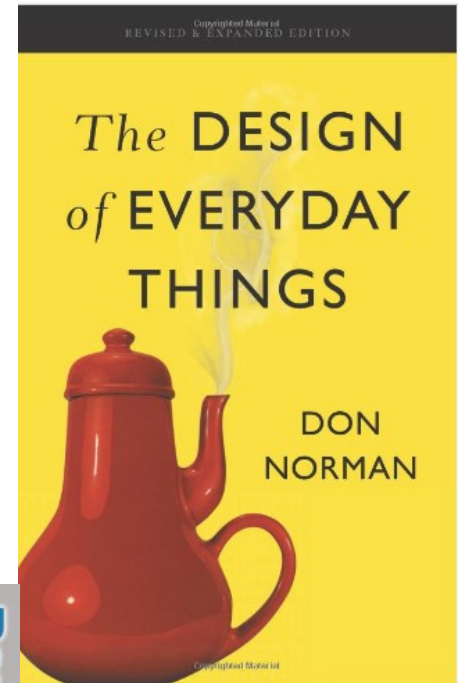
- For next week:

  - Select the presentation dates you prefer via doodle
  - And the papers you prefer via google form
  - Think about two interactive systems/applications to evaluate

Good luck with your work
in this course and have fun!