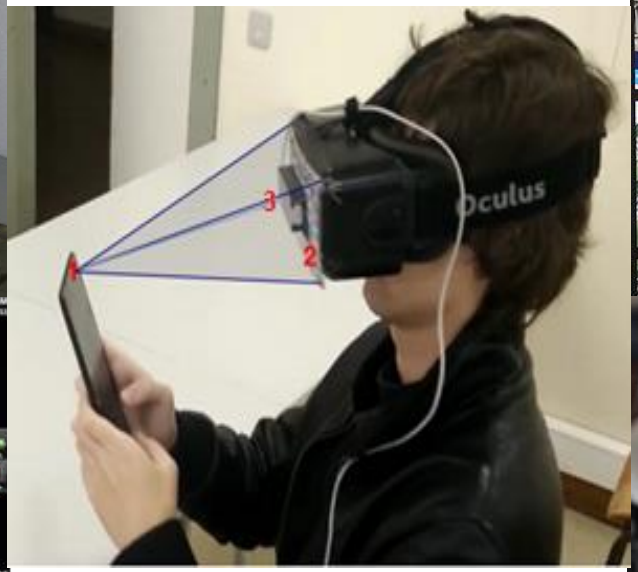
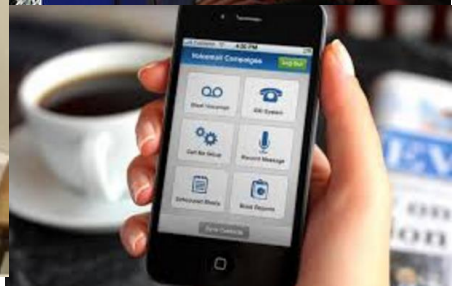
Universidade de Aveiro
Departamento de Electrónica,
Telecomunicações e Informática

Human-Computer Interaction





Beatriz Sousa Santos, 2016/2017

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”

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

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

- "As popular computing has grown, the role of HCI has increased. Most software today is interactive, and code related to the interface is more than half of all code."

- "HCI also has a key role in application design. In a consumer market, a product's success depends on each user's experience with it. Unfortunately, great engineering on the back end will be undone by a poor interface, and a good UI can carry a product in spite of weaknesses inside."

- "Innovation in the product is a nice virtue, but it's an option in terms of marketability. Usability is not."

Canny, J.,The Future of HCI, ACM Queue, Jul.-Aug., 2006, pp.25-32

- "Those of us who deal with user interfaces tend to think primarily in terms of computer programs. But user interface problems in the real world are often worse since the real world is not nearly as malleable as the computer world. An ideal solution, even if we know what it is, might not be practical to implement."

- "The real world is just as much a nuisance to design for as the computer world, and maybe more."

Blinn, J, "User Interface Stories from the Real World", *IEEE Computer Graphics and Applications*, Jan./Feb, 2005, pp.92-93

“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 the year 2020?

- “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 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

- Code:
  - 41549 – 6 ECTS
- Web
  - http://sweet.ua.pt/bss
  - Materials also in moodle.ua.pt
- Responsible:
  - Beatriz Sousa Santos
    - IEETA, room 1.17
    - bss@ua.pt
  - Paulo Dias
    - IEETA, room 0.05
    - paulo.dias@ua.pt
  - Joaquim Madeira
    - IEETA, room 1.11
    - jmadeira@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

You will have the opportunity to:

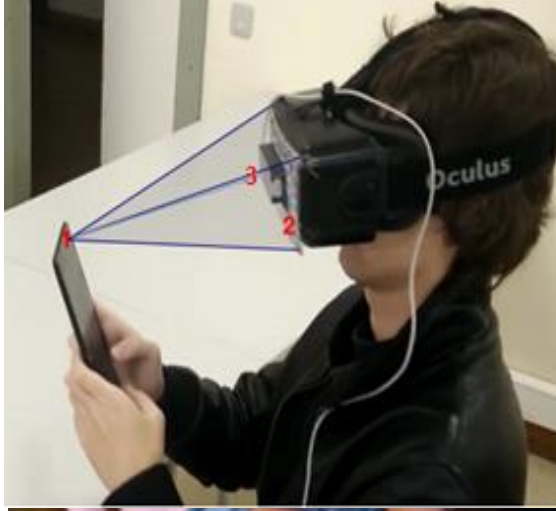
Learn the fundamentals of this pivotal field

Attend the presentation of cutting edge research

Test and use new interaction and display equipment

Develop for various platforms

Participate in user studies and usability tests



Attending lectures and lab classes

- Presence in lectures will help you in several ways.

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

  [Tuesdays -13 classes – must attend 11]

  [Wednesdays, Thursdays - 15 classes – must attend 12]

- Students that have a full time job must contact responsible faculty members during the two first weeks of the semester

Lectures (subject to minor changes)

- **1 (14/02/17)** - Introduction to the course
- **2 (21/02/17) -** Definition of User Interface, Usability principles and paradigms
- **3 (7/03/17) –** The user: the Human Information Processing System (HIPS)
- **4 (14/03/17) -** The user (cont). Mental models and conceptual models
- **5 (21/03/17) –** Dialog Styles: Menus and direct manipulation
- **6 (28/03/17) -** Other dialog styles
- **7 (4/04/17) –** Screen Layout. Color models and color usage
- **8 (18/4/17) –** Introduction to Interactive S/W lifecycle. Models for UI design
- **9 (2/5/17) –** Models for UI design (cont)
- **10 (16/5/17) –** Models for UI design (cont)
- **11 (23/5/17) –** Input and output devices
- **12 (30/6/17) –** Evaluation methods
- **13 (6/6/17) –** Introduction to Virtual and Augmented Reality

Lab classes (subject to minor changes)

- Introduction to the Lab classes
- Evaluation of UIs using analytical methods
- **Assignment n.1 (evaluate an interactive system) (groups of 2x2)**
- Evaluation of UIs using Observation. Usability testing.
- **Presentation and discussion of assignment n. 1. March, 14, 15, 16**
- UI design, Implementation and test
- **Assignment n.2 (develop a prototype of an interactive system) (groups of 2)**
- Introduction to event driven programming - Visual C#
- Introduction to programming for a mobile platform - Android
- **Presentation and discussion of assignment n. 2**

Assessment

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

Minimum mark in each part – 7.5/20

- paper presentation (10%) + assignment n. 1 (5%) + assignment n.2 (35%)

- paper to select from a conference -> 15 min presentation

- assignment n. 1: heuristic **evaluation** -> presentation, demo and discussion

- assignment n. 2: design, implementation and test of a UI following **User Centered Design** -> presentation, demo, discussion and report

Main bibliography

- **Dix, A., J. Finley, G. Abowd, B. Russell, *Human Computer Interaction*, 3rd. ed., Prentice Hall, 2004**
- **Mayhew, D., *The Usability Engineering Lifecycle*, Morgan Kaufmann, 1999**
- 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
- Shneidermen, B., *Designing the User Interface, Strategies for Effective Human-Computer Interaction*, 3rd ed., Addison Wesley, 1998
- Preece, J., Y. Rogers, H. Sharp, D. Benyon, S. Holland, T. Carey, *Human Computer Interaction*, Addison Wesley, 1994
- **Mitchell, P., *A Step-by-step Guide to Usability Testing*, iUniverse, 2007**
- Nielsen, J., *Usability Engineering*, Academic Press, 1993
- Newman, W., M. Lamming, *Interactive System Design*, Addison Wesley, 1995

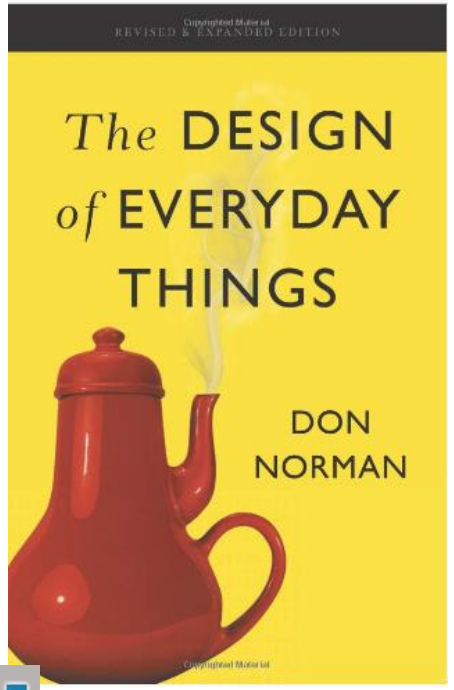
Portuguese bibliography

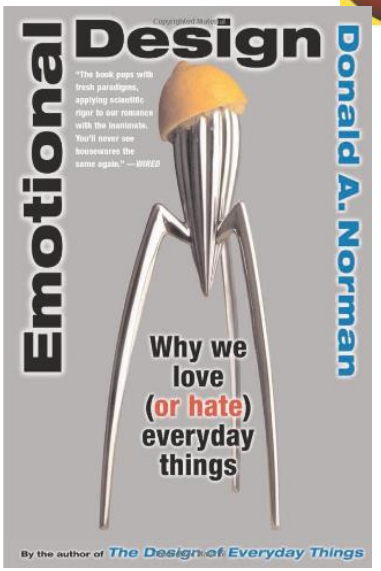
- Manuel J. Fonseca, Pedro Campos, Daniel Gonçalves, *Introdução ao Design de Interfaces*, FCA, 2012

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





Paper presentation assignment (groups of two students)

- Tuesday 9h -11h - 24 paper presentations
- Tuesday 14h-16h – 24 paper presentations

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

MOBILEHCI 2016

http://mobilehci.acm.org/2016/

CHI 2016 #chi4good

http://chi2016.acm.org/wp/

http://humanrobotinteraction.org/2016/

3DUI
IEEE SYMPOSIUM
ON 3D USER INTERFACES

http://3dui.org/2016/

- 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 February 23:

Each group (two students) should:

- select paper (with >=8 pages) from the conference proceedings
  (CHI2016, HRI2016, MObileCHI2016, or 3DUI 2015)

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

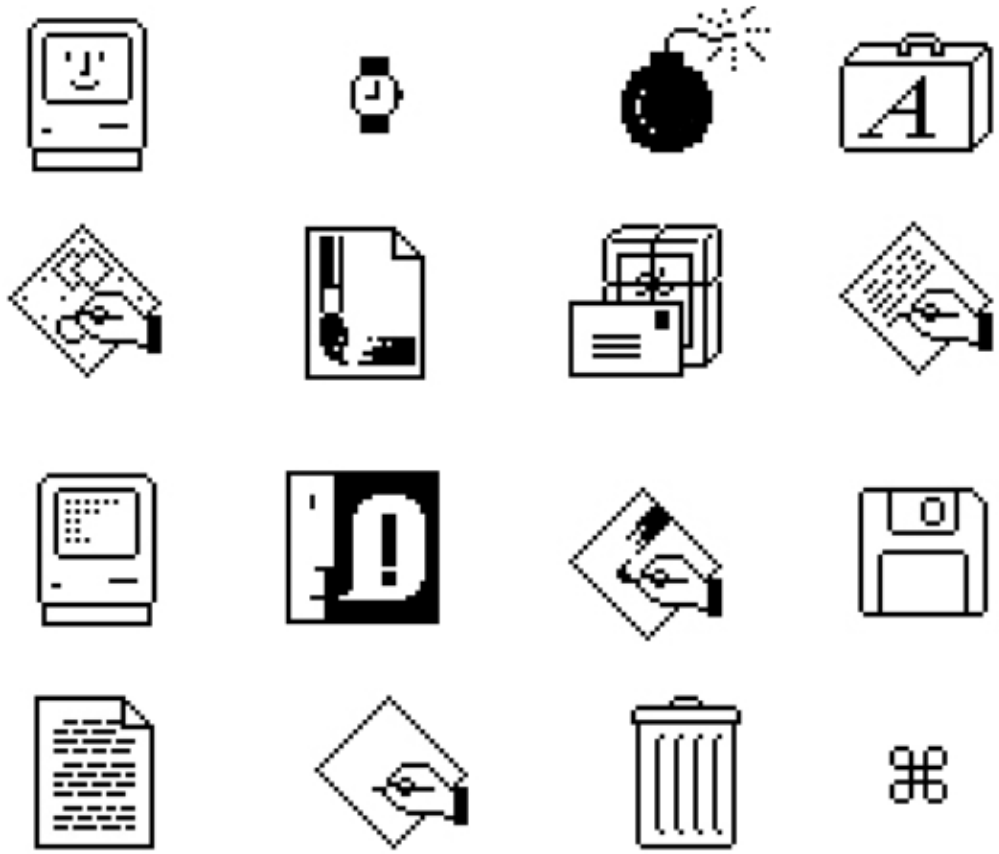
- wait for approval of paper and date (posted on Moodle)

- 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 past of HCI



Brad A. Myers. "A Brief History of Human Computer Interaction Technology." *ACM interactions*. Vol. 5, no. 2, March, 1998. pp. 44-54

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Some Present and Future trends:

Gesture interfaces

Large public displays

Virtual and augmented reality

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

- For the next week:

  - Select the presentation dates you prefer via doodle
  - And the papers you prefer via google form

Good luck with your work !