Human-Computer Interaction

Beatriz Sousa Santos, 2019/2020
Outline

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- Lectures and lab classes schedule
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“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”


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

• “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”

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

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

• Team:
  – Beatriz Sousa Santos
    • bss@ua.pt
  – Pedro Almeida
    • pma@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

• Attending lectures will help you in several ways.

• Attending lab classes is mandatory, will be registered formally and you cannot pass if you do not have the minimum required (80%).
  [Tuesdays - 15 classes – must attend 12]
  [Thursdays - 15 classes – must attend 12]

• 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 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- Dialog Styles: Menus and direct manipulation
- 6- Other dialog styles
- 7- Introduction to the Interactive S/W lifecycle and S/W patterns for UIs
- 8- Models for UI design (cont)
- 9- Models for UI design (cont)
- 10- Screen Layout. Color models and color usage
- 11- Evaluation methods
- 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)**

- Evaluation of UIs using analytical methods

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

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

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

- Introduction to event driven programming - Visual C#

- Introduction to programming using a multi-platform library- Qt

- **Presentation and discussion of assignment n. 2**
Devices that can be used in the lab classes
Assessment

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

Minimum mark in each part – 7.5/20

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

- paper from a conference -> 15 min presentation

- assignment n. 1: evaluation with analytic methods -> presentation, demo and discussion

- assignment n. 2: design, implementation and test of a interactive prototype following
  
  User Centered Design
  -> presentation, demo, discussion
Main bibliography

- Mayhew, D., *The Usability Engineering Lifecycle*, Morgan Kaufmann, 1999
Portuguese bibliography

Interesting books


- Donald Norman, *Emotional Design: Why We Love (or Hate) Everyday Things*, Basic Books, 2010
Paper presentation assignment  
(groups of two students)

- Wednesday 9h-11h – 30 paper presentations

- Wednesday 11h -13h - 30 paper presentations
This year you may read and present papers from one of these conferences:

- [Human-Robot Interaction 2019](http://humanrobotinteraction.org/2019/)
- [Mobile HCI 2019](http://mobilehci.acm.org/2019/)
- [IEEE VR 2019](http://ieeevr.org/2019/)
• 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 28

Each group (two students) should:

- select paper (with \( \geq 8 \) pages) from the conference proceedings (HRI2016, MobileCHI2017, ISMAR2017 or 3DUI 2017)

- 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
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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

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
- Think about two interactive systems/applications to evaluate

Good luck with your work!