

Interação Humano-Computador/ Human-Computer Interaction

LECI, LEI

2023

Informatics/Information Systems

I. Introduction and objectives

This is an introductory course in Human-Computer Interaction intended to expose students to the basic concepts of the field and methods to develop interactive systems. Its main objectives are to:

- 1- emphasize the importance of good user interface and user experience in interactive systems;
- 2- introduce the scientific area of Human-Computer Interaction;
- 3- introduce concepts, methods, tools, techniques and ideas for the design, implementation and evaluation of interactive systems, fostering the capacity of developing interactive systems;

In addition to these specific objectives, this course also intends to foster important general capabilities such as critical thinking, team-work and communication skills.

II. Syllabus

Foundations of Human-Computer Interaction:

- Introduction to the problem: introduction to Human-Computer Interaction, definition of user interface (UI), general usability principles and paradigms;

- User profile: Human Information Processing System, mental models and other relevant characteristics for the Design of interactive systems.

Development of interactive systems:

- Human-centered design of interactive systems: overview of a methodology and methods to be used along the development cycle: to model the user and usage context, as well as analyze the tasks and prototype;

- Interaction styles: a classification, characteristics and applicability of the most used interaction styles, principles and guidelines to their use;

- Input/output devices: existing devices and usability issues; introduction to more specific devices (e.g. head-mounted displays and haptic displays);

- Evaluation methods: analytic methods and methods that involve users, their characteristics and how to select them;

- Introduction to less conventional systems and types of user interfaces (e.g. 3DUI, tangible interfaces).

III. Teaching

Lectures present topics to be addressed, as well as application examples, and include the presentation by the students and discussion of recent conference papers.

Practical classes address interactive systems evaluation and development in two practical assignments. The first assignment, concerning evaluation, involves evaluating an interactive system using analytical evaluation methods (as heuristic evaluation, and cognitive walkthrough). The second assignment, concerning the design of an interactive application follows a human centered approach; its focus is on the requirements analysis, prototyping and evaluation. Assignments include an oral presentation and discussion, as well as a demonstration.

IV. Expected Outcomes

After this course, students should:

- Be aware of the importance of the user interface and user experience (UX) in interactive systems and know the interaction principles and paradigms
- Be aware of the importance of human-centered design and development methodologies
- Know a human centered design methodology, including the main methods, and how to apply it in simple cases
- Know interaction styles and main guidelines to use them correctly in a user interface
- Know the more common input/output devices and their characteristics concerning user experience and be able to select them for a specific case
- Know the main usability evaluation methods; know how to perform a heuristic evaluation and a simple usability test.

V. Assessment

Exam and group assignments.

VI. Main Bibliography

Cooper, A., *About Face: The Essentials of Interaction Design*, 4th edition, John Wiley and Sons, 2014

Dix, A., J. Finlay, G. Abowd, R. Beale, *Human-Computer Interaction*, 3rd edition, Prentice Hall, 2004

Mitchell, P., *A Step by step guide to usability testing*, iUniverse, 2007

Sharp, H., Y. Rogers, *Interaction Design: Beyond Human-Computer Interaction*, 5th edition, Wiley, 2019

Shneiderman, B., C. Plaisant, M. Cohen, S. Jacobs, *Designing the User Interface- Strategies for Effective Human–Computer Interaction*, 6th edition, Addison Wesley, 2016

Sommerville, I., *Software Engineering*, 10th edition, Addison Wesley, 2010

Articles of conferences and journals as well as chapters of the Interaction Design Foundation, *The Encyclopedia of Human-Computer Interaction*, 2nd Ed., <https://www.interaction-design.org/literature>

- Papers to be presented may be selected in conferences such as: - CHI (ACM CHI Conference on Human Factors in Computing Systems), IEEE VR (Virtual Reality), ISMAR (Int. Symposium on Mixed and Augmented Reality), HRI (ACM/IEEE International Conference on Human-Robot Interaction), MobileHCI (ACM International Conference on Human-Computer Interaction with Mobile Devices and Services), and other well-known conferences in the field of Human-Centered Computing.