UCLouvain

linfo1311

2024

Human Machine Interface

5.00 credits	30.0 h + 15.0 h	Q2

Teacher(s)	Vanderdonckt Jean ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	None
Main themes	**Introduction** • Major principles of human-machine interaction and user-centered design • Evolution of the HMI: from textual to graphic, from real to virtual, from static to dynamic, from interactive to highly interactive. **HMI technology** • Software and hardware devices for interaction with the user • Concrete and abstract interactive objects • Techniques (eg pull-leash), styles (eg, command language, direct manipulation) • Means of interaction (eg trackball) • HMI development environments (programming languages, toolboxes, libraries, demonstration programming, automatic generation, assisted design) • HMI standards, standards and development guides (eg IBM CUA, ISO 9241, CBN, etc.) **Contributions external to HMIs** • Contributions of cognitive psychology, prescriptive models • Theory of perception, of attention • Software ergonomics **HMI development methodology** • Life Cycles and Models (eg V, Spiral, ProdUser, Nabla) • Existing methods (eg Muse, Trident, Diane +, SOMA) • Preliminary design (including task model) • Detailed design (including operational specifications) • Prototyping (fast or not, iterative or not) • Evaluation: evaluation methods with / without users, with heuristics, by observation.
Learning outcomes	**At the end of this learning unit, the student is able to :** **Students who have successfully completed this course will be able to:** • Explain the challenges of human-machine interaction in order to design a human-machine interface (HMI) of an interactive application that is adapted to the user's task • Master the construction models of an HMI to use them wisely when designing an interactive application 1 **Students will have developed methodological and operational skills. In particular, they will have developed their ability to:** • Use interface development tools and appropriate technologies when developing the interface of an interactive application

Evaluation methods	The continuous evaluation of this course is organized as follows: • Students will be clustered by group of 2 members and will receive the statement of an assignment to be reported according to the provided report template. • Each group will select an existing user interface and perform a heuristic evaluation based on usability guidelines and ergonomic criteria to find out and classify 10 usability problems. • Each group will produce a task model based on the statement. • Each group will submit via an on-line system a preliminary version of their report containing the evaluation and the task model. A formative evaluation will take place to send feedback to each group based on this preliminary version. • Each group will define two contexts of use (user based on persona, device, environment), model the abstract and the concrete user interfaces for both contexts of use. These results will be incorporated in the report. • By the end of the course, each group will submit via an on-line system the final version of their report, which will be summatively evaluated (20 points).

Teaching methods	This introductory course to HCI consists of the following contents:
	• Introduction to HCI and user interface: definition, scope, principles, models.
	• Usability Engineering: usability principles, guidelines, and ergonomic criteria.
	• User Interface Development Life Cycle: for each context of use (i.e., user and tsk, device, and environment)
	  • Task modeling and domain modeling
	  • Abstract user interface modeling
	  • Concrete user interface modeling
	  • Final user interface prototyping

Content	The Association for Computing Machinery (ACM) defines Human–Computer Interaction (HCI) as "a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them". The primary object of study in HCI is the user interface, the means by which the user and a computer system interact, in particular the use of input devices and software.
Inline resources	All resources (slides, report template, examples, case studies, references) are available on-line at the Moodle corresponding course: https://moodle.uclouvain.be/course/view.php?id=4515 W3C Introduction to Model-based User Interface Design W3C Abstract User Interfaces
Bibliography	• Gaelle Calvary, Joëlle Coutaz, David Thevenin, Quentin Limbourg, Laurent Bouillon, Jean Vanderdonckt, A Unifying Reference Framework for Multi-Target User Interfaces, June 2003, Interacting with Computers 15(3)
Other infos	There is no pre-requisite for this course.
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in numerical technologies and society	MINSTIC	5		
Master [120] in Information and Communication Science and Technology	STIC2M	5		
Additional module in computer science	APPSINF	5		
Master [120] in Linguistics	LING2M	5		