Consiglio Nazionale delle Ricerche

Istituto di Scienza e Tecnologie dell'Informazione "A. Faedo"

HUMAN INTERFACES IN INFORMATION SYSTEMS

RESEARCH LAB

HIIS
Human Interfaces in Information Systems

Our research activity aims to address fundamental questions on the interaction between people and technologies, and focuses on methods and tools to support user interface designers, software developers, and end users in obtaining systems that can be accessed from any context of use in such a way to improve usability, accessibility, and user experience.

RESEARCH TOPICS

Interactive Smart Spaces Methods and techniques for enabling systems interacting with users to adapt to the context of use. We consider various contextual aspects related to users, technologies, environments and social relations. Methods employed range from sensor-based solutions to high level tools for defining UIs adaptive behaviors on a rule-based manner.

Tools for Accessibility and Usability Evaluation We design and develop tools able to provide developers with a number of pieces of information that can be helpful to improve their interactive applications. We support various techniques ranging from intelligent analysis of logs of user interactions to code inspection aimed to check consistency with relevant guidelines.

Human-Robot Interaction We have designed and implemented environments to allow people without programming experience to personalize the behaviour of humanoid robots. We also design and implement serious games for cognitive stimulation of older adults that exploit the robot's features to improve user engagement, also exhibiting different robot's personalities.

Assistive Technologies and Accessibility Assistive technologies can work effectively if the user interfaces are designed and developed in an accessible way according to specific guidelines. In this regard, we have worked with various user groups, such as older adults, blind users, young ASD individuals.

End User Development We design and develop methods, techniques, and tools that allow users who are not professional software developers to create, modify or extend software to better support their own needs, investigating new metaphors and techniques for the development process.

MultiModal User Interfaces We design and develop methods, languages, tools, applications that exploit multimodal user interfaces, which are able to interact by exploiting multiple human senses, in order to improve the user experience. For this purpose, we consider various modalities such as graphics, voice, gesture, vibro-tactile feedback, gaze, brain activity.

Human-centered Artificial Intelligence This research line aims to investigate how to obtain automations generated with the support of artificial intelligence that are transparent, and under the users' control so that users can perceive, understand, predict, and modify their behaviour.

PROJECTS

Automatic Monitoring of Accessibility in Public Administration Web Sites (funded by Agid for the PNRR 1.4.2, 2022-2025) The project aims to contribute to the implementation of measure 1.4.2 of the PNRR, focused on improving the accessibility of digital services provided to the public. The agreement supports the evolution of the MAUVE++ platform to provide public administrations with a system free of charge aimed at automatically verifying the accessibility of web sites. The tool will be useful to analyse the actual state of the accessibility Italian Public Administration, identify problematic areas, and stimulate more attention to this important social aspect.

SERENI (SERious gamEs with humanoi robots in cogNItive training, Progetti@CNR) The SERENI research project aims to develop a new solution using serious games with humanoid robots to stimulate cognitive and social abilities in older adults. The humanoid robots will act as personal trainers, proposing exercises and communicating through various modalities and stimulating users in cognitive games relevant to their daily life. One aspect that will be carefully considered is that of the personality, both of the elderly and that manifested by the robot.

EMPATHY (Empowering People in Dealing with Internet of Things Ecosystems, PRIN 2017) The EMPATHY project aims at developing new concepts, languages, methods, and tools to support people in tailoring IoT context-dependent interactive applications.
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SOFTWARE TOOLS

Cross-device UI framework - Framework for Multi-User Distributed User Interfaces with peer-to-peer configuration

Platform for specifying, executing, and monitoring personalization rules in trigger-action format for controlling smart things and humanoid robots

Serious games for older adults using humanoid robots

ConcurTaskTrees Environment - Development, analysis, and simulation of task models of interactive applications

MAUVE++ – Automatic verification of accessibility of Web sites

MUSE - The usability evaluation of Web applications based on client logs and detection of bad smells.

HTTP://HIIS.ISTI.CNR.IT