



Knowledge Science and Technology

Human Interfaces in Inf. Systems Lab



Design of Interactive Systems Making systems easier to use implies taking into account many factors in the design of an interactive application, such as tasks to support, context of use, user preferences and abilities, interaction modalities and techniques available. It is thus important to have structured methods for allowing designers to manage such complexity. For this purpose various models have proved to be useful in human-computer interaction: task, user, domain, interaction models. Our methods also support the use of HCI models integrated with Business Process Models. We have developed various tools supporting the development, analysis and use of HCI models in order to design and develop multi-device interactive applications, which can be able to access remote Web services. We also work on solutions and environments able to make design and development of interactive applications possible for end users without programming experience, for example in order to create mashup by direct manipulation of existing Web applications.

Accessibility and Usability We are interested in tool support for usability evaluation. The goal is not to provide designers with an overall, definitive evaluation; rather, to provide a number of pieces of information that can be helpful to evaluators and developers in order to improve their applications. To this end, we also consider remote usability evaluation techniques, where the user and the evaluators are separate in time and/or space. We have developed tools that provide various types of analysis of logs of user interactions detected on the client side (which can be a desktop or a mobile device). Another important concept that we consider is accessibility, that indicates whether an application can be actually accessed from all types of users in any context. In this area we have developed guidelines for usability and accessibility of blind users; tools for accessibility evaluation, including languages to represent and manipulate user interface guidelines; tools for making e-documents and e-books accessible and readable by using various devices such as mobile smart phones or mobile special devices.

Ubiquitous Interfaces In order to perform their tasks, people now have available a wide variety of computational devices. Users wish to be able to seamlessly access information and services regardless of the device they are using, even when the system or the environment changes dynamically. Our research goal in this area is to build methods and environments supporting highly usable context-sensitive interactive software systems and develop techniques and components that facilitate adaptation to the changing context, user interfaces distributed across various devices, and task continuity even when people change interaction device at run-time. We have also designed various types of mobile guides, in particular for museums, able to support also access to public displays and provide location-aware information (using various technologies including RFIDs).

MultiModal User Interfaces We are interested in supporting the design of multi-modal user interfaces for both desktop and mobile systems. For this purpose we consider various modalities and combinations: graphics, voice, gesture, vibro-tactile feedback, user orientation, ...In this area we also design and assemble custom hardware devices (such as detectors and output modules) enabling multimodal user interaction.

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Projects

SERENOA (Multidimensional context-aware adaptation of Service Front-ends) EU ICT FP7-ICT N.258030 Serenoa is aimed at developing a novel, open platform for enabling the creation of context-sensitive service front-ends (SFEs). As a result UIs will be adapted to a person's devices, tasks, preferences, and abilities, thus improving people's satisfaction and performance compared to traditional SFEs based on manually designed UIs. Serenoa will perform automatic adaptation of UIs involving the end user in two major ways: users can intervene in the adaptation (e.g. by controlling, suggesting, accepting/rejecting adaptations, requesting better adaptations) and the system can learn from users (e.g., by observation, by sensing, by machine learning). In this scenario, we envisage Serenoa as the open source reference implementation of a SFE adaptation platform for the 'Future Internet'.



SMARCOS (Smart Composite Human-Computer Interfaces) ARTEMIS N.100249 When multiple devices and/or services are combined to create a new service today, it takes considerable effort to ensure the resulting combination of multiple platforms, functions, and user interfaces becomes useful and enjoyable to the human users. We apply context-aware technology and model-based design to give the users delightful experiences in the form of new interaction techniques. Smarcos allows devices and services to communicate in UI level terms and symbols, exchange context information, user actions, and semantic data. It allows applications to follow the user's actions, predict needs and react appropriately to unexpected actions.

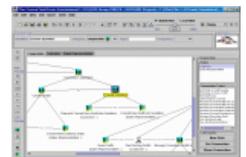


abcd - ABCD SW project mainly aims to define an educational ad hoc methodology for Autism Spectrum Disorder (ASD) children and create didactic computer-based courses in order to render therapy more effective and efficient. The idea is to map Applied Behavioral Analysis (ABA) principles in the creation of a specific SW suitable for therapists and children, with modules designed to enhance children's cognitive processes, language development, and recognizing emotions.



Software Tools

- ConcurTaskTrees Environment - Development, analysis, and simulation of task models of interactive applications.
• Migrantes - Server-based platform for Migratory Web User Interfaces
• MARIAE - Authoring Environment for Ubiquitous User Interfaces for Applications based on Web services
• Web Usability Probe - The evaluation of every kind of existing website
• MashupEditor - EUD environment for web mashups
• ReverseMaria - Desktop tool able to reverse any web page and build the corresponding specification in MARIA
• WebRemUsine - Usability evaluation of Web sites.
• WebRevEng - Reverse engineering in order to reconstruct the task model of a Web site.
• Marble Museum - Adaptable and adaptive interactive system to navigate in the information of the Marble Museum and the Carrara town.
• UbiCicero - Interactive, Location-aware, mobile Guide able to exploit public large displays.



People

Table listing staff members: Bellucci Federico (Research Associate), Galesi Giulio (Technical Staff), Leporini Barbara (Research Staff), Paternó Fabio (Research Director), Santos Danado José Carlos (PostDoc Fellow), Spano Lucio Davide (Research Staff), Carta Tonio (Technical Staff), Ghiani Giuseppe (Research Staff), Manca Marco (Research Associate), Santoro Carmen (Research Staff), Sisti Christian (Research Associate).

