



Our research activity is in methods and tools to support user interface designers, software developers, and end users in obtaining systems that can be accessed from different contexts of use in order to improve usability, accessibility, and user experience.

Research topics

Context-dependent User Interfaces Methods and techniques for enabling user interfaces to adapt to the context of use for better suiting the current situation. We consider various contextual aspects related to users, technologies, environments and social relations. Technologies employed range from sensor-based solutions for detecting the actual contextual parameters to high level tools for defining UIs adaptive behaviors on a rule-based manner.

Tools for Accessibility and Usability Evaluation We work in tool support for usability and/or accessibility evaluation in order to provide evaluators and 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 detected on the users' devices to code inspection in order to check whether consistency with relevant guidelines.

Assistive Technologies and Accessibility Assistive technologies are hardware and software tools that allow people with disabilities to access digital information, and services in general. Assistive technologies can work effectively if the user interfaces are designed and developed in an accessible way according to specific guidelines. We work with various user groups, in particular with blind users.

Emotion-based User Interfaces This research line aims to investigate the impact of some Web design criteria eliciting a particular emotional state on the user. The final goal is the design of Web applications able to adapt with the objective of eliciting more positive emotions.

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. We investigate new metaphors and techniques for the development process that allow users to easily express their concepts and intents, and then support mapping them to available services and editing their composition. We focus on Web mashups, context-dependent applications, and Internet of Things domains.

MultiModal User Interfaces We design and develop methods, languages, tools, applications that exploit multimodal user interfaces, which are able to interact with a system by exploiting multiple human

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senses, in order to improve the user experience. We consider them both in stationary and mobile scenarios. For this purpose we consider various modalities (exploiting different physiological parameters) such as graphics, voice, gesture, vibro-tactile feedback, gaze, brain activity, ..., which can be combined in different ways depending on the desired effect.

Model-based User Interface Design We research on languages and methods that allow designers and developers of interactive systems to focus on key logical aspects of user interfaces, through the use of relevant models that can be specified at various abstraction levels. We also develop tools supporting such notations in order to better support and improve the design, development and evaluation of interactive software applications.

Projects

EIT ICT Labs High Impact Initiative on Street Smart Retail

In this project we aim to support retailers to create better shopping experiences with augmented reality, interactive public displays, and distributed user interfaces. Our goal is to obtain an authroing environment for context-dependent retail applications able to support shoppers dynamically depending on their interests and activities.

FITS.ME (Flexible Indoor Tracking System for Medical Environments)

FITS.ME aims to design and implement an integrated system that would facilitate the orientation of users within large buildings, obviating intuitively and effectively to the disorientation that these often complain moving within extended structures and complex (eg. hospitals, government offices, historic buildings and great museums). The system will prove particularly useful and effective for those users who experience reduced capacity for orientation (eg. Disabled, elderly, hospital patients). The project envisages the development of an innovative wearable interactive device (Wearable Device Positioning or DIP), equipped with a vibro-tactile interface.

PersonAAL (Personalized web applications to improve quality of life and remote care for older adults) AAL Call 2014.

The PersonAAL project aims at extending the time older people can live in their home environment by increasing their autonomy and assisting them in carrying out activities of daily living by means of intelligent and intuitive web applications enabling users to receive personalized and context-dependent assistance directly in their own homes.

Software Tools

- Cross-device UI framework - Framework for Multi-User Distributed User Inter-faces with peer-to-peer configuration
- ConcurTaskTrees Environment - Development, analysis, and simulation of task models of interactive applications
- MARIAE - Authoring Environment for Ubiquitous User Interfaces for Applica-tions based on Web services
- MUSE - The usability evaluation of Web applications based on client logs and detection of bad smells.
- MashupEditor - EUD environment for web mashups

People

Luca Corcella	<i>Graduate Fellow</i>	Giulio Galesi	<i>Technical Staff</i>
Giuseppe Ghiani	<i>Research Staff</i>	Barbara Leporini	<i>Research Staff</i>
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