Human-Computer Interaction

PsychNology Journal

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TARGET ISSUE: Human Computer Interaction

Editorial Preface

PsychNology Journal has now arrived to its fifth issue, particularly rich with topics and approaches and entirely devoted to Human-Computer Interaction. After dealing in the previous issues with new kinds of interfaces (Special Issue on Future Interfaces, Vol.1,n.3/4), the Journal broadens its scope now to the whole field of human interaction with technologies, a cherished theme by people interested in the 'other side of technology'. The issue has benefited from the collaboration with SIG-CHI Italy and collects selected papers from the 'HCItaly Conference 2003', including the prestigious contribution from Peter Brusilovsky (University of Pittsburgh), invited speaker in the Italian event and invited author here.

As Editors-in-Chief of PsychNology, we warmly thank Liliana Ardissono and Anna Goy, brilliant scholars at the Department of Computer Science (Turin, Italy), chair persons of HCITALY 2003 and flawless guest editors of this issue of PsychNology.

Luciano Gamberini
Anna Spagnolli

Editors-in-Chief

Introduction to the Special Issue

The recent expansion of the Internet has opened the avenue to services supporting the access to remote data repositories, the search for information and documents, and the execution of various everyday activities, such as home banking and e-government. Moreover, the research about intelligent systems has enabled the human user to remotely pilot smart machines performing difficult or dangerous tasks.

Unfortunately, the development of user interfaces supporting the interaction with complex services and devices has not kept the pace with the technological development, so that the potential offered by the technology is challenged by the limited usability of the new products and services. The gap between the user-oriented view of the offered service and the technical level concerning its implementation has to be filled in order to make machines and software systems acceptable to the end-user. Moreover, the user's trust in automated systems has to be enhanced, by taking predictability and controllability issues into account.

The design and development of usable user interfaces has attracted the attention of various research communities. For instance, the Human Computer Interaction research has focused on the definition of methodologies for the development of user interfaces that meet the user's interaction requirements during the life cycle of products and services. Moreover, the User Modeling and Intelligent User Interfaces research has focused on the definition of techniques for the dynamic adaptation of services to the individual user's preferences. Furthermore, within the Adaptive Hypermedia field, researchers have developed Web-based systems that tailor the content, the interaction and the layout to the needs of users having heterogeneous knowledge, interests, and exploiting different devices to interact with the services (e.g., smart phones, PDAs, portable and desktop computers).

Fundamental challenges that must be addressed in order to make products and services widely usable include:

- The adaptation of User Interfaces to the user's device and to multiple communication channels, as well as to bandwidth and other related constraints.
- The mediation between the user's interaction requirements and the technical aspects underlying the service execution.
- The enhancement of the usability of automated decision makers and the satisfaction of user's requirements concerning the predictability and controllability of their behavior.
- The support for ubiquitous and multimodal interaction with the user, taking not only technical issues, but also accessibility and pleasure requirements into account.
- The availability of infrastructures facilitating the development of multi-platform services.
- The provision of adaptive features and direct support to the user during the exploration of virtual environments.
- The availability of user-centered software development methodologies supporting the implementation of systems that can be easily configured and tailored to the user's needs.
- The definition of guidelines and strategies for the design of usable multimodal and multi-platform user interfaces, as well as the availability of software environments supporting the system development.

The Italian Intelligent User Interfaces (IUI) and Human Computer Interaction (HCI) communities have proposed leading solutions to address the above-mentioned challenges, which have been presented in several International Conferences and Journals. In particular, this special issue includes a selection of the work presented at HCITALY 2003, the 3rd Human-Computer Interaction Symposium of SIG-CHI Italy, organized by the Computer Science Department of the University of Torino (Italy). The papers are focused on 5 main themes: adaptivity and user support in 3D and animated user interfaces, user interface design issues, end-user software development and tailoring, infrastructures for the development of multi-platform interactive applications, and user interfaces supporting the interaction with automated problem solvers. Specifically:

- Peter Brusilovsky, invited speaker at the Symposium and author of the first article, gives a brief history of adaptive navigation support in the pre-Web Hypermedia and discusses challenges emerging with the evolution from Adaptive Hypermedia to the Adaptive Web. The paper also introduces the concept of adaptive support to the exploration of Virtual Reality environments and presents the results of a number of projects, carried out at the University of Pittsburgh, focused on the study of adaptive navigation support in different contexts. The paper includes three videos demonstrating the employment of adaptive navigation techniques in a virtual museum.

- The adaptive navigation of 3D environments is also the focus of the paper by Chittaro et al., who propose the introduction of embodied characters guiding the exploration of the environments as an effective aid to the user. In particular, the authors propose a tool supporting the automated code generation for adding guided tours to virtual environments and they describe the deployment of the proposed tool in a virtual museum.

- Abbattista et al. propose a different perspective on embodied characters: in the paper, they overview the exploitation of animated agents as user interface components of Web-based services. Moreover, they describe the conversational and emotional features offered by SAMIR, a 3D conversational agent recommending books in a Web-based store.

- The paper by Valitutti et al. addresses open issues in the development of expressive user interface agents having advanced conversational capabilities. The authors discuss the importance of Affective Computing in HCI, where the ability of displaying emotions and of understanding the user's emotional state plays a key role. Moreover, they present WORDNET-AFFECT, an affective lexicon that correlates affective concepts to words and represents a basic resource for the development of emotional user interfaces.

- Di Nocera et al. focus on Web page design and describes experiments aimed at suggesting criteria for the organization of objects that optimize the user performance. They hypothesize that the location of some web objects, such as links to specific contents, are expected by the users at specific spatial locations, and proposes the Cognitive GeoConcept procedure for supporting the information architect's decisions.

- In the paper by Costabile et al., the user participation in the configuration and adaptation of software to individual needs is proposed as a mean to address the usability issues emerging during the life cycle of software. The authors present the Software Shaping Workshops environment, which supports the development and customization of software enabling both software engineers and domain experts to modify products to satisfy their emerging needs and requirements.

- Chesta et al. present a model-based approach to the development of context-sensitive, multi-platform, nomadic applications. In the paper, the authors describe the TERESA tool, which supports the development activity by providing different levels of abstraction for the specification of device-dependent user interfaces and the enforcement of the consistency between the various interfaces.

- The article by Cortellessa et al. addresses usability and trust issues concerning the interaction with automated decision makers. The authors present an intelligent user interface mediating the interaction between the user and an automated problem solver that schedules tasks during space missions. Moreover, they present the results of a preliminary evaluation of the system aimed at assessing the extent to which the proposed user interface features enhance the usability and acceptability of the system in real cases.

The HCITALY 2003 Symposium has been promoted by SIG-CHI Italy (http://giove.cnuce.cnr.it/sigchi/), the Italian association on Human-Computer Interaction. This association, run entirely by volunteers, is active since 1995 and has the goal of promoting and increasing knowledge and interest in the science, technology, design, development, and application of methods, tools, and techniques for Human Computer Interaction. SIG-CHI Italy has scientific and educational goals, and aims at providing a mean of communication between people interested in HCI; the hcitaly@cnuce.cnr.it mailing list is devoted to the exchange of information in the field. The association also organizes meetings, conferences, discussion groups and workshops. The main event is HCITALY, which provides a unique opportunity for the Italian HCI community to meet and discuss research results. In addition, daily events on specific topics with multi-disciplinary participation are organized. For example, the Usability and Accessibility day (http://giove.cnuce.cnr.it/usac.htm) has been recently organized at ISTI-CNR in Pisa. Moreover, the Natural Interaction day (http://naturalinteraction.org/workshop/) has been organized in Firenze by the local University. Furthermore, INTERACT (www.interact2005.org), the main IFIP HCI event, will take place in Roma on September 12-17, 2005. The next edition of HCITALY is planned in conjunction with this event.

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