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Designing the Human Computer Interaction: Trends and Challenges

J.UCS Special Issue

Crescencio Bravo
(School of Computer Science and Engineering
Department of Information Technologies and Systems
University of Castilla – La Mancha, Spain
Crescencio.Bravo@uclm.es)

Miguel A. Redondo
(School of Computer Science and Engineering
Department of Information Technologies and Systems
University of Castilla – La Mancha, Spain
Miguel.Redondo@uclm.es)

Manuel Ortega
(School of Computer Science and Engineering
Department of Information Technologies and Systems
University of Castilla – La Mancha, Spain
Manuel.Ortega@uclm.es)

Interaction between humans and machines is being increasingly recognized as a crucially interesting "dialogue" that requires modeling, design and evaluation in order to build software systems usable in any form (Web applications, groupware, mobile and ubiquitous systems, etc.). Lots of resources and efforts are being devoted to this task, being the focus of the research community in Human-Computer Interaction (HCI).

The present special issue contains a selection of the ten highest-quality papers presented at the 7th International Conference on Interacción Persona-Ordenador (IPO), which stands for Human-Computer Interaction (HCI) in Spanish and was called Interacción'2006 for short. This conference took place in Puertollano (Ciudad Real, Spain) on November 13th-17th, 2006, and was organized by the CHICO research group from the Universidad de Castilla – La Mancha (Spain). Each year this conference is promoted by the Asociación para la Interacción Persona-Ordenador (AIPO), the Spanish Human-Computer Interaction Association. In its seventh edition this conference has become a multidisciplinary forum for the discussion and dissemination of novel research on Human-Computer Interaction.

The papers included in this issue deal with some hot topics in the HCI research sphere. In the first paper, H. T. Dao, A. Bazinet, R. Berthier and B. Shneiderman address a visualization approach that highlights the ever-changing qualities of NASDAQ Market Velocity and Market Forces. They propose innovative visualization

techniques to observe the behavior of these metrics for one or many companies throughout the course of a trading day.

Four papers discuss technological and social issues in the design of systems to support communities and working groups. Thus, C. Gutwin, S. Greenberg, R. Blum, J. Dyck, K. Tee and G. McEwan introduce the idea of community-based groupware in order to become common shared-workspace groupware in the workplace. The authors argue that this way of organizing groupware supports informal collaboration better than other existing approaches. A. I. Molina, M. A. Redondo, M. Ortega and U. Hoppe discuss the design of groupware as a progressively extended task and thus they propose a methodological approach based on a set of notations of both a graphical and a textual nature. In the same methodological atmosphere, M. Sendín, V. López-Jaquero and C. A. Collazos propose the reuse and specializing of some existing plasticity tools for groupware design. In particular, a conceptual framework aimed at being a reference for the generation of plastic user interfaces for collaborative environments in a systematic and comprehensive way is presented. Finally, R. Duque, J. Gallardo, C. Bravo and A. J. Mendes propose the use of meta-models and XML-based languages to specify the most important characteristics of groupware modeling systems, such as the application domain, the requirements of the tasks to be carried out, how communication takes place and the regulation of the shared workspace.

Leaving groupware apart, the paper from J. I. Panach, S. España, I. Pederiva and Ó. Pastor describes an approach that makes it possible to obtain a final software product from its corresponding conceptual model through a model compilation process, where interaction modeling is properly embedded with the most conventional data and process modeling. Two papers tackle evaluation and usability of user interfaces. L. M. Tobar, P. M. Latorre and E. Lafuente describe a tool for the development, analysis and follow-up of the processes designed to assure the usability and accessibility of websites. M. P. González, T. Granollers, A. Pascual and J. Lorés discuss the main statistical results coming from the second and third stages of the UsabAIPO project, where the UsabAIPO heuristic method (based on heuristic evaluation techniques) and seven cognitive walkthroughs were performed over 69 university websites.

To conclude, this special issue approaches ambient intelligence and pervasive computing as new challenges in HCI. M. García-Herranz, P. A. Haya, A. Esquivel, G. Montoro and X. Alamán analyze the requirements of automation and adaptation in the so-called perceptive environments. The authors present a first prototype to semi-automatic adaptation of such perceptive environments through a system of rule-based, configurable and modular agents, which are able to explain their behaviors and to adapt to the changing habits of the users. Lastly, R.F. Arroyo, M. Gea, J.L. Garrido and P. A. Haya address the integration of proactive and collaborative aspects into a unique design model for the development of ambient intelligent systems applied to learning systems. The implementation of this system is based on a blackboard-based architecture, which provides a well-defined high-level interface to the physical layer.

As a whole, this special issue provides a perspective on trends and challenges about the design of the human-computer interaction mainly in Spanish speaking countries and in collaboration with some of the most notable international researchers on HCI.

Regarding the reviewing process, our referees (integrated by recognized researchers from the international community) made a great effort to select the best papers for the conference and later on for this publication. The success rate for papers to be part of this publication was under 15% of the accepted full papers in the conference. We would like to acknowledge the effort of all of them, without which this publication would not have been possible.

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Crescencio Bravo
Miguel A. Redondo
Manuel Ortega
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