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# Engineering Human Computer Interaction and Interactive Systems

Joint Working Conferences EHCI-DSVIS 2004  
Hamburg, Germany, July 11-13, 2004  
Revised Selected Papers

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# Preface

As its name suggests, the EHCI-DSVIS conference has been a special event, merging two different, although overlapping, research communities: EHCI (Engineering for Human-Computer Interaction) is a conference organized by the IFIP 2.7/13.4 working group, started in 1974 and held every three years since 1989. The group's activity is the scientific investigation of the relationships among the human factors in computing and software engineering.

DSVIS (Design, Specification and Verification of Interactive Systems) is an annual conference started in 1994, and dedicated to the use of formal methods for the design of interactive systems. Of course these two research domains have a lot in common, and are informed by each other's results. The year 2004 was a good opportunity to bring closer these two research communities for an event, the 11th edition of DSVIS and the 9th edition of EHCI. EHCI-DSVIS was set up as a working conference bringing together researchers and practitioners interested in strengthening the scientific foundations of user interface design, specification and verification, and in examining the relationships between software engineering and human-computer interaction.

The call for papers attracted a lot of attention, and we received a record number of submissions: out of the 65 submissions, 23 full papers were accepted, which gives an acceptance rate of approximately 34%. Three short papers were also included. The contributions were categorized in 8 chapters:

Chapter 1 (Usability and Software Architecture) contains three contributions which advance the state of the art in usability approaches for modern software engineering. Bonnie John and her colleagues discuss that, in contrast to other software quality attributes such as performance, reliability and maintainability, usability is not usually tackled at the software architecture level. Their contribution is to propose usability-supporting architectural patterns, assorted with sample solutions. The second paper, by Brinkman et al., proposes three usability measures designed to be applied in a component-based environment. These measures can be objective, based on event logs, or subjective, obtained through questionnaires. An experimental study assessing the value of these measures is also described. The third paper, by Folmer and her colleagues, also deals with the relationships between usability and software architecture. They show how explicit evaluation of usability during architectural design may reduce the risk of building a system that fails to meet its usability requirements and may prevent high costs incurring adaptive maintenance activities once the system has been implemented.

Chapter 2 is devoted to issues regarding task modelling, which is a traditional topic of choice for both the EHCI and DSVIS series of conferences. The paper by Dittmar et al. investigates the slow adoption of task modelling by software practitioners. A thorough examination of the leading-edge tools for task modelling reveals how this situation can be improved by better integration of scenario-based design elements. The work of Clerckx et al. investigates the improvement that can be brought to usual task, environment and dialogue models by tackling the new application domain of

context-sensitive user interfaces. The paper by Eicholz et al. explores the relationships between task modelling and workflow, or business process modelling.

Chapter 3 is concerned with the “browsing and searching” application domain, which is of high industrial relevance considering the current interest in Web-based applications. Ormerod et al. present new browser concepts to support the sharing of digital photographs and also report on the combined use of ethnographic, experimentation and design methods they used for their project. Gonçalves and Jorge propose a new classification scheme for document retrieval systems, where users “tell a story” about their document, in order to make the later retrieval of the document more natural.

Chapter 4 deals with model-based approaches. It is made up of six contributions, making it the longest chapter of the book, witness to the fact that the definition and use of models is at the core of the EHCI-DSVIS community. Campos and Nunes, in this chapter’s first paper, emphasize the need for a better integration of models and tools. They present a new UI specification language bridging the gap between envisioned user behavior and concrete user interfaces. Macías and Castells bring the field of programming-by-example to the domain of Web-based applications by detecting iteration patterns in user behavior and generating a programmatic representation of a user’s actions. Navarre et al. integrate two different notations in order to offer a tool-supported approach for the prototyping of advanced multimodal applications. Limbourg and his colleagues apply their USIXML language to show how a user interface can be specified and produced at and from different, and possibly multiple, levels of abstraction while maintaining the mappings between these levels. The chapter is concluded by two short contributions: In the paper by Schaefer et al., a novel dialogue model for the design of multimodal user interfaces is proposed. Ziegler and Specker conclude by proposing the use of “Navigation Patterns,” pattern systems based on structural mappings.

Chapter 5 is devoted to a rapidly developing application domain, ubiquitous computing. Borkowski et al. propose several software tools with the assorted interaction techniques to develop multisurface computer-augmented environments. Evreinov and his colleagues explore the use of vibro-tactile interaction, especially useful for new mobile devices such as palmtop computers.

Chapter 6 is called “Bridging Viewpoints”: this refers to an ongoing activity of the IFIP 2.7/13.4 working group, which is to find ways to reconcile the fundamental paradigms of user-centered design and software engineering. For instance, Blandford, Green and Connel analyze the misfits between the user’s conceptualization of the domain and device with which they are working and the conceptualization implemented within those systems. Barbosa et al. discuss the role of an enhanced extended lexicon as a shared communicative artefact during software design. They describe how it may act as an interlingua that captures the shared understanding of both stakeholders and designers. López-Jaquero et al. contribute a short paper on a design process for adaptive interfaces.

Chapter 7 is concerned with the emerging application domain of plastic and adaptive interfaces. Increasingly often, the same application has to be delivered on widely different platforms, ranging from a complete workstation to a PDA or a cell phone. Clearly, advances in design approaches are needed to avoid redesigning the user interface from scratch for each platform. Dobson’s work is concerned with laying out such principles, in particular for pervasive computing systems. Calvary and her

colleagues present a software widget explicitly dealing with plasticity of the user interface. Gilroy and Harrison propose the incorporation of interaction style into abstract UI specification, in order to accommodate with different UI platforms. Correani et al. present a new version of the TERESA tool supporting flexible development of multidevice interfaces.

Chapter 8 (Groupware) concludes the book with two papers, both concerned with supporting collaborative software construction. Wu and Graham present the Software Design Board, a prototype collaborative design tool supporting a variety of styles of collaboration and facilitating transitions between them. Gutwin et al. explore ways to improve group awareness in collaborative software design.

The conference was held in the beautiful, quiet and secluded Tremsbüttel Castle, near Hamburg, Germany, providing a studious atmosphere propitious to after-hours discussion. As usual for the EHCI conference series, the discussion that followed each paper presentation was transcribed, revised and appended to the edited version of the paper. From these, the reader may catch a glimpse of the lively debates that were held at the conference.

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