

# Workshop HCI for Medicine and Health Care (HCI4MED)

Andreas Holzinger  
Medical University Graz  
Auenbruggerplatz 2/V  
A-8010 Graz  
+43 316 385 3883  
andreas.holzinger@  
meduni-graz.at

Harold Thimbleby  
Swansea University  
Singleton Park  
Swansea SA2 8PP  
+44 1792295393  
H.Thimbleby@  
swansea.ac.uk

Russell Beale  
University of Birmingham  
Edgbaston  
Birmingham B15 2TT  
+44 (0) 121 414 3729  
r.beale@  
cs.bham.ac.uk

## ABSTRACT

Ensuring good usability can be seen as the key success factor in our whole digital world: technology must support people. In particular, Medicine and Healthcare are currently subject to exceedingly rapid technological change. Vital areas for the economy include health of nations; medicine and healthcare entangles everybody, accordingly the role of usability is of increasing importance. Consequently, Medicine and Healthcare are a great challenge for Human-Computer Interaction (HCI) research; however, it is of vital importance that the findings are integrated into engineering at a systemic level. Information Processing, in particular its potential effectiveness in modern Health Services and the optimization of processes and operational sequences, is of increasing interest, but we need to ensure that we engineer effective solutions as well as understanding the stakeholders and the issues they can and do encounter. It is particularly important for Medical Information Systems (e.g. Hospital Information Systems and Decision Support Systems) to be designed from the perspective of the end users, especially given that this is a diverse set of people.

## Categories and Subject Descriptors

H.5, D.2, J.3, J.4, K.4

## General Terms

Design and Human Factors.

## Keywords

Human-Computer Interaction, Usability, Medicine, Health Care

## 1. INTRODUCTION AND MOTIVATION

The focus on HCI and UE research is of increasing importance in Medicine & Health Care [4]. HCI and UE must be focused on the daily activities of medical professionals, surrounding and supporting them with new and emerging technologies. New technologies must be designed to support and enhance the safe and effective delivery of health care. However, Information

performance increases exponentially, resulting in a mass of information [1], [2]; however, human cognitive evolution does not advance at the same speed, and consequently this gap results in a possible information overload [7].

Couple this with a wide range of users, even for simple devices - ranging from patients to medics to technicians to nurses, all having different skills and backgrounds, yet all needing to be able to use devices rapidly and without error - and the principles of good HCI become vital.

However, whilst the traditional approaches of HCI are essential, they are unable to cope with the complexity of typical modern interactive devices in the safety critical context of medical devices [8], [9]. This has led to a broad range of UCD methods (see e.g. [6], [5], [3]); however, much further work is necessary, especially to bridge both user models and computational models, so that the most naïve end user can operate the devices.

## 2. AIM OF THE WORKSHOP

Traditionally, Human-Computer Interaction (HCI) bridges Psychology and Informatics, while Usability Engineering (UE), as an engineering discipline, is anchored in software technology thus enabling appropriate technological implementation. Together, HCI&UE provide an emerging potential to assist the daily workflows in the realm of medicine and health care.

This workshop is intended to facilitate future collaboration and continuing discussions and bring together researchers from both HCI and UE. The workshop will attempt to identify approaches towards device and system design and build that meet the diverse needs of users, manufacturers and patients alike, and will open up a stream of discussion and debate between the design community, the engineering community, and the medial one.

## 3. WORKSHOP TOPICS

Topics include, but are not limited to:

Formal Methods and Methodologies (incl. Agile Methods); Usability of Medical Information Systems; Human Aspects of Future Technologies in Health Care; Incident Investigation and Safety Issues for Healthcare; Human Error and System Development; Usability and Human Aspects of Medical Informatics; Aspects of Usability in Information Visualization; Usability in Ambient Assisted Living and Life Long Learning; Augmented Cognition (AugCog) in medical workflows etc.

## 4. WORKSHOP APPROACH

This full-day workshop is aiming to take a case-based approach, allowing participants to understand a scenario, or set of

Systems are extremely sophisticated and their technological

scenarios, and contribute their perspectives onto that. This will highlight differences and disjunctions between approaches, focusing discussion and debate amongst the participants. Participants will be chosen on the basis of a position paper and/or original work on the workshop topics, and will be a given a brief slot to introduce their work and its relevance, but the main aim for the day is to generate some focused interest on specific problems and approaches. The main objective of the workshop is to identify potential approaches that are ripe for development, combination and modification to meet the particular needs of healthcare and medicine.

## 5. WORKSHOP COMMITTEE

An international board of experts will support this workshop and ensure the highest possible quality of the contributions:

Patricia A. Abbot, Johns Hopkins University, US; Ray Adams, Middlesex University London, UK; Henning Andersen, Risoe National Laboratory, DK; Sheikh Iqbal Ahamed, Marquette University, USA; Sue Bogner, ISME Bethesda, USA; Noelle Carbonell, Université Henri Poincaré Nancy, France; Tiziana Catarci, Università di Roma La Sapienza, Italy; Wendy Chapman, University of Pittsburgh, USA; Luca Chittaro, University of Udine, Italy; Matjaz Debevc, University of Maribor, Slovenia; Alan Dix, Lancaster University, UK; Pier Luigi Emiliani, National Research Council, Florence, Italy; Eduard Groeller, TU Wien, Austria; Sissel Guttormsen, University of Bern, Switzerland; Timo Honkela, Helsinki University of Technology, Finland; Bin Hu, Birmingham City University, UK; Ebba P. Hvannberg, University of Iceland, Reykjavik, Iceland; Julie Jacko, Georgia Institute of Technology, USA; Chris Johnson, University of Glasgow, UK; Homa Javahery, Concordia University, Montreal, Canada; Zhengjie Liu, Dalian Maritime University, China; Klaus Miesenberger, University of Linz, Austria; Silvia Miksch, Donau University Krems, Austria; Shogo Nishida, Osaka University, Japan; Hiromu Nishitani, University of Tokushima, Japan; Nuno J Nunes, University of Madeira, Portugal; Anne-Sophie Nyssen, Université de Liege, Belgium; Erika Orrick, GE Healthcare, Carrollton, USA; Philippe Palanque, Université Toulouse, France; Helen Petrie, University of York, UK; Margit Pohl, TU Wien, Austria; Robert W. Proctor, Purdue University, USA; Wendy Rogers, Georgia Institute of Technology, USA; Anthony Savidis, ICS FORTH, Heraklion, Greece; Albrecht Schmidt, Fraunhofer IAIS/B-IT, Uni Bonn, Germany; Andrew Sears, UMBC, Baltimore, USA; Ahmed Seffah, Concordia University, Montreal, Canada; Hironobu Takagi, IBM Research Tokyo, JP; A Min Tjoa, Vienna University of Technology, AT

## 6. PUBLICATION STRATEGY

The main publication organ of this workshop is a special issue of the International Journal of Human-Computer Studies (IJHCS), scheduled for spring 2009. IJHCS publishes original research over the whole spectrum of work relevant to the theory and practice of innovative interactive systems. The journal is inherently interdisciplinary, covering research in computing,

artificial intelligence, psychology, linguistics, communication, design, engineering, and social organization, which is relevant to the design, analysis, evaluation and application of innovative interactive systems. Papers at the boundaries of these disciplines are especially welcome. All articles considered for publication must be based on original research. The special issue is not particularly bound to the workshop attendees, on the contrary, there will be a separate call for papers. Find details via: <http://hci4all.at/HCI4MED08.html>

## 7. REFERENCES

- [1] Beale, R., Supporting serendipity: Using ambient intelligence to augment user exploration for data mining and Web browsing, *International Journal of Human-Computer Studies*, 65 (2007), 421-433.
- [2] Edmondson, W. H. and Beale, R., Projected Cognition - extending Distributed Cognition for the study of human interaction with computers, *Interacting with Computers*, 20 (2008).
- [3] Holzinger, A., Application of Rapid Prototyping to the User Interface Development for a Virtual Medical Campus, *IEEE Software*, 21 (2004), 92-99.
- [4] Holzinger, A., ed., HCI and Usability for Medicine and Health Care: Third Symposium of the Workgroup Human-Computer Interaction and Usability Engineering of the Austrian Computer Society, USAB 2007 Lecture Notes in Computer Science (LNCS 4799), Springer, Berlin, Heidelberg, New York, 2007.
- [5] Holzinger, A., Usability Engineering for Software Developers, *Communications of the ACM*, 48 (2005), 71-74.
- [6] Holzinger, A. and Errath, M., Mobile computer Web-application design in medicine: some research based guidelines, *Universal Access in the Information Society International Journal*, 6 (2007), 31-41.
- [7] Holzinger, A., Geierhofer, R. and Errath, M., Semantic Information in Medical Information Systems - from Data and Information to Knowledge: Facing Information Overload, *Proceedings of I-MEDIA '07 and I-SEMANTICS '07*, Graz, 2007, 323-330.
- [8] Thimbleby, H., User-Centered Methods Are Insufficient for Safety Critical Systems, In Holzinger, A., ed., HCI and Usability for Medicine and Health Care: Third Symposium of the Workgroup Human-Computer Interaction and Usability Engineering of the Austrian Computer Society, USAB 2007 Lecture Notes in Computer Science (LNCS 4799), Springer, Berlin, Heidelberg, New York, 2007, 1-20.
- [9] Thimbleby, H. and Thimbleby, W., *Internalist and Externalist HCI*, HCI 20007, British Computer Society, Lancaster, 2007.