Mobile Interaction with the Real World

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ABSTRACT
The Mobile HCI community is moving beyond the interaction between a single user and her mobile device taking the users environment into account. Mobile interaction with the real world concentrates on using mobile devices as tools to interact with real world objects. This workshop continues the successful mobile interaction with the real world workshops 2006 and 2007. Relevant topics include (but are not limited to) mobile interaction with the real world; mobile devices as user interfaces for terminals; and Frameworks, middleware and APIs for the development of applications that take mobile interactions with the real world into account. The workshop combines technical presentations with the presentation of prototypes and focused discussions to drive interaction between participants.

Categories and Subject Descriptors
H.5.2 [Interfaces and Presentation]: User Interfaces - Interaction styles; I.3.6 [Computer Graphics]: Methodology and Techniques - Interaction techniques

General Terms
Performance, Design, Experimentation, Human Factors.

Keywords
Mobile interaction, mobile device, smart objects, real world, user interface generation.

1. INTRODUCTION
Mobile devices have become a pervasive part of our everyday lives. People have mobile phones, smartphones and PDAs which they take with them almost everywhere. Stordahl et al. for example forecast that in the year 2010 over 90% of the population in Western Europe will use mobile phones [2]. So far these mobile devices have been mostly used for interactions between the user, her mobile device and the services (phone calls, writing short messages and organizer functionalities) she uses. In the last years we saw increased interest in using the mobile device for interactions with other people (mobile gaming) and places (location based mobile services, mobile guides) [1]. Work on mobile applications, concepts, and techniques enabling the user to interact with real world objects using mobile devices have shown promising results [3,4].

The mobile interaction with the real world workshop series provides a forum which concentrates on mobile interactions with real world objects. Examples for this are for instances the usage of RFID/NFC equipped mobile devices for interactions with smart objects such as advertisement posters or vending machines; the usage of mobile devices as a universal remote control or the usage of mobile devices for direct interactions (e.g. based on image recognition) with objects in a museum. When looking at this research area the following questions occur:

- Which kinds of interaction techniques with the real world exist?
- What technologies can be used to implement mobile interaction with the real world?
- How can real world objects and services be described?
- How should systems and services for this kind of mobile interactions be designed?
- What should these user interfaces look like?
- What does the interaction design and usability look like for mobile interaction with physical objects?
- Can these interfaces be generated automatically?
- Should real world services be defined in a standardized way (e.g. with semantic web services)?
- How can real world objects be associated with new services?
- Which issues concerning privacy and security arise from this new kind of mobile interaction?
- How can interaction with real world entities help people with special needs?

Following the successful workshops on “Mobile Interaction with the Real World” at MobileHCI 2006 and MobileHCI 2007, we will continue this workshop as a forum that concentrates on mobile interactions with real world objects.

2. RESEARCH THEMES
Possible topics for the workshop include (but are not limited to):

- Mobile interaction with real world objects and smart objects
- Using mobile devices as user interfaces for terminals and vending machines
- Frameworks, middleware, architectures and APIs for the development of applications that take mobile interactions with the real world into account.
- Guidelines for mobile interactions with the real world

- Automatic user interface generation for real world interactions
- Semantic web within mobile applications and interactions
- Multimodal interaction taking mobile devices into account
- Usage of sensors of mobile devices (camera, microphone, GPS, etc.) for pervasive applications
- Interaction metaphors for pervasive applications and services
- Augmented, virtual and mixed reality on mobile phones and PDAs (tracking, markers, visualisation)
- Portable media players (e.g. iPod Video) and personal servers as mobile interaction devices
- Interactive context-aware services on mobile devices
- User experience, user studies
- Applications and scenarios

3. GOALS

The main goal of the workshop is to develop an understanding of how mobile devices can be used to interact with the real world. We seek for new ideas, prototypes, and insights as basis to develop a deeper understanding of the field. We will provide a forum to share information, results, and ideas on current research in this area. This workshop encourages discussion about future topics concerning mobile interaction with the real world. Furthermore we aim to develop new ideas on how mobile devices can be exploited for new forms of interaction with the environment. We will bring together researchers and practitioners who are concerned with design, development, and implementation of new applications and services using personal mobile devices as user interfaces.

4. ORGANIZERS

Niels Henze (Primary Contact), OFFIS, Germany,
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Niels is working as a research assistant and PhD student in the Multimedia and Internet Information Services division at the research institute OFFIS in Oldenburg, Germany. He was involved in some national and European research projects such as the European IST project ENABLED for providing visually impaired with universal access to digital information and the project InterMedia researching in interaction with media using personal networked devices. Among his other research interests are advances in accessing digital information using real world entities.

Gregor Broll, University of Munich, Germany,
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Gregor is working as a research assistant and PhD student in the Media Informatics Group at the University of Munich (LMU), Germany. He is also part of the European IST project Simple Mobile Services (SMS) about the simple development, provision and usage of context-aware mobile services. Among his other research interests are advanced mobile interaction with the real world, its application to context-aware services as well as mobile usability. The focus of his current work lies on the evolution of physical mobile interaction to an approach that is driven by information rather than by technology.

Enrico Rukzio, Lancaster University, United Kingdom,
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Enrico is working as an academic fellow and lecturer at the Computing Department at Lancaster University. Enrico's research interests are physical mobile interactions and applications as well as context-aware mobile services. Enrico believes that mobile devices which were so far mostly used for interactions between the user and the device itself will more and more be used for interactions with objects in the real world. Currently he works on the evaluation and comparison of physical mobile interaction techniques. More details about Enrico can be found at www.rukzio.de.

Michael Rohs, Deutsche Telekom Laboratories, Germany,
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Dr. Michael Rohs is a senior research scientist with Deutsche Telekom Laboratories at TU Berlin. His research interests are in mobile and pervasive interaction and comprise interfaces at different scales, ranging from handheld device screens to large public displays, the integration of physical and virtual aspects of the user's environment, and sensor-based mobile interaction. His research currently focuses on small-display interaction. As part of his doctoral dissertation he developed camera-based interaction techniques for mobile devices, like optical flow control for large public displays and a marker recognition system for camera phones that uses device orientation as an input parameter. In 2005 he obtained a Ph.D. in Computer Science from ETH Zurich, Switzerland. From 2000 to 2005 he was a research assistant at the Institute for Pervasive Computing, headed by Prof. Dr. Friedemann Mattern. His dissertation entitled "Linking Physical and Virtual Worlds with Visual Markers and Handheld Devices" was awarded the Fritz Kutter Preis 2006.

Andreas Zimmermann, Fraunhofer FIT, Germany
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Andreas is working as a senior researcher in the department "Information in Context" at the Fraunhofer Institute for Applied Information Technology (FIT) in Sankt Augustin (Germany). He has a strong research background in context-aware computing and artificial intelligence, and his further research interests include areas such as nomadic systems and end-user control of ubiquitous computing environments. Within the scope of two European projects he currently manages, he is responsible for the user-centred design process and for the design of software architectures.

4.1 PROGRAM COMMITTEE

- Susanne Boll, University of Oldenburg, Germany
- Jonna Häkkilä, Nokia Multimedia, Finland

- Pasi Välkkynen, VTT, Finland
- Christof Roduner, ETH Zürich, Switzerland
- Massimo Paolucci, NTT DoCoMo Euro-Labs, Germany
- Derek Reilly, Dalhousie University, Canada
- Andreas Lorenz, Fraunhofer FIT, Germany
- Paul Holleis, University of Munich, Germany

5. ORGANIZATION OF THE WORKSHOP

5.1 Workshop format

The workshop will feature presentations of research results, ongoing work, ideas, concepts, and critical questions related to the use of mobile devices as user interfaces in the real world. Every presentation will be followed by a corresponding discussion. We invite the presenters to show their demonstrators during their presentation and in the breaks. Discussions on focused topics will allow deepen the discussions on individual topics.

5.2 Submission Process

The participants are expected to submit a paper of up to 4 pages via the workshop's submission system (http://mirw08.offis.de) by May 5th, 2008. Submissions must follow the Mobile HCI 2008 2-column proceedings format. The authors of accepted submissions will be notified by May 19th 2008. The workshop proceedings will be produced digitally following the publishing standards of the ACM and ready for the ACM Digital Library. The proceeding will be available online and as a printed proceedings volume.

6. REFERENCES

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