Proceedings of the

1st International Workshop on

Large-scale and Model-based Interactive Systems

Approaches and Challenges (LMIS 2015)

Co-located with the 7th ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2015)

June 23, 2015, Duisburg, Germany

UNIVERSITÄT ZU LÜBECK
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Proceedings of LMIS 2015 Workshop
Workshop on Large-scale and model-based Interactive Systems: Approaches and Challenges,
June 23 2015, Duisburg, Germany.

Edited by:
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GEFÖRDERT VOM

Bundesministerium
für Bildung
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CONTENTS

1 INTRODUCTION

Pervasive and ubiquitous computing introduce a new quality of interaction both into our lives and into software engineering. This has led into an unprecedented interest in implying the full potential of the human body's sensory and motor systems for multi-modal interactivity, manifested by new market initiatives for motion gestures, brain-computer interfaces, multi-touch devices, etc. Whilst this new Post-WIMP interaction paradigm provides rich interaction possibilities and fertile ground for innovation, its increasing popularity imposes new critical challenges for the adoption of interaction techniques in real-world ambient spaces. Software becomes increasingly dynamic, requiring frequent changes to system structures, distribution and behaviour. The aforementioned needs and challenges are mainly caused by increased user mobility, increased heterogeneity of available interaction resources, and increased diversity of physical abilities (i.e., diversity of user population).

This workshop discusses various approaches and challenges to handle these challenges to support flexible, context-aware and interactive spaces. We put special focus on promising approaches for coping with dynamics and uncertainties inherent to interactive ubiquitous systems, particularly model-based interaction at runtime and large-scale interaction ensembles (i.e., combining and adapting multiple interactions at runtime). The workshop will be held as a full day workshop and aims to provide a forum for discussing new ideas, issues and approaches. It will include a keynote speech, presentation of participants' contributions and various forms of interactive discussions concerning the presented topics.

Workshop Topics

In this workshop, we are mainly interested in exposing those challenges and potential approaches for tackling them. The workshop aims to stimulate a discussion on the aforementioned core research questions by inviting position papers between 4 and 6 pages in length on any of the the following topics (other related topics are welcomed as well):

- Model-driven architecture (MDA) in the context of interactive systems

- Advantages and potential problems of using MDA in the interactive systems domain

- Distributed user interfaces and UI migration at runtime

- Model-driven generation of (intelligent) interfaces

- Tools and frameworks for supporting the model-driven development

- Concepts for context-awareness and self-adaptation of interactive systems

- Requirements, insights and experiences from existing mobile and pervasive settings

- Architectural concepts for dynamic runtime deployment of interaction techniques

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- Formal languages, notations, and concepts for describing interactions for NUIs

- Designing and implementing highly adaptive interaction techniques

- Studies on users' diversity in NUI, including age, physical limitations, etc.

- Studies on user challenges in highly adaptive interactive environments

- Analysis of limitations of existing NUI middleware frameworks and systems

- Analysis and evaluation of HCI community practices and norms for disseminating interaction techniques

- Adjustable, customizable, and modular interactive systems

2 WORKSHOP ORGANIZERS

2.1 Ronny Seiger

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Ronny Seiger has been a research assistant within the research project VICCI, funded by ESF, at SEUS at Technische Universität Dresden. His research interests include distributed systems architectures, security and privacy, web technologies, business process, event processing, and software engineering. During his studies, he has been a student assistance whithin the projects Theseus/Texo and FlexCloud at the chair for computer networks. In addition, he has been a working student and thesis student within the new business development department at T-Systems Multimedia Solutions GmbH. In the VICCI project, he is responsible for the design and implementation of a dynamic, highly adaptive runtime environment for complex cyber-physical systems, applying means for central and decentral communications, complex event processing and process orchestration.

2.2 Bashar Altakrouri

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Bashar Altakrouri is currently a senior researcher at the Ambient Computing Group at the Institute of Telematics at Luebeck University. He worked previously as a research associate at the Embedded Interactive Systems group at Lancaster University (Lancaster, The United Kingdom), research assistant at the International School of Digital Media (Luebeck, Germany), intern at the Open University of Netherlands (Netherlands), and Computer Lab Assistant at the Palestine Polytechnic University (Hebron, Palestine). He is mainly involved in designing, prototyping and implementing Context-aware Systems, Internet of Things (IoT), Natural User Interfaces, and Mobile Services and Applications. His work is currently focused on frameworks for deployable and adaptive interaction techniques for inclusive smart interactive environments for elderly and physically challenged users.

2.3 Andreas Schrader

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Andreas Schrader is a professor for Ambient Computing and head of the Ambient Computing Working Group at the University of Lübeck realizing interactive and context-sensitive multimedia applications in ubiquitous and pervasive computing systems. Current focus area is the development of concepts for Ambient Assisted Living as a means for serving an ageing society. In a number of third-party funded projects (BMBF and others) the group develops frameworks for context-aware mobile services, dynamic composition of interaction channels in spontaneous device ensembles and ambient health solutions in co-operation with several clinical partners. Prof. Schrader has published more than 75 papers and achieved several awards for best paper (IEEE iThings 2013) and best demo (IEEE Percom 2013, IoT 2012). He has performed lectures at various universities in Germany, Sweden, Lithuania and Latvia. He is member of ACM and GI, committee member for many international scientific conferences and journals and acts as reviewer for German and Austrian national boards. He is also holding patents in Germany, Japan and the U.S.

2.4 Thomas Schlegel

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Thomas Schlegel is heading the Junior Professorship SEUS at the Technical University of Dresden since 2010. He contributed to more than 60 publications, numerous activities in program committees as well as reviewer and various academic courses and scientific cooperation, he engages in research and academics in the field of Software Engineering of Ubiquitous Systems, focusing on interaction, models, processes and software systems. He perviously worked for different companies like HP, Daimler, Agilent and ETAS/Bosch, and Fraunhofer IAO, where he initiated and coordinated a series of national and international research projects.

3 PROGRAMME COMMITTEE

- Ulf Blanke, ETH Zuerich, Switzerland

- Daniel Burmeister, University of Luebeck, Germany

- Mirko Fetter University of Bamberg, Germany

- Mehmet Aydin Baytas, Koc University, Turkey

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4 PROGRAM

1st Workshop on Large-scale and Model-Based Interactive Systems:
Approaches and Challenges
Duisburg, Germany – June 23, 2015, 9:00–17:30

9:00   *Welcome and Introductions*

9:15   *Keynote*

- Johannes Schöning

  Navigation in Ambient Spaces

10:00   *Paper Presentations*

- Daniel Burmeister, Bashar Altakrouri and Andreas Schrader

  Ambient Reflection: Towards self-explaining devices

10:30   *Coffee Break*

11:00   *Paper Presentations*

- Ronny Seiger, Florian Niebling, Mandy Korzetz, Tobias Nicolai and Thomas Schlegel

  A Framework for Rapid Prototyping of Multimodal Interaction Concepts

- Bashar Altakrouri and Andreas Schrader

  Challenging Documentation Practices for Interactions in Natural User Interfaces

- Jürgen Engel, Christian Märtin and Peter Forbrig

  A Concerted Model-driven and Pattern-based Framework for Developing User Interfaces of Interactive Ubiquitous Applications

12:30	*Lunch*
14:00	*Paper Presentations*
	• Enes Yigitbas, Bastian Mohrmann and Stefan Sauer *Model-driven UI Development integrating HCI Patterns*
14:30	*Discussions and Visual Roadmapping I*
15:30	*Coffee Break*
16:00	*Discussions and Visual Roadmapping II*
17:00	*Conclusions and Outlook*

5 ACCEPTED PAPERS

Invited Keynote:

- *Navigation in Ambient Spaces*
  Johannes Schöning

Accepted Papers:

- *Ambient Reflection: Towards Self-explaining Devices*
  Daniel Burmeister, Bashar Altakrouri and Andreas Schrader

- *A Framework for Rapid Prototyping of Multimodal Interaction Concepts*
  Ronny Seiger, Florian Niebling, Mandy Korzetz, Tobias Nicolai and Thomas Schlegel

- *Challenging Documentation Practices for Interactions in Natural User Interfaces*
  Bashar Altakrouri and Andreas Schrader

- *A Concerted Model-driven and Pattern-based Framework for Developing User Interfaces of Interactive Ubiquitous Applications*
  Jürgen Engel, Christian Märtin and Peter Forbrig

- *Model-driven UI Development integrating HCI Patterns*
  Enes Yigitbas, Bastian Mohrmann and Stefan Sauer