

Engineering Patterns for Multi-Touch Interfaces

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ABSTRACT

Multi-touch gained a lot of interest in the last couple of years and the increased availability of multi-touch enabled hardware boosted its development. However, the current diversity of hardware, toolkits, and tools for creating multi-touch interfaces has its downsides: there is only little reusable material and no generally accepted body of knowledge when it comes to the development of multi-touch interfaces. This workshop seeks a consensus on methods, approaches, toolkits, and tools that aid in the engineering of multi-touch interfaces and transcend the differences in available platforms. The patterns mentioned in the title indicate that we are aiming to create a reusable body of knowledge.

Author Keywords

Multi-Touch Interfaces, Engineering Patterns, EICS Workshop

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Human Factors

THEME, GOALS, AND RELEVANCE

The theme of this workshop is “engineering multi-touch interfaces”, with the main focus on methods, approaches, toolkits, and tools for developing actual multi-touch interfaces. The current body of work is mainly tailored toward a specific hardware platform, or relies on platform specific toolkits. In contrast with engineering WIMP (or single-touch) interfaces, there is no established work on transcending the diversity in hardware and software platforms. To name a few challenges posed by multi-touch:

- Different hardware platforms often provide different ways to specify the touch data, using different levels of detail (e.g. a set of 2D coordinates, a set of ovals, the actual touch shape, pressure, etc.).

- The form factor and orientation of multi-touch devices strongly influence the user experience. Horizontal tabletops afford collaborative work and support annotation tasks, whereas vertical displays are more appropriate for reading and presentation purposes. Mobile multi-touch devices require a completely different user interface.
- Each tracking technology (FTIR, DI, capacitive sensing, etc.) comes with its own advantages and drawbacks, and strongly influences the enabled interaction styles. For example, while capacitive sensing allows the use of thin displays, detecting markers of tangible interfaces is a hard task.
- Text input on multi-touch devices is still an open problem.

The main goal of this workshop is to reach a consensus on methods, approaches, toolkits, and tools that aid in the engineering of multi-touch interfaces and transcend the differences in available platforms.

A secondary goal of this workshop is to create a series of re-occurring workshops covering this theme. As the user base and available software for multi-touch platforms increases and matures, this workshop series can provide regular updates on the current state of the art for engineering multi-touch interfaces, as well as foster a community working on this topic.

FORMAT

We organize a full day workshop. Specialists from the field that are involved in the development of multi-touch interfaces are invited for the workshop, such as software developers, interface designers, tool(kit) builders, hardware manufacturers and researchers. Our goal is to facilitate a combination of presentations, demonstrations, discussions and community building.

Candidate participants submitted a short paper or a position statement. The short paper describes experiences, ongoing work or results related to the workshop’s topic. Video demonstrations are encouraged. A position statement describes requirements or issues the participant encounters when engineering multi-touch interfaces, as well as desirable solutions from the author’s point of view.

The workshop will start with brief introductory talks from each participant, followed by a review and discussion of topics emerged from position papers. If possible, we would

like to start with a set of experience reports, describing engineering issues with current multi-touch platforms. After the lunch break, participants will be split in groups structured around the core topics provided in the papers and statements. Afterwards, the groups will report back to the plenary forum.

ORGANIZATION

Kris Luyten is a professor at Hasselt University, affiliated with the Expertise Centre for Digital Media (EDM). His main research interests are context-aware user interfaces, user interface description languages, model-based and user-centered interface development, multi-touch interaction, mobile guides, ubiquitous computing, and social and collaborative software.

Davy Vanacken is a research assistant and PhD student at Hasselt University, affiliated with the HCI group of the Expertise Centre for Digital Media (EDM). His main research interests include modeling interaction techniques, collaborative software, and multi-touch interaction.

Malte Weiss is a research assistant and PhD student at RWTH Aachen University. His research focuses on haptic feedback and tangible user interfaces on tablets.

Jan Borchers is a full professor of computer science and head of the Media Computing Group at RWTH Aachen University. With his research group, he explores the field of human-computer interaction, with a particular interest in new post-desktop user interfaces for smart environments, ubiquitous computing, interactive exhibits, and time-based media such as audio and video.

Shahram Izadi works at Microsoft Research, UK. In recent years, his research has focused on developing novel, touch-based computers and devices, including SecondLight and ThinSight. He has worked as a researcher at PARC, and was a research fellow on the Equator UK project, working at Nottingham University, University College London (UCL), and the Royal College of Art. He was recently listed on the TR35, a list of 35 innovators, under the age of 35 who have made significant contribution to technology and the sciences.

Daniel Wigdor is a User Experience Architect at Microsoft, and an Assistant Affiliate Professor in both the Department of Computer Science & Engineering and the Information School at the University of Washington. His research interests are in Human Computer Interaction (HCI), interactive computer graphics, and in emerging post-WIMP user interfaces. His present work focuses on the development of software and interaction techniques with novel hardware devices, gestural interfaces, and multi-touch and freehand input.

PARTICIPANTS

We aim for participants with various backgrounds, though our main goal is to gather participants who are involved in the different stages of the design, creation, realization, and

deployment of multi-touch interfaces. We expect most participants to have a design or engineering (technical) background.

WORKSHOP CONTENTS

Martin Radvak, Dieter Wallach; *A Best Practice Approach to the Design of Tabletop-based Multi-Touch Applications.*

Erwin Aitenbichler, Dirk Schnelle-Walka; *An Extensible Architecture for Multitouch & Pen Interactive Tables.*

Stefan Bachl, Martin Tomitsch, Christoph Wimmer, Thomas Grechenig; *Challenges for Designing the User Experience of Multi-touch Interfaces.*

Mark Bolas, Logan Olson, Joe Osborn, Niko Bolas; *Design Approach for Multi-touch Interfaces in Creative Production Environments.*

Micha Block, Jasmin Link, Alexander Phleps; *Design Patterns for Multitouch-TUIs.*

Oscar Ardaiz, Ernesto Arroyo, Valeria Righi, Oriol Galimany, Josep Blat; *Distributed virtual collaborative environments with Multitouch support: Implementation and Experiences.*

Raphael Wimmer, Fabian Hennecke; *Everything is a Window: Utilizing the Window Manager for Multi-Touch Interaction.*

Florian Echtler, Gudrun Klinker, Andreas Butz; *Features, Regions, Gestures: Components of a Generic Gesture Recognition Engine.*

Michael Ameling, Philipp Herzig; *FraMuS - An Adaptive Framework for Multi-Touch Screens.*

Jan Derboven, Dries De Roeck, Mathijs Verstraete, David Geerts, Dirk De Grooff; *Low-Fidelity Prototyping for Multi-Touch Surfaces.*

Uwe Laufs, Christopher Ruff, Jan Zibuschka; *MT4j - A Cross-platform Multi-touch Development Framework.*

Ole Smørdal, Anthony Perritano, Idunn Sem; *Multi context, multi representation, multi touch.*

Oliver Schmid, Agnes Lisowska, Michèle Courant, B at Hirsbrunner; *Robust and reliable solutions for middle cost large multi-touch displays.*

Dietrich Kammer, Mandy Keck, Georg Freitag, Markus Wacker; *Taxonomy and Overview of Multi-touch Frameworks: Architecture, Scope and Features.*

Georg Kaindl; *Towards a flexible software framework for multi-touch application design.*

AFTER THE CONFERENCE

The community would benefit from a wide distribution and availability of the papers presented at the workshop. Therefore, we will look for an accessible, but well appreciated output channel. We will consider CEURS proceedings or we will assemble all papers in a published book or special issue.