Magdalena Blöckner

'Mobile Interaction with Media Facades'

Diploma Thesis

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Supervisor: Alexander Wiethoff MA

Professor in charge: Prof. Dr. Andreas Butz

Overview:

- **Literature research – related work**

- **Project 'iRiS –** an **I**ntuitive **R**emote **I**nteraction **S**ystem'
  - ➢ **Introduction of the project**
  - ➢ **Video showing the first pre-tests**
  - ➢ **Technical background, assignment of tasks**

- **Research phase**
  - ➢ **User Research – Interview Phase**
    - ⇨ Ideas for suitable content and forms of interaction
  - ➢ **User Study with Paper Prototypes**
    - ⇨ Finding and evaluating concepts for an easy-to-use Graphical User Interface for the iPhone application

- **Further tasks and next steps**

Literature research – related work

Dexia Tower in Brussels [1]

- **Subject 'multimedia facades'**

  ➢ Terms, techniques, general background, existing projects

  ➢ Challenges and issues in designing media facades

- **Subject 'mobile interaction with public or distant displays'**

  ⇨ Mobile interaction with multimedia facades is an upcoming field of work

  ⇨ Combination of knowledge about media facades in general and mobile interaction with public displays, as media facades can be considered as a kind of gigantic public displays

Sources: [1] Dexia tower, Brussels, Belgium http://commons.wikimedia.org/wiki/File:301_R317a.jpg, last visited 12.06.2010

'iRiS – an Intuitive Remote Interaction System'

- A cooperation of LMU, Munich and
  German Research Center for Artificial Intelligence, Saarbrücken
  and the Ars Electronica Center in Linz, Austria

- **Goal:**

  ➢ An application for mobile interaction with the facade of the Ars Electronica Building

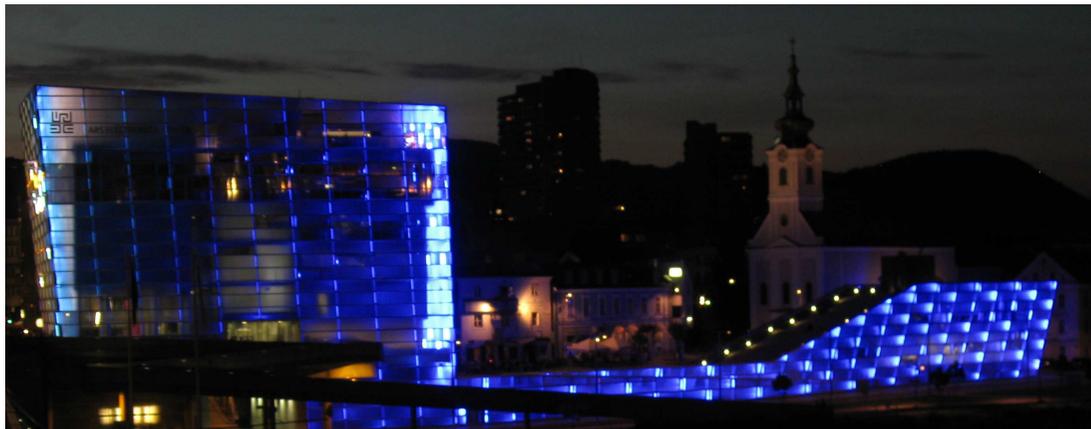 ➢ Will be running during the Ars Electonica Festival in September 2010

Image 1: Ars Electonica Center in Linz, Austria - own picture

Image 2: mobile interaction
- image by Alexander Wiethoff
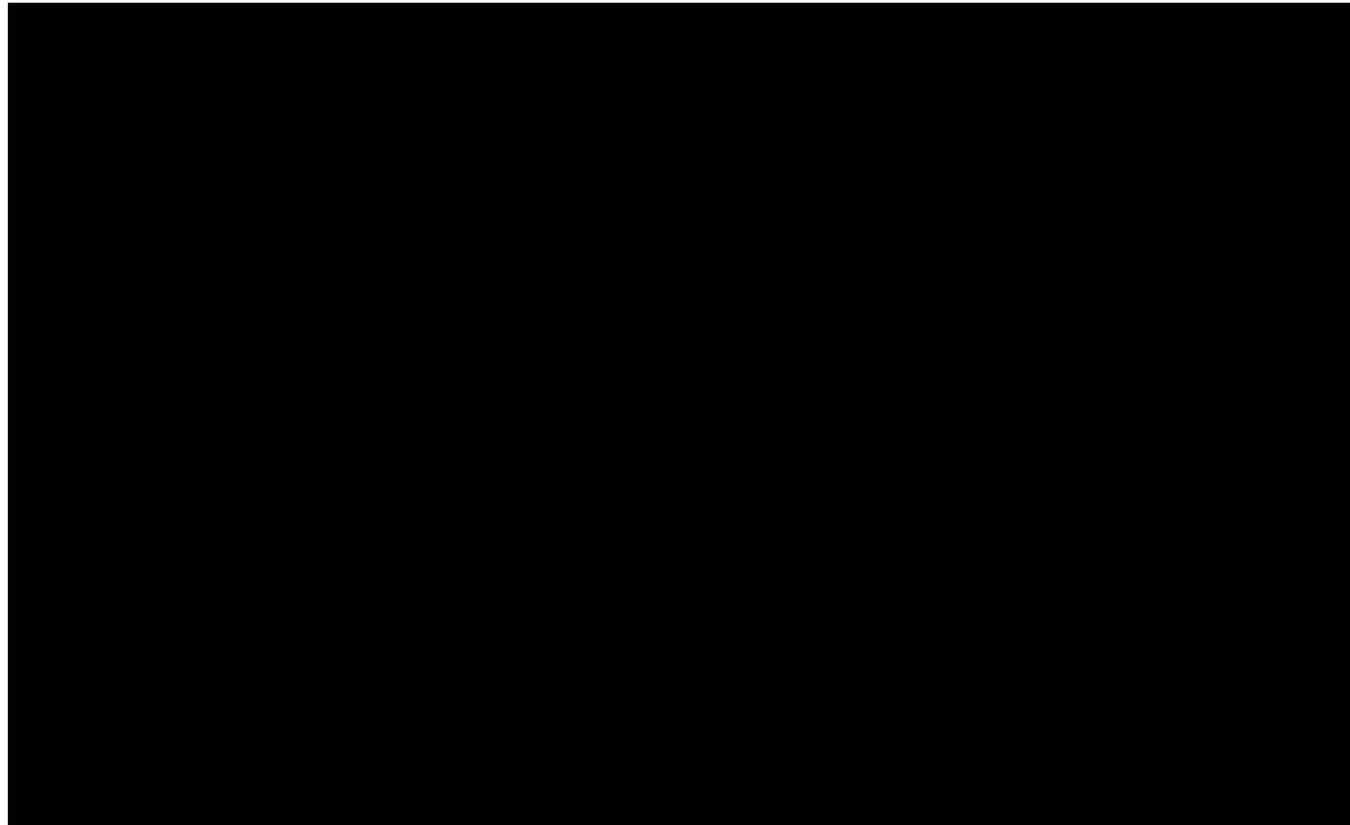
First pre-tests in Linz, June, 02, 2010
Video by Alexander Wiethoff

It already works!

'iRiS – an Intuitive Remote Interaction System'

- **iRiS is technically based on the 'touch projector',**
  a mobile application that allows the manipulation of content on distant displays
  through live video, using the camera of an iPhone
  By Sebastian Boring, Dominikus Baur, Andreas Butz (LMU),
  Sean Gustavson, Patrick Baudisch (Hasso Plattner Institute)

- **Assignment of responsibilities**

  Sebastian Boring (LMU): **Adaption of the Touch Projector to the iRiS project**

  Johannes Schöning, Sven Gehring (DFKI): **Communication with the building**

  Alexander Wiethoff, Magdalena Blöckner (LMU): **Front end of the application**
  - ➢ User Research (User Centered Design Process)
  - ➢ Finding and evaluating suitable content
  - ➢ Development and evaluation of GUI with good usability

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DEPARTMENT FOR COMPUTER SCIENCE
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User Centered Design Process - Interviews

- **Interviews covering the subject of interactive media facades in general**
  - 9 informal interviews, 20 minutes each
  - about possible content and forms of interaction
    + people's desires or annoyances with multimedia facades
  - age of participants between 24 and 55, different professions, 5 male, 4 female

Main findings from participants regarding possible content:
  - ➢ **In terms of general appearance of the facade:**
    Artistically appealing, playful interactions, not disturbing, no commercials
  - ➢ **In terms of own ideas:**
    Retro 8-bit games, visualizing city mobility,
    multiplayer challenge games, body interface,
    sensory games (Wii-like)

- **On-site findings -> interviews with passers-by in Linz**
  We interviewed about 40 people, what they think about
  mobile interaction with the Ars Building and asked for
  concrete ideas for games or other applications they would like.

Ideas building on results of the interviews

1st Category: Paint and Graffiti
- finger becomes a pen or 'spray – can'
- user can choose a color and paint the facade with colored light

2nd Category: Play and Interact
Games that are suitable for the low resolution of the facade, for example
- retro games like the *snake* game
- physical games
- user can catch objects flying around the facade
- memory and reaction games

3rd Category: Collaborative Installations
- multiple users paint or play together
- collaborative experience

User Centered Design Process – a study with 6 paper prototypes

=> finding an appealing and easy-to-use interface for the painting application

- Six participants between 24 and 32, different professions, 4 male, 2 female

- Two simple tasks for each prototype (sequence of prototypes randomly chosen)
    1) Selecting a given color and drawing a line on the building
    2) Choosing one color of the building and filling a whole side of the building with it

- Time to fulfill the task + additional questionnaire with 12 Likert Scale and rating questions + additional comments
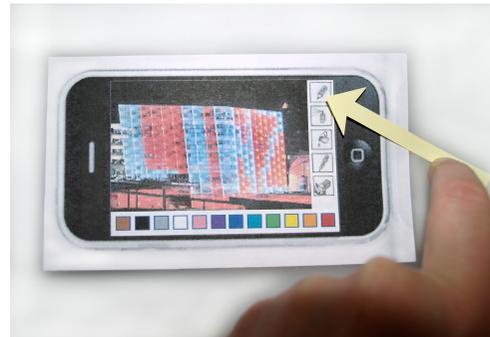

Some findings:
- Predefined colors are the fastest and easiest way for choosing colors, but most users felt restricted in their choice of colors.
- Users preferred to use the HSV color choosers.
- Switching screens during the tasks is very time-consuming -> all-in-one screen works best. But some users preferred multiple screens for having more space for painting.

Different Paper Prototypes (1)

- everything in one screen
- predefined colors
- four tools
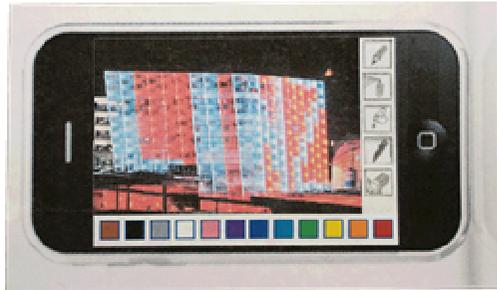
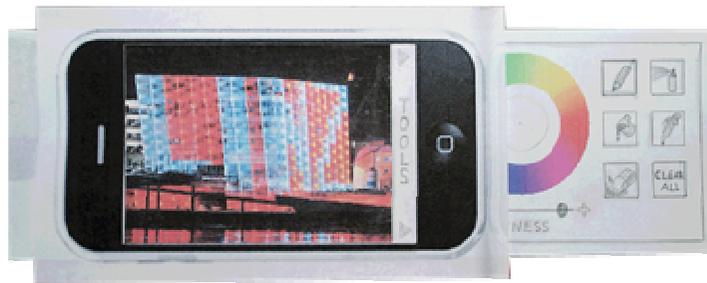- everything in one screen
- predefined colors
- five tools

- everything in one screen
- HSV color chooser
- five tools

Different Paper Prototypes (2)

- everything in one screen
- toolbox in an active corner
- HSV color chooser
- four tools

- two screens
- screen change with slide gesture
- HSV color chooser
- six tools

- three screens
- screen change with special gestures
- RGB color chooser
- six tools

Further tasks and next steps

- Evaluating all interviews and research resources

- Developing content (paint application, games) building on the research results

- Developing easy-to-use GUIs for all parts of the application
  building on the existing and following user studies with paper prototypes

- Figuring out and implementing suitable solutions for collaborative games

- Evaluating the application in terms of usability

- Evaluating the project with reference to challenges and issues
  in designing interactive media facades

Any questions?

Thank you for your kind attention!