Seminar
Personalizing the User Experience: Techniques and Applications from Selected Domains (automotive, retail & web)

Introduction

Michael Feld
Today

- Organizational Stuff
- Tips & Guidelines regarding Talks
- Brief Introduction to Personalization
ORGANIZATIONAL STUFF
Fast Facts

- **Time:** Fridays, 10-12am (c.t.)
- **Location:** Building E1 3, Room 015 (seminar room)
- **Credit Points:** 7
- **Organizers:**
  - Michael Feld
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  - Matthieu Deru
  - M. Mehdi Moniri

Procedure

- 12-13 seminar days with student presentations
- 2 presentations per day
- Attendance is required (list)
- Every participant
  - gives one presentation of a particular subject
  - has two “dedicated” subjects presented by other students → “responder”
    - responders read papers and prepare questions in advance
  - creates a short written report of their topic
Prerequisites and Grading Scheme

- **Prerequisites**: formally none, but ideally
  - Experience in User Interface design
  - Knowledge in Artificial Intelligence (lecture)

- **Grading**
  - Active participation (35%)
    - General
    - Responder
  - Oral presentation (40%)
    - Contents
    - Formal aspects of presentation
  - Written Report (25%)
    - Contents
    - Formal aspects of writing

- Don’t forget to register with HISPOS
Talks

- In English
- Based on one (sometimes multiple) pre-selected sources (papers, book chapters...)
- Find at least one additional source
- Find one (other) practical example of a personalized system from the three domains (1 slide)
- Approx. 30 minutes for the presentation
- Approx. 15 minutes for questions / discussion afterwards
- Send a **draft** version of your talk to your supervisor two weeks in advance (be prepared to meet with your supervisor to discuss)
- Send a **98% final** version of your talk at least on Tuesday prior to your presentation
- **Do set up / test your laptop in time before the talk!**
- Send me the final version in PDF format right after your talk
- If you really need to postpone/cancel your talk, please tell us as early as possible!
Written Reports

- 4-5 pages + title page
- should include
  - motivation
  - main part
  - summary
  - references (even if just a few)
- must not be a 1:1 copy of excerpts
- submit as PDF to your supervisor by e-mail
  - include external sources (if available electronically)
- Deadline for reports is 31st August
Questions?
Qestionnaire

...is handed out NOW!
Topics

- Will be published on the web page as well
- After on-line publication, choice is open (by e-mail)
- Assignment is first-come-first-serve
- Please specify 3+ topics (in order of preference)
Topics (1) – Basics

General
- Jameson & Gajos (2012): Systems That Adapt to Their Users
- Görlich (2009): Runtime Adaptation of Usage Interfaces for Ambient Intelligence Environments using Spatial Usage Models [GERMAN]

Knowledge Acquisition
- Li & Ji (2005): Active Affective State Detection and User Assistance With Dynamic Bayesian Networks → DBNs

Knowledge Modeling
- User Profiles for Personalized Information Access

Adaptation
Topics (2) – Automotive

  + “Development Of A Driver Situation Assessment Module In The Aide Project”
- Fischer & Nürnberger (2010): myCOMAND Automotive User Interface: Personalized Interaction with Multimedia Content Based on Fuzzy Preference Modeling
- Hassel & Hagen (2006): Adaptation of an automotive dialogue system to users’ expertise and evaluation of the system
- Zajicek & Jonsson (2005): Evaluation and Context for In-car Speech Systems for Older Adults
- Ziegler, Hussein, Münter, Hofmann, & Linder (2011): Generating route instructions with varying levels of detail
  + “An Adaptive Interactive Agent for Route Advice”
Topics (3) – Retail

- Asosheha, Bagherpoura, & Yahyapoura: Extended Acceptance Models for Recommender System Adaption, Case of Retail and Banking Service in Iran
- Khakzar, George, & Blum: Adaptive User Interfaces for the Clothing Retail
- Lawrence, Almasi, Kotlyar, Viveros, & Duri: Personalization of Supermarket Product Recommendations
- Liu, Yih, & Chieu: A Personalized Offer Presentation Scheme for Retail In-Store Applications
- Sackmann, Strüker, & Accorsi: Personalization in Privacy-Aware Highly Dynamic Systems
- Vrček, Bubaš, & Bosilj: User Acceptance of Location-based Services
Topics (4) – Web

- Bunt, Carenini, & Conati: Adaptive Content Presentation for the Web
- Micarelli, Gasparetti, Sciarrone, & Gauch: Personalized Search on the World Wide Web
- Soller (2007): Adaptive Support for Distributed Collaboration
- Teevan, Alvarado, Ackerman, & Karger: The Perfect Search Engine Is Not Enough: A Study of Orienteering Behavior in Directed Search
GIVING A TALK
Some tips and guidelines
Important Points

- Form / presentation matters!
- Practice your talk.
  The best talks are (almost) always well-practiced talks.
- Know your slides
Structure

- Think about the overall structure before creating slide contents
  - Should be a logical order – don’t jump between topics
- Make sure listeners understand your structure
  - Outline slide or section separators
  - For very short talks, a classical outline can be omitted
  - Headings can also be used to convey structure
- Almost every talk should have an **Introduction/Motivation** section and a **Conclusion/Summary** section
- Test whether someone else would get the key points of your objective through your motivation slides
- Title page with talk title, speaker name, and where it is presented
- Don’t switch into PPT after you have reached the end of your slides
● Add content that
  - supports the understanding of your topic
  - contributes to the discussion
● Completeness is not the primary goal
● Examples can be extremely helpful for understanding!
  - Include examples on your slides
● Cut down the text on your slides to the essential parts
  - Much different from written style!
  - Avoid long / full sentences
● Be prepared to explain everything on your slide
● If you present something complex (e.g. formula), make sure you explain it in reasonable manner – otherwise you have to omit complexity from the presentation.
Presenting Other Sources

- **Abstraction** is an important contribution
  - Simply summarizing other sources saves people time, but does not really add value yet
  - Instead of only presenting work A, B, C..., focus on similarities and differences
  - If you present multiple related references, consider having a slide comparing them side-by-side, e.g. in tabular manner

- Maintain the **perspective** of a third party when presenting other’s work
Layout (1)

- Try to use an intuitive layout for each slide that fits the contents
  - E.g. for a comparison, you could use two columns
- Your natural enemy: Bulleted lists
  - Generally fine, but easily over-used or malformed
  - However far better than raw text paragraphs!
- **Vary the layout** intentionally → keeps the audience awake
- But don’t confuse: Certain style elements should be consistent (e.g. titles, colors, fonts)
  - PPT e.g. offers presentation color / font / effect schemes
- In other words, slides should look dynamic but not chaotic
- **Do not sacrifice readability for design**
Layout (2)

- Avoid slides with a single top-level bullet point → simply remove the “point”
- Apply formatting to **highlight** things (e.g. bold, color, font size...)
- Make use of multiple indentation levels in lists
- Use consistent capitalization and line endings
- Don’t use text that is too small
  - Multiple short slides often work better than fewer full ones
Images

- **Combination of text and image** is a key element!
- Number of images depends e.g. on the subject, type of talk and audience
- Most people use **too few** images
  - Rule of thumb: 1 per slide
- Use helpful images if available, or symbolic otherwise
  - Just not too many prominent but meaningless images...
- Drawing custom figures from basic shapes (boxes & arrows) is worth the effort
- **Add text to images** that are not self-explanatory
- Motivation is usually a good place to have images (photos)
Animation

- Can generally be used for most types of talk (but don’t have to)
- For scientific talks, limit yourself to subtle effects (e.g. fade, wipe)
- Keep in mind that animations increase the talk time
- Special case: Animations that illustrate a process
- Simple form of animation: Incremental slides
  - Can be very helpful, especially for complex graphics
  - Can be used to simplify following your talk
  - But can also limit readability for “fast” listeners when overused
    - Combine items to appear in blocks when too many
  - Can slow down the talk
    - You have to know your slides very well
    - More difficult to speed up / skip points
Other Media

- It can be very helpful to incorporate other media (e.g. videos or audio files)
- You can also switch to other applications for a demo or to the blackboard for explanations
- Use a laser pointer when you refer to parts of your slide
  - Alternatively you can integrate “pointers” into the slides
Timing

- Being too slow is just as bad as being too quick
  - Try to stay in a +/- 5 minutes time window (for this seminar)
- Design your slides for a normal speaking pace
- **Practice your timing at least once**
- As a rough rule of thumb while drafting slides, most people use
  
  1 slide ~ 1 minute
- Keep an eye on the time while giving the presentation
- If you are seriously behind, it is sometimes better to skip slides
  - Don’t make that the default case though
  - Obviously, don’t skip important matter
Talking

- Speak **freely** – don’t convey the impression of reading
- Speak **clearly** (loud, not too fast)
- Don’t speak with your back to the audience
That’s it!
SEMINAR TOPIC OVERVIEW
What is Personalization?

- Commonly associated with the Web
  - **Recommender Systems**
- System reacts differently depending on...
  - *Who* uses it
  - *When* it is used
  - In what *state* the person is
  - etc.
Personalization

- “A process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to an individual” (Blom, 2000)
- Preserves the state across sessions (Mackay, 1991)
- Very active research topic in HCI due to increasing system ubiquity and user diversity (special needs)
Personalization: System Properties

**Personalization**

- **Tailored/Customized**
  - Designed/customized for a specific person
  - Expert knowledge required
  - Not easily reverted
  - Spray paint to a new color
  - MTV’s Pimp My Ride
  - Batmobile, James Bond Cars …

- **Adaptability**
  - Can be adapted by the user himself
  - Little Expert knowledge required
  - Easily reverted
  - User can easily change the High-tech finish of car at will

- **Adaptivity**
  - System adapts itself to the user/context
  - No Expert knowledge required
  - Easily reverted
  - Car adapts its own color to user’s mood

**Becoming a Person/Having a Personality**

Endres et al. (2010)
Jameson (2001)
Why do we care?

- Provides a number of potential benefits
  - Convenience / Comfort
    - discovering features otherwise not found
  - Efficiency
    - allowing to do more in less time
  - Safety
    - e.g. by reducing UI clutter / memory load
  - Accessibility
- Can also cause issues if not done carefully
  - Visibility
  - Explicability
  - Reversibility
„Levels“ of Personalization

Individual in a Specific State
• User Sören in state relaxed

Specific Individual
• User Sören

Closed Group of Users
• e.g. family, friends

Open, but Concrete Group
• e.g. everyone having trouble with a specific bend

Abstract Group
• e.g. Elderly, Women/Men
User-Centered Design (UCD)

- Early computing: human-machine interaction focused entirely on the **machine**
  - *How* can a certain task be accomplished?
  - missing experience
  - requirements and limited flexibility of the underlying hardware

- Focus shift towards the **task** at hand
  - *What* is going to be accomplished?
  - Task-oriented HMI design
  - Task design may be wrong; tasks may be rarely used in practice

- **User**-Centered Design
  - Emphasis on how tasks are perceived by the user, trying to understand and reproduce their thinking
  - thorough analysis of usage scenarios; user studies

- Task-Oriented + User-Centered $\rightarrow$ **Useware**
Three Main Aspects of Personalization

Knowledge Acquisition
- Adding new knowledge from sources external to the knowledge-based system

Knowledge Representation
- Storing, querying and processing knowledge

Adaptation
- Determining and applying changes to the systems
Knowledge Acquisition

- **Knowledge**
  - No decision without knowledge!
  - Knowledge: Aggregation of facts, experience, and problem solving strategies, which represent the base for complex information processing.
  - **Data vs. Knowledge**
    - Complex statements

- **KA: New knowledge from outside of the system**

- **Modes of acquiring knowledge**
  - “Built-in” Knowledge (World K., Inherited K.,...)
  - **Explicit entry** by the user
    - Requested vs. user-initiated
  - **Implicit** acquisition through Sensing
    - W.r.t. intention (e.g. steering wheel)
    - Intrusive vs. non-intrusive
  - Factual knowledge from other knowledge bases
    - eMail, Web, Traffic Central, car2car \(\rightarrow\) Information Extraction
Knowledge Representation

- **Why?**
  - Persist Knowledge
  - Share Knowledge
  - Querying & Inference

- **Historically (1980+)**
  - Terminological Languages (KL-ONE, NIKL,...)
  - Concepts and Relations, T-Box and A-Box

- **Current (2000+)**
  - **OWL** (Web Ontology Language)
  - **RDF** (Resource Description Framework), **RDF Schema**

- **Ontology**
  - Domain-specific structure of terms and their relations
  - Can be used for reasoning and inference

(W. Wahlster, AI Lecture)
# Types of Adaptation

<table>
<thead>
<tr>
<th>Adaptation of the Interface</th>
<th>Adaptation of the Function</th>
</tr>
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<tbody>
<tr>
<td>• „Cosmetic“ changes</td>
<td>• Functional changes</td>
</tr>
<tr>
<td>• Changes how content is displayed (graphical UI)</td>
<td>• Changes the actual content</td>
</tr>
<tr>
<td>• Changes modalities or interaction parameters</td>
<td>• e.g. selection of a different route</td>
</tr>
<tr>
<td></td>
<td>• Determines if certain content is shown</td>
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</tbody>
</table>
Adaptation Strategies

- Adaptation Strategies provide a generic way to describe an effect. Examples are:
  - Increasing / reducing information (# of elements)
  - Changing method for scrolling/paging through long lists
  - Adjusting colors
  - Changing layout (e.g. element size)
  - Changing instant of display
  - Increasing / decreasing time of display (e.g. speech rate)
  - Choosing output modalities
  - Determining repetition behavior
  - Adjusting mood/style of message
  - Re-ordering a list items
Selected Application Domains

Automotive

Retail

Web
Next Time

Talk by Christian Müller: Introduction to the Automotive Domain and its challenges related to personalized User Interface Design
Theses?

→ Ask any of the tutors for Bachelor / Master thesis topics and/or check their websites!
See you next time!