Mensch-Maschine-Interaktion 2

HCI and the Web

Prof. Dr. Andreas Butz, Dr. Julie Wagner
HCI and the Web

• Organizational stuff

• Usability: a quick reminder
• How we use the web (device side)
• How we use the web (human side)

• HTML+CSS: a quick reminder
• Responsive Web Design: some Basics
• Responsive Web Design: Example and Exercise
Introducing the MMI2 team

Prof. Butz  Dr. Julie Wagner  Sarah Thiel  Maraike Stuffler
Structure of Lecture

Desktop Environment
- context and task
- challenges
- input technologies
- challenges in interaction design
- output technologies

Mobile Environments
- context and task
- challenges
- input technologies
- challenges in interaction design
- output technologies

Interactive Environments
- context and task
- challenges
- input technologies
- challenges in interaction design
- output technologies
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Final Exam
Structure of Exercise

Please register for one of the exercises in UniWorx

3 parts:
1. Summary of Lecture
2. Quiz (about summary of last week’s exercise.)
3. Solution
   - bring your equipment and program in class
   - help each other
Rules for Plagiarism

• one trial leads to non-admission to the final exam
  – tools to check similarities of solutions
  – invitation to oral exam to determine if you are the true originator.

• think about your reputation if you plan to write master/bachelor thesis at our chair.

• check for plagiarism can occur any time during the semester.
Exercise 1 (2 weeks time)

• design a responsive web design for the Olyphonics choir webpage (details later and in the exercise sheet)

• reward for best solution
  – Prof. Butz will call your phone to give his personal congratulations ;-)  
  – Solution will be used on the web  
  – Acknowledgement on the Olyphonics page
HCI and the Web

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• Usability: a quick reminder
  • How we use the web (device side)
  • How we use the web (human side)

• HTML+CSS: a quick reminder
• Responsive Web Design: some Basics
• Responsive Web Design: Example and Exercise
What is Usability?

• “Usability is a quality attribute that assesses how easy user interfaces are to use. The word ‘usability’ also refers to methods for improving ease-of-use during the design process.” (Jakob Nielsen)

• “Scientific discipline using observation, measurement and design principles to enhance a site visitor’s ability to perform specific tasks” (Kathy Gill)

• “… the effectiveness, efficiency and satisfaction with which a specified set of users can achieve a specified set of tasks …” (ISO)
Why is Usability Important?

• Improving usability can
  – increase productivity of users
  – reduce costs (support, efficiency)
  – increase sales/revenue (web-shop)
  – enhance customer loyalty
  – win new customers

• Several case studies that show the benefit of usability
• Usability is often considered a sign of quality
• Working with users can create ideas for new products, e.g. "similarities" feature (people who bought this also bought that) at amazon.com (Source: Interview Maryam Mohit

How do we achieve usability?

• Investigate requirements seriously
  – Observations, studies, focus groups
• Usability is a central element of all development activities
  – Part of quality assurance
• Iterative development
  – Early prototypes: Paper prototypes, mock-ups
  – High-fidelity prototypes & user studies
• Guidelines and principles
  – E.g. learnability, efficiency, memorability, errors, satisfaction (Nielsen)
• Evaluation
  – Usability engineering as an empirical discipline
Web Usability

• Usability of Web sites and Web applications
  – delivered over the WWW

• Dependent on several issues related to
  – Web technology
  – Web design
  – Project Management
  – Usability evaluation

• Web usability is not about “adding some fancy graphics, color, and cool styles at the end of the project”

• Web usability can be measured!
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The Web Means Heterogeneity of Platforms

• Processing power
  – Processor, co-processors, cache
  – RAM

• I/O-performance
  – Hard drive speed
  – Network

• Input and Output
  – Displays
  – Keyboard layout

• Additional Hardware and Periphery
  – Video and audio (in/out)
  – Card reader, printer, scanner

• Software
  – Browser
  – Operating System
Ausland

Rücktritt und Neustart

Berlusconi

Der italienische
Ministerpräsident wirft aus
taktischen Gründen das
Handtuch, denn er will mit
seinen alten Partnern eine neue
Koalitionsregierung bilden. Doch
die Parteien sind völlig
zerstritten. Daher sind
kurzfristige Neuwahlen nicht
auszuschließen

115 Zeilen, MICHAEL BRAUN
(TAZ-Bericht)

falls Sie sich
Other Graphical Browsers (2005 ;-)

Other Graphical Browsers (2013 version)
Plain Text Browser, e.g. Lynx

Audio Browsing

• There are users who listen to Web sites!
• Example:
  – Web browser Safari
  – Screen reader Voice Over (built into Mac OS)
• Who among the Web designers will think of these users?
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The Web Means Heterogeneity of Users

• In principle, anybody can use the Web!
• Huge span of user variety:
  – Kids
  – Beginners
  – Elderly
  – Experienced technically educated professionals
  – Technically ill-educated professionals
  – Hackers
• “Know Thy User” - Is it possible on the Web?
• Why do people use the Web?
  – Assumedly easy and simple way of achieving things
  – Because it is fun
  – Because there are no other options
• (As always:) Simplicity is most important
Steve Krug: Design and Reality

Don't make me think! Web Usability: Das intuitive Web, [Steve Krug](#) ISBN-10: 3826608909
Steve Krug: We Don’t Read Pages, We Scan Them

• We are in a hurry.
• We know that we do not have to read everything.
• We are educated in scanning things.
Heatmaps to analyze web page usage
Steve Krug: We **Satisfice**
(satisfying & sufficing)

- We do not make optimal choices
  - We are in a hurry.
  - There is not much penalty for guessing wrong.
  - Weighing options does not guarantee success.
  - Guessing is more fun.

- **Gary Klein: Sources of Power - How People Make Decisions**
  - Example: Fire commanders do rarely compare options!
    - Find a reasonable plan
    - Check it for obvious problems
    - Try it!

- see also: Daniel Kahneman: Thinking, Fast and Slow
Steve Krug: We Muddle Through

- Users in general do not care how and why things work
  - Any working solution is accepted
  - We do not have the time to analyze the details
  - There is no incentive for having it understood better

- Example:
  - Use a search box for navigating to a site
HCI and the Web

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- HTML+CSS: a very (!!) quick reminder
- Responsive Web Design: some Basics
- Responsive Web Design: Example and Exercise
Technological Basis

- See also [http://diveintohtml5.info/past.html](http://diveintohtml5.info/past.html)
- [http://www.w3.org/People/Raggett/book4/ch02.html](http://www.w3.org/People/Raggett/book4/ch02.html)

HTML Recap

• For details see lecture „Web-Informationssysteme“
  – http://www.pms.ifi.lmu.de/lehre/webinfosys/13ws14/
  – http://videoonline.edu.lmu.de/en/node/1668

<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <title>Title of the document</title>
  </head>

  <body>
    Content of the document......
  </body>

</html>  

http://www.w3schools.com/html/html5_intro.asp
CSS recap

• Main idea: Separate format from content!
  – content in HTML file
  – format in Cascading Style Sheet (CSS file)
• Style definitions for the tags in the HTML file
  – defaults if nothing is given
  – can be nested and become more and more specific
  – details again in the WebInfo lecture

body{font-size:75%;
font-family:verdana,arial,'sans serif';
background-color:#FFFFF0;
color:#000080;
margin:10px;}

h1 {font-size:200%;}
h2 {font-size:140%;}
h3 {font-size:110%;}

http://www.w3schools.com/css/demo_default.htm
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• Responsive Web Design: Example and Exercise
Static Web Design
Fluid Web Design
Responsive Web Design
Responsiveness across media

- e.g., screen vs. print
- examples:
  - http://www.mvv-muenchen.de
  - http://www.bahn.de
Basic Elements of Responsive Design

- **Flexible Grid Layout**
- **Media Queries**
- **Flexible Images + Media**

- Source: presentation by Nicolas Leyking
  - [http://de.slideshare.net/ERGOSIGN/vortrag-responsive-design-upa-2013](http://de.slideshare.net/ERGOSIGN/vortrag-responsive-design-upa-2013)
Flexible grid layout (example)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>3</th>
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<td>Element</td>
<td>Element</td>
<td>Element</td>
<td>Element</td>
<td>Element</td>
</tr>
</tbody>
</table>
Switching between layouts

http://www.metaltoad.com/blog/simple-device-diagram-responsive-design-planning
Media Queries

- width/height
- device-width/-height
- orientation
- aspect ratio
- color
- resolution
- medium
  - screen
  - print
  - handheld

```css
@media screen and (max-device-width: 480px) {
    /**
     * some CSS Code
    /**/}
```

```css
@media screen and (orientation: portrait) {
    /**
     * some CSS Code
    /**/}
```

```css
@media screen and (device-aspect-ratio: 1280/720) {
    /**
     * some CSS Code
    /**/}
```

http://www.w3.org/TR/css3-mediaqueries/
Responsive vs. Adaptive Design

**Responsives Design**

- Desktop
- Notebooks
- Tablets
- Phone

**Adaptives Design**

- Desktop
- Notebooks
- Tablets
- Phone

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1 flexibles Layout Grid

6 fixe Layoutgrößen
Flexible Image Scaling
Some design patterns for RWD

• Not a comprehensive list, just examples
• Layout patterns
  – column drop
  – off canvas
• Navigation patterns
  – navigation drawer
  – Toggle
• Accommodating touch across different screen sizes

• Sources:
  – presentation by Nicolas Leyking (http://de.slideshare.net/ERGOSIGN/vortrag-responsive-design-upa-2013)
Layout: Column drop

Example: http://modernizr.com
Modernizr is a JavaScript library that detects HTML5 and CSS3 features in the user's browser.

Why use Modernizr?
Taking advantage of cool new web technologies is great fun, until you have to support browsers that lag behind. Modernizr makes it easy for you to write conditional JavaScript and CSS to handle each situation, whether a browser supports a feature or not. It's perfect for doing progressive enhancement easily.

How it works
Modernizr runs quickly on page load to detect features; it then creates a JavaScript object with the results, and adds classes to the `html` element for you to key your CSS on. Modernizr supports dozens of tests, and optionally includes YesNope.js for conditional loading of external .js and .css resources.

Check out the full list of features that Modernizr detects, or learn more about conditional resource loading with Modernizr.
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Get started with Modernizr

While Modernizr gives you finer control over the experience through JavaScript-driven feature detection, it is important to continue to use best practices throughout your development process. Use progressive enhancement wherever you can, and don’t sacrifice accessibility for convenience or performance.

- [Documentation: Getting started](https://modernizr.com/docs/)
- [Taking Advantage of HTML5 and CSS3 with Modernizr](https://modernizr.com/docs/taking-advantage/), Faruk Ates
- [How to use Modernizr, Inayaíl de León](https://modernizr.com/docs/how-to-use/)
- [Modernizr: front-end development done right](https://modernizr.com/docs/front-end-development/), Ryan Seddon
- [The Undetectables: features that cannot be detected](https://modernizr.com/docs/undetectables/)
- [Cross-browser Polyfills](https://modernizr.com/docs/polyfills/)

Also check out our [Resources section](https://modernizr.com/docs/resources/).

Tip: check our [Modernizr test suite](https://modernizr.com/test/) to quickly test your current browser features.
Modernizr is a JavaScript library that detects HTML5 and CSS3 features in the user's browser.

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Download Modernizr 2.6.2

Use the commented, uncompressed Development version to develop with and learn from.

Then, dive into the Production build tool and pick just the tests you need!
Layout: Off Canvas

Example: http://www.kaemingk.com/de/
Finden Sie Ihre Frühjahrs-/Sommer-Inspiration bei Kaemingk

ERHALTEN SIE EINEN Eindruck unserer Frühling 2014 KOLLEKTION
Oder sehen Sie sich unsere Kollektion Weihnachten 2012 an.

BESICHTIGEN SIE UNSEREN SHOWROOM VON 5.600 m²

IN KÜRZE:

04-20 Dez. 2013 'Open door days' Weihnachten 2014
Finden Sie Ihre Frühjahrs-/Sommer-Inspiration bei Kaemingk

ERHALTEN SIE EINEN Eindruck UNSERER
Frühling 2014

KOLLEKTION

BESICHTIGEN SIE UNSEREN SHOWROOM
Navigation Drawer

Example: http://www.kaemingk.com/de/
Finden Sie Ihre Frühjahrs-/Sommer-Inspiration bei Kaemingk

ERHALTEN SIE EINEN EINDRUCK UNSERER
Frühling 2014 KOLLEKTION

Oder sehen Sie sich unsere Kollektion Weihnachten 2012 an →

BESICHTIGEN SIE UNSEREN SHOWROOM

ENGLISH

FRANÇAIS
Toggle

Example: Wikipedia mobile
Media queries allow the page to use different CSS style rules based on characteristics of the device the site is being displayed on, most commonly the width of the browser. Server-side components (RESS) in conjunction with client-side ones such as media queries can produce faster-loading sites for access over cellular networks and also deliver richer functionality/usability avoiding some of the pitfalls of device-side-only solutions.[13]

Related concepts
Challenges, and other approaches
History
See also
References

Read in another language

Last modified 12 days ago
Touch on mobile phones

- bottom of screen is easiest to reach
- top corner is hardest to reach
- we don’t know how the device will be held
- put important stuff at the bottom
Touch on tablets  

- bottom corners are easiest to reach
- top middle is hardest to reach
- again: we don‘t know how exactly the device will be held
- put important stuff at the bottom and to the sides

Touch on ultrabooks (http://www.lukew.com/ff.entry.asp?1649)

• bottom corners are easiest to reach
• top middle is hardest to reach
• not so many ways to hold the device

• put important stuff along the sides

- Mobile: usually OK
- Larger layouts:
  - designed for mouse
  - wrong areas for touch
  - discriminate between desktop and handheld!
  - adapt touch areas to tablet usage if possible!
HCI and the Web

• Organizational stuff

• Usability: a quick reminder
• How we use the web (device side)
• How we use the web (human side)

• HTML+CSS: a quick reminder
• Responsive Web Design: some Basics
• Responsive Web Design: Example and Exercise
Resources for self-teaching and reference

- http://www.w3.org
- http://www.selfhtml.org
- http://www.csszengarden.com
- http://css-tricks.com
- http://coding.smashingmagazine.com/2011/01/12/guidelines-for-responsive-web-design/
- http://getbootstrap.com/
- http://www.mobilephoneemulator.com
Task for the exercise

• Build a responsive website for the Olyphonics Choir
  – web site should work on desktop, tablet, phone + print
  – should be easily maintainable (i.e. without complicated tools)

• Structure is given as a result of initial discussions
• Text is given in a .doc file (right from the texter ;-)
• Photo currently is just a placeholder
  – better photo will be shot on Oct. 26th
  – provide room for a gallery of future photos
  – provide room for future announcements

• Best solution will actually be used
  – author will be acknowledged on the web page
Just the end of the process

• Requirements
  – Web site structure from group discussions
  – existing logo should be used
  – domain http://olyphonics.de is already blocked

• Initial design
  – Infos collected and text formulated
  – technology decision: HTML5 + CSS3
  – decision for a responsive design (potentially single page?)

• Initial functional prototype

• Design iterations
  – defining visual and functional design
  – tests on different platforms
Base material for the exercise

- [http://www.cip.ifi.lmu.de/~butz/olyphonics/website/](http://www.cip.ifi.lmu.de/~butz/olyphonics/website/)
- [http://www.cip.ifi.lmu.de/~butz/olyphonics/website/Homepage.docx](http://www.cip.ifi.lmu.de/~butz/olyphonics/website/Homepage.docx)
- [http://www.cip.ifi.lmu.de/~butz/olyphonics/website/olylogo-big.jpg](http://www.cip.ifi.lmu.de/~butz/olyphonics/website/olylogo-big.jpg)
- [http://www.cip.ifi.lmu.de/~butz/olyphonics/website/D2X_2357_small.jpg](http://www.cip.ifi.lmu.de/~butz/olyphonics/website/D2X_2357_small.jpg)
Appendix: Potential Problems on the Web

- Downright errors
- Annoying or inaccessible page design
- Search engine problems
- Information architecture problems
- E-commerce problems

- From http://www.siteusability.com/mistakes.html (now offline)-:
What are potential problems? (1)

• **Downright errors:**
  – Broken links or missing images.
  – Firewall errors, server cannot be contacted, directory browsing not allowed (or allowed?).
  – Scripting errors that pop up an error message, make the page unusable, or write strings of gibberish amongst the text.
  – HTML coding errors that mean the page doesn't display properly, or at all.
What are potential problems? (2)

- Annoying or inaccessible page design:
  - An "entrance tunnel" or splash screen - lots of flashy imagery but no real content that requires a click to get to the real home page.
  - Pages with such poor contrast between background and text they are hard to read.
  - Text in tiny or illegible fonts.
  - Pages that take minutes to download (even worse if when they have finished, you weren't interested in the content anyway).
  - Content that requires a specialised plug-in to read it.
  - Pages that require a specific browser to display nicely.
  - Links that lead to "under construction" pages.
  - Link colour schemes where you can't tell which ones you have already visited.
  - Links with badly-chosen targets that display numerous hidden windows on the desktop, break the Back button, or display pages without the necessary menus to use them properly.
  - Forms where you don't know what the site owners want to do with the information you are asked to supply.
  - Forms that don't explain properly what you need to enter, or don't let you go back and amend any errors.
  - Pages with typographical or grammatical errors, confusing and poorly-written text, or inconsistent terminology.
What are potential problems? (3)

• Search engine problems:
  – Pages with no links to other pages in the site.
  – Pages called "No title", "Untitled", "Insert document title here", and/or with a meaningless abstract, so the user has no idea whether the link is relevant or not.
  – Pages that no longer exist on your site because you moved or renamed them.
  – Pages so poorly designed they will never even appear in a search engine listing.
What are potential problems? (4)

• Information architecture problems:
  – Pages with different layouts and appearance for the same kind of information.
  – Very long pages with no quick way to skip about them.
  – Forms that don't work in a comprehensible way, and shopping cart systems that confuse in their complexity.
  – Links that lead to mystery destinations (e.g. "click here"), or to other sites without warning.
  – Overwhelming numbers of links on the home (or other) page.
  – Menu options or navigation bar icons that mean little to the average visitor.
  – No consistent way to move around the site on every page.
  – No clear distinction between different kinds of information.
  – Confusing site structure so the visitor cannot guess where to go for information.
What are potential problems? (5)

• E-commerce problems:
  – Potential buyers can't find the product they want because they don't understand the categories you have chosen.
  – Visitors leave without purchasing because they don't want to register.
  – Visitors can't find your returns policy or how their privacy is protected if they buy from you.
  – Buyers have to work out the shipping and handling charges for themselves when viewing an item in your online catalogue.
  – Visitors from overseas don't understand the measurement system you use for sizes or weights.
  – ... the list of potential problems is endless - this just skims the surface for sites selling to the consumer.
Appendix: Dos and don‘ts
from http://de.slideshare.net/ERGOSIGN/vortrag-responsive-design-upa-2013

+ Dos
+ Sorge für ein einheitliches, teamweites Verständnis über Responsivität
+ Sammel soviel Informationen wie möglich über deine Zielplattformen
+ Teste dein responsive Design so früh wie möglich mit leichtgewichtigen Prototypen
+ Sammel Feedback von langjährigen Benutzern der Plattformen
+ Dokumentiere das Layoutverhalten durch anschauliche Mittel
+ Stelle die Dokumentation und die Prototypen den Entwicklern zur Verfügung

- Don‘ts
- Einsatz von fixen layouting Tools (Photoshop)
- Entwicklungsbeginn vor Abschluss und Abnahme des Designs
- 1:1 Übertragung des Designs von Desktop auf Mobile
- Verzicht auf relevante Inhalte aufgrund von Platzmangel.