Who Am I?

- Studied CS at Karlsruhe (& Imperial)
- Human-Computer Interaction
- PhD CS, TU Darmstadt (& Linz, Ulm)
- Interaction with multimedia
- HCI design patterns
- Assistant professor at Stanford & ETH
- Interactive rooms
- Ubicomp user interfaces
- Full professor at RWTH since Oct. 2003
- Interaction with audio & video
- Tangible UIs
- Physical computing

Our Team

Chat Wacharamanotham
Touchscreen usability
Gestural Interface
chat@cs.rwth-aachen.de

Simon Völker
Interactive surfaces
Curved surface
voelker@cs.rwth-aachen.de

Questions go to them!
Usability Sells

Class Topics

Theory
- Models of interaction
  - Affordances, mappings, constraints
- Human cognition and performance
- History and vision of HCI

Practice
- Sketching, ideation
- Iterative design
- Prototyping
- User study and evaluation

What’s Human-Computer Interaction?

Use and Context

Human
- H1 Human Information Processing
- H2 Language, Communication and Interaction
- H3 Ergonomics

Computer
- C1 Input and Output Devices
- C2 Dialogue Techniques
- C3 Dialogue Genre
- C4 Computer Graphics
- C5 Dialogue Architecture

Development Process
- D1 Design Approaches
- D2 Implementation Techniques and Tools
- D3 Evaluation Techniques
- D4 Example Systems and Case Studies
Format

- Group oriented, project centered
- Credits (6 ECTS): Graded 'Schein'
  - 40% assignments, projects, and idea logs
  - 25% written exam part 1 (midterm)
  - 35% written exam part 2 (final)
- Passing the course
  - You need a passing grade in the assignments (average of 4.0) to write the exams
  - You need to pass the final exam to pass the course
  - You need to participate in at least one user study at our chair or the Psychology chair

Details

- BSc/MSc/Diplom regulations
- Work time @uni vs. @home is roughly 1:2!
- Each lecture: theory + practice
- Limited to 100 seats
  - Register via Campus Office by October 24, 18:00
  - Registration result: October 25, 18:00
  - Priority: compulsory > past grades > BSc

Media Computing and HCI
— English • annual —

<table>
<thead>
<tr>
<th>SS,WS</th>
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<th>The Media Computing Project</th>
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<tbody>
<tr>
<td>WS</td>
<td>S</td>
<td>Post-Desktop User Interfaces</td>
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<tr>
<td>SS</td>
<td>V3Ü2</td>
<td>Current Topics in HCI</td>
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<tr>
<td>WS</td>
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<td>iPhone Application Programming</td>
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<tr>
<td>SS</td>
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<td>Designing Interactive Systems II</td>
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<td>WS</td>
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<td>SS</td>
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<td>SS</td>
<td>SW-Pr</td>
<td>M3: Multimodal Media Madness</td>
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Lecture: iPhone Programming

- Dates
  - Lecture: Tue. 09:00 – 11:30 (2010)
  - Lab: Mon. 16:00 – 17:30 (4U15; max. 16 students)
- Credits:
  - Lecture + Lab: 6
  - Lecture: 3
- Assignments + Exam + Final Project
- Sign up by Thursday (October 13, 12:00)
  - http://hci.rwth-aachen.de/iphone
iPhone Programming Topics

- Mobile application design principles
- iOS development basics
- View Controllers & Dialogs
- Input techniques
- Networking
- Multimedia
- Performance tweaking
- iPad programming

All slides and lecture videos for both DIS1 and iPhone Programming will be available on iTunes U

http://hci.rwth-aachen.de/dis

Tabletop Tower Defense: http://hci.rwth-aachen.de/moellers

http://hci.rwth-aachen.de/madgets
• People doing strange things with electricity in Aachen
• Next meeting: October 19, 18:30 (Room 2010)
• http://www.dorkbot.de

CocoaHeads Aachen

• International group devoted to discussion of Apple’s Cocoa Framework for Mac OS X and iOS
• Next meeting: October 27, 19:00 (Room 2010)
  • Talk/Demo: OpenCL & AppCode
• http://www.cocoaheads.de

In-class Exercise: Your First Design

• Sketch a universal remote control for radio, TV, DVD player, and VCR player
• You have five minutes.
  Get set, ready, go!
User Errors Are Design Errors

• A Big Message of DIS I
• We tend to blame users for mistakes
• But usually it’s the product / user interface design that is to blame
• Computers are nothing special—they have many of the same problems as everyday things (and others because of their flexibility)

“Mystery Meat Navigation”

• What is wrong here?

Visibility

• The mind is excellent at noticing and interpreting clues in the world, rationalizing, explaining cause and effect
• Much everyday knowledge is in the world, not in the head
• So visibility is one of the most important aspects in design
• Ideally, natural clues are made visible, requiring no conscious thought: natural design
• Just the right things have to be visible; excess is as bad as lack of visible clues
Improving the Swedish Hair Dryer

- Detach scale (labels) and control
- Provide at-a-glance overview of possible settings (What Can I Do?)
- Design control knob to show how it can be operated (e.g., pushed)
- Make current setting of control against scale easy to determine (Where Am I?)
- Use natural ordering of settings ($0 < I < II$)
- These all work for a new product—but design for use
  - One-handed operation, labels must not wear off, water-resistant controls, voltage settings, ...
- Apply the First Rule of UI Design: *Keep It Simple*
Visibility & Superstitions

- Coincidence and lack of visibility can cause false causalities (thinking your action had a bad or no effect).
- They lead to superstition and loss of control.
- Example: Multiple clicks because system doesn't respond—and then the chaos when it does…

Market Constraints

- Better UIs are not automatically business goals
- Consumers have to prioritize usability before industry changes (it's happening gradually)
- Goal of this class: Turn you into nitpickers that notice bad (and good) UIs everywhere.

How do you check your voicemail?
RWTH University Phones

- More phone issues
  - Tone dialing doesn’t work, have to dial “* 8” to activate
  - Missed calls are hard to retrieve, and numbers disappear after looking at them once
  - Etc…
- Mobile phones (“network features”) are not much better (e.g., blocking caller ID)

Affordances

- Model by Norman, after Gibson
  - “…affordances of the environment are what it offers the animal…” [Gibson77]
- Affordances are the actions that the design of an object suggests to the user
  - “…the term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used…” [Norman88]
Utility of Affordances

• Affordances provide strong clues
  • No instructions/labels needed
  • A design with labels is often a bad design!
  • Also true for many software UIs
  • Exceptions: complex, abstract functions that do not support simple “physical” affordances
• Product design can support usability when using affordances well

British Rail Shelters

• British Rail shelters with glass walls were being vandalized routinely
  • Glass suggests (“affords”) being broken
• After replacing them with equally strong plywood, the demolishing stopped
  • Wood suggests/affords stability and support
• However, now they were being scribbled upon…
  • Smooth, even surfaces “afford” drawing!

Example: Headlamp

Flat surfaces suggest pushing, so a label “PULL” is needed.
False Affordances

- False affordances suggest actions that are not actually possible or the right ones
- Example: Winchester Mystery House
  - Staircases leading nowhere
  - Cupboards with nothing behind their door

A Note on Active Reading

- Highlight 1–2 key points per page
- Scribble brief summaries, ‘!’ marks, crazy associations, project ideas,… in margins
- Put sticky notes with keywords onto pages you keep referring back to
- Type short bullet-point summaries of each chapter
- Make sure you can tell your copy of the book apart from 10ft
- Increases value of the book for you many times
Idea Logs

- One place to store your ideas as you have them.
- A place to develop your idea.
- Graphical record in a physical medium
- “Just for you”
- Submit snapshots during projects and annotated log at the end of the semester

Gayle Curtis on idea log:

Example from CS 247: Interaction Design Studio, Stanford University

How to Draw Users

- Star Man and friends
  - Stick Man (bad)
  - Star Man
  - Sad, happy Star Man
  - Star Man pressing a button
  - A hand
  - Star Trek Man, Simple Star Trek Man
  - Family, users around an exhibit
  - Architect Man, Suits
References on How to Draw Users

- The full version of Sketching lecture by Bill Verplank: http://hci.rwth-aachen.de/verplank

Revisiting the Remote Control

- In your idea log, refine your remote control using what you have learned today
- Reflection:
  - What did you change? Why?
  - What stayed the same? Why?

Assignment

- Get an idea log and a suitable pen
  - Recommended: A4 size, heavy papers that feel good when you sketch on it
  - Put date on every page as you go through
- Universal remote control
  - Put your first remote control sketch in the idea log
  - Reflect and develop your idea further from what you have learned
- Get Norman's book and start reading
  - You have four weeks to finish the book
  - You should get through half of the book by the next lecture

Summary

- The Media Computing Group does cool stuff.
- HCI is about humans, computers, the design process, and the social context
- Visibility and affordance provide clues how the system can be used
- Idea logs are great way to collect and develop your ideas
- Register if you have not done so yet.
  - (Step-by-step guide: http://hci.rwth-aachen.de/dis)

No lecture & lab next week