Introduction
Organization, Overview and Projects

Vorlesung „Advanced Topics in HCI”
Prof. Dr. Florian Alt, SS 2015
Navigation für Fußgänger: Elektrische Muskelstimulation als Richtungsgeber

Bislang müssen Fußgänger aufs Handydisplay schauen oder auf Sprachausgabe setzen, wenn sie mit ihrem Smartphone navigieren wollen. Deutsche Forscher entwickeln ein System, bei dem die Richtungshinweise als Art Fernsteuerung direkt in die beine gehen.

Deutsche Forscher arbeiten an einer Navigationshilfe, bei der die Richtungshinweise direkt als elektrische Impulse in die Beinmuskulatur gegeben werden. Die Nutzer könnten sich so etwa von der Navi-App eines Smartphone dirigieren lassen, ohne ständig auf das Display schauen zu müssen, schreiben die Wissenschaftler in ihrem Paper.

Für die richtungweisenden Stromimpulse werden am Oberschenkel der Spaziergänger Elektroden angebracht. Die stimulieren dann den vom Becken bis zum Schienbein verlaufenden Schneidernuskulatur (Musculus sartorius), der Knie- und Hüftgelenk beugt sowie Oberschenkeldrehungen ermöglicht. Die Impulse erfolgen beim Gehen, wenn das jeweilige Bein in der Luft ist, und bewirken eine leichte

Top-News

Wiederleitung auf SMB-Freigabe petit Passwort-Hash
Stromsparender Funk: Entwicklungsumgebung für Geräte mit Bluetooth Smart
Programmiersprachen: TIOBE-Index sieht Java wieder vom
SoftMaker Office 2016 für Windows im öffentlichen Beta-Test
Navigation für Fußgänger: Elektrische Muskelstimulation als Richtungsgeber

Top-Newsletter

Die wichtigsten Meldungen
2 X wöchentlich.

E-Mail-Adresse    Anmelden

Datenschutz
Dieser Doktorand steuert seine Studenten mit Elektroschocks am Bein

VON MORITZ GEIER
FOTO VON PFEIFFER

Some Infos About Me

LMU MÜNCHEN (2001-2007)
Media Informatics / Communication Science

  Internship | Web development

- Fraunhofer IAIS (Bonn) (2007)

IT Specialist

Ph.D. studies in Computer Science | PD-Net | Guest Lecturer (Pervasive Computing)

- Deutsche Telekom Labs, TU Berlin (2011)
  Visiting Researcher | Project: Looking Glass

UNIVERSITY OF STUTTGART (since 2012)
Ph.D. in Computer Science (Dr. rer. nat.) | PD-Net | Post-Doc

- Johann-Kepler University Linz (2013)
  Guest Lecturer (Unconventional User Interfaces)

LMU München (since October 2013)
Assistant Professor in Media Informatics
Organisation
Objectives

• Introducing foundations and current trends in HCI
• Provide an overview of active research areas at the LFE Medieninformatik (bachelor/master theses, Ph.D.)

• Format:
  – Weekly lecture on varying topics
  – Subsequent group project (2-3 students)
    – appr. 2 weeks full time project work
    – scientific paper (4 pages ACM format)
    – scientific presentation (15 minutes + 5 minutes discussion)
      – slides in English
      – talk in English or German
Lecture

• Lecture
  – Wednesday 16-18h
  – Geschwister-Scholl-Platz 1, D Z005
  – Lecturers: staff of LFE Medieninformatik

• Website
  – http://www.medien.ifi.lmu.de/lehre/ss15/ath/
    (Slides, Readings, additional material)

• Uniworx
  – https://uniworx.ifi.lmu.de/?action=uniworxCourseWelcome&id=404
Projects

• Topics taken from current projects
• Research focussed

• Organization
  – Projects begin after the respective lecture, latest at end of term
  – Supervisor from scientific staff of LFE Medieninformatik
  – Regular meetings with supervisor
  – Seminar Day:
    – Suggestion: Wednesday, 02.09.2015
    – Alternative: Monday, 21.09.2015
## (Preliminary) Outline

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Literature

Briony J. Oates
Researching Information Systems and Computing

A. Field & G. Hole
How to Design and Report Experiments

Slides and Papers from Seminar Wissenschaftliches Arbeiten und Lehren
Topics and Projects
Pervasive Displays -
Understanding the Future of Digital Signage
Pervasive Displays
Understanding the Future of Digital Signage
Project: PD Survey

How to motivate users to provide feedback?
Data Physicalization -
Exploring the Potential of Physical Visualizations
Collaborative Problem Solving with Physical Visualizations
Data Physicalization

Source: http://dataphys.org/list / meshu.io / Föllmer et al. / Mitchell Whitelaw / Andreas Nicolas Fischer
Group Mirrors
Computer Supported Cooperative Work

CSCL

Awareness Support

Group Mirrors

Trends in CSCW
Investigating the influence of different aspects of feedback on argumentation

Group members provide feedback to each other about the quality of argumentation.

We developed light objects that can be controlled via smartphones for that purpose and compared an identifiable and an anonymous version.

What influence do individual variables (position of the feedback, amount of feedback) have on group processes?
Certainly Uncertain but Probably Predictable: Modelling User Behaviour in Mobile HCI
Modelling User Behaviour in Mobile HCI

**Grand Goal:** Make „smart“ devices (at least a bit) smart...

... with informed assumptions (=models) about users,

e.g. for touch:

„Rich touch“: *How?*  
Targeting: *Where?*  
Typing: *What?*
Modelling User Behaviour - Project

• **Background**: Touch targeting models predict where users wanted to touch
  → improve touch accuracy

• **Previous research**: These models are highly individual!
  i.e. they look different for different users:

  ![Diagram showing different models for different users]

• **Question**: Are models still individual across mobile conditions (walking/standing)?

  → **Project – Conduct a user study to find out!**
  1. Record touch targeting data
  2. Analyse (models already implemented)

  Is it better to predict current touches with a model from:
  - Same user, but different condition (walking/standing)?
  - Same condition, but different user?
Usable Gaze-based Interaction
Eye-tracking based Interaction
Eye-tracking based Interaction
Project Ideas

• Multiplayer gaze-based games
• Multimodal authentication
• Gaze-based Voting
  • Voting using your eyes
  • Can we deduce the voting decision from gaze-data?
Interactive Tabletops and Surfaces
Interactive Surfaces

Interactive Surfaces denote a broad topic that includes for example interactive furniture (e.g. tables), interactive walls and floors, arbitrary shaped objects with interactive surfaces or the integration of screens with different form factors. This lecture discusses the history of interactive surfaces and concerns touch technologies, interaction techniques and areas of application.

Literature:


Project
Evaluation of a touch-based 3D-modeling prototype

FAD – Finger Aided Design: Two touch screens and touch tools on the horizontal display that allow bimanual polygon-based 3D modeling.

Task:
• Recruit 3-4 participants
• Train them to become expert users
• Design and conduct a “long term” study
• Report your findings
Through-the-Lens Controls
Through-the-Lens Control
New ways in Cinematography
Axel Hösl
Follow Focus with Arduino
Code already exists!
Brain Computer Interfaces
Brain Computer Interfaces
Mariam Hassib
Brain Emoticons in Chat 😊

Want to know what your friend/partner is really feeling while chatting online?

Using off-the-shelf BCI devices, emotions and mental states such as “Concentration”, “Meditation”, “Happiness”, “Excitement”, “Boredom” will be detected via brain signals and communicated during chats.

Open Questions:
- How to interpret brain data?
- How often?
- How to visualize that in chat?
- Effects on both sides
- Other use-cases for such an application
Usable Security and Privacy I - Establishing and Breaking Trust on the Web
Establishing and Breaking Trust on the Web
Project: The MirrorMeter

• **Research Question:**
  Does seeing yourself while you enter a password lead to better passwords?

• **Tasks:**
  • research for existing password strength meters (1 day)
  • create a concept (1 day)
  • iterate the design with users in the field (coffee shop study) (1 day)
  • implement the prototype (4 days)
  • evaluate the prototype (3 days)

• **Advisor:** Tobias Stockinger, tobias.stockinger@ifi.lmu.de
Usable Security and Privacy II - Authentication on Mobile Devices
Usable and Secure Authentication on Mobile Devices

[Schaub et al, 2013]
Quantifying Shoulder Surfing Risks in the Wild

Emanuel von Zezschwitz

- Literature Review
- Evaluation Concept
- Case Study
- Evaluation
- Report
mHealth -
Addressing our Unconscious Self
Health and Wellbeing Technology
Understanding Use and Non-Use
Freeletics, Fitbit, Jawbone Up & Co

• **Questions**: What motivates people to use mHealth technology? Does mHealth help users achieve their goals?

• **Method**: Online Survey, Focus Groups, Interviews
Computer-Facilitated Collaboration and Argumentation
Computer-facilitated collaboration and argumentation
Combining learning and HCI research topics

Fysaraki Maria
HCI and the Learning Sciences: Exploring Design and Usability Aspects of Collaborative Learning Systems

The main questions are:

– how can the Learning Sciences benefit from HCI methods (e.g., usability, rapid prototyping, user centred design)?
– what can the Learning Sciences learn from the HCI research field (e.g., being aware of related work)?

Tasks:
1. research for design synergies in computer supported collaborative learning systems (CSCL). (1 day)
2. create a concept map of the design synergies (1 day)
3. test and compare design features of two online CSCL systems with users in the field (1 day)
4. implement a prototype based on the results of step 3 (4 days)
5. evaluate the prototype (3 days)