Aktuelle Themen der Mensch-Computer-Interaktion

Introduction

Human-Computer
Interaction Group

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Lernziele

- in Kooperation mit einem Doktoranden
  ein Forschungsprojekt bearbeiten

- aktuelle Forschungsthemen der
  Mensch-Computer-Interaktion kennenlernen

- Interaktionstechnik implementieren bzw. erweitern

- ggf. in einer Benutzerstudie evaluieren

ORGANIZATION

Ort, Zeit & Zuordnung

- Donnerstag 14–17 Uhr
- Seminarraum 901, Appelstr. 9A
- 4 SWS, 6 ECTS
- Master
  - Master-Studierende haben Priorität
  - Bachelor-Studierende können teilnehmen, aber Schein erst im Master anrechenbar
- maximal 20 Teilnehmer
  - Stud.IP: 35 Anmeldungen
- Arbeit in Gruppen von 4 Teilnehmern

Bedingungen für erfolgreiche Teilnahme

- Fertigstellung eines Projekts in der Gruppe
- wöchentliche Reviews des jeweiligen Zwischenstands
  - jedes Gruppenmitglied präsentiert mindestens einmal
  - Feedback durch die anderen Gruppen
- Führen eines Projekt-Wikis
- Gesamtpräsentation und Video
- unbenoteter Schein

Two Variants

- "RepliCHI"
  - Take a research paper as a basis
  - Re-implement the interaction technology of that paper
  - Extend the interaction technology, try it in a slightly different way, add features
  - Evaluate your modification / extension
- "BlueSky"
  - Take a research question or project idea as a basis
  - Brainstorm on possible realizations
  - Build a prototype of the interaction technology
  - Evaluate the prototype

Potential "RepliCHI" Schedule

- Week 1: Read paper and related work
- Week 2: Discuss paper, find open issues, define hypothesis
- Week 3: Create concept, plan prototype
- Week 4–7: Build and test prototype
- Week 8: Present prototype and plan evaluation
- Week 9: Pre-study and bug fixing
- Week 10–11: Evaluate prototype
- Week 12: Analyze results
- Week 13: Prepare final presentation + video
- Week 14: Final presentation (findings, contribution, novelty)

Potential "Blue Sky" Schedule

- Week 1: Brainstorm, find related work
- Week 2: Discuss idea, define research questions and hypothesis
- Week 3: Create concept, plan prototype
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TOPICS

Virtual Reality Multitasking

- Measuring and improving multitasking performance inside VR
- Implement VR scenarios
  - To measure users' multitasking performance
  - To train users and potentially increase their multitasking performance
    - Using a variety of different multitasking tasks, all inside VR using the Vive controllers and potentially other tracked objects
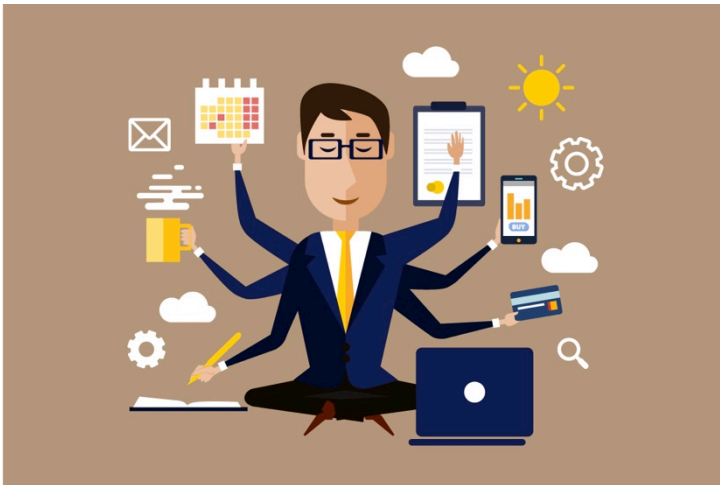
EMS Navigation Belt

- Previous research guided users using vibrotactile sensations
- Idea: Use EMS as pure tickling sensation instead of muscle actuation
  - Completely silent tactile sensation, advantage over vibration motors
  - Research methods, build prototype and evaluate performance, compare to vibration motors
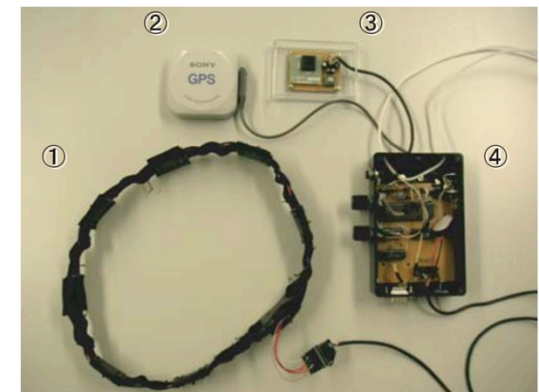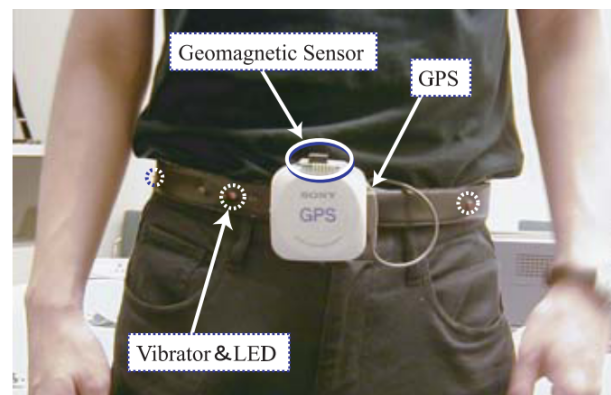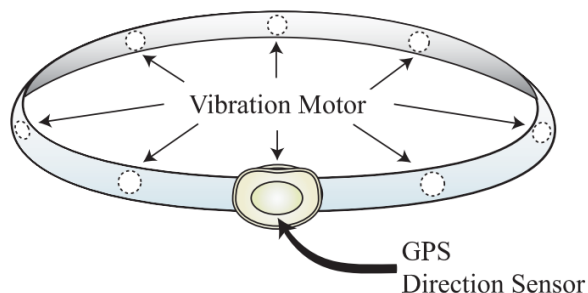
Ambient Displays for the HCI Group

- Information content/richness

- User identification, adaptation

- End-user configuration, personalization

- Privacy-aware encoding

- Components
  - Wall-mounted touch display
  - a) Moving and illuminated columns (Andre Lehnert)
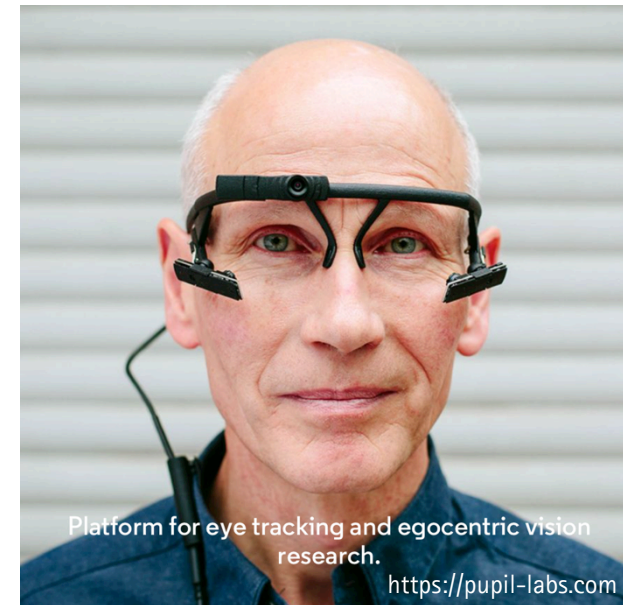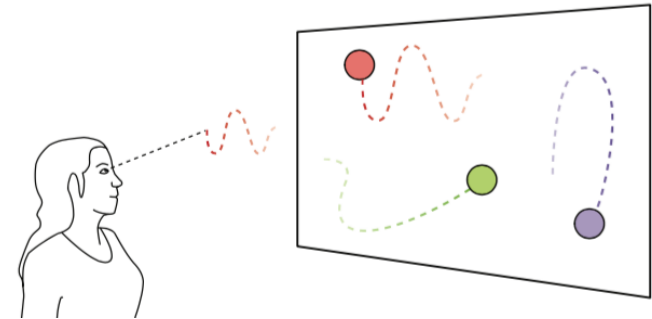 - b) Color lamp and display (Sezer Dursun)

Andre Lehnert

Sezer Dursun

Implicit Calibration of Eyetracking Glasses

- Implicit calibration through reading text

- Correlating eye movement with object movement

- How to design an interface using smooth pursuits?

- PupilLabs open source eye tracker

- Mohamed Khamis, Ozan Saltuk, Alina Hang, Katharina Stolz, Andreas Bulling, Florian Alt. TextPursuits: using text for pursuits-based interaction and calibration on public displays. In *Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (UbiComp '16). ACM, New York, NY, USA, 274-285. DOI: http://dx.doi.org/10.1145/2971648.2971679
- Mélodie Vidal, Andreas Bulling, and Hans Gellersen. 2015. Pursuits: Spontaneous Eye-Based Interaction for Dynamic Interfaces. GetMobile: Mobile Comp. and Comm. 18, 4 (January 2015), 8-10. DOI: http://dx.doi.org/10.1145/2721914.2721917
- Andreas Bulling and Hans Gellersen. 2010. Toward Mobile Eye-Based Human-Computer Interaction. IEEE Pervasive Computing 9, 4 (October 2010), 8-12. DOI=http://dx.doi.org/10.1109/MPRV.2010.86

Platform for eye tracking and egocentric vision research.

https://pupil-labs.com

Smartwatch as a Mouse for a Mobile Phone

- Use Smartwatch as pointing device for mobile phone

- Smartwatch contains accelerometer

- Mobile phone contains accelerometer, gyroscope, magnetometer

- In combination with touch screen
  - Finger orientation + position
  - 3D object manipulation
  - Additional degree of freedom

- Evaluate
  - Precision, accuracy
  - Scenarios

3D object

(x, y)

translate

rotate
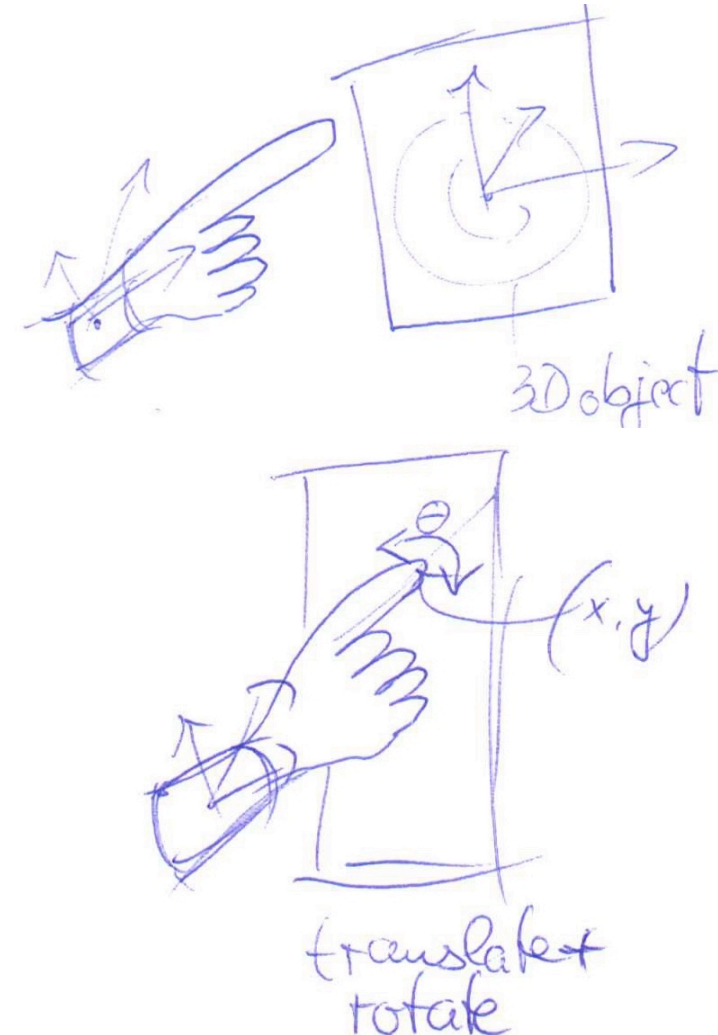
Groups

- 3-4 participants

Open Lab

- You are welcome to use the lab throughout the week
- Follow the lab rules
- The lab has
    - Hand tools
    - Electronic parts
    - Electronic tools (soldering stations, multimeters, etc.)
    - Laser cutter
    - 3D printer
    - Tracking system
- We'll do a lab tour later…

Web and Stud.IP

- Web
  - http://hci.uni-hannover.de/teaching/winter16-CurrentTopics

- Stud.IP
  - https://elearning.uni-hannover.de/index.php

- Wiki
  - https://wiki.hci.uni-hannover.de
  - https://ldap.hci.uni-hannover.de

Wiki

- Document your progress each week

- 1-2 paragraphs of text: What you have done, learned

- 1+ Sketches, photos, videos

- http://wiki.hci.uni-hannover.de

- Use as basis for weekly progress presentations
  - 5 minutes beginning of each session

zum nächsten Mal...

- Wiki-Account
- erster Eintrag Thema
- Runde am Ende