

Seminar und Praktikum, SoSe 2014

# „Wissenschaftliches Arbeiten und Lehren“

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# Organization

# Seminar

- Termin:
  - Mittwoch 9-12h, Amalienstraße 73, A 021
  - Zeitraum 16.4.2014 -11.06.2014 (siehe Zeitplan)
- Website:
  - <http://www.medien.ifi.lmu.de/lehre/ss14/swal/>  
(Folien, Organisatorisches)
- UniWorx:
  - <https://uniworx.ifi.lmu.de/?action=uniworxCourseWelcome&id=251>  
(Abgabe von Folien und Aufgaben)

# Seminar

- Ziel:
  - Erlernen der Grundlagen des wissenschaftlichen Arbeitens
  - Erarbeitung verschiedener Themen in Kleingruppen (2 Studenten)
- Format:
  - Präsentation und Diskussion zum jeweiligen Thema
  - Länge: 45 Minuten (30 Minuten Vortrag, 15 Minuten Diskussion)
  - Folien auf englisch, Vortrag auf deutsch
  - Abgabe der Folien 1 Woche vor dem Vortrag

# Praktikum

- Ziel:
  - Üben des wissenschaftlichen Schreibens auf Englisch
  - Üben der Begutachtung wissenschaftlicher Beiträge
  - Üben der Präsentation von Forschungsergebnissen
- Format schriftliche Ausarbeitung:
  - 4 Seiten im ACM Format
  - Aufbau wie ein wissenschaftliches Konferenz-Papier
- Begutachtung:
  - Einreichen der Beiträge über ein Konferenzsystem (EasyChair)
  - Erstellen von Gutachten für 2 Beiträge
- Format der Präsentation (Seminartag):
  - Länge ca. 10 Minuten
  - Folien auf englisch, Vortrag auf deutsch oder englisch

# Praktikum

- Projekt:
  - kleines Forschungsprojekt
  - entsprechend ca. 2 Wochen Vollzeit
  - 2er-Teams
- Thema:
  - Teilaspekt eines Forschungsprojekts am Ifl in das sie involviert sind
  - Eigenes Thema vorschlagen, z.B. Weiterführung der Bachelorarbeit
  - Eines der offenen Themen von Mitarbeitern des Lehrstuhls wählen

# Praktikum

- Tutortätigkeit

- Tutor für eine reguläre Lehrveranstaltung

*Master-Studierende können eine Tutortätigkeit als Praktikum Wissenschaftliches Arbeiten und Lehren (PWAL) einbringen (3 ECTS). Dabei wird aber eine zusätzliche Betreuung seitens der Lehrenden und eine zusätzliche Reflektionsleistung seitens der Studierenden erwartet. Denkbare Formen sind etwa ein Besuch in einer Tutorstunde mit anschließender "Manöverkritik" (Modell Lehrprobe), eine schriftliche Ausarbeitung oder die Erarbeitung von speziellem Lehrmaterial (4-6 Seiten). In diesem Fall muss dem Studiengangs-Koordinator eine Bestätigung des Betreuers über die Zusatzbetreuung vorgelegt werden. Es ist wichtig, dass diese Zusatzleistung in direktem Zusammenhang mit der Tutortätigkeit steht; zuständig für die Bestätigung ist auch der Lehrstuhl, an dem die Tutortätigkeit erbracht wurde. Damit wird es in der Regel nicht möglich sein, eine früher im Bachelor erbrachte Tutortätigkeit (ohne Bescheinigung der Zusatzleistung) nachträglich im Masterstudium einzubringen.*

- Tutor bei einer Lehrveranstaltung des Ifl

- Formale Trennung zwischen Hiwi-Job und PWAL

- Zusätzlich ein Paper schreiben und einen Vortrag darüber halten

- Als Thema z.B. einen Teilaspekt der Bachelorarbeit vorstellen

# Zeitplan Seminar

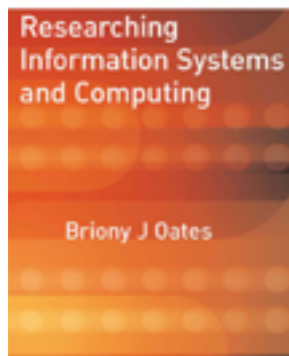
16.04.2014	<i>Themenvergabe Seminar</i>	<i>Themenvergabe Praktikum</i>	The Research Process
23.04.2014	Purpose of Research	How to write a scientific paper	Presentation of Research
30.04.2014	entfällt		
	<b>Thema 1</b>	<b>Thema 2</b>	<b>Thema 3</b>
07.05.2014	<b>Reviewing by Literature</b>	<b>Design and Creation</b>	
14.05.2014	<b>Experiments</b>	<b>Case Studies</b>	<b>Action Research</b>
21.05.2014	<b>Ethnography</b>	<b>Surveys</b>	<b>Interviews</b>
28.05.2014	<b>Observations</b>	<b>Questionnaires</b>	<b>Quantitative Data Analysis</b>
04.06.2014	<b>Qualitative Data Analysis</b>	<b>Participants and Research Ethics</b>	
11.06.2014	Ersatztermin		



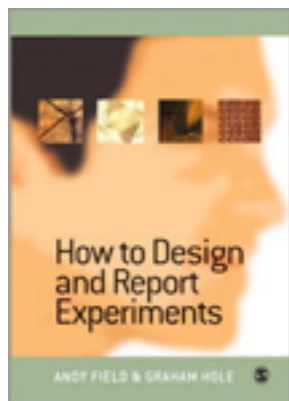
# Zeitplan Praktikum

<b>Datum</b>	<b>Abgabe</b>	<b>Beschreibung</b>
23.04.2014	Konzept	Gruppen verfassen eine konzeptuelle Beschreibung des Projekts (1 A4 Seite)
30.04.2014	Feedback zum Konzept	Gruppen erhalten Feedback zum Konzept; Finalisierung des Konzepts
21.05.2014	Paper Outline	Gruppen geben ein Outline ihres Papers ab
28.05.2014	Feedback zum Paper Outline	Gruppen erhalten Feedback zum Paper Outline
11.06.2014	Abgabe Paper	Gruppen geben die finale Version ihrer Paper über EasyChair ab
25.06.2014	Abgabe Gutachten	Gruppen geben Gutachten über EasyChair ab
09.07.2014	Abgabe der Camera-Ready Version	Gruppen arbeiten Verbesserungsvorschläge entsprechend der Gutachten ein und geben die finale Version ab
16.07.2014	Seminartag	

# Literature



Briony J. Oates  
**Researching Information Systems and Computing**



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

# Motivation

# Motivation

- Until recently, research in CS mainly concerned with the development of computer-based products
- CS has understood the necessity to go beyond designing and creating computer-based products in order to find out what happens when products are implemented in the real world
  - Why do products fail?
  - How do methods work in practise?
- **Example:** Mobile Internet

# Evidence-based Practice

- Often little work to find evidence that validates ideas about appropriate technical products and methods
- **Example:** Programming Languages

*"There are plenty of computer science theories that haven't been tested. For instance, functional programming, object-oriented programming, and formal methods are all thought to improve programmer productivity, program quality, or both. It is surprising that none of these obviously important claims have ever been tested systematically, even though they are all 30 years old and a lot of effort has gone into developing programming languages and formal techniques."*  
(Tichy, 1998, p. 33)
- Evidence-based computing: when people suggest how to develop systems in better ways or how to get computers do new things, we should know that
  - there is proper evidence to support these proposals
  - the ideas are based on more than the opinion of someone in an academic ivory tower, or some well-paid 'consultant'

# What is Research?

<b>Research Task</b>	<b>Everyday Thinking</b>
Identify a problem	How can I deal with my punctured tyre?
Gather data	Obtain prices of new tyres?
Analyse the data	What is the cheapest?
Interpret the data	That's more than I want to pay. I need more information.
Gather more data	Is it repairable? What is the lowest cost? How does the cost compare with a new tyre?
Analyse the data	Can it be repaired? What is the lowest cost? How does the cost compare with a new tyre?
Interpret the data	Repairing is possible. Repair will cost 20% of a new tyre. Repair rather than replace means I can still afford to go out on Friday night.
Draw conclusions	I will get it repaired at Tyres-U-Like

# Everyday Thinking vs. Good Research

**Everyday thinking is often characterised by**

- poor data
- incomplete data
- hasty thinking

**Good academic research is characterised by**

- Sufficient data sources
- Appropriate data sources
- Accurately recorded
- Properly analysed
- No hidden assumptions
- Conclusions well-founded
- Properly presented

As judged by the users of the research

# Satisfaction

- Everyday thinking:  
gather enough information to deal with the problem to *your own satisfaction*
- Research:  
create new knowledge to the *satisfaction of the user(s) of the research*

## Definition of Research

*“Research is the creation of new knowledge, using an appropriate process, to the satisfaction of the users of the research.”*



# Evaluating Research

## Why Evaluation

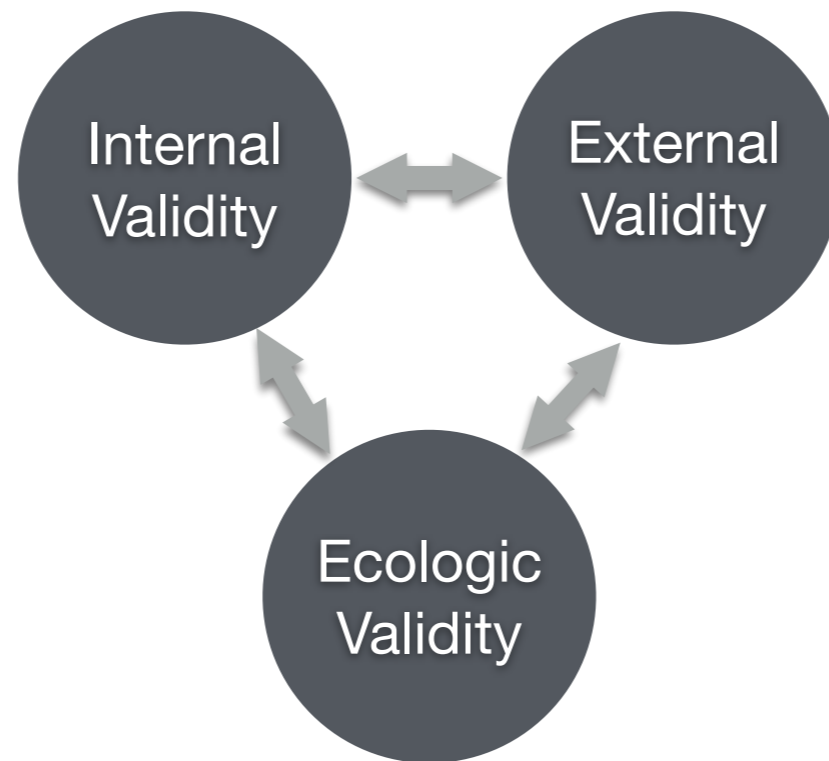
- ...to get a paper published?

## Evaluation is not required, because

- ... my prototype works?
- ... I have used it and I like it?
- ... my implementation was running for the last 6 days?
- ... my colleagues liked it?
- ... we followed a user-centered design process?

# Rigour and Relevance in Research

- Computing research should be rigorous and relevant
- **Rigour** encompasses systematic conduct and validity
  - **Systematic conduct:** research tasks undertaken in a rational fashion with logical relationship between them
  - **Validity:** appropriate process has been used; findings come from the data; they do answer the research questions



- **Relevance** means being pertinent, having direct bearing

# Relevance

- CS researchers often regard only other academics as their users
- Often research seems understandable and relevant only to a few other academics; only later does its relevance become apparent

*I think there is a world wide market for maybe five computers.*

(Thomas Watson, Chairman IBM, 1943)

*This telephone has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us.*

(Western Union internal memo, 1876)

*But what is it good for?*

(Engineer at the Advanced Computing Systems Division of IBM, 1968, commenting on the microchip)

*There is no reason why anyone would want a computer in their home.*

(Ken Olson, president, chairman and founder of Digital Equipment Corporation, 1977)

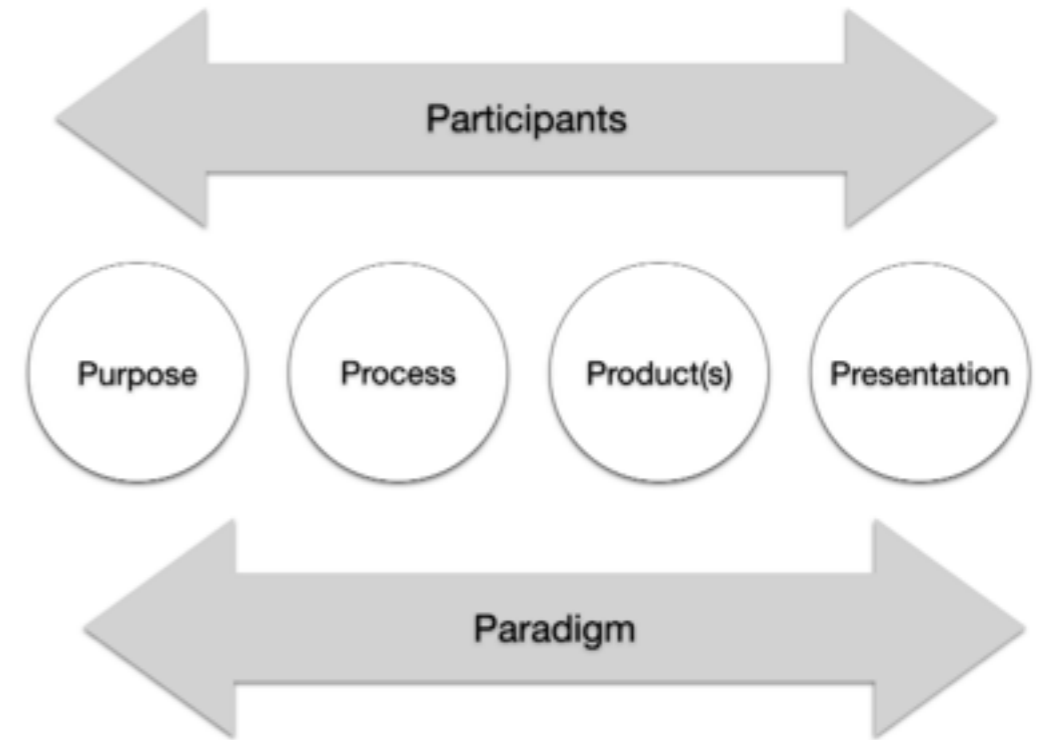
*Computers in the future may weigh no more than 1.5 tons.*

(Popular Medtanics, 1949)

Source: [www.ideasmerchant.com/go/useful/facts-quotes.htm](http://www.ideasmerchant.com/go/useful/facts-quotes.htm)

# The 6Ps of Research

- **Purpose:**  
Reason for doing research, topic, importance
- **Products:**  
Outcomes of the research / contribution; can include unexpected findings;  
Examples: paper, thesis, product
- **Process:**  
Sequence of activities (identifying topic; selection and use of strategy and data generation methods; data analysis; drawing conclusions; recognising limitations)
- **Participants:**  
Subjects involved in your research (e.g., through observing, interviewing); ethics
- **Paradigm:**  
Pattern, mode, or shared way of thinking; (not part of this course)
- **Presentation:**  
Means of dissemination (thesis, conference paper; demonstration); important to be carried out professionally



# Reasons for Doing Research

- To add to the body of knowledge
- To solve a problem
- To find out what happens
- To find the evidence to inform practice
- To develop a greater understanding of people and their world
- To predict, plan, and control
- To contribute to other people's well-being
- To contribute to personal needs
- To test or disprove theory
- To come up with a better way
- To understand another person's view
- To create more interest in the researcher

# The Outcomes of Research

- A new or improved product
- A new theory
- A re-interpretation of an existing theory
- New or improved research tool or technique
- A new or improved model or perspective
- An in-depth study of a particular situation
- An exploration of a topic, area or field
- A critical analysis
- Unanticipated outcomes

# Types of Research Products

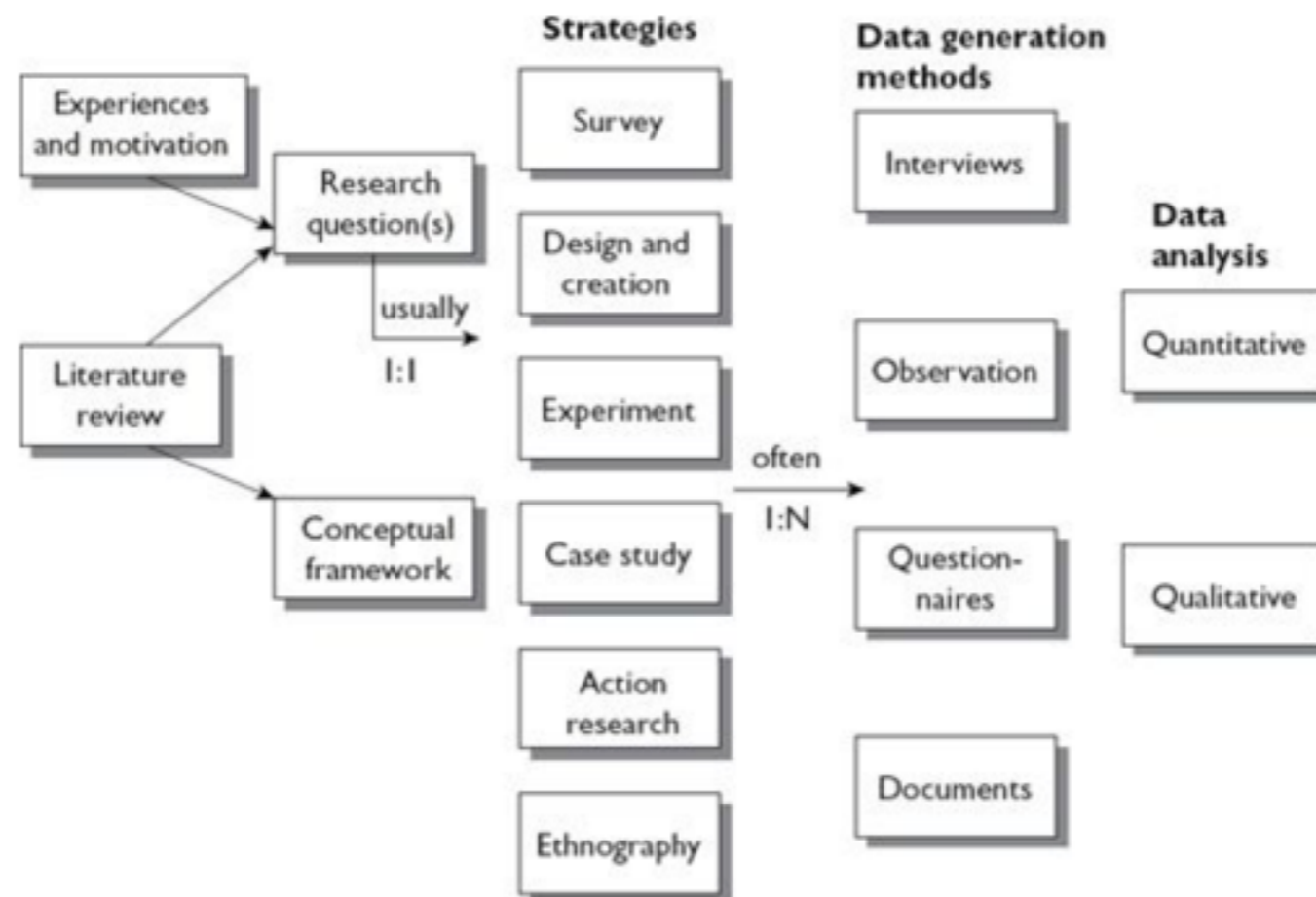
- new or improved evidence
- new or improved methodology
- new or improved analysis
- new or improved concepts or theories
- new or improved computer-based products

# Overview of the Research Process



# The Research Process

- **You've got a research question that interests you, you're keen to get started, so what should you do next?**
- Answer: start to plan a sequence of activities that will
  - take you from your initial research question to an answer / set of answers
  - enable you to present your evidence and conclusions to an academic audience and argue convincingly that you have created some new knowledge



# Personal Experiences and Motivation

- **Why are you doing research?**
  - Depends on your likes and dislikes, your strengths and weaknesses
  - Reminding you about why you do research helps you keep going through the difficult, boring or frustrating times

# Literature Review

- Find out what has been done before and what topics remain to be addressed
- Decide upon a viable research question
- Critically evaluate previous work
- Look for themes that link different authors' work together
- Helps to provide the conceptual framework for your research

## **Never underestimate the literature review!**

You will be assessed based on the thoroughness of the review, your analysis of the literature, and your ability to synthesise it into a coherent account that justifies your own research and puts it into context

# Reviewing by Literature

- Levy, Yair, and Timothy J. Ellis. "A Systems Approach to Conduct an Effective Literature Review in Support of Information Systems Research." *Informing Science* 9 (2006).
- Jane Webster and Richard T. Watson. 2002. Analyzing the past to prepare for the future: writing a literature review. *MIS Q.* 26, 2 (June 2002), xiii-xxiii.
- Kock, Ned, and Robert Davison. "Dealing with plagiarism in the information systems research community: A look at factors that drive plagiarism and ways to address them." *MIS Quarterly* (2003): 511-532.
- Bogus Research Uncovered: <http://ocw.metu.edu.tr/pluginfile.php/3298/course/section/1172/Bogus%20Research%20Uncovered.pdf>

## Learn about

- the purpose of a literature review;
- the range of available literature resources;
- how the Internet can be used during a literature review;
- how to do a literature review.

# Conceptual Framework

- Makes explicit how you structure your thinking about your research topic and the process undertaken
- Makes clear
  - different factors that comprise your topic
  - your way of thinking about a particular topics (e.g., via a theory or a technology)
  - your research methodology (the way you tackle your research question)
  - your approach to analysing any generated data (quantitative or qualitative analysis)
  - your approach of designing any new IT product
  - your approach of evaluating your research (focus on technical accuracy, greater understanding, increased efficiency, aesthetic criteria)

# Strategies

- Survey
- Design and Creation
- Experiment
- Case Study
- Action research
- Ethnography

**Typically one strategy per research question! If you need more, you probably have more research questions.**

# Surveys

- <http://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources/conduct-surveys/main>
- Newsted, Peter R., Sid L. Huff, and Malcolm C. Munro. "Survey Instruments in Information Systems." *MIS quarterly* 22.4 (1998).
- Oates, Briony J. *Researching information systems and computing, Chapter 7 - Surveys*. Sage, 2005.

## Learn about

- what is meant by a survey research strategy;
- issues to address in planning and designing survey research;
- how surveys have been used in IS and computing;
- the advantages and disadvantages of survey research;
- analysing and evaluating survey research.

# Design and Creation

- Salvatore T. March and Gerald F. Smith. 1995. Design and natural science research on information technology. *Decis. Support Syst.* 15, 4 (December 1995), 251-266.
- von Alan, R. Hevner, et al. "Design science in information systems research." *MIS quarterly* 28.1 (2004): 75-105.
- Muller, M. J. (2003). Participatory design: the third space in HCI. *Human-computer interaction: Development process*, 165-185.
- Kensing, F., & Blomberg, J. (1998). Participatory design: Issues and concerns. *Computer Supported Cooperative Work (CSCW)*, 7(3-4), 167-185.
- [http://en.wikipedia.org/wiki/Participatory\\_design](http://en.wikipedia.org/wiki/Participatory_design)

## Learn about

- what is meant by a design and creation research strategy;
- issues to address in undertaking design and creation research;
- how design and creation research has been used in IS and computing;
- the advantages and disadvantages of design and creation research;
- analysing and evaluating design and creation research.



# Experiments

- Field A. & Hole, G. (2013). How to Design and Report Experiments.
- MacKenzie, I.S. (2011). Empirical Research Methods in Human-Computer Interaction. Course @ CHI
- Jarvenpaa, Sirkka L., Gary W. Dickson, and Gerardine DeSanctis. "Methodological Issues in Experimental IS Research: Experiences and Recommendations." MIS quarterly 9.2 (1985).
- <http://en.wikipedia.org/wiki/Experiment>

## Learn about

- what is meant by an experimental research strategy;
- issues to address in planning and performing experimental research;
- how experiments have been used in IS and computing;
- the advantages and disadvantages of experiment-based research;
- analysing and evaluating experiment-based research.

## Topic 5

# Case Studies

- Oates, Briony J. Researching information systems and computing, Chapter 10 - Case Studies. Sage, 2005.
- Yin, Robert K. Case study research: Design and methods. Vol. 5. sage, 2009.
- Yin, Robert K. Applications of case study research. Sage, 2011.
- Flyvbjerg, Bent. "Five misunderstandings about case-study research." Qualitative inquiry 12.2 (2006): 219-245.

### Learn about

- what is meant by a case study research strategy;
- issues to address in planning and undertaking case study research;
- how case studies have been used in IS and computing;
- the advantages and disadvantages of case study research;
- analysing and evaluating case study research

## Definition of a Case Study

*A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. (Yin, 2003)*

# Action Research (aka Deployment-based Research)

- Henze, N., Sahami Shirazi, A., Schmidt, A., Pielot, M., & Michahelles, F. (2013). Empirical Research through Ubiquitous Data Collection. IEEE Computer.
- Henze, N., & Pielot, M. (2012). How to do Mobile HCI Research in the large? Tutorial at MobileHCI.
- Alt, F., Schneegaß, S., Schmidt, A., Müller, J., & Memarovic, N. (2012, June). How to evaluate public displays. In Proceedings of the 2012 International Symposium on Pervasive Displays (p. 17). ACM

## Learn about

- what is meant by action research;
- issues to address in planning and designing action research;
- developments in action research;
- how action research has been used in IS and computing;
- the advantages and disadvantages of action research;
- analysing and evaluating action research.

# Ethnography

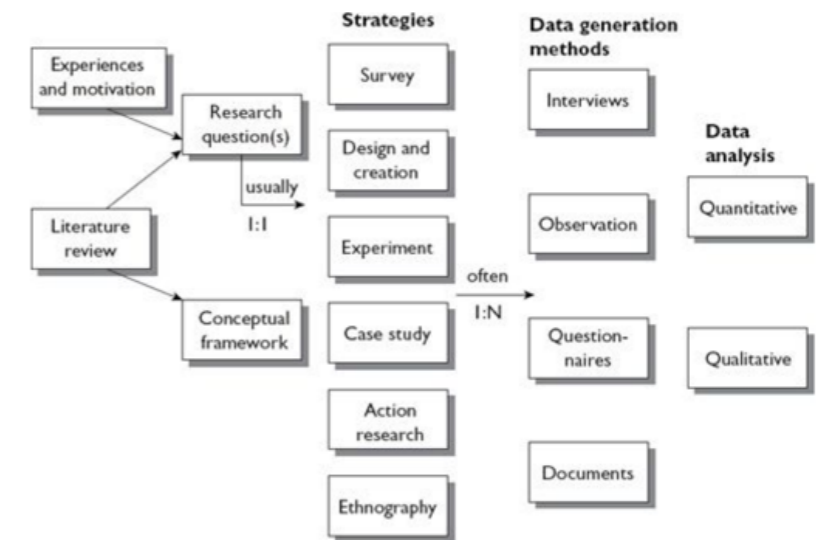
- Dourish, P. (2006). Implications for design. In Proceedings of the SIGCHI conference on Human Factors in computing systems (pp. 541-550). ACM.
- Crabtree, A., Rodden, T., Tolmie, P., & Button, G. (2009). Ethnography considered harmful. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 879-888). ACM.
- <http://en.wikipedia.org/wiki/Ethnography>

## Learn about

- what is meant by ethnography;
- issues to address in planning and designing an ethnography;
- how ethnography has been used in IS and computing;
- the advantages and disadvantages of ethnography;
- analysing and evaluating research based on ethnography .

# Data Generation Methods

- Interview
- Observations
- Questionnaire
- Document



## Using more than one data generation method

- Some data generation methods are associated with particular research strategies (e.g., a survey often uses questionnaires), However, one research strategy can use several data generation methods (e.g., observations and interviews)
- Drawback: may take longer and cost more
- Possibility to compare data from one method with that of another method (consistency across methods can increase confidence in findings)

# Interviews

- Seidman, I. (2012). Interviewing as qualitative research: A guide for researchers in education and the social sciences. Teachers college press.
- Keats, D. Interviewing: A practical guide for students and professionals. UNSW Press, 1999.

## **Learn about**

- interviews as a data generation method;
- how to plan and conduct both individual and group interviews;
- how interviews have been used in previous IS and computing research;
- the advantages and disadvantages of interviews as a data generation method;
- how to analyse and evaluate interview-based research .

# Observations

- Oates, Briony J. Researching information systems and computing, Chapter 15 - Observations. Sage, 2005.
- N. Mack, C. W. Song, K. M. MacQueen, G. Guest, E. Namey. Qualitative Research Methods: A Data Collector's Field Guide. FHI, 2005.

## **Learn about**

- observations as a method of generating data for your research;
- how to use observations in research;
- how observations have been used in previous IS and computing research;
- the advantages and disadvantages of observations as a data generation method;
- how to analyse and evaluate observation-based research.

# Questionnaires

- Brinkman, W.-P.(2009). Design of a Questionnaire Instrument, Handbook of Mobile Technology Research Methods, ISBN 978-1-60692-767-0, pp. 31-57, Nova Publisher.
- Jendryschik, M. Fragen macht klug - AttrakDiff und UEQ: Fragebögen zum Messen der User Experience. iX 2/2014.
- NasaTLX:  
<http://humansystems.arc.nasa.gov/groups/tlx/>
- AttrakDiff: <http://attrakdiff.de>
- System Usability Scale
- UEQ: <http://www.ueq-online.org>

## Learn about

- questionnaires as a method of generating data for your research;
- how to use questionnaires in research;
- how questionnaires have been used in previous IS and computing research;
- the advantages and disadvantages of questionnaires as a data generation method;
- how to analyse and evaluate questionnaire-based research .



# Method Triangulation

**One research strategy can use more than one data generation method!**

- Method triangulation: using 2 or more data generation methods
- Strategy triangulation: using 2 or more research strategies
- Time triangulation: study takes place in 2 or more different points in time
- Space Triangulation: study takes place in 2 or more countries
- Investigator Triangulation: study is carried out by 2 or more researchers
- Theoretical Triangulation: study draws on 2 or more theories

**Provides multiples modes of attack on research question.**

# Data Analysis

## **Quantitative Data Analysis:**

uses mathematical approaches, such as statistics, to examine or interpret data

## **Qualitative Data Analysis**

looks for themes and categories within the words people use

- In general possible to apply quantitative methods to qualitative data (count number of times a particular phrase is used)
- Conceptual framework could suggest themes and relationships to look for
- Some researchers argue that qualitative data should never be analysed with any pre-conceived ideas or theories in mind  
=> just analyse data in its own terms (grounded theory)

# Quantitative Data Analysis

## Types of data, Coding, Visual Aids, Validity, Statistics, Interpretation of Results

- A. Field & G. Hole: How to Design and Report Experiments. 2003.
- Field, A. (2013). Discovering statistics using IBM SPSS statistics. Sage.
- MacKenzie, I.S. (2011). Empirical Research Methods in Human-Computer Interaction. Course @ CHI
- [http://en.wikipedia.org/wiki/Statistical\\_hypothesis\\_testing](http://en.wikipedia.org/wiki/Statistical_hypothesis_testing)

### Learn about

- the different kinds of quantitative data;
- how to prepare your quantitative data for analysis;
- using visual aids for quantitative data analysis;
- using statistics for quantitative data analysis;
- how to analyse and evaluate research based on quantitative data analysis

# Qualitative Data Analysis

## Grounded Theory

- Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. Pine Forge Press.
- Urquhart, C. (2001). An encounter with grounded theory: tackling the practical and philosophical issues. Qualitative research in IS: Issues and trends, 104-140.
- [http://en.wikipedia.org/wiki/Grounded\\_theory](http://en.wikipedia.org/wiki/Grounded_theory)

### Learn about

- how to prepare your qualitative data for analysis;
- how to analyse both textual and non-textual qualitative data;
- the grounded theory approach to qualitative data analysis;
- computer tools to support qualitative data analysis;
- how to analyse and evaluate research based on qualitative data analysis .

# Participants and Research Ethics

- <https://www.acm.org/about/code-of-ethics>
- Langheinrich, M., Schmidt, A., Davies, N., & José, R. (2013). A practical framework for ethics: the PD-net approach to supporting ethics compliance in public display studies. In Proceedings of the 2nd ACM International Symposium on Pervasive Displays (pp. 139-143). ACM.
- McMillan, D., Morrison, A., & Chalmers, M. (2013, April). Categorised ethical guidelines for large scale mobile HCI. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1853-1862). ACM.
- The Milgram Study, 1974
- The Stanford Prison Experiment, 1971

## Learn about

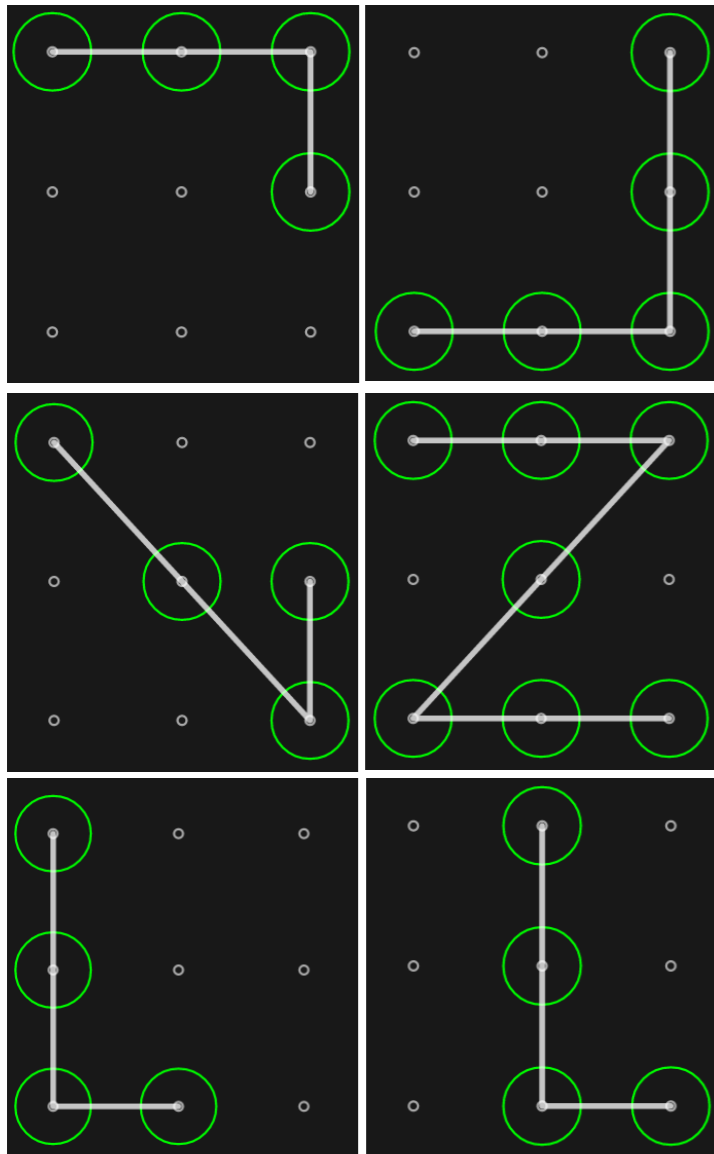
- the rights of your research participants;
- your ethical responsibilities towards those who are involved in your research, whether directly or indirectly;
- the difficulties of being an ethical researcher;
- how to analyse and evaluate the ethics of research.

# Topics for Practical Part

# Android Pattern Choice

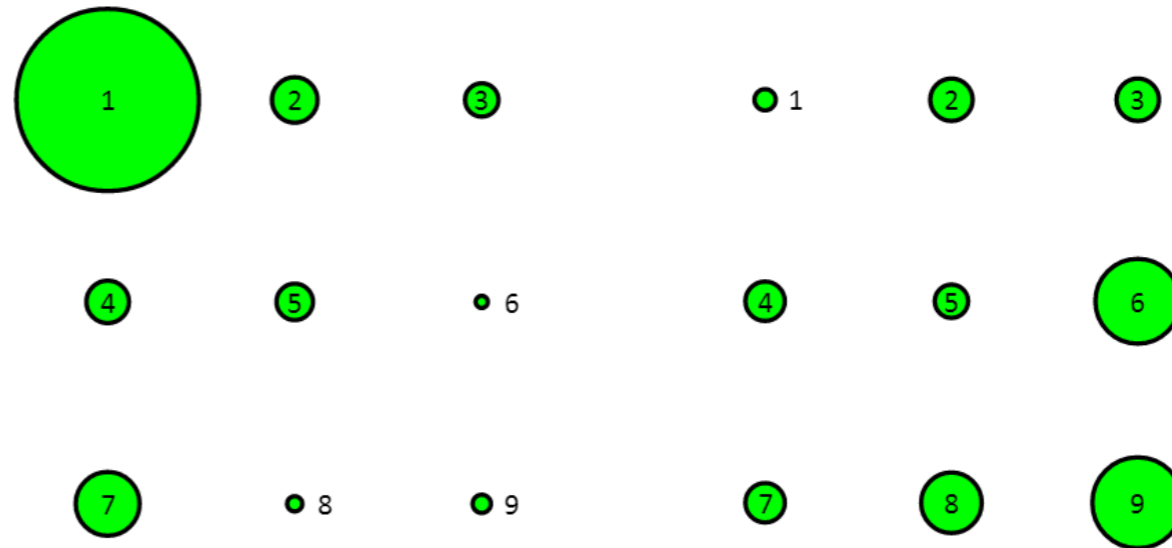
- A Human Model -

Often Used Patterns



Start

End



## Task

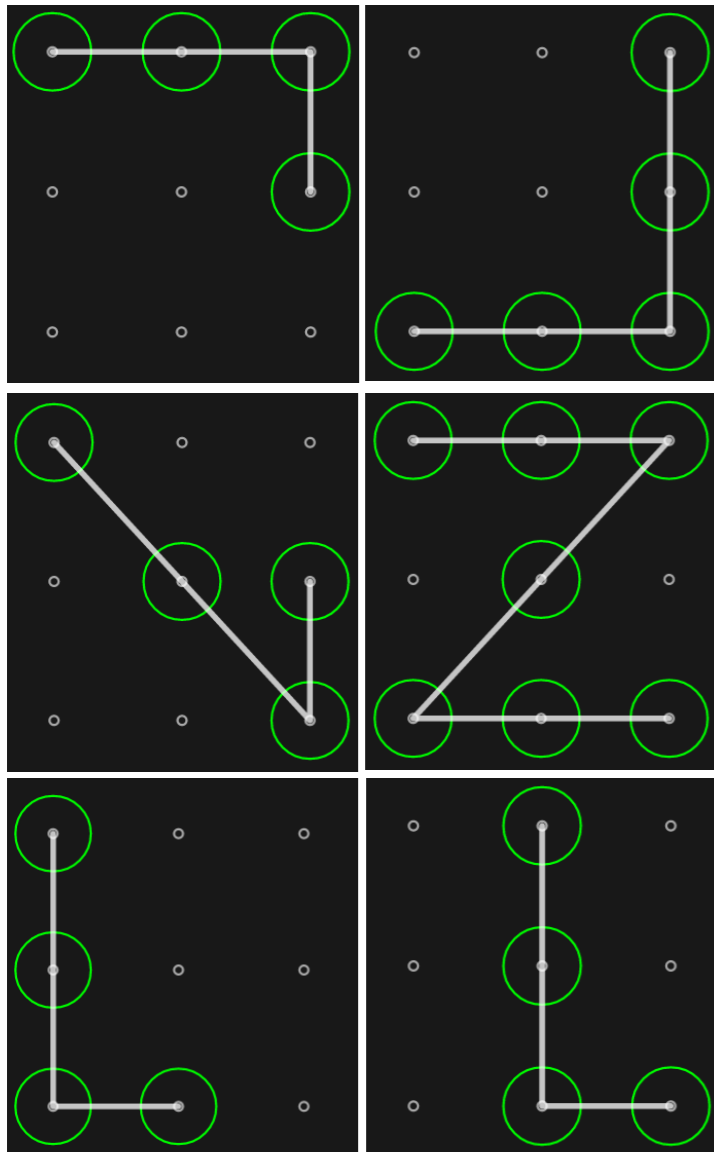
- Analyze 500 human-generated Android patterns
- Develop and evaluate a human model of pattern choice
- Write a paper on your research and present the results

Betreuer: Emanuel von Zezschwitz

# Android Pattern Choice

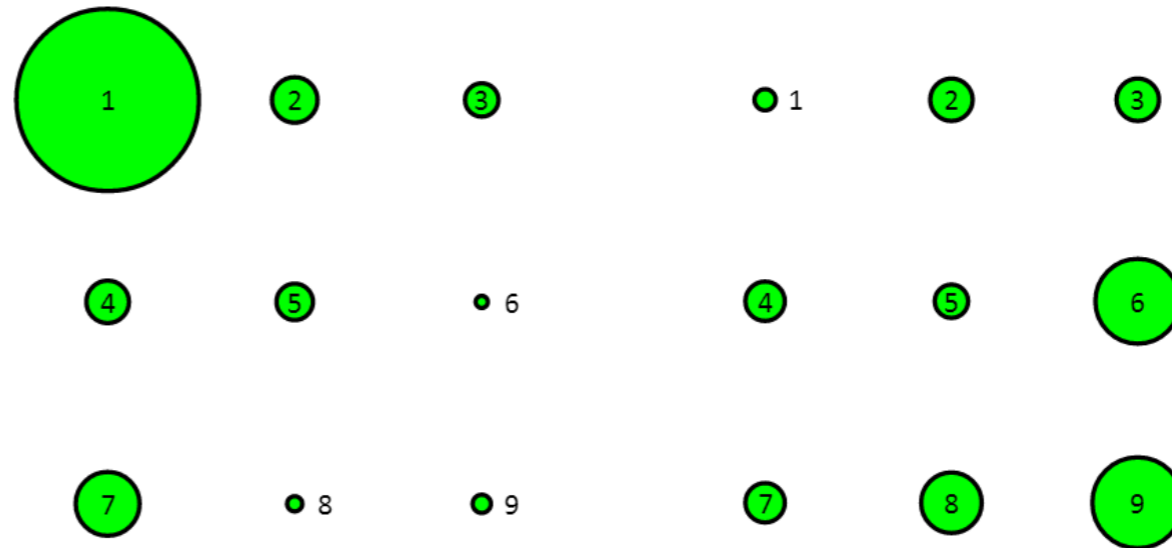
- Comparing Users' Personal Passwords -

Often Used Patterns



Start

End



## Task

- Conduct a small user study that investigates people's actual, personal passwords
- Ideally conduct study within the next 4 weeks
- Write a paper on your research and present the results

Betreuer: Emanuel von Zezschwitz



# How to say goodbye to QWERTY

**Problem:** Research has proposed many keyboards that are better than QWERTY - but we are too lazy to learn them...

## Project suggestions:

- Implement or find an existing implementation of an alternative layout (e.g. smartphone keyboard app)
- Conduct a user study (and self study!) over 2 weeks

## Observations:

- Quantitative: typing speed, learning curve
- Qualitative: Do users find it worth the effort? Do they notice the proposed benefits? What might motivate them to give other layouts a chance?

## Check these papers:

- Dunlop, M., & Levine, J. (2012). Multidimensional pareto optimization of touchscreen keyboards for speed, familiarity and improved spell checking. <http://dl.acm.org/citation.cfm?doid=2207676.2208659>
- Oulasvirta, A., Reichel, A., Li, W., Zhang, Y., Bachynskyi, M., Vertanen, K., & Kristensson, P. O. (2013). Improving two-thumb text entry on touchscreen devices.

**Betreuer: Daniel Buschek**

# Motivation to Interact in Public Space

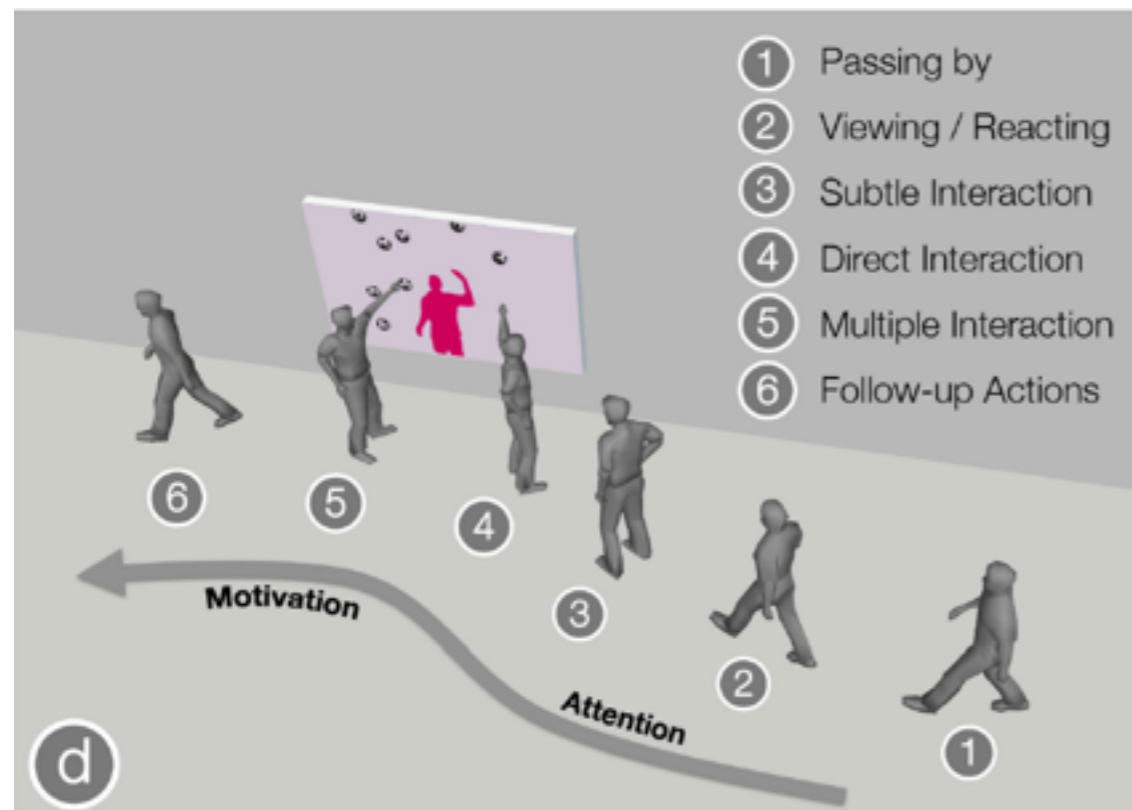
## Task

- Think of topics that could be relevant to people in public space
- Conduct a study where you investigate the effects of the content on people's motivation to contribute
- Write a paper on your research and present the results



**Betreuer: Julie Wagner / Florian Alt**

# Guiding People in Front of Public Displays



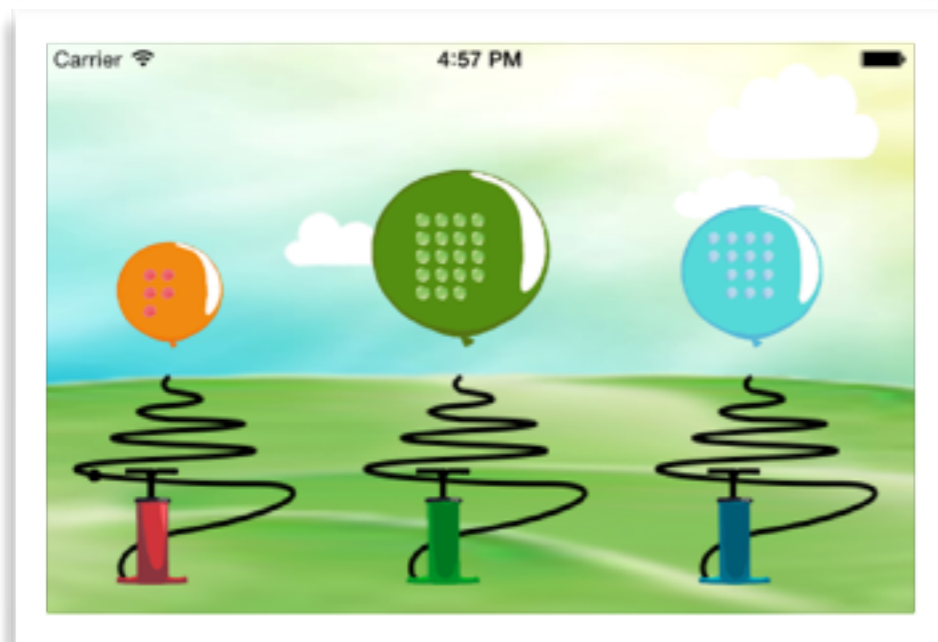
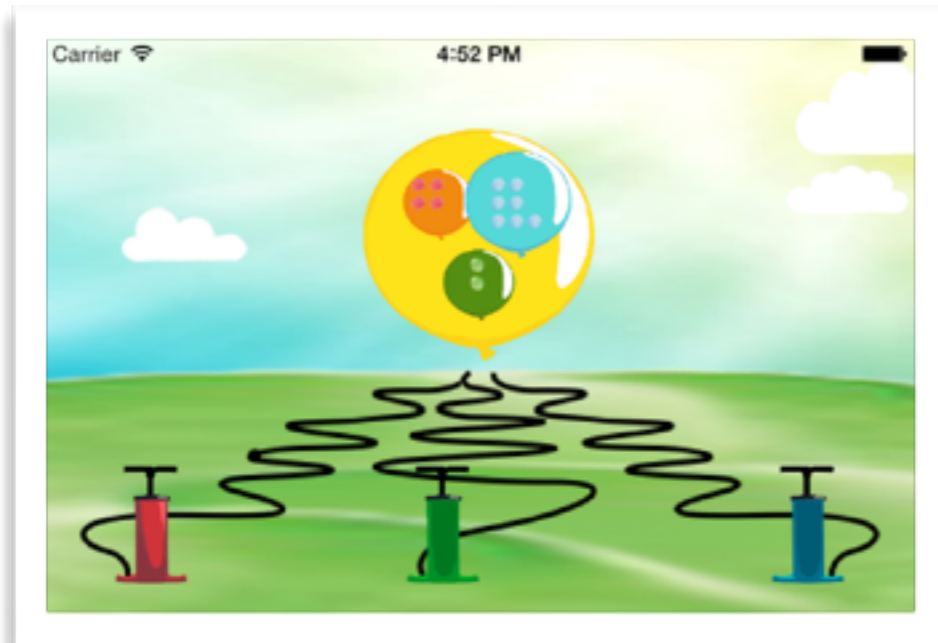
## Task

- Investigate visual cues to help users find the optimum interaction distance with a display
- Conduct a study where you evaluate the effect of the visual cue on people's accuracy and speed
- Write a paper on your research and present the results



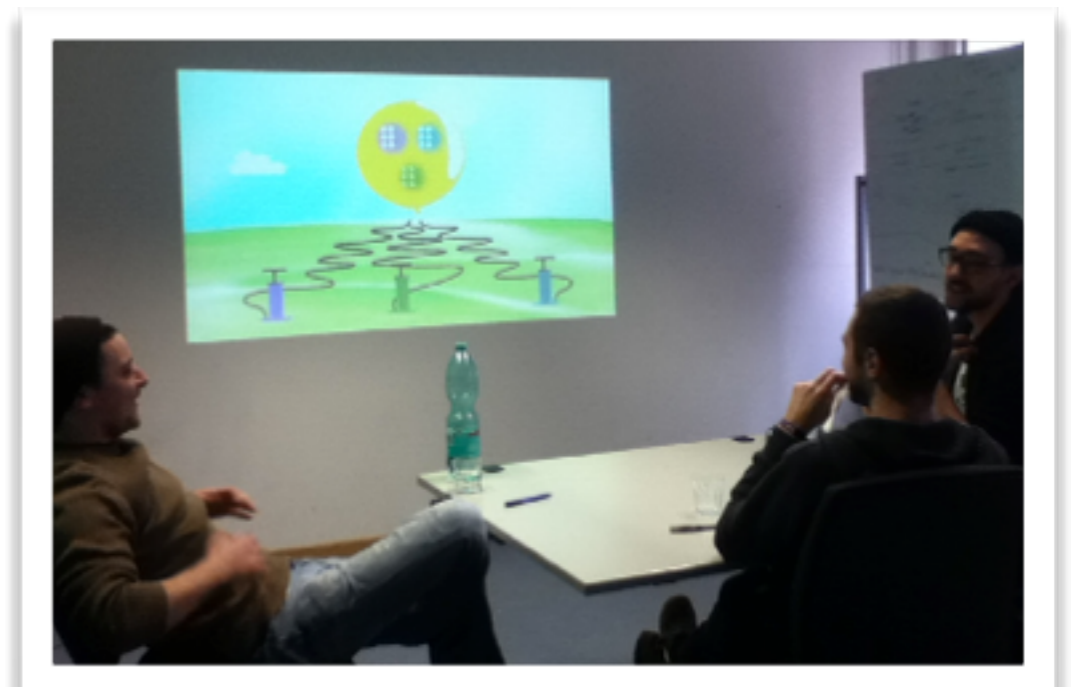
Betreuer: Florian Alt

# Evaluating the Effect of Visual Feedback on Productivity in Brainstorming Session



## Task

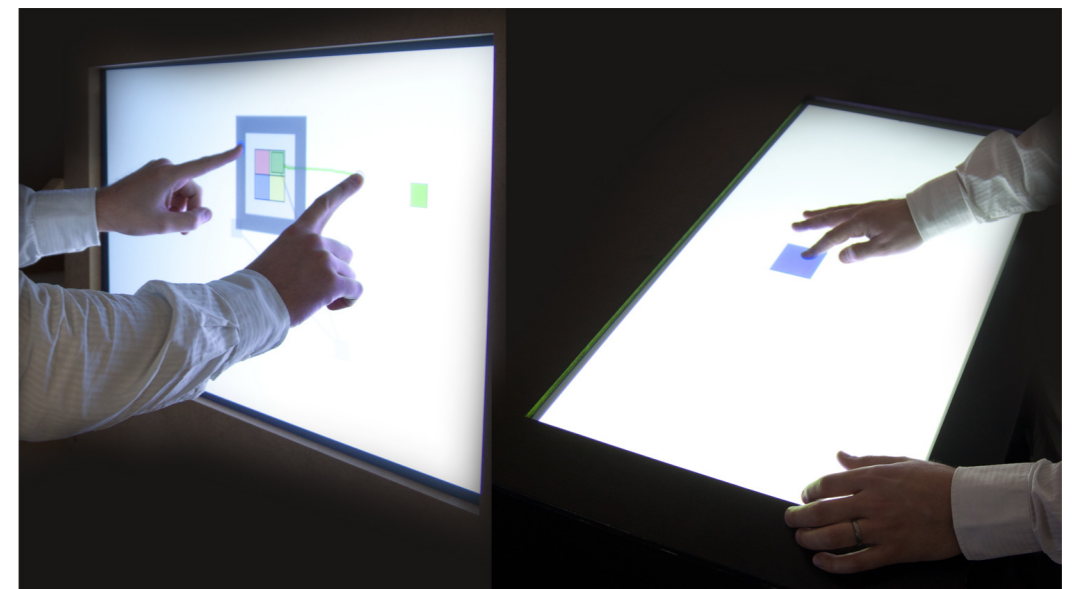
- Conduct a user study (4 brainstorming session à 3 people) to compare the effect of different visualisation in brainstorming sessions
- Measure performance and emotion
- Write a paper and present results



Betreuer: Sarah Tausch

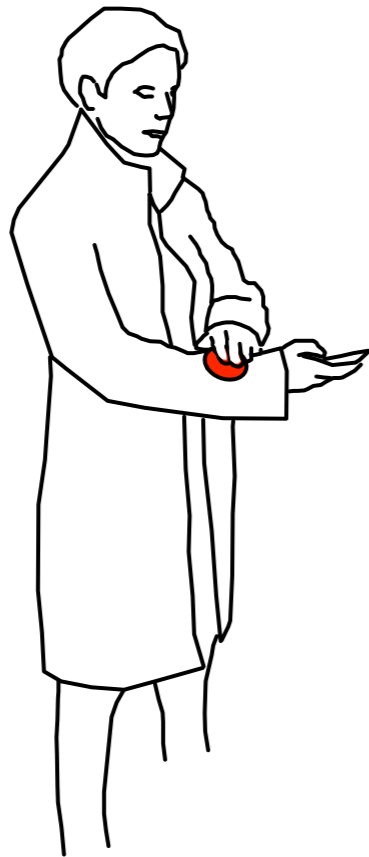
# Grounding

- **tapping** was performed 5% faster on vertical surfaces
- **dragging** was performed 5% faster in horizontal surfaces



Literature: Pedersen et al., An Experimental Comparison of Touch Interaction on Vertical and Horizontal Surfaces, NordiCHI 2012

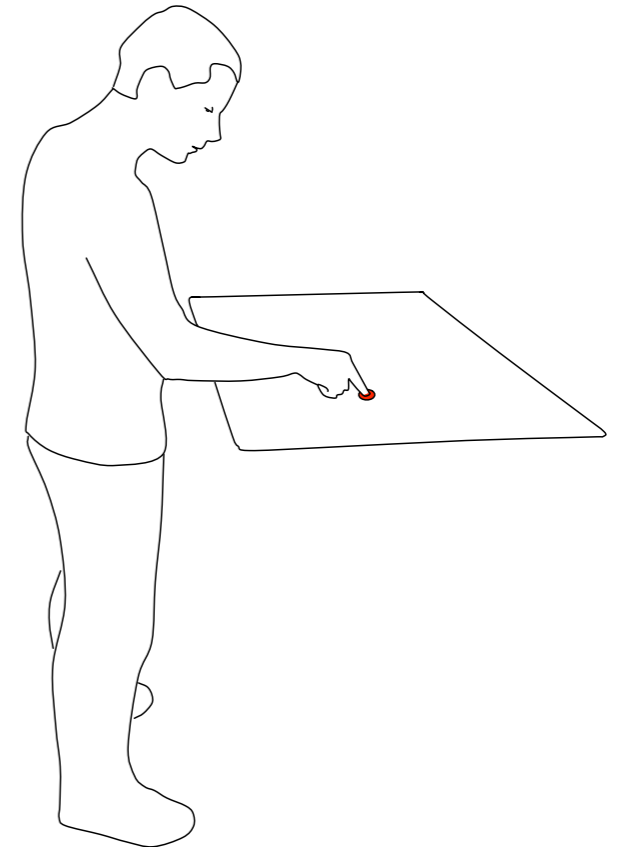
# Input Precision



**wearable**



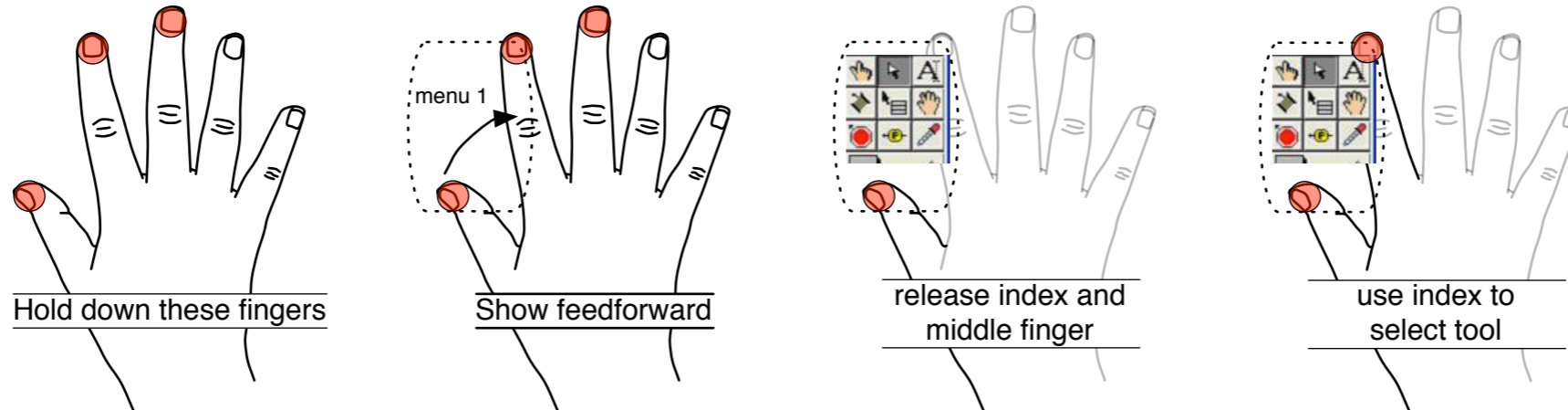
**hand-held**



**fixed**

- **Factors:**
  - Task (pointing, dragging)
  - surface orientation (horizontal vs. vertical)
  - body-device relationship (wearable, hand-held and fixed)

# Finger Widgets



- pointing precision and comfort of index finger while thumb is touching the surface
- informs the design of the widget (size, position of targets)