CTHCI

Current Topics in Media Computing and HCI

Prof. Dr. Jan Borchers

Media Computing Group
RWTH Aachen University

Summer Semester 2020

https://hci.rwth-aachen.de/cthci

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Video Conferencing Etiquette

- We would like to have an interactive class

  - Please **turn on your video** so we can see each other

  - Your video will **not** be in the lecture recording

- Please **ask questions** (only your voice will be in the recording)

  - Use Zoom's **'Raise Hand' function** so we don't talk over each other

  - Otherwise, please **Mute** yourself to avoid echos
    (we may do this for you if you forget)

  - In Audio settings, turn on the option to press **Space** to temporarily unmute

- Turn on your **lights** so you don't look like a zombie :)

Team

Lecturer

Prof. Dr. Jan Borchers
borchers@cs.rwth-aachen.de

Teaching Assistant

Anke Brocker
brocker@cs.rwth-aachen.de

Guest Assistants

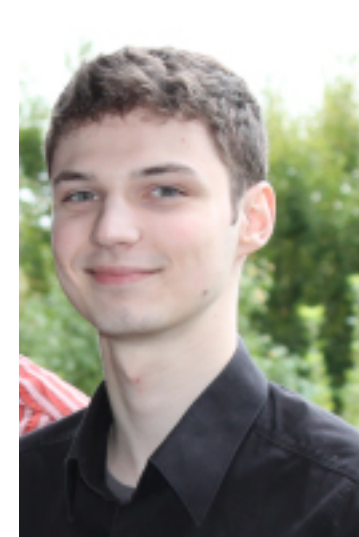Sebastian
Hueber

Adrian
Wagner

Krishna
Subramanian

Oliver
Nowak

Marcel
Lahaye

Philipp
Wacker

Goals

- Understand **types of research and methods in HCI**

- Practice how to **retrieve** and **evaluate** information from the literature
  ⇒ Prepare for thesis and future (research) work

- Learn about **up-to-date developments** in Human–Computer Interaction from **recent HCI conference and journal articles**

- Meet our PhD students and learn about our research areas, to find a favorite topic and advisor for your thesis

Who Are You?

- Audience

  - M.Sc. Computer Science

  - M.Sc. Media Informatics

  - M.Sc. Software Systems Engineering

  - B.Sc. Computer Science (extra credit / carry-over)

  - B.Sc. / M.Sc. Technical Communication (with focus on CS/HCI research)

- Prerequisite: **Designing Interactive Systems (DIS1)** strongly recommended

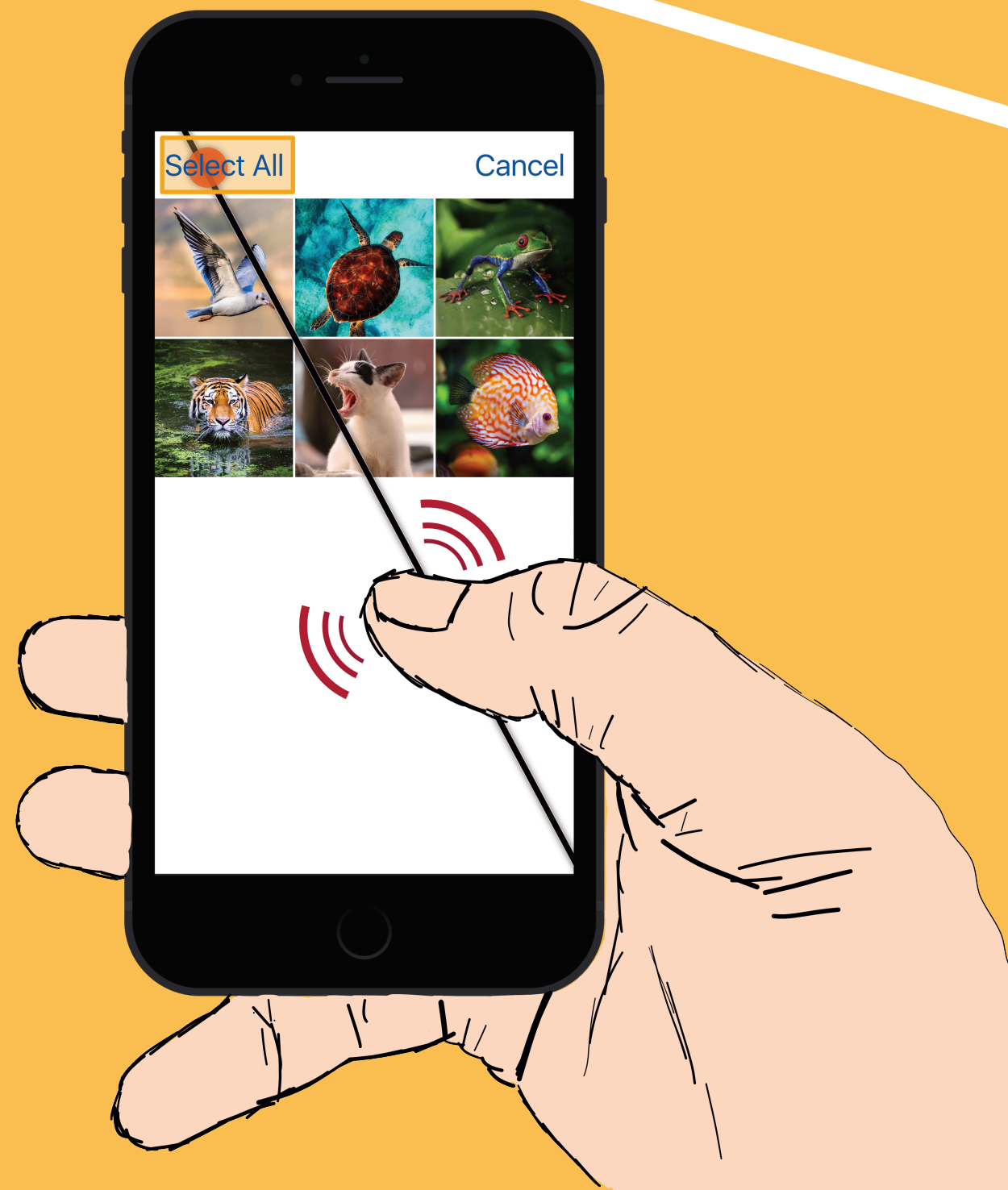 - In our labs, assignments, and exams we assume that you know DIS I

Administrative

- Format: 6 ECTS

- Lecture: Tuesdays, 10:30–12:00

- Lab: Wednesdays, 12:30–14:00

- Expect to spend around 9h/week in total on this class
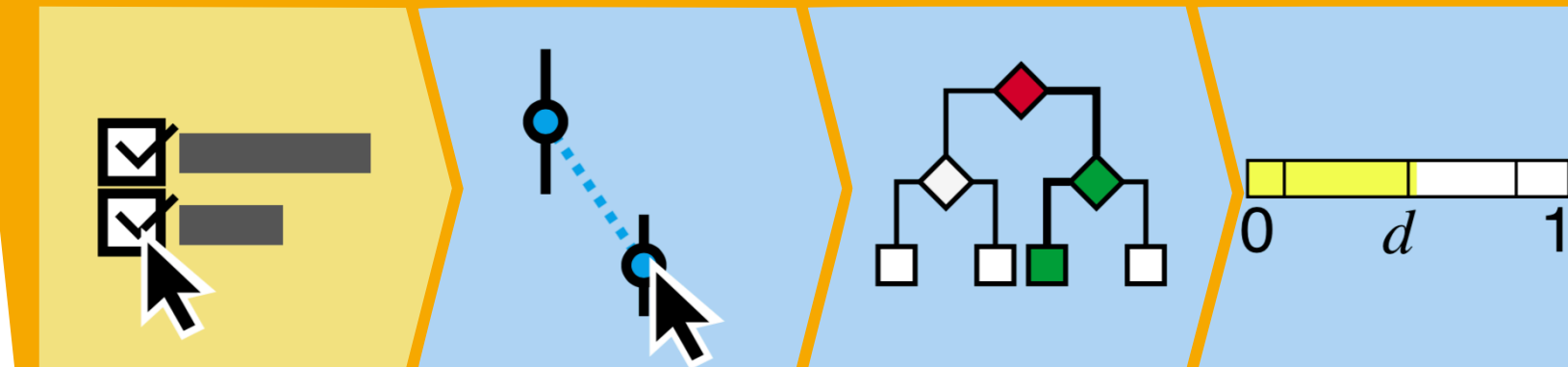
Philipp Wacker:
AR and Immersive Sketching
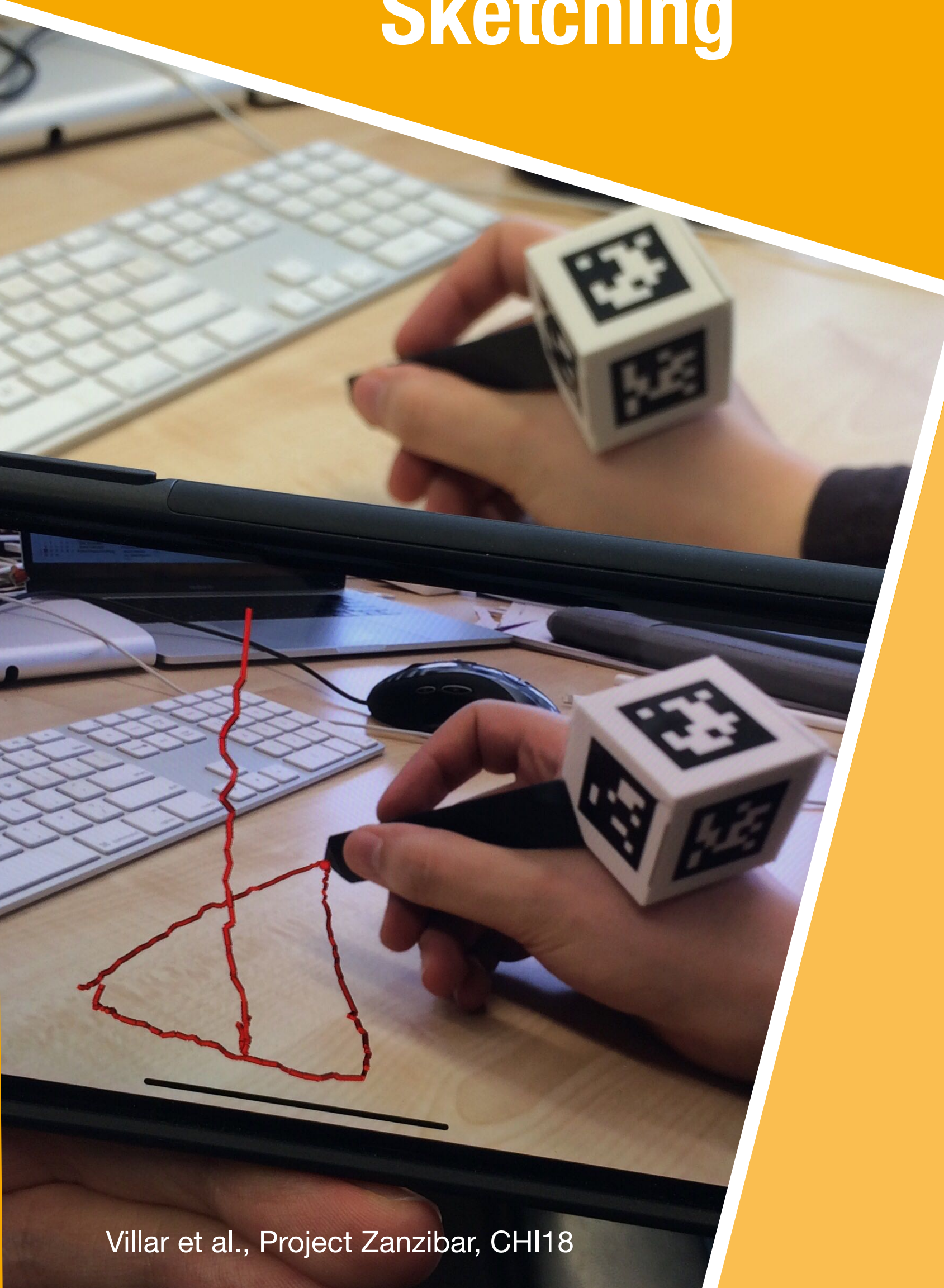
Villar et al., Project Zanzibar, CHI18

Oliver Nowak:
Force Input on Handheld Devices

Statsplorer

Krishna Subramanian:
Supporting Exploratory Programming Workflows

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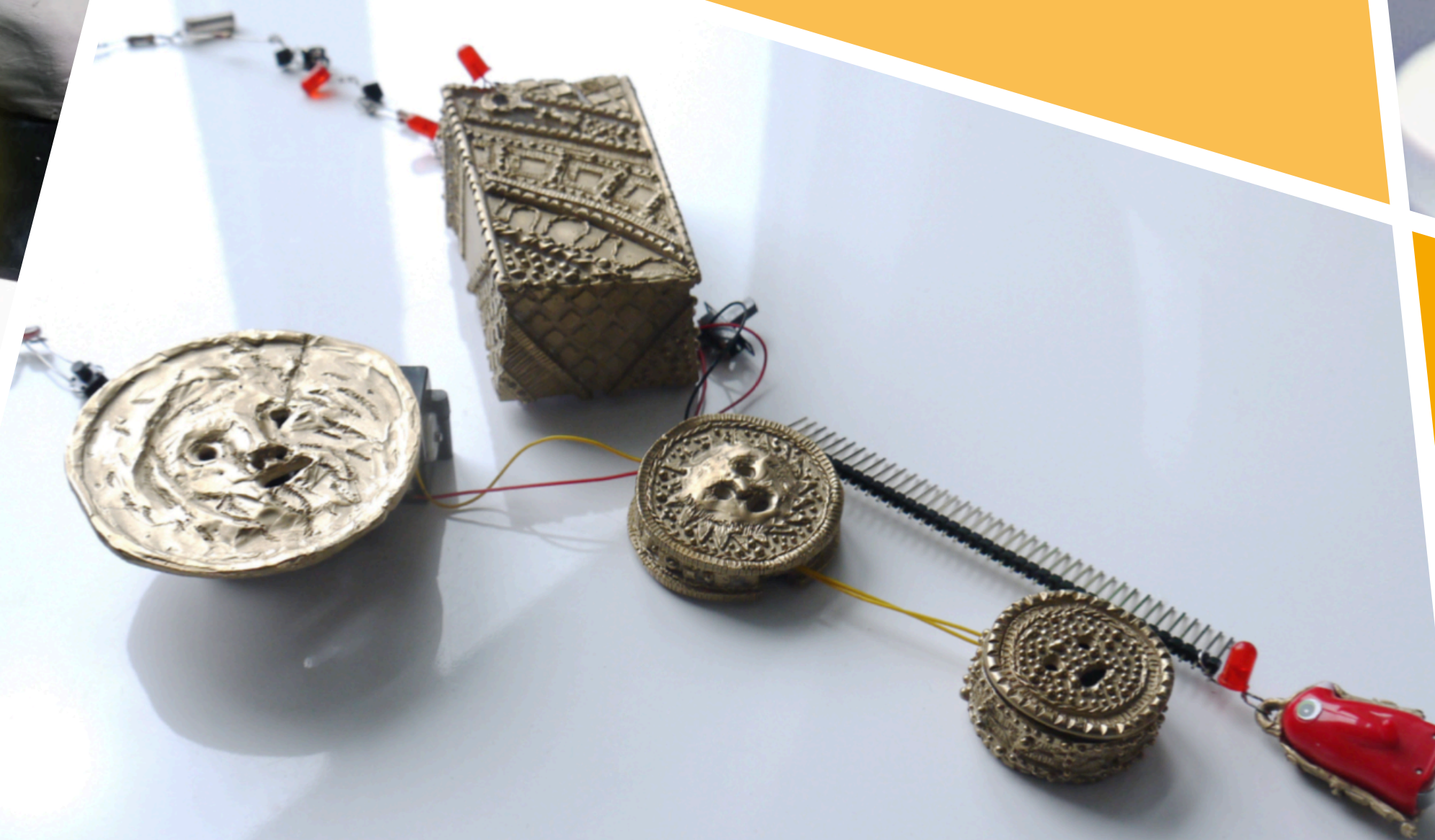
Marcel Lahaye:
Personal Fabrication

Anke Brocker:
Soft Robotics & Jewellery

Christian Cherek:
Tangible on Tabletops

Weichel et al., ReForm, UIST15

Alexandra Ju, Functionality in Wearable Tech, TEI16

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Course Structure

Online Lecture via Zoom

Lectures: Basic Concepts (Tuesday)
- Interactive classes with Prof. Borchers

Lab: Practice concepts (Wednesday)
- Assignments handed in in groups of two
- Discuss assignments

Apr 8th – June 8th

Midterm

June 8th

Frontal Lecture

Lectures: Current Topics in HCI (Tuesday)
- Interactive classes with Prof. Borchers and i10 PhD students

Mini HCI Project (Wednesday)
- Write your own research paper!

June 9th – Jul 8th

Final Exam

Jul 27th

**Final Exam**

Aug 17th

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Literature Sources

- Recent conference papers

  - CHI, UIST, ISS, DIS, Ubicomp,…

- Recent journal articles

  - TOCHI,…

Literature Sources

- Recent books

  - Research Methods in HCI (Lazar et al., 2017)

    - Highly **recommended reading** for more details about evaluation methods—especially if you are considering to do your thesis at our chair!

  - Research Methods for the Behavioral Sciences (Gravetter and Forzano, 2015)

    - Further **recommended reading** for more details about experimental research methods

Final Grade

Midterm exam
30%

Final exam
45%

Assignments & project
25%
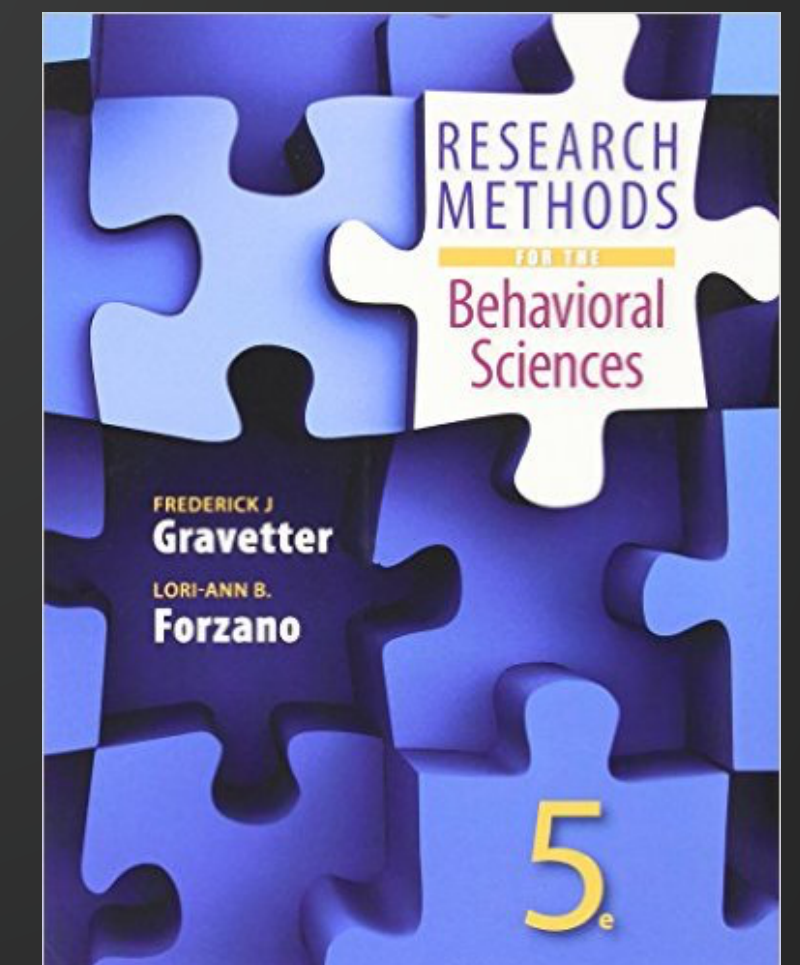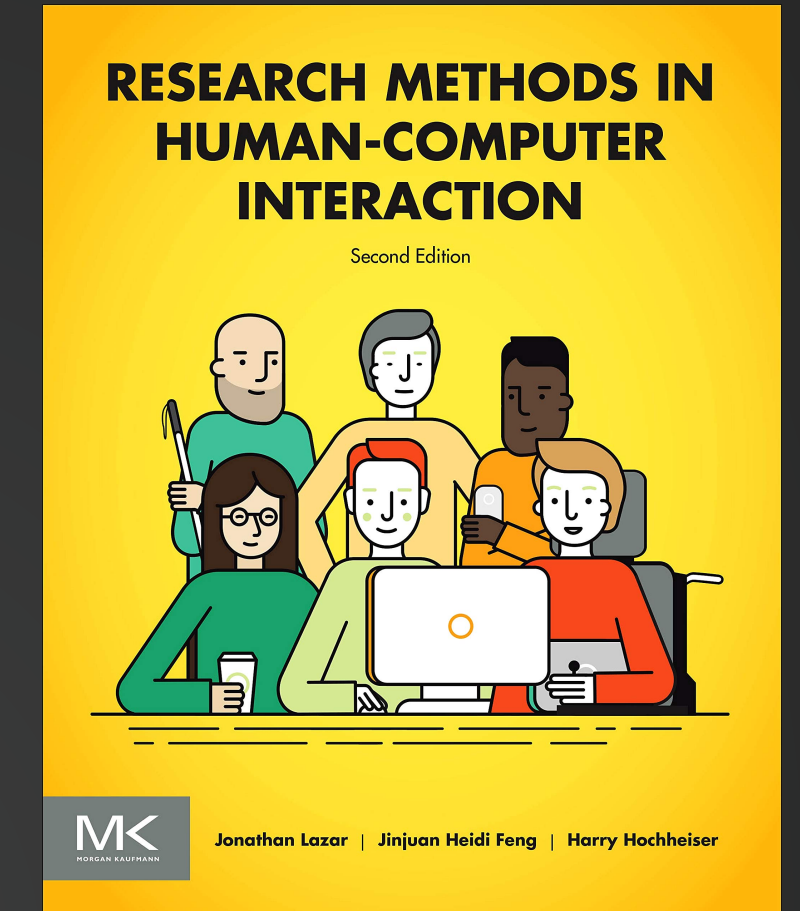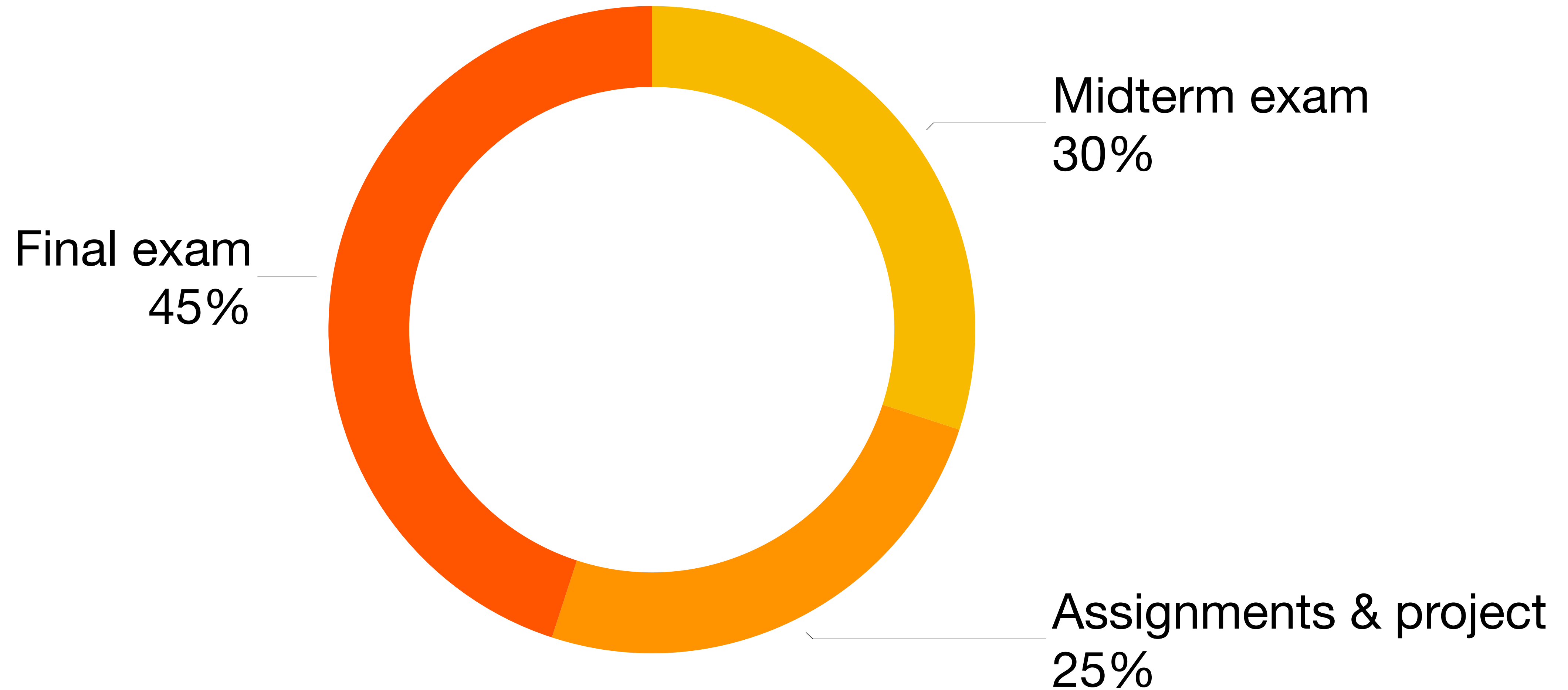
Plagiarism

Usability testing—whether inside a lab facility, using portable equipment, or outside of a lab facility—was rated highest as an effective usability methodology to create greater strategic impact. One reason for this high rating

"Usability testing–whether inside a lab facility, using portable equipment, or outside of a lab facility–was rated highest as an effective usability methodology to create greater strategic impact." **[1]**

Usability testing has the largest impact on strategic improvement **[1]**.

[1] Rosenbaum, Stephanie, Janice Anne Rohn, and Judee Humburg. "A toolkit for strategic usability: results from workshops, panels, and surveys." Proceedings of the SIGCHI conference on Human Factors in Computing Systems. ACM, 2000.

Cite and quote instead of plagiarizing!

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Consequences of Plagiarism in this Class

- Plagiarism will result in an immediate 5.0 for this class.

- Repeated plagiarism will also ban you from all other i10 classes.

- Sign the declaration of compliance (on our jump page),
  scan it and send it to Anke

  - Use **[CTHCI]** as a prefix for the mail

Limited Seats

- **50 seats** available

- Register in RWTHonline by the end of **today**

Current Topics in HCI (2020)

This class covers basic research methods and current research trends in Human–Computer Interaction. We use a mix of recent book chapters and papers from conferences and journals of the last few years to give you an idea of how HCI research is conducted, and of the hot topics that are being worked on in the international research community. Examples from past years include interactive surfaces, tangible user interfaces, human computation, gestural input, interactive textiles, augmented reality, and personal fabrication.

The class explains the differences between empirical, ethnographic and systems research in HCI, and how to quickly retrieve and evaluate information from existing literature, a skill you will need for your Master's thesis and future research work in HCI.
The class consists of weekly lectures, labs, group assignments, reading assignments, a group project, and graded written midterm and final examinations.

The first part of the class consists of weekly **lectures**, labs, **reading assignments** and **group assignments**. In the second part of this class, the **lectures** are dedicated for presenting new topics in HCI, and the **labs** are for project work and discussions. The lecture includes also a graded written midterm and final examinations.

This course has limited seating. You need to **register** to obtain a seat in this course.

Contact

Prof. Dr. Jan Borchers

Anke Brocker

For any questions about the class, please contact Anke Brocker, MSc.

Class Information

Lecture	Tue, 10:30 - 12:00
	2222, i10 Seminar room
Lab	Wed, 12:30 - 14:00
	2222, i10 Seminar room
Language	English
Credits	6

Exams

Midterm	Mon, June 8th, 08:30
Final PT1	Mon, Jul 27th, 11:30
Final PT2	Mon, Aug 17th, 11:30

Resources

▸ **RWTHonline**

▸ **Moodle**

▸ iTunes U

▸ **Organization Slides**

Current Topics in Media Computing and HCI

Seven Research Contribution Types

Prof. Dr. Jan Borchers
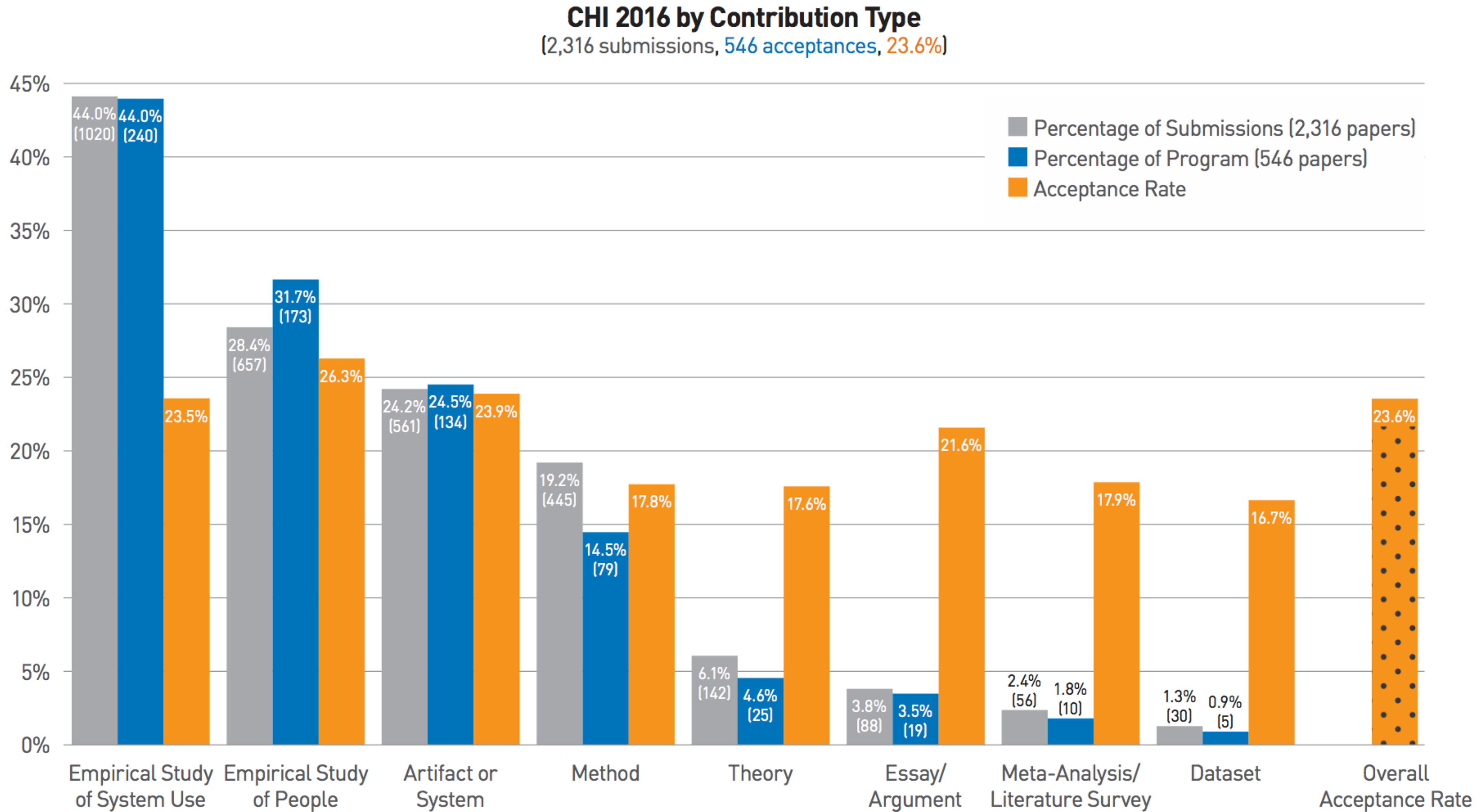Media Computing Group
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CHAPTER 1

Overview

Seven Research Contribution Types in HCI

(Wobbrock, 2016)

CHI 2016 Contribution Types

CHI 2016 by Contribution Type
(2,316 submissions, 546 acceptances, 23.6%)

Legend:
- Percentage of Submissions (2,316 papers)
- Percentage of Program (546 papers)
- Acceptance Rate

Contribution Type	% of Submissions	% of Program	Acceptance Rate
Empirical Study of System Use	44.0% (1020)	44.0% (240)	23.5%
Empirical Study of People	28.4% (657)	31.7% (173)	26.3%
Artifact or System	24.2% (561)	24.5% (134)	23.9%
Method	19.2% (445)	14.5% (79)	17.8%
Theory	6.1% (142)	4.6% (25)	17.6%
Essay/Argument	3.8% (88)	3.5% (19)	21.6%
Meta-Analysis/Literature Survey	2.4% (56)	1.8% (10)	17.9%
Dataset	1.3% (30)	0.9% (5)	16.7%
Overall Acceptance Rate			23.6%

CHAPTER 2

# Empirical Contributions

Prof. Jan Borchers: Current Topics in Media Computing and HCI

Empirical Contributions

- Based on observation and data gathering

- From experiments, users test, field observations, interviews, surveys, focus groups, diaries, ethnographies, sensors, log files

- Evaluated based on the **importance** of findings and the **soundness** of the methods

Example: Performance of Soft Buttons

- Lee et al., CHI '09

- Studied the efficacy of soft buttons on touch screens compared to hard buttons

| Hard button | Soft button - stylus | Soft button - finger |

- Method: Three empirical experiments:

  - OPERATING MODE (finger vs stylus) and FEEDBACK TYPES (acoustic vs haptic)

  - ACTIVATION MECHANISM (contact–capacitive vs force activation–resistive)

  - BUTTON SIZE (2 sizes) and ACTIVATION MECHANISM

- Measured input accuracy, speed, amount of corrections, and subjective ratings with soft and hard buttons
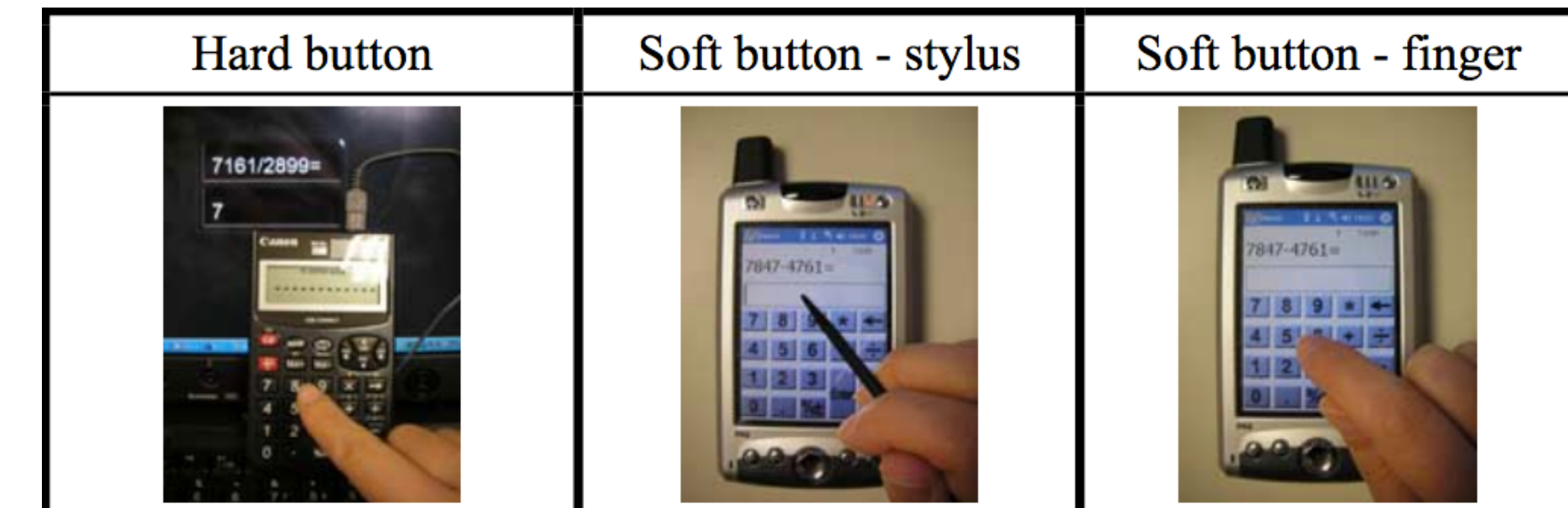
Example: User Awareness

- Cherek et al., CHI '18

  - Goal: Studied the **effect on users' awareness** regarding tangible objects on a screen vs. their virtual presentation

- Method: **Empirical experiment**

  - Groups of 2–4 users played a game grabbing their attention

  - Users had to become aware of other players actions occaionally

- Measured **speed** of the reaction time
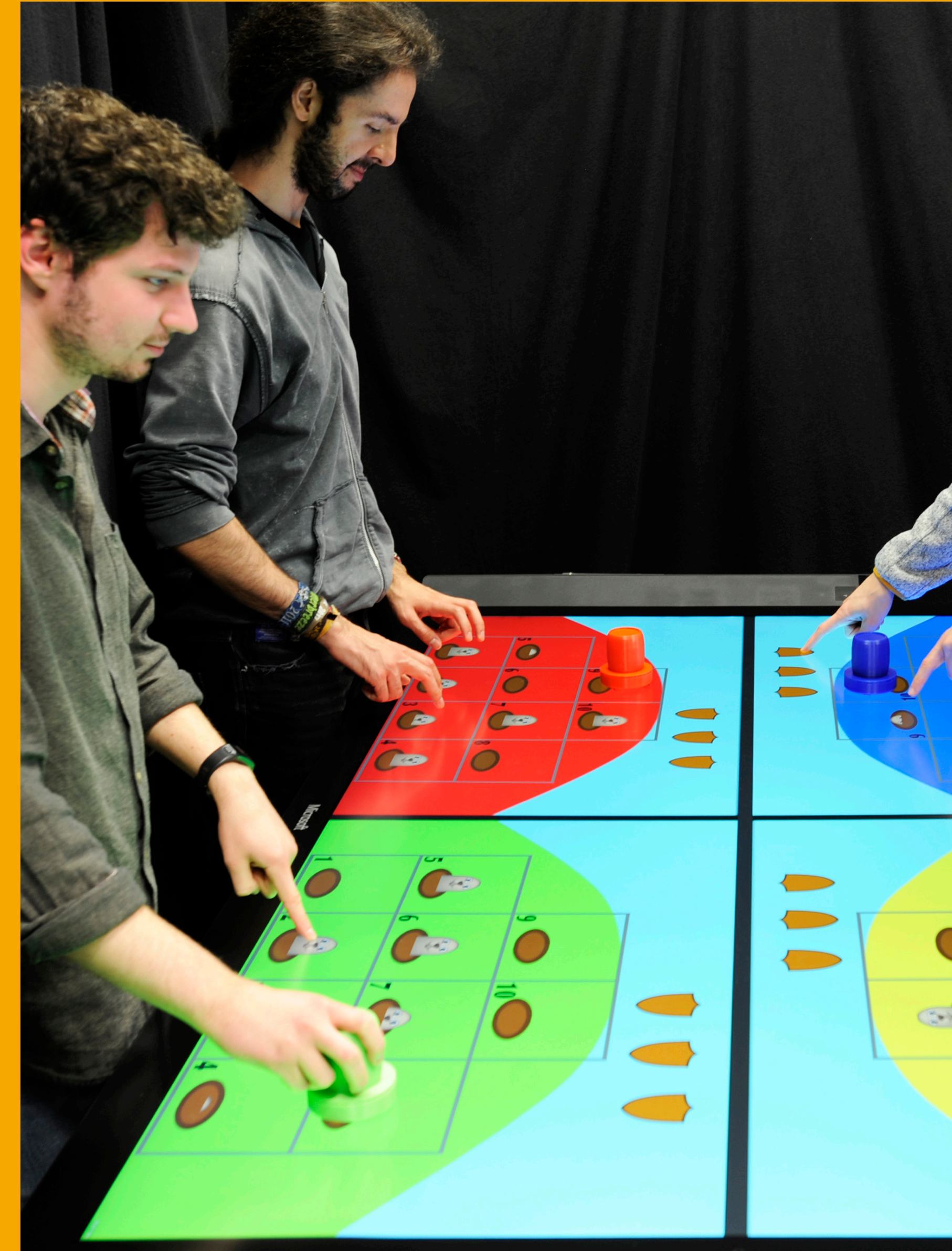
Artifact Contributions

Artifact Contributions

- **Driven by new** systems, architectures, tools, toolkits, techniques & sketches

- **Enable** new exploitations, and suggest new insights and possible futures

- Evaluated based on:

  - What they make **possible** (e.g., toolkits),

  - **Performance** (e.g., techniques),

  - **Innovation** insightfulness (e.g., sketches)

- Empirical studies can be harmful for some artifacts

Example: Springlets

- Hamdan et al., CHI '19

  - Developed **Springlets -** expressive, non-vibrating mechano-tactile interfaces on the skin based on SMAs

- Goal: Developing **thin & flexible tactile interfaces** that are easy to reproduce

- Method: **Empirical experiment**

  - Study on effectiveness & wearability in stationary and mobile situations