

Current Topics in Media Computing and HCI

S01 Research Contributions in HCI Part 1

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Media Computing Group
RWTH Aachen University

Summer term 2018

<http://hci.rwth-aachen.de/cthci>



Goals

- Understand **types of research and methods in HCI**
- Practice how to **retrieve** and **evaluate** information from the literature
⇒ Preparation for thesis and future (research) work
- Learn about **up-to-date developments** in Human–Computer Interaction and interactive multimedia from new books and **recent conference/journal articles**
- Meeting PhD students at the lab and learning about their research areas to find a favorite topic and **advisor for your thesis**

Topics for 2018

- Research literacy
 - Research contributions and approaches in HCI
 - Experimental research and user study protocol
 - Peer-review process
 - Statistics in HCI research
- Research topics
 - Bendable Displays
 - Statistical Tools in HCI
 - Force Input
 - AR Interaction
 - Smart Textiles
 - Touch and Tangibles on Large Interactive Surfaces
 - Personal Fabrication topics



Flipped Classroom

- More interaction, in-class exercises, face-to-face feedback, and Studio-like work on a research project in class
- Content from frontal lectures made available as video clips organised by topic:
Learn at your own pace
 - Some topics will stay frontal lectures
- You can help us make this work through feedback and active participation

Current Topics in Media Computing and HCI

- 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: [DIS I](#)
 - In our studios, assignments, and exams we assume that you know DIS I

Literature Sources



CHI 2018

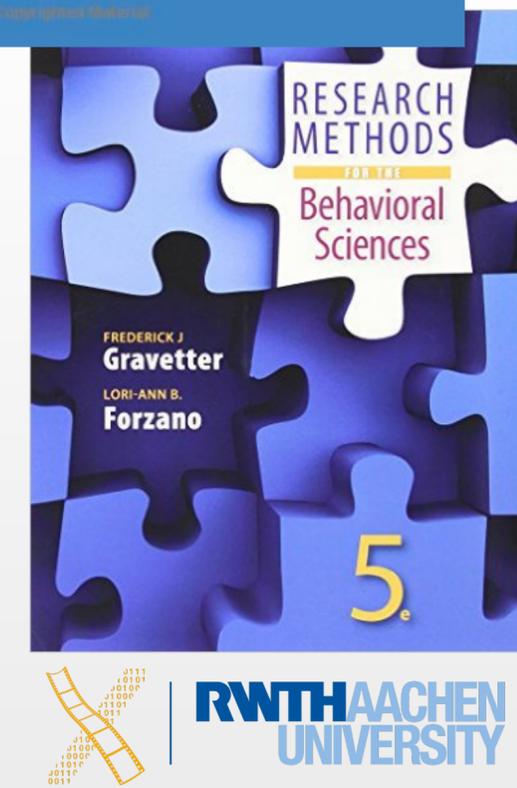
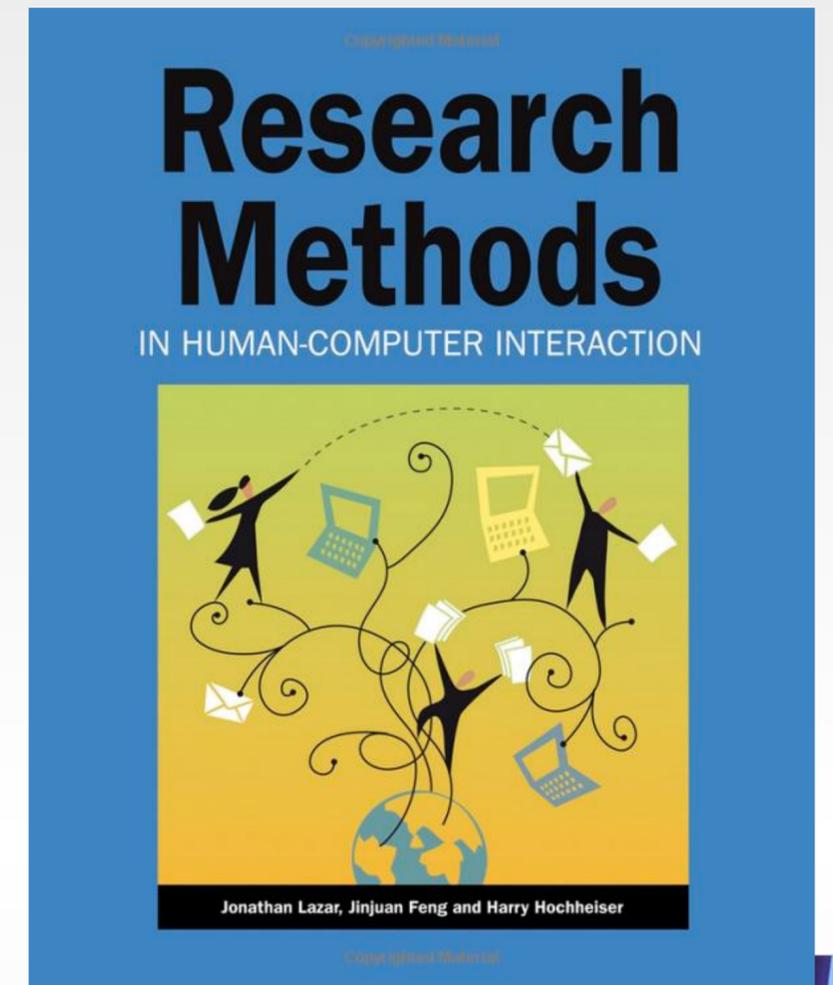
Engage with CHI

- Recent conference papers
 - CHI, UIST, ISS, DIS, Ubicomp,...
- Recent journal articles
 - TOCHI,...
- Older seminal papers



Literature Sources

- Recent books
 - Research Methods in HCI (Lazar et al., 2010)
 - 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



Administrative

Active attendance in both
labs & studios expected!

- Format: 6 ECTS
 - Studio: Tuesdays, 10:15–11:45
 - Lab: Wednesdays, 14:15–15:45
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- In-class exercises
 - Working on your group assignments and mini HCI research project
 - Face-to-face feedback on assignments and project
 - Weekly video and reading assignments (individual)
 - Expect to spend around 9h/week in total on this class



Final Grade

- 30% midterm May 29th — on labs, studios, videos, and readings (the date might change, check on our landing page)
- 25% assignments and project
- 45% final (July 31st)

Limited Seats

- **30 seats** available
- Register in CAMPUS **today**
- Priority will be given based on:
 - Semester
 - Prior involvement with classes at this chair
 - Handing in the declaration of compliance tomorrow in the lab
- You will know if you're in tomorrow after the lab
- First assignment in the first lab (tomorrow)

Tuesdays (10:15-11:45)		Presenters	Wednesdays (14:15 - 14:45)	
17.04.2018	S1: Logistics + Research Contributions in HCI Part 1	Jan	18.04.2018	L1: Research Contributions in HCI Part 2
24.04.2018			25.04.2018	
1.5.2015			02.05.2018	L2: Experimental Research + Writing a Review
08.05.2018	S2: Experimental Research + Writing a Protocol	Nur	09.05.2018	L3: Experimental Research + Writing a Protocol
15.05.2018	S3: Introduction to Statistical Analysis for HCI	Krishna	16.05.2018	L4: Midterm Prep
22.5.2018			23.5.2018	
29.05.2018	Midterm	Nur	30.05.2018	L5: Project kick-off
05.06.2018	S4: Bendable Displays	Simone Voelker and Marcel Lahaye	6.6.2018	
12.06.2018	S5: Statistical Tools in HCI + TBA	Krishna Subramanian + Sebastian Hueber	13.06.2018	L6: Define research questions
19.06.2018	S6: Force Input + AR	Chris Corsten + Philipp Wacker	20.06.2018	L7: Literature review
26.06.2018	S7: Fabrication topics in CHI2018 + Smart Textiles	Paulina Reijtsmeijer + Nur Hamdan	27.06.2018	L8: Experimental protocol
03.07.2018	S8: TBA	TBA	04.07.2018	L9: Pilot study
10.07.2018	S9: Tangibles	Christian Cherek + Anke Brocker	11.07.2018	L10 User study
17.07.2018	S10: TBA	TBA	18.07.2018	Presentations

Learning Resources

- Public website with all general info:
<http://hci.rwth-aachen.de/cthci>
including links to:



- Learning material (slides, literature, assignments)
- Labs and flipped classroom recordings on [iTunes Podcasts](#)
- Research papers in the [ACM Digital Library](#)
 - Free access from inside RWTH network



CTHCI Team

- Prof. Dr. Jan Borchers
- Nur Hamdan, M.Sc.
 - hamdan@cs.rwth-aachen.de
(start subject with “[CTHCI]”)
- Additional topic presenters



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!**

Consequences of Plagiarism in this Class

- Plagiarism will result in an immediate 5.0 for this class.
- Repeated plagiarism will also lead to banning from all other i10 classes.
- Sign the declaration of compliance and hand it in during the lab.

Research Contribution Types in HCI

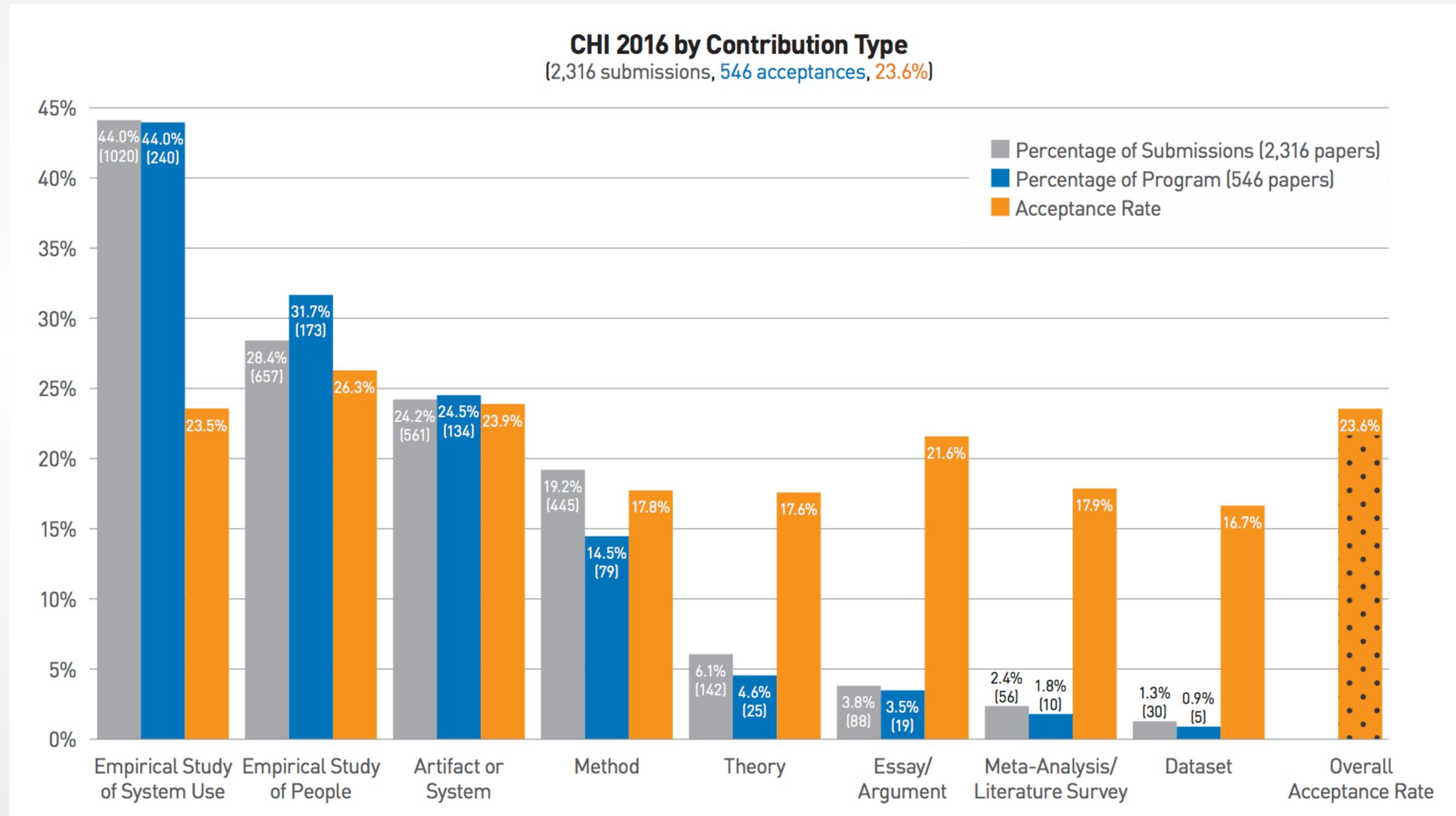
Wobbrock, Jacob O., and Julie A. Kientz. "Research contributions in human-computer interaction." *interactions* 23, no. 3 (2016): 38-44.



Seven Contribution Types

1. Empirical
2. Artifact
3. Methodological
4. Theoretical
5. Database
6. Survey
7. Opinion

Contribution Types from CHI 2016

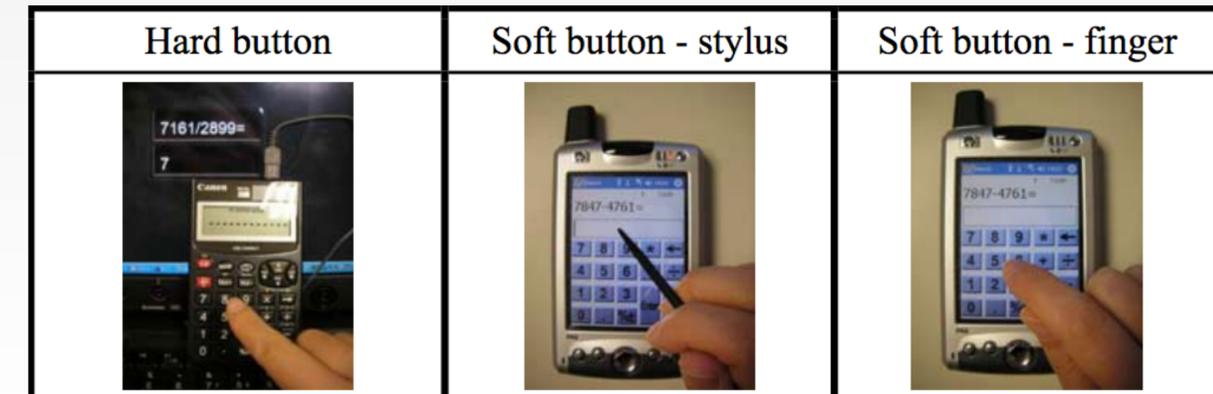


1. Empirical Contributions

- 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
- **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

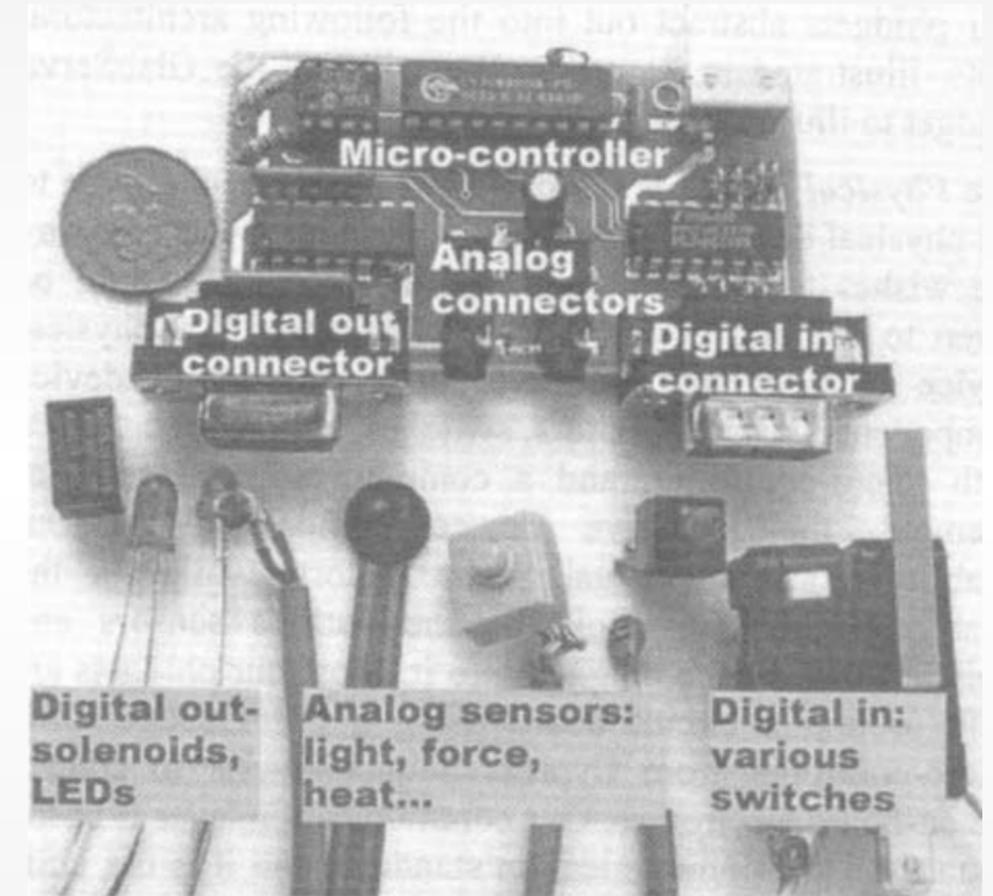


2. Artifact Contributions

- Driven by new systems, architectures, tools, toolkits, techniques, sketches, mockups, envisionment
- 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
- Artifact contributions should negotiate trade-offs and balance priorities

Example: Phidgets

- Greenberg et al., UIST '01
- Developed a physical toolkit for building physical user interfaces
 - For example, an on-screen dial widget could be implemented physically as a knob
- Goal: a toolkit that allows users to focus on their design, simple to use and extend by average programmers
- **Method:** Observation of undergraduate students developing physical projects in a workshop setting (no formal evaluation metric)
- A description of the resulting projects was provided



What type of contribution?

The Effect of Visual Decoration on the Performance of Continuous Sliders and Visual Analogue Scales

Justin Matejka
Mike Glueck
Tovi Grossman
George Fitzmaurice



What type of contribution?

FlexCase:

Enhancing Mobile Interaction with a Flexible Sensing and Display Cover

Christian Rendl¹, David Kim², Patrick Parzer¹, Sean Fanello², Martin Zirk³, Gregor Scheipl³, Michael Haller¹, Shahram Izadi²

¹Media Interaction Lab (Austria) ²Microsoft Research (Redmond, WA, USA) ³Joanneum Research (Austria)

Music: Janiev - Into The City



In-Class Exercise

- From your handouts, read abstracts 1, 2, and 3
- Identify the research contributions

“Such reflection can be challenging in a broad and diverse field, and while we should be wary of constraining our imaginations, we should embrace giving definition to the knowledge we produce. Doing so provides a valuable **map** for navigating the field of HCI and helps **newcomers** take their first steps.”

–Wobbrock, 2016

Next

- **In the lab**
 - Continue with exercises on HCI contribution types: Methodological, Theoretical, Database, Survey, Opinion
 - Attend to registration issues on campus and L2P
- **Next week**
 - No studio or lab, we are at CHI 2018 in Quebec, Canada
 - Watch the first video clips on **experimental research** on iTunes Podcasts (link in our wiki)

What You Need To Do Now

Links to learning materials:
hci.rwth-aachen.de/cthci

- Sign up for this class in CAMPUS by [today!](#)
- [Required Read: Seven Research Contribution Types in Human-Computer Interaction](#) — Jacob Wobbrock, 2016
- [Recommended Read: Framing IxD knowledge](#) – Kristina Höök, 2015
- Come to the lab this Wed, April 18th