Investigating Human-Technology Relations through Research through Design

Guest Lecture | Designing for People CPCS 544 – Fundamentals in Designing Interactive Computational Technology for People (HCI) | November 27th, 2018

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This Lecture | Overview

INTRODUCTION
• My Background

MY HCI WORK
• The kind of HCI research I do
• Methods I use
• HCI research space: design-oriented HCI

RESEARCH INSIGHTS
• Human-Technology Relations; Technological Mediation
• Research through Design (RtD)
• Look at Several RtD projects

Investigating Human-Technology Relations through Research through Design
• My lecture will offer insights into the kind of work I do in HCI that uses a Research through Design approach with contemporary philosophical perspectives.
• A main thread in my research is to explore a deeper and more holistic understanding of humans, technology and the different kinds of relations that can emerge between them.
• This work is situated in an emerging strand of HCI research exploring alternatives to goal-driven, feature-laden, and productivity-oriented ways of designing digital technologies through expanded foci beyond interaction, functionality, and human-centeredness.

READINGS
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HfG Ulm – Ulm School of Design (1953 - 1968)
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- PhD, Simon Fraser University, School of Interactive Arts and Technology, Everyday Design Studio [2018]
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- PhD, Simon Fraser University, School of Interactive Arts and Technology, Everyday Design Studio [2018]
- **Instructor at Emily Carr University of Art and Design, Interaction Design B.A. [2015-17]**
My Work in HCI
My work in HCI | The kind of HCI research I do

Interaction Design Researcher in Design-oriented HCI

- **What I do/ Methods I use:**
  - qualitative studies;
  - *design ethnography*: ethnography-informed studying of people/future users)
  - *Research through Design*: constructive design research; deployment studies
  - try to actively integrate critical (contemporary) philosophical perspectives and approaches in my design research work and practice

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My work in HCI | Design-oriented HCI

- ACM CHI 2019 Subcommittees
  - User Experience and Usability
  - Specific Application Areas
  - Learning, Education and Families
  - Interaction Beyond the Individual
  - Games and Play
  - Privacy, Security, and Visualization
  - Health
  - Accessibility and Aging
  - Design (since 2011)
    - Interaction techniques, Devices and Modalities
    - Understanding People: Theory, Concepts, Methods
    - Engineering Interactive Systems and Technologies

- ACM Designing Interactive Systems (DIS)
  - since 1995
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Dr. John, Adjunct Professor</td>
<td>Research on Human Behavior</td>
<td>Dr. Jane, Professor</td>
<td>Dr. Smith, Professor</td>
<td>Dr. Brown, Professor</td>
<td>Dr. Scott, Professor</td>
<td>Dr. Green, Professor</td>
<td>Dr. Blue, Professor</td>
<td>Dr. Red, Professor</td>
</tr>
</tbody>
</table>

**Note:** The table continues with similar entries.
»Things carry morality because they shape the way in which people experience their world and organize their existence, regardless of whether this is done consciously and intentionally or not. Designers ... materialize morality.«
Wireless Implantable Medical Devices

- Deep Brain Neurostimulators
- Cochlear Implants
- Cardiac Defibrillators/Pacemakers
- Gastric Stimulators
- Insulin Pumps
- Foot Drop Implants

https://groups.csail.mit.edu/netmit/IMDShield/

http://www.auger-loizeau.com/projects/toothimplant

Radio Chew
Listen to shows and phone via your tooth

http://www.auger-loizeau.com/projects/toothimplant
https://www.cnet.com/news/google-said-to-be-working-on-mini-google-home-smart-speaker
Research Insights | Human-Technology Relations; Technological Mediation (Postphenomenology)

18-Year-Old Model Edits Her Instagram Posts To Reveal The Truth Behind The Photos

1.3M views 2 years ago by Ged

Like Bored Panda on FB: 1 like 14M

18-year-old internet sensation Essena O'Neill had been making thousands of dollars modeling on Instagram and sharing her pictures with almost 580,000 followers, but all that changed last week. The Australian deleted 2,000 photos from her account and changed the name to "Social Media Is Not Real Life." She has since re-captioned many of the remaining photos to reveal the "truth" behind them, and launched a new website, "Let's Be Game Changers."

"Without realising, I've spent the majority of my teenage life being addicted to social media, social approval, social status and my physical appearance," O'Neill wrote in an October 27th Instagram post. "Social media, especially how I used it, isn't real. It's a system based on social approval, likes, validation in views, success in followers. It's perfectly orchestrated, self-absorbed judgement."

More info: letsbegamechangers.com | Instagram (h/t: elitedaily)
“Technologies and human beings help to shape each other. Technologies are an element of human nature: They are part of us. […]”
“Technologies help shape perceptions and actions, experiences, and practices” (Verbeek 2015, p.29).
How terrifying food technology has changed our lives

From fridge freezers to microwaves, coffee percolators to toasters, an astonishing array of kitchen tech has revolutionised domestic life.

Microwave ovens, first invented in the Forties, were a source of befuddlement and concern for Telegraph columnists over the years, with Fanny Cradock comparing hers to “a reactor station after a leak”
Research Insights | Human-Technology Relations; Technological Mediation (Postphenomenology)

- How do we even understand what a preferable future with technology could be??
- It’s complicated; no single answer
- Yet we need to move forward and understand and know better how to design technologies and systems
- In my research I have largely migrated towards using postphenomenology as a framing
Research Insights | Human-Technology Relations; Technological Mediation (Postphenomenology)

- A strand of philosophy of technology to understand the role of technologies in human existence and experience (e.g. Verbeek 2005, Rosenberger & Verbeek 2015).
- Views technology as transformative mediators of human-world relations.
- Humans and technology mutually shape each other in the relations that come about between them.
- The human is no longer understood as an autonomous agent. Agency is distributed across the human and technology; intentionality is mediated.
- Technologies are investigated in terms of the relations humans have with them; several sets of bodily-perceptual human-technology relations are considered.
- Technology could be encountered as an embodiment, as an alterity, through a hermeneutic, or a background relation (Ihde 2009).
- Offers a holistic understanding of Human-Technology Relations
- Emerging interest into postphenomenology in HCI
How the world is there or becomes meaningful for humans - hermeneutic
Perception/Experience
amplifies/reduces

HUMAN — TECHNOLOGY — WORLD

subjectivity

objectivity

invites/inhibits
Actions/Practices

How human beings are in their world - existential
Research Insights | Human-Computer Interaction vs. Human-Technology Relations

- Understanding the relations between technologies and humans as *interactions* and technologies as *tools* has been foundational to HCI's establishment & development.

- Yet *Interactions* (in *use contexts*) may just be one of many possible relations that can come about between humans and technologies (Verbeek, 2015).

- Technologies not only are instrumental tools but also actively shape us. Technologies help shape perceptions and actions, experiences, and practices (Verbeek, 2015).

→ There is an opportunity for HCI to engage with a deeper understanding of the relations between humans and technology to complement its existing approaches.

→ The broad goal of my research is to explore moving beyond a focus solely on interaction, use, utility, and human-centeredness in the context of HCI.

https://foundationsofhci.wordpress.com/
Research Insights | Research through Design

What design is

• *To design is to devise courses of action aimed at changing existing situations into preferred ones* – Herbert Simon 1969).

• Design is the ability to imagine that-which-does-not-yet-exist, to make appear in concrete form as a new, purposeful addition to the real world (Nelson & Stolterman 2002)

• The power of design is not only problem solving but also problem framing (Rittel & Webber 1973; Schön 1983).

What Research through design is

• Research through Design (RtD) is a growing methodological approach to conducting scholarly research in HCI that investigates and asks questions potential futures with technology (Zimmerman, Forlizzi & Evenson 2007)
Design Research Case:
An Annotated Portfolio on Doing Postphenomenology through Research Products

Sabrina Hauser¹, Doenja Oogjes¹, Ron Wakkary¹,² and Peter-Paul Verbeek³

¹ Simon Fraser University, Surrey, BC, Canada
² Eindhoven University of Technology, Netherlands
³ University of Twente, Netherlands
**Design Research Case | An Annotated Portfolio on Doing Postphenomenology through Research Products**

**table-non-table as a postphenomenological inquiry**

- Inquiry into the human-technology relations with and through the table-non-table
- Insights into relations beyond use and into the background relation organized by the table-non-table


Wakkary, Oogjes, Lin, and Hauser. *Philosophers Living with the Tilting Bowl*. CHI ’18
Overarching Question:

Could postphenomenology contribute a holistic perspective on human relations with technology that can help complement and expand human-centered approaches to design research and practice?

Overarching Commitment

- A reflexive account of a design researcher exploring what a postphenomenology-informed approach holds to complement human-centeredness
- Unique researcher-designed framework (Creswell, 2009)
- Two cases that challenge aspects of human-centeredness + use of postphenomenology

Three Design Research Cases

I. Retrospective Analysis of an empirical design ethnography study of guide dog teams


II. Analysis of a Research through Design (RtD) study of the table-non-table


III. Annotated Portfolio of Research Products as Postphenomenological Inquiries

My PhD Dissertation | Methodological approach

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Three Design Research Cases

I. Retrospective Analysis of an empirical design ethnography study of guide dog teams

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Design Research Case:
Field Deployments of the table-non-table
Design Research Case | table-non-table
The approach informing the table-non-table project

• Research through Design (RtD) project that inquiries into non-utilitarian aspects of human-technology relations.

• The table-non-table diverts from assumptions around use-centric ideas of technologies and design

• Combines familiarity with unfamiliarity
  • Specific functionality but not in the service of human use
  • Avoids specific use goals yet is still crafted in an intentional and purposeful way (Wakkary, Desjardins & Hauser 2016)

• Material Speculation (Wakkary, Odom, Hauser, Hertz & Lin 2015)

• Research Product (Odom, et al. 2016)

• Studied through three different field studies with six deployments over the course of 4 years
Three series of field deployments between 2013 - 2017 with six different case instances

**First Series**
thing-oriented explorations
informed by *everyday design* and
*theories of social practice*

How the table-non-table can
find a place in the home

Informed by: Everyday Design (Wakkary & Maestri 2007), Theories of Social Practice (e.g. Shove Watson & Pantzar 2012)

*Will the TNT find a place in a home?*
*How could the TNT be taken up in people’s domestic settings and practices?*
*Letting the thing do the talking.*

#1 Two Researchers’ Homes: Few Days
#2 One Participant Household: 6 Weeks
### Design Research Case | Field Deployments of the table-non-table

**Three series of field deployments between 2013 - 2017 with six different case instances**

<table>
<thead>
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<th>First Series</th>
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<td>thing-oriented explorations informed by <em>everyday design</em> and <em>theories of social practice</em></td>
<td>ethnographic accounts of lived-with experiences informed by <em>goodness of fit</em> and <em>unselfconscious culture</em></td>
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**THING**

*How the table-non-table can find a place in the home*

Informed by: Everyday Design (Wakkary & Maestri 2007), Theories of Social Practice (e.g. Shove Watson & Pantzar 2012)

*Will the TNT find a place in a home? How could the TNT be taken up in people’s domestic settings and practices? Letting the thing do the talking.*

#1 Two Researchers’ Homes: Few Days

#2 One Participant Household: 6 Weeks

**HUMAN**

*How the table-non-table relates to other things*

Informed by: Alexander (1964)’s notions of *goodness of fit & unselfconscious cultures*

*How does the TNT fit in our participants’ homes? Looking into participants’ lived-with experiences, using established HCI oriented methods*

#3 One Participant Households: 6 Weeks

#4 Home of Two Researchers: 3½ Months

#5 One Participant Household: 3½ Months
Three series of field deployments between 2013 - 2017 with six different case instances

**First Series**
thing-oriented explorations
informed by *everyday design* and *theories of social practice*

**Second Series**
ethnographic accounts of lived-with experiences informed by *goodness of fit* and *unselfconscious culture*

**Third Series**
exploration of relational and mediating effects informed by *postphenomenology*

**THING**

*How the table-non-table can find a place in the home*

Informed by: *Everyday Design* (Wakkary & Maestri 2007), *Theories of Social Practice* (e.g. Shove Watson & Pantzar 2012)

**HUMAN**

*How the table-non-table relates to other things*

Informed by: Alexander (1964)’s notions of *goodness of fit* & *unselfconscious cultures*

**MEDIATION**

*How the table-non-table co-constructs human-world relations*

Informed by: *Postphenomenology* (e.g. Ihde 1990, Rosenberger & Verbeek 2015)

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**Design Research Case | Field Deployments of the table-non-table**

**Will the TNT find a place in a home?**
*How could the TNT be taken up in people’s domestic settings and practices?*  
*Letting the thing do the talking.*

#1 Two Researchers’ Homes: Few Days  
#2 One Participant Household: 6 Weeks

**How does the TNT fit in our participants’ homes?** Looking into participants’ lived-with experiences, using established HCI oriented methods

#3 One Participant Households: 6 Weeks  
#4 Home of Two Researchers: 3½ Months  
#5 One Participant Household: 3½ Months

**How is the table-non-table encountered (relationship-wise)?**  
*How does the table-non-table mediate our participants lives?*

#6 Professional Designer Couple Household: 11 Weeks
• The relations we have with things and technologies are not solely based on or begin with ‘use’

• As soon as an artifact becomes part of a home, it shapes a new reality and mediates people’s existence and experience regardless of its usefulness

• A postphenomenological account of the TNT
  • Human-Technology Relations: Background relation (cf. Ihde 1990) with added particulars
  • Mediating effects: can be subtle, diffuse, and go well beyond use

• TNT as a postphenomenological inquiry
**Research Insights | An Annotated Portfolio on Doing Postphenomenology through Research Products**

**table-non-table as a postphenomenological inquiry**

- Inquiry into the human-technology relations with and through the table-non-table
- Insights into relations beyond use and into the background relation organized by the table-non-table

→ **Could this framing be extended to other key Research through Design works in HCI?**

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*Wakkary, Oogjes, Lin, and Hauser. Philosophers Living with the Tilting Bowl. CHI '18*
• **Greenscreen Dress**  
  (Mackey et al. 2017)

• **Obscura 1C Digital Camera**  
  (Pierce & Paulos, 2015)

• **Indoor Weather Stations**  
  (Gaver et al. 2013)

• **Morse Things**  
  (Wakkary et al. 2017)

• **Photobox**  
  (Odom et al. 2012, 2014)

• **Datacatcher**  
  (Gaver et al. 2016)

• The term and concept of *research products* “emphasizes the actuality of the design artifact helping to overcome the limitations of prototypes when investigating complex matters of human-technology relations over time, which is of growing interest in the HCI community” [Odom et al. 2016].

• designed to **drive a research inquiry**;

• they have a **high quality of finish** such that people engage with them as they are, rather than what they might become and such that

• they can **fit among other things** and into everyday environments;

• they operate independently in everyday settings over time.
GreenScreen Dress (Mackay et al)
Obscura 1 C Camera (Pierce & Paulos)
Indoor Weather stations (Gaver et al / Interactions Research Studio @Goldsmiths)
Datacatcher (Gaver et al / Interaction Research Studio @Goldsmiths)
Photobox (Odom et al)
Morse Things (Wakkary et al)
1 Empirical work as the basis of the inquiry

2 Structures of human-technology-world relations as a starting point

3 Technology co-constitutes objectivity and subjectivity of any given situation (mediations)

(c.f. Rosenberger and Verbeek, 2015)
1 Empirical work as the basis of the inquiry

- First Person Experiences
- Self-conducted studies
- Empirical Work by others

**What kind of empirical work is done with and through the selected research products?**

- 20 cameras as stand-alone products
- distributed through bulletin boards, local stores, & craigslist
- empirical account builds on the specific actuality
- 1st person experience by Pierce

Obscura 1C Digital Camera (Pierce & Paulos, 2015)
1 Empirical work as the basis of the inquiry

2 Structures of human-technology-world relations as a starting point

- We can encounter technologies through different bodily-perceptual relationships (Ihde 1990):
  - as an embodiment
  - as an alterity,
  - through a hermeneutic, or
  - a background relation.
- We can also encounter technologies through cyborg relationships (Verbeek 2008):
  - through fusion, immersion, & augmentation

What structures of relationships are at play in the selected research products?

- Designed to be encountered hermeneutically revealing aspects of the home’s microclimate
- They eventually become part of the home’s background and in a desirable way
- Novelty results in relationships and their dynamics to evolve over time
Empirical work as the basis of the inquiry

Structures of human-technology-world relations as a starting point

Technology co-constitutes objectivity and subjectivity of any given situation (mediations)

What kind of ‘human’ and what kind of ‘world’ is co-constituted by our research products?

- Greenscreen Dress changed Mackey’s ways of relating to clothing, her identity, & her environment.
- Her perception of and experiences with the system moved from being “gimmicky” to an exploration into regaining control and expressing identity.
- She experienced her environment as wearable, as most of the digital content she ‘wore’ came from captures from her surroundings.
**Implications** | Research Products as Doing Postphenomenology (in a more experimental way)

- Revealed how the research products inquire and align with key postphenomenological commitments.
- Empirical approaches, human-technology relationship structures, and mediation.
- Established a postphenomenological vocabulary and concepts in the context of HCI and RtD.

→ Research products can be seen as doing *postphenomenology in a more experimental way*.

The co-constructive roles of HCI researchers in their postphenomenological inquiries.
Research Insights | Implications

Annotated Portfolio of Research Products as Postphenomenological Inquiries

- Revealed how the research products inquire align with key postphenomenological commitments.

- Empirical approaches, human-technology relationship structures, and mediation

- Established a postphenomenological vocabulary and concepts in the context of HCI and RtD

→ Research products can be seen as **doing postphenomenology in a more experimental way**

![Diagram of Design Researcher](image)

Co-constructive roles of HCI researchers in their postphenomenological inquiries
The constructive roles of HCI researchers in their inquiries
How can this be useful for you?

- Think about not only what your designing as what it enable. What does it obscure?
- What kind of human subjectivity are you co-constituting through your technology?
- Besides its functionality, in what way does your technology shape or change people?
- How can people relate to it?
- …

Co-constructive roles of HCI researchers in their postphenomenological inquiries

Technological Mediation; Human-Technology Relations
Thank you!

Investigating Human-Technology Relations through Research through Design

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