

This forum highlights conversations at the intersection of design methods and social studies of technology. By highlighting a diversity of perspectives on design interventions and programs, we aim to forge new connections between HCI design and communication, science and technology studies, and media studies scholarship. — Daniela K. Rosner, Editor

# Reshaping the Limits of Design in HCI

Daniela K. Rosner, University of Washington

Perhaps more than any other area of HCI, design research faces an identity crisis. While some researchers extend *human-centered design* (turning cycles of observation, ideation, prototyping, and testing into design recommendations and guidelines), other researchers favor *studies of design* (empirical studies of design processes). Still others offer a kind of *design meta-analysis*, defining and characterizing modes of design research.

As early as Christopher Frayling's discussion of research in art and design [1], concerns for generalizable knowledge have pervaded design research. Whether to legitimate design in the academy or to inform design pedagogy, such connections between theory and practice have spawned attempts to formalize [2] and reorient [3] how design projects might improve or design methods might travel. For these scholars, research produces design knowledge in the form of *frameworks*, *philosophies*, or *implications for design* [2]. Theory generation remains design-oriented and not the other way around.

A few important challenges follow from this line of reasoning. The first concerns the *analytic reach* of design research. By limiting design research to the work of informing design, we generate research outcomes that contribute little beyond guidelines, principles, and so on. Design recommendations prioritize "improving" technology over understanding technology in action.

The second issue has to do with our

*frame of investigation*. Design research operates within a specific temporal and geographical scope: namely, the times and places in which design work unfolds. This presents challenges for explicating how a set of design techniques might work beyond the site in which they are built or studied. In this, design research resembles the ethnographic case study, which is, in sociologist Michael Burawoy's words, "inherently particular" [3].

The third issue relates to the *normative character of design*. As designers, we tend to advance (often unwittingly) our own concerns through what we build. Though we may aim to develop a better system, through prototyping we begin to define what that "better" means (reusable parts, learning by doing, guidance for the vision impaired, etc.). Even as we try to avoid idealistic or universalist solutions, our projects build suggestions for a standard way of living and what "ought" to be.

To address these concerns, one might suggest further separating design scholarship and professional practice. This could place design departments alongside professional fields such

as law and education—seeking to inform practice through field trials, for example. Instead, I argue for a mode of research through design [2,4] that treats the design as social inquiry (hereafter referred to as *design inquiry*). This positions designed systems and processes as tools with which to examine social phenomena. Design becomes a means rather than an end.

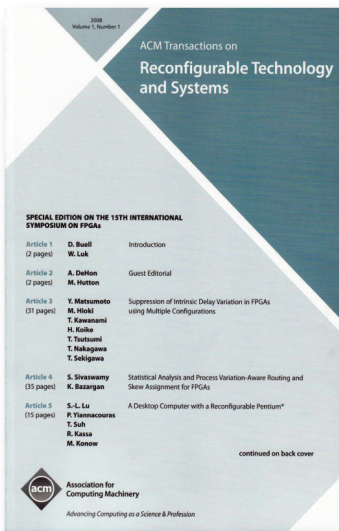
This work is hardly new to strains of art practice, or to speculative, adversarial, or critical design. From the Gutai group [5] to Survival Research Labs [6], a long legacy of performance art has highlighted the meanings forged through action and intervention, using technologies to question assumptions about our social worlds and the place of the technical within them. Similarly, cultural probes [7] and other forms of intervention fit comfortably in this form of inquiry. Here the work of building serves to extend and restructure the conceptual frameworks that order daily practice.

Consider a recent design research project from my lab, a study on walking. Today, software developers typically use GIS-routing (as in Google Maps) to specify target destinations, emphasizing geographic precision over "local improvisation" [8]. To rethink this orientation, I worked with a design team at the University of Washington to develop Trace, a mobile application that generates walking routes based on digital sketches people create, annotate, and send to others without reference to a map. We gave the Trace application to 16 people to explore how they took up this form of walking in their daily lives. During field trials, we

## Insights

- Some researchers are using design as a means to study social phenomena, rather than as an end unto itself. I call this *design inquiry*.
- Design inquiry relies on provocation.
- While potentially providing new directions for design, design inquiry also promises to engage and refine social theory.

# ACM Transactions on Reconfigurable Technology and Systems



This quarterly publication is a peer-reviewed and archival journal that covers reconfigurable technology, systems, and applications on reconfigurable computers. Topics include all levels of reconfigurable system abstractions and all aspects of reconfigurable technology including platforms, programming environments and application successes.

[www.acm.org/trets](http://www.acm.org/trets)  
[www.acm.org/subscribe](http://www.acm.org/subscribe)



Association for  
Computing Machinery

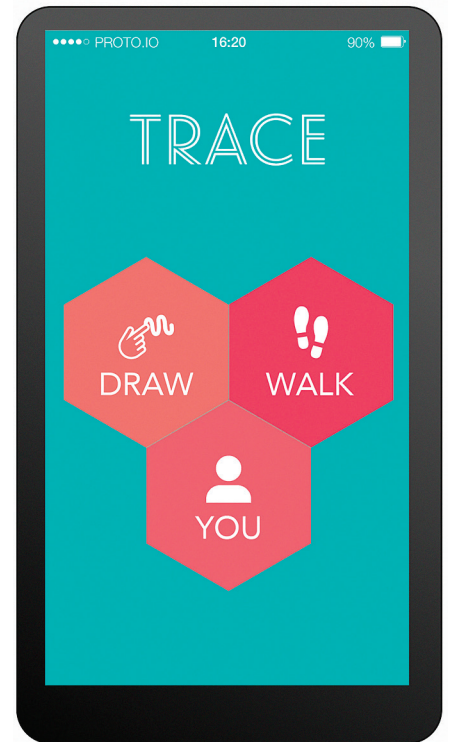
learned that Trace evoked surprising contrasts. At times, people used Trace to extend routine interactions in daily life. By presenting short guides as they walked, Trace prompted people to “slow down” walks to encounter new features of their environment, such as neighbors they had never met or a park they had overlooked. At other times, the application led people to use scarce spare time to walk redundant paths, sometimes intensifying desires for efficiency and control.

As a result of our observations, our design team began to view walking through GIS routing not only as improvisational, but also as part of enacting people’s values and beliefs through claims to public space. The walk mattered less for the final outcome (a healthy body, fresh air) and more for what the walking activity represented (e.g., an invitation to connect with others). Our goal was not to satisfy a specific user need or to develop new design principles. Rather, we used Trace to trigger alternative configurations of GIS and gain a new understanding of people’s relations to geographic space.

## WHAT MAKES DESIGN INQUIRY A DISTINCT MODE OF INVESTIGATION?

The Trace example shows us how design inquiry can build on but remain distinct from other methods of social inquiry. Unlike ethnographic methods of observation and participation, design inquiry relies on provocation. Ethnographers take advantage of their own presence in a given setting to surface the concealed, taken-for-granted, and nonverbal activity dwelling within it. As investigators engaged in design as inquiry, we use novel constraints and possibilities as interjections in the current lived experience of our research subjects and ourselves. Our surprising findings elicit responses to what alternatives might

**Unlike ethnographic  
methods of observation  
and participation,  
design inquiry relies  
on provocation.**

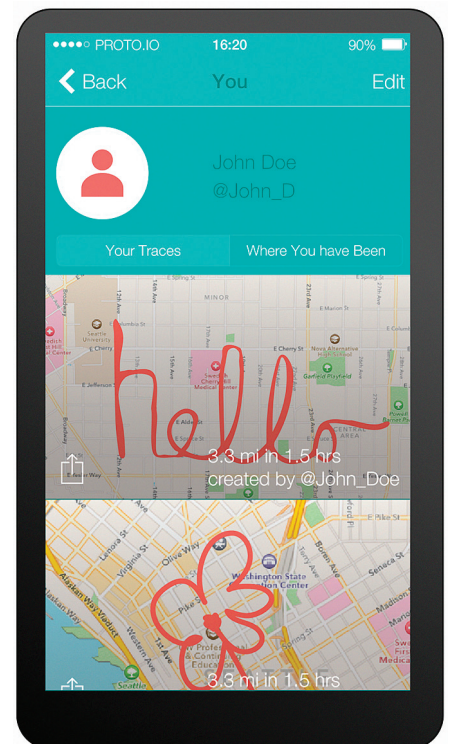
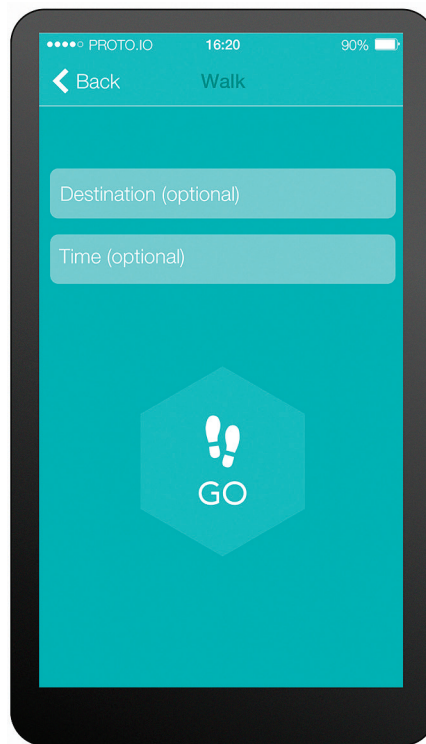
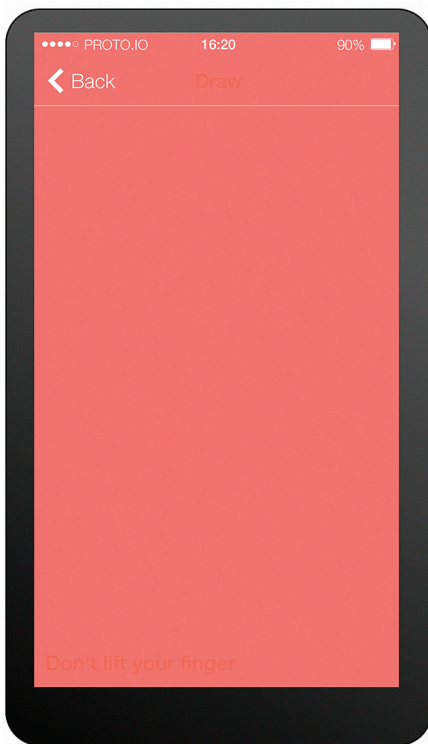


look like. While researching the now, we are concurrently looking to other possible paths and futures.

In the Trace study, the work of design contributed new knowledge based on particular experiences of walking and the occasional frustration it surfaced. It also points to opportunities for enabling new forms of engagement and expressivity through GIS routing. Our ways of studying navigation ethnographically might have focused on current use of GIS routing or productivity-tracking applications. However, the particular techniques we used in the Trace study represent an approach aimed at understanding how existing applications might be done differently.

Design inquiry is distinct in research questions and approach from not only ethnography but also experimental methods. The goal of our intervention was not to recognize general trends around navigation with GIS routing. Instead, we aimed to answer questions specific to how circumstances of walking might change; for example, how walking routes might incorporate the concerns of walkers themselves. In this sense, we supplant the questions of *where*, *how much*, and *how often* for *what*, *why*, and





how circumstances could be changed.

Last, this form of design inquiry contrasts with other approaches to developing new knowledge through design. Bill Gaver and John Bowers, for example, present annotated portfolios as a methodology for communicating process and drawing links within and across design projects [9]. Annotated portfolios may help people describe design processes and patterns by abstracting work from particular times and places. We instead reveal the particular contingencies of the design situation, rethinking the conceptual frameworks that change, bend, or break down.

In sum, design inquiry may not quell a possible separation of "design research" and "design practice." The design profession involves clients, socioeconomic constraints, and so on that limit the degree to which one could engage in such interventions. Instead, design inquiry begins to build bridges with bodies of research (e.g., communication, media studies, science and technology studies) that remain distinct but integral to HCI. In linking these accounts, empirically and analytically, we may generatively

reshape the limits of design within HCI.

Downplaying design interventions such as Trace simply because they do not produce the kinds of knowledge we are used to would be unfortunate, particularly since the aforementioned approaches have been enhanced by diverse research methods before. Although the approach and questions posed differ from more conventional research, our criteria for success remain similar. They rest on an engagement with discourse that demonstrates the work's broader impact. Equally, they call for a capacity to show the legitimacy of the approach in terms of clarity of method and empirical evidence. While potentially providing new directions for design, this process also promises to engage and refine social theory. It enables us to continue coming to grips with how social worlds unfold by shifting the situation of those within them.

#### ENDNOTES

1. Frayling, C. Research in art and design. Royal College of Art, London, 1993.
2. Zimmerman, J., Stolterman, E., and Forlizzi, J. An analysis and critique of Research through Design: Towards a

formalization of a research approach. *Proc. of the 8th ACM Conference on Designing Interactive Systems*. ACM, New York, 2010, 310–319.

3. Burawoy, M. *The Extended Case Method: Four Countries, Four Decades, Four Great Transformations, and One Theoretical Tradition*. Univ. of California Press, 2009.
4. Gaver, W. What should we expect from research through design? *Proc. of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, New York, 2012, 937–946.
5. Jiro, Y. Gutai bijutsu sengen (Gutai Art Manifesto). *Geijutsu Shinchō* 7, 12 (1956); <http://web.guggenheim.org/exhibitions/gutai/data/manifesto.html>
6. <http://www.srl.org>
7. Gaver, W.H., Hooker, B., Dunne, A., and Farrington, P. *The Presence Project*. RCA CRD Projects Series, 2001.
8. Suchman, L.A. Practice-based design of information systems: Notes from the hyperdeveloped world. *The information Society* 18, 2 (2002), 139–144.
9. Gaver, B., and Bowers, J. Annotated portfolios. *Interactions* 19, 4 (2012), 40–49.

**Daniela Rosner** is an assistant professor of human-centered design and engineering at the University of Washington, where she co-directs the Tactile and Tactical Design Lab (TAT Lab). Her research focuses on how cultural histories are woven into our interactions with things we create. → [dkrosner@uw.edu](mailto:dkrosner@uw.edu)