Decentering the Human in the Design of Collaborative Cities

Laura Forlano

Cities around the world are currently rushing to build sensor networks capable of tracking pollution and crime; connect their traffic lights, street lamps, garbage cans, and parking meters to the Internet; and reform industrial innovation regions into postindustrial hubs for digital design and fabrication. The networked character of the socio-technical landscape has forced collisions between the city, its infrastructure, and its citizens. Of course, these efforts are rife with technological determinism and Silicon Valley buzzwords such as "smart cities," the "Internet of things," and 3D printing, but they also signify new terrain for the practice of civically engaged, tech-savvy designers. For example, the street furniture, fixtures, casings, and interfaces for these networked and interactive infrastructures must be aesthetically (and politically) designed to suit the city and the surrounding urban environment. More important, designers can play a role in mediating between the top-down plans of government officials and their corporate suitors and the bottom-up actions of citizens and civic technologists. In this sense, we might consider design as a *hybrid* and *liminal* practice—one that occupies "a position at, or on both sides of, a boundary or threshold."[1] Increasingly, designers must operate simultaneously at multiple scales (such as the urban, architecture and the built environment, objects, things and bodies) and often contradictory perspectives (including human as well as nonhuman stakeholders)—to remake the collaborative, peer-produced, open-source city.[2] This article extends previous arguments about decentering the human and nonanthropocentric design to think through ways designers can evolve existing human-centered design (HCD) methodologies to contend with socio-technical complexity—such as economic and ecological crisis—and create more responsible, accountable, and ethical ways of engaging with emerging technologies.[3]

Designers are increasingly engaged in projects that go beyond crafting individual graphics or products and toward the design of services, organizations, systems, platforms, and experiences. As designers take on these roles, they are engaged in the active creation and curation of complex socio-technical networks, constituencies, and alliances that come together around

1 See Oxford Dictionaries online, http://www.oxforddictionaries.com/definition/english/liminal (accessed June 22, 2015).

2 Laura Forlano, "Work and the Open Source City," Urban Omnibus (June 3, 2009), http://urbanomnibus.net/2009/06/work-and-the-open-source-city/; Laura Forlano, "Building the Open Source City: New Work Environments for Collaboration and Innovation," in *From Social Butterfly to Engaged Citizen*, Marcus Foth et al., eds. (Cambridge, MA: MIT Press, 2011).

3 Carl DiSalvo and Jonathan Lukens, "Seeing the City through Machines: Non-Anthropocentric Design and Youth Robotics," in *Digital Cities 6: Concepts, Methods and Systems of Urban Informatics*, Marcus Foth, Laura Forlano, and Hiromitsu Hattori, eds. (State College: Penn State University Press, 2009); Carl DiSalvo and Jonathan Lukens, "Nonanthropocentrism and the Nonhuman in Design: Possibilities for Designing New Forms of Engagement with and through Technology," in *From Social Butterfly to Engaged Citizen: Urban Informatics, Social Media, Ubiquitous Computing, and Mobile Technology to Support Citizen Engagement*, Marcus Foth et al., eds. (Cambridge, MA: MIT Press, 2011).

© 2016 Massachusetts Institute of Technology

Design*Issues:* Volume 32, Number 3 Summer 2016 doi: 10.1162/DESI_a_00398

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

problems, issues, and controversies that have distinct politics, values, and ethics. These are the artifacts of contemporary design work as it relates to collaborative citymaking for the benefit of all citizens.

As design moves out of the studio and into the city, there are many opportunities to create services, experiences, and organizational structures that can cope with the challenges of the great economic and environmental crises presently facing municipalities. Technological fixes (especially in the absence of social and organizational changes) are certainly no solution to these difficulties, but they do provide interesting avenues for experimentation and imagining in which designers might facilitate and translate knowledge across multiple stakeholders (in the tradition of participatory design) and enable cities to glimpse and grasp at their possible futures (as speculative design might suggest). However, few of today's designers trained in traditional art and design schools are equipped analytically and ethically to take on these challenges. This is in part due to the fact that design methods (at least in HCD) have often been stripped of their historical, socio-political, and theoretical context. Design methods are too often applied as a "cookie-cutter" process that can be used universally. While an investigation of the context through ethnographic methods or the like is common, there is little reflection as to whether the existing design methods are adequate for the problem at hand. The majority of designers are not trained to think critically about socio-technical problems and ethical challenges that are raised by emerging technologies. Furthermore, many designers have limited experience working on projects that defy the boundaries of a typical corporate design brief.

With the continued move to colonize all aspects of everyday life with technological applications, the best designers (especially those with some exposure to user experience design and interaction design) certainly may be in high demand, but will they be analytically equipped for the socio-technical complexities they will face? This essay revisits concepts from the field of science and technology studies (STS) that have been introduced into design theory to challenge some of the commonly used methodological frameworks of HCD. Drawing on examples from recent projects that engage with emerging technologies, I propose that purposefully decentering the human (often conceived of as a discrete individual subject) and embracing multiple and nuanced forms of hybridity offer a way of enabling designers to think and act more critically about their responsibility to design more ethical ways of living and working in cities given socio-technical complexity.

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

Design and Collaborative Citymaking

One important site of collaborative citymaking is in the socio-technical systems (more specifically, urban technologies) that we create, adopt, and use as well as those we reject. In the age of the so-called smart city, these urban technologies, which are mobilized for the primary purpose of creating greater efficiency and productivity, operate at a variety of scales, including municipal Wi-Fi networks, adaptive traffic signals, and even mapping applications. Rather than being understood as political in themselves, decisions around these technological black boxes take place in bureaucratic black boxes: city agencies with endless acronyms and responsibility for technology and telecommunications issues. Within these city agencies, requests for proposals are issued, vendors are reviewed, and contracts are awarded with little notice or care from citizens. Yet within these walls, cities are being made through the socio-technical systems that are being designed.

Drawing on examples from design, social science, and information science, I have written previously about the ways terminology, principles, and objectives from computer science such as seamlessness, ubiquity, invisibility and "anytime, anywhere" make their ways into common parlance among civic leaders as a means of advancing the values associated with the smart city.[4] These rational corporate values embedded in urban technologies favor productivity over leisure, efficiency over delay, control over serendipity, and speed over pause. They succeed in creating smooth cities rather than acknowledging the everyday frictions and tensions that arise in densely populated urban spaces.[5] They decide who is included and who is excluded. They often directly contradict the social practices of citizens.

In the field of design, the HCD philosophy, which incorporates ethnographic field research and qualitative interviews to empathize with users and understand their needs, has been an important shift in the ways images, products, and technologies have been produced.[6] However, collaborative citymaking, which requires curating convening networks, constituencies, and alliances of diverse stakeholders, suggests a different role for designers. Collaborative citymaking is a philosophical inquiry in which politics, values, and ethics are central. As such, designers must be able to engage with socio-political questions and frameworks to create the conditions for the formation of networks around important urban issues. This requires the ability to think critically and generatively. Designers must engage more deeply with the social sciences to avoid reinventing the wheel, and then they must go ahead and prototype and iterate new versions of the proverbial urban wheel. Designers are integrators of knowledge by their nature, but it is difficult to think critically and generatively at the same time. To be successful, collaborative citymaking must draw

4 Laura Forlano, "Digital Materiality and the New Geographies of Media Cities" (paper presented at MediaCities, Buffalo, NY, 2013); Paul Dourish and Genevieve Bell, *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing* (Cambridge, MA: MIT Press, 2011); Laura Forlano, "Making Waves: Urban Technology and the Coproduction of Place," *First Monday* 18, no. 11 (2013).

5 Jerry Kang and Dana Cuff, "Pervasive Computing: Embedding the Public Sphere," *Washington and Lee Law Review* 65 (2005).

6 Tony Fry has discussed the social construction of need and the role of designers in generating needs in Tony Fry, "Against an Essential Theory of 'Need': Some Considerations for Design Theory," *Design Issues* 8, no. 2 (Spring 1992).

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

on a range of design traditions and methodologies, including the lab, field research, and art traditions.[7] In particular, the integration of codesign and participatory design with critical and speculative design offer exciting prospects for collaborative citymaking.[8]

HCD is concerned with the relationship between people, technology, and business; the identification of the needs of users; and the creation of desirable, possible, and viable solutions. While HCD and aligned practices (such as user experience design) have been widely applied in some fields, there are still many opportunities for its application and development, for example, architecture, healthcare, and (almost counterintuitively) fashion design. Because of its innate orientation toward the future, belief in "the new," and embrace of problem solving, design often seems to be blatantly technologically deterministic in its approach. Although design has cultivated a culture of critique (not unlike architecture or the arts), there is considerably less reflection on the role of the designer herself in completely rethinking the design brief (and the socio-political values of the client), considering prior design precedents and forging toward particular visions of the future. The intensifying complexity of socio-technical systems make it illogical to continue applying the same models and methods, which have often been stripped of their specific contexts and politics. Rather, it is necessary to derive new frameworks that can cope with complexity in a time of great economic and environmental crisis.

Entanglements between STS and Design

The fields of STS and design have had a productive engagement since at least the late 1990s. However, if design is to move beyond the application of methods in discrete areas of practice (graphics, products, interactions, services) and toward a deeper, richer, more critical philosophical engagement with the world, it must create more generative engagements between STS theory and design practice. What follows is a brief overview of some of the most relevant articles from *Design Issues* that have introduced STS concepts to design scholarship over the past 20 years.

In an article "The Things That Matter," Verbeek and Kockelkoren declare, "Things have been rediscovered," referring to a series of useful concepts from STS such as artifacts, delegation, durability, the nonhuman, scripts, and materialism.[9] In 2004, *Design Issues* held a symposium, "Design by Society: Science and Technology Studies and the Social Shaping of Design," which resulted in a special issue. In their introduction to the special issue, Woodhouse and Patton explain the notion of design by society: (1) there are no simple boundaries between "what counts as design, or who engages in it"; (2) "social norms, values, and assumptions are reproduced—often unintentionally in the products of design"; (3) the social costs of innovation, social equity, and public outcomes of

7 Ilpo Koskinen et al., *Design Research through Practice: From the Lab, Field, and Showroom* (New York: Elsevier, 2011).

8 Elizabeth B.-N. Sanders and Pieter Jan Stappers, "Co-Creation and the New Landscapes of Design," *CoDesign* 4, no. 1 (2008); Douglas Schuler and Aki Namioka, *Participatory Design: Principles and Practices* (Hillsdale, NJ: Erlbaum Associates, 1993); Anthony Dunne and Fiona Raby, *Speculative Everything: Design, Fiction, and Social Dreaming* (Cambridge, MA: MIT Press, 2013).

9 Peter-Paul Verbeek and Petran Kockelkoren, "The Things That Matter," *Design Issues* 14, no. 3 (Summer 1998): 1.

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

design processes should be "identified, deliberated and mitigated earlier rather than later" in the design process.[10] This is approach encourages the field of design to consider issues of participation and social norms as well as what now might be called design for social innovation.

Tatum draws on STS to ask questions about responsibility, accountability, and ethics in the field of design.[11] Specifically, he outlines the following STS principles: "Underdetermination of science and technology. Vast realm of technological and socio-cultural possibility. Consequentiality of technology choice. Political construction of technology. Competing images of the world. Discursive significance of 'ultimate ends.' Design as an embrace of selected patterns." Despite the growing interest in design for social innovation, which necessitates more democratic design processes to bridge concerns across multiple stakeholders, there has been little substantial development of the importance of values and ethics within the field of design and in particular within design curriculums.[12] Curriculums tend to focus on the methods of how to do design, rather than the theory of why to do design or the specific socio-political contexts in which different design methods were produced and applied. In addition, enthusiasm around what is now derided as "design thinking" has been extremely high in the past decade, so new graduates are quickly hired into corporations without a need for a deeper reflection around their practice. Tatum reframes the often cited goals of HCD—to create what is desirable (responding to human need), possible (technically), and viable (financially)—by replacing what is viable in the business sense with what is responsible in the moral sense.

Ingram, Shove, and Watson draw on a variety of STS concepts—acquisition, scripting, appropriation, assembly, normalization, and practice—to argue for a cyclical model of design and consumption (one might also add to this list the importance of disposal).[13] Steen incorporates STS theory (such as actor-network theory) with participatory design to highlight the role of ethics in design.[14] Drawing on the social construction of technology, he develops the idea that HCD is a "fragile encounter" in which there are opportunities for openness (divergence and generative) and closure (convergent and evaluative), but where there is an inherent bias toward closure.[15]

Design scholars have long argued that design is a practice-based approach to knowledge building.[16] Similarly, in computer science, scholars have described a critical technology practice situated between craft and critique and, more recently, in the social sciences and humanities, scholars have been exploring nontraditional modes of discovery such as research creation, critical making, public ethnography, and inventive methods.[17]

10 E. Woodhouse and J. Patton, "Design by Society: Science and Technology Studies and the Social Shaping of Design," *Design Issues* 20, no. 3 (Summer 2004): 2–3.

11 Jesse S. Tatum, "The Challenge of Responsible Design," *Design Issues* 20, no. 3 (Summer 2004), 66–80.

12 Geoff Mulgan, "Social Innovation: What It Is, Why It Matters and How It Can Be Accelerated," Young Foundation, Skoll Centre for Social Entrepreneurship, Oxford Said Business School, 2007.

13 Jack Ingram, Elizabeth Shove, and Matthew Watson, "Products and Practices: Selected Concepts from Science and Technology Studies and from Social Theories of Consumption and Practice," *Design Issues* 23, no. 2 (Spring 2007).

14 Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005).

15 Trevor J. Pinch and Wiebe E. Bijker, "The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," *Social Studies of Science* 14, no. 3 (1984); Marc Steen, "Human-Centered Design as a Fragile Encounter," *Design Issues* 28, no. 1 (Winter 2012): 1.

16 Bruce Archer, "The Nature of Research," *Co-Design* 2, no. 11 (1995); Richard Buchanan, "Declaration by Design: Rhetoric, Argument, and Demonstration in Design Practice," *Design Issues* 2, no. 1 (Spring 1985); Christopher Frayling, *Research in Art and Design* (London: Royal College of Art London, 1993); J. Bardzell, S. Bardzell, and L. K. Hansen, "Immodest Proposals: Research through Design and Knowledge" (paper presented at the CHI'15: World Conference on Human Factors in Computing Systems, Seoul, Korea, 2015).

17 Philip Agre, "Toward a Critical Technical Practice: Lessons Learned in Trying to Reform Ai," in *Bridging the Great Divide: Social Science, Technical Systems, and Cooperative Work* (Mahwah, NJ: Erlbaum, 1997); Owen B. Chapman and Kim Sawchuk, "Research-Creation: Intervention, Analysis and 'Family Resemblances,'" *Canadian Journal of Communication* 37, no. 1 (2012); Herbert J. Gans, "Public Ethnography;

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

While theorists in science and technology studies engage in philosophical discussions about the importance of objects, artifacts, and things in mediating socio-technical processes, they do not typically engage in the generative act of creating new things (with several notable exceptions).[18] However, this is changing; more recently, scholars engaged in the material practices have produced artifacts, performances, exhibits, and workshops and events.[19] These engagements can serve as moments in which publics and constituencies are mobilized around matters of concern and scientific controversies.[20]

For example, there has been interest in exploring the world of design as a site for field research, as a scholarly identity, and as a methodology that emphasizes visual sense making, hands-on prototyping, and collaboration.[21] Over the past two years, there have been a number of activities—workshops and exhibits ("Experiments in [and out of] the Studio," "digitalSTS and Design"), new open-access journals (such as *Demonstrations*) and special issues in design journals (such as *CoDesign*), book chapters (*The Handbook of Science and Technology Studies*), book projects (such as the in progress digitalSTS handbook, of which I am a coeditor)—that continue to deepen the relationship between STS and design.[22] For the first time, the upcoming Society for the Social Studies of Science has introduced a new meeting format and awards for making and doing "to share scholarly practices of participation, engagement, and intervention in their fields of study."[23]

Decentering the Human

While STS concepts have traveled into design scholarship, it is more difficult to assess their impact on the practice of design. For the most part, as evidenced by their rich, ethnographic studies of scientific laboratories and the development of specific technologies, the work of STS scholars is to describe the social construction of technology and the socio-technical nature of systems, organizations, and infrastructures. Such studies often refer to the affordances and constraints of particular technologies as they are invented, appropriated, and used.[24] If "artifacts have politics," as Winner's paper famously asked, then how might we design socio-technical systems that embody our sense of ethics, values, and responsibility?[25]

One of the main contributions of STS theory has been the rejection of discrete binary categories such as science/society, human/nonhuman, digital/material, subject/object, nature/culture, private/public, and individual/collective.[26] Instead, for STS scholars, the world is made up of hybrids, assemblages, and collectives that are composed of human and nonhumans that act and organize together, sharing the delegation of power and agency as

Ethnography as Public Sociology," *Qualitative Sociology* 33, no. 1 (2010); Matt Ratto, "Critical Making: Conceptual and Material Studies in Technology and Social Life," *Information Society* 27, no. 4 (2011); Celia Lury and Nina Wakeford, *Inventive Methods: The Happening of the Social* (New York: Routledge, 2012).

18 Tim Ingold, "Bringing Things to Life: Creative Entanglements in a World of Materials," World 44 (2010).

19 Laura Watts, "The Design Mailboat," http://www.sand14.com/?p=277; Kat Jungnickel, "Bikes & Bloomers. Research Website for the ESRC Funded 'Freedom of Movement: The Bike, Bloomer and Female Cyclist and Late Nineteenth Century Britain," http://bikesandbloomers.com; Jonathan Belman et al., "Grow-a-Game: A Tool for Values Conscious Design and Analysis of Digital Games" (paper presented at the Proceedings of DiGRA 2011 Conference: Think Design Play, Hilversum, The Netherlands, 2011); Jackie Orr, *Panic Diaries: A Genealogy of Panic Disorder* (Durham, NC: Duke University Press, 2006); Bruno Latour and Peter Weibel, *Making Things Public: Atmospheres of Democracy* (Cambridge, MA: MIT Press, 2005); Anthony Townsend, Laura Forlano, and Antonina Simeti, "Breakout! Escape from the Office: Situating Knowledge Work in Sentient Public Spaces," in *Sentient City,* M. Shepard, ed. (Cambridge, MA: MIT Press, 2011); Anna Greenspan, Silvia Lindtner, and David Li, "Hacked Matter," http://www.hackedmatter.com; Yanni Loukissas et al., "DigitalSTS and Design," http://stsdesignworkshop.tumblr.com.

20 Latour and Weibel, *Making Things Public;* Carl DiSalvo, "Design and the Construction of Publics," *Design Issues* 25, no. 1 (Winter 2009).

21 Albena Yaneva, "Making the Social Hold: Towards an Actor-Network Theory of Design," *Design and Culture* 1, no. 3 (2009).

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

understood by actor-network theory.[27] Other theoretical traditions, such as new materialism and object-oriented ontology, share this attribution of agency to things.[28] More recently, terms such as the anthropocene have been adopted to capture the inseparability of humans and nature, which has important ramifications on how we think about environmental sustainability.

Here it is useful to revisit some of the reasoning behind the recombination of discrete binary categories around the human/nonhuman divide. Latour states:

> We have been able to delegate to nonhumans not only force as we have known it for centuries but also values, duties, and ethics. It is because of this morality that we, humans, behave so ethically, no matter how weak and wicked we feel we are. The sum of morality does not only remain stable but increases enormously with the population of nonhumans. It is at this time, funnily enough, that moralists who focus on isolated socialized humans despair of us—us meaning of course humans and their retinue of nonhumans.[29]

Given the socio-technical complexity of the current period and the enthusiasm for design, it would seem that we have more opportunities to delegate values, duties, and ethics to nonhumans. To expand on this concept, in *We Have Never Been Modern,* Latour discusses the birth of nonhumanity:

> Modernity is often defined in terms of humanism, either as a way of saluting the birth of "man" or as a way of announcing his death. But this habit itself is modern, because it remains asymmetrical. It overlooks the simultaneous birth of "nonhumanity"—things, or objects, or beasts—and the equally strange beginning of a crossed-out God, relegated to the sidelines. Modernity arises first from the conjoined creation of those three entities, and then from the masking of the conjoined birth and the separate treatment of the three communities while, underneath, hybrids continue to multiply as an effect of this separate treatment. The double separation is what we have to reconstruct: the separation between humans and nonhumans on the one hand, and between what happens "above" and what happens "below" on the other.[30]

Latour's point about reconstructing what happens above with what happens below can also be applied to the ways citymaking is currently being discussed as an opposition between top-down

22 Laura Forlano et al., "Experiments in (and out of) the Studio: Art and Design Methods for Science and Technology Studies" (2012), https://www.academia.edu/2527061/Experiments_in_and_out_of_the_studio_Art_and_design_methods_for_Science_and_Technology_Studies_2012_; Loukissas et al., "DigitalSTS and Design."

23 See http://www.4sonline.org/meeting/sts_making_and_doing_call_for_submissions (accessed June 26, 2015).

24 Donald A. Norman, The Design of Everyday Things (New York: Doubleday, 1990); J. J. Gibson, "The Theory of Affordances," in *Perceiving, Acting and Knowing,* R. Shaw and J. Bransford, eds. (New York: Wiley, 1977).

25 H. Nissenbaum, "How Computer Systems Embody Values," *Computer* 34, no. 3 (2001); Langdon Winner, "Do Artifacts Have Politics?," in *The Whale and the Reactor: A Search for Limits in an Age of High Technology,* Langdon Winner, ed. (Chicago: University of Chicago Press, 1986); Mary Flanagan and Helen Nissenbaum, *Values at Play in Digital Games* (Cambridge, MA: MIT Press, 2014).

26 Donna Jeanne Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991).

27 Bruno Latour, "Where Are the Missing Masses? A Sociology of Few Mundane Objects," in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* W. E. Bijker and J. Law, eds. (Cambridge, MA: MIT Press, 1992).

28 Ian Bogost, *Alien Phenomenology, or What It's Like to Be a Thing* (Minneapolis: University of Minnesota Press, 2012).

29 Latour, "Where Are the Missing Masses?," 232.

30 Bruno Latour, *We Have Never Been Modern* (Hemel Hempstead, UK: Harvester Wheatsheaf, 1993), 13.

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

(often framed as government and large private sector players such as technology companies) and bottom-up strategies (i.e., civic technologists). Rather, designers can operate as mediators of these forces and advocates for less visible nonhuman stakeholders.

As Suchman points out, the "ongoing project of unsettling binary oppositions" has been central to feminist STS and postcolonial scholarship with respect to philosophical critique of the categories around sex and gender. She states:

> The study of those connections includes a concern with the labors through which particular assemblages of persons and things come into being, as well as the ways in which humans or nonhumans, cut off from the specific sites and occasions that enliven them, become fetishized. In the latter process, social relations and labors are obscured, and artifacts are mystified.[31]

Introna has also discussed Latour's argument with respect to the inseparability of humans and nonhumans in detail. Specifically, he highlights Latour's reference to the "common history" of humans and nonhumans and the ways action, intentionality, and morality are distributed through a network.[32]

Beyond STS but in many ways still aligned with actor-network theory, in the humanities, (more specifically, in the branch of philosophy known as object-oriented ontology and speculative realism), the notion of hyperobjects has been introduced by Morton to account for a particular kind of nonhuman actor. Hyperobjects suggest "scalar dilemmas" that are simultaneously intimate and extraterrestrial. They are viscous, nonlocal, spatially and temporally fluid, and phased—for example, the BP Deepwater Horizon oil spill in 2010 or the Fukushima nuclear disaster in Japan in 2011.[33]

In beginning to apply these theories to the practice of design, DiSalvo and Lukens argue for a nonanthropocentric approach in which humans are "a single factor in a larger system of relations and interactions between humans and nonhumans." The human "does not disappear: it becomes one entity among many entities, all of which are granted legitimacy in a kind of radical pluralism among objects and things, human and otherwise."[34] They argue that from an applied perspective, "a nonanthropocentric approach would broaden the research and design endeavors to include situational conditions that may impact human experience, but that are beyond the attribution of agency or responsibility to discrete human acts and desires," and, from an ethical perspective, it is important to consider nonhumans to avoid negative impacts on other species and the environment.[35] They

31 Lucy Suchman, "Feminist STS and the Sciences of the Artificial," in *New Handbook of Science and Technology Studies* (Cambridge, MA: MIT Press, 2007), 140.

32 Lucas D. Introna, "Towards a Post-Human Intra-Actional Account of Sociomaterial Agency (and Morality)," in *The Moral Status of Technical Artefacts* (New York: Springer, 2014).

33 Timothy Morton, *Hyperobjects: Philosophy and Ecology after the End of the World* (Minneapolis: University of Minnesota Press, 2013).

34 DiSalvo and Lukens, "Nonathropocentrism and the Nonhuman in Design."

35 DiSalvo and Lukens, 2.

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

offer a range of design possibilities and examples of projects that apply nonanthropocentrism to the practice of various design approaches through a deeper engagement with the agency, form, and senses of nonhumans.

The vast majority of examples from design projects are still within the realm of artistic practice and/or academic scholarship. How might we further expand the application of nonanthropocentric design to the broader practice of HCD beyond niche academic conversations? The potential of nonanthropocentric design surely goes far beyond what is today considered "sustainable design," which might be understood as fulfilling human needs with incrementally more sustainable products and services. Instead, nonanthropocentric design could radically shift our experience of the world and allow us to dramatically reevaluate our "needs" and, instead, find pathways toward asking the right questions of corporations, governments, and of ourselves as designers. Designers who consider the nonhuman might find themselves reorganizing entire social and environmental systems. How might we—through the eyes of the nonhuman—marry approaches from HCD along with participatory design and speculative design, which have long been considered at odds with one another, and what impact might this have?

Moving Beyond the Meat Sack

At a recent conference on "Algorithms and Accountability" (New York University, February 2015), legal scholar James Grimmelman gave a presentation on copyright and human readers versus digital readers of text, such as bots. He exclaimed (and I promptly tweeted), "Humanism and 'the meat sack' as a dominant perspective of thinking about technology is problematic." This statement helps shed light on how human-centered modes of thinking (including HCD) are insufficient in coping with current legal and socio-economic challenges. As such, design must explore and recombine theoretical perspectives from other fields such as STS, which offers such a deep reflection on the importance of the nonhuman and the nonanthropocentric point of view. By taking these approaches seriously, design can develop relevant methods that build on its rich, diverse history to pose relevant questions about socio-technical dilemmas and controversies and prototype alternative possible futures.

While HCD (grounded in psychology, computer science, and engineering) is primarily concerned with problem solving, participatory design (drawing on anthropology and sociology) has often been engaged with convening multiple stakeholders, and speculative design (pioneered in the arts) has typically been considered merely an artistic practice (with little impact on the public or the real world).[36] In particular, rather than being

36 Koskinen et al., *Design Research through Practice;* Clay Spinuzzi, "The Methodology of Participatory Design," *Technical Communication* 52, no. 2 (2005); Sanders and Stappers, "Co-Creation and the New Landscapes of Design."

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

solution-oriented, design practices rooted in the arts, such as speculative design, critical design, critical making, and design fiction, offer great potential to broaden the scope of engagement with notions like the nonhuman because of their imaginative and rigorous ability to defy the constraints of a typical design brief.[37] These approaches need not be consigned to elitist exhibitions that lack political impact or naive depictions of utopias and dystopias that invoke humor or terror for the purpose of raising questions about emerging phenomenon but also serve to reproduce the fears of the designers themselves (based on their race, class, gender, sexuality, and/or ability).[38] Rather, they might be reconceived of a practical ways of engaging the public and stakeholders in reimagining their cities.

These disciplinary differences are often treated as scholarly cults that show one's belief in a particular world view. But as Latour's 2003 lecture at the Center for Religion and Media at New York University exclaimed, "If the Gods Are at War, What Are the Peace Conditions?"[39] How does HCD move beyond its preoccupation with needs and solutions, how does participatory design know when not to engage stakeholders, and how does speculative design get out of the gallery? These various kinds of design practices need not be completely in opposition even though they often reside in different universities, schools, and academic departments.

In decentering the human, it is possible to rethink the disciplinary boundaries between these design traditions and create new points of connection and tension. One point of connection that runs across many distinct design practices is the emphasis on an experiment, prototype, or demonstration of a particular idea. These prototypes are often physical and promote a material deliberation with concepts and ideas that might not otherwise be apparent. Although there is currently an evangelism about demos that has been critiqued as a product of Silicon Valley solutionism that enforces an "entrepreneurial citizenship," prototypes have a long history as symbolic objects.[40]

In a recent essay, Fred Turner discusses the ways current prototypes, such as models of software and devices, make a "possible future visible."[41] According to his definition:

> the material, technical and organizational elements of prototypes are always also potentially symbolic. Advocates within an engineering firm or a political campaign can turn them into stories. Outsiders, such as journalists, can also take them up and turn them into the elements of national or even global memes. In each case, particular sociotechnical configurations become available as potential visions of a larger and presumably better way of organizing society as a whole.

37 Dunne and Raby, *Speculative Everything;* Matt Ratto, "Open Design and Critical Making," in *Open Design Now: Why Design Cannot Remain Exclusive,* P. Atkinson, M. Avital, B. Mau, R. Ramakers, and C. Hummels, eds. (Amsterdam: BIS Publishers, 2011); Julian Bleecker, "Design Fiction: A Short Essay on Design, Science, Fact and Fiction," (2009), www.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction/

38 Carl DiSalvo, "Spectacles and Tropes: Speculative Design and Contemporary Food Cultures," *Fibreculture Journal*, no. 20 (2012); Luiza Prado de O. Martins, "Privilege and Oppression: Towards a Feminist Speculative Design," in *Design Research Society* (Umea, Sweden, 2014).

39 See http://www.crmnyu.org/event/1353/ (accessed July 1, 2015).

40 Lilly Irani, "Hackathons and the Making of Entrepreneurial Citizenship," *Science, Technology & Human Values* (2015).

41 Fred Turner, "Prototypes," *Culture Digitally* (2014).

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

He links prototypes with the historical relationship between Puritan teleology and scientific progress in the use of types and typologies that can mobilize a particular rhetoric, such as techno-determinism. He asks us to consider how prototypes summon the past and foreshadow particular futures, embed particular teleologies, and become mobilized in narratives about the world as well as for whom and for what purposes they are invoked.

Stark and Paravel illustrated the socio-technical nature of complex policy decisions by analyzing the ways architects use demonstrations—in this case, digital images of postcards of future city skylines, performed and circulated as slide decks—that include their proposed buildings as ways of constructing an argument for investing in their projects.[42] They write:

> In an era when policy decisions involve complex technical questions, demonstrations are as likely to marshal charts, figures, models and simulations as to mobilize popular movements in the street. To be clear, people still go to demonstrations; but political demonstrations are not confined to the massing of bodies in public settings.

As such, demonstrations function as a kind of prototype with which to communicate and argue on behalf of particular kinds of possible futures. Prototypes embed complex socio-technical arguments and ideas and can be used to raise critical questions around emerging phenomenon that are not (yet) well understood.[43] Kera traces a history of the philosophy of science to argue that prototypes allow for the "convergence between philosophy and design and connect the creative practices of thinking and doing," through an analysis of the material practices of hackerspaces and DIY bio labs.[44] In a participatory design setting, prototypes can also be used to expose dissensus, debate, adversarial positions, and acknowledge differences.[45]

In attempting to create situations in which some of these theoretical and methodological challenges can be worked out, my research and teaching has focused on the combination of codesign and critical design at public workshops on complex socio-technical issues such as urban technology and the future of work.[46] For example, the Reimagining Work workshop challenged labor activists to consider the ways they might have greater engagement with the values embedded in technologies, such as just-in-time scheduling, crowdwork, and sharing economy platforms such as Amazon Mechanical Turk and Uber. Other scholars have drawn on fostering speculative conversations among stakeholders about the alternative possible futures of their cities. For example, Marshall

42 David Stark and Verena Paravel, "Powerpoint in Public: Digital Technologies and the New Morphology of Demonstration," *Theory, Culture & Society* 25, no. 5 (2008): 31.

43 Alan Galey and Stan Ruecker, "How a Prototype Argues," *Literary and Linguistic Computing* 25, no. 4 (2010).

44 Denisa Kera, "On Prototypes: Should We Eat Mao's Pear, Sail Saint-Exupéry's Boat, Drink with Heidegger's Pitcher or Use Nietzsche's Hammer to Respond to the Crisis?," in *Pedagogies of Disaster,* Vincent WJ van Gerven Oei, Nico Jenkins, and Adam Staley Groves, eds. (Brooklyn, NY: Punctum Books, 2013).

45 Carl DiSalvo, *Adversarial Design* (Cambridge, MA: MIT Press, 2012); Per-Anders Hillgren, Anna Seravalli, and Anders Emilson, "Prototyping and Infrastructuring in Design for Social Innovation," *CoDesign* 7, nos. 3–4 (2011); Thomas Markussen, "The Disruptive Aesthetics of Design Activism: Enacting Design between Art and Politics," *Design Issues* 29, no. 1 (Winter 2013); Ramia Mazé, "Forms and Politics of Design Futures," in *Ethnographies of the Possible* (Aarhus, Denmark: Research Network for Design Anthropology, 2014); Chantal Mouffe, "Pluralism, Dissensus and Democratic Citizenship," *II Seminário internacional educação intercultural, gênero e movimentos sociais. Identidade, diferença, mediações* [II International Seminar intercultural education, gender and social movements. Identity, difference, mediations] (2003).

46 L. Forlano and M. Halpern, "Reimagining Work: Entanglements and Frictions around Future of Work Narratives," *Fibreculture,* no. 25 (2015); Laura Forlano and Anijo Mathew, "From Design Fiction to Design Friction: Speculative and Participatory Design of Values-Embedded Urban Technology," *Journal of Urban Technology* 21, no. 4 (2014).

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

Brown uses an approach called "scenariograms," which are short, experimental videos, to critically reflect on the nature of architecture and urban space in a way that other architectural tools and methods cannot. According to Brown:

> Rather than positing single solutions or confirming desired futures, the scenariograms generate a field of plausible futures for the site that speak to a range of civic, cultural, and political audiences. . . . It surpasses the current conception of urban design as a continuous line of desires, causes, and effects represented through still images and artifacts. Instead, the future is conceptualized as a navigable scenario space of expanding possibilities. The alternative worlds of the scenariograms leverage the power of time, motion and storytelling to construct an urban imagination with the flexibility to embrace the volatility and uncertainty inherent in urban contexts.[47]

Similarly, graduate students in my Networked Cities and Networked Objects courses have used participatory design and critical design to foster discussions about the socio-cultural and political attitudes around cultured meat and create a game called Critical Loop about ethics, values, and responsibility related to the Internet of things.[48] These design investigations of socio-technical systems and collaborative citymaking require more nuanced theoretical underpinnings than those offered by HCD. Instead, they require that we decenter the human to consider the agency of nonhumans in the context of the anthropocene. Furthermore, participatory and speculative design can be useful in terms of removing the traditional constraints of HCD (particularly those around viability as it is currently defined by a business need to achieve the bottom line) and, instead, introducing considerations of ethics, values, responsibility, and accountability. Yet these practices must be taken seriously not as purely scholarly or artistic practice but rather as a pathway toward the creation of relevant design methods for socio-technical complexity in the midst of economic and environmental crises.

Conclusion

What is the role of designers in collaborative citymaking? This essay argues that socio-technical systems are the site of politics, values, and ethics where cities are being made. As such, it is increasingly important for the field of design to find ways to move beyond human needs and the human experience of the world, particularly in light of environmental and economic crisis. One way of evolving design methodologies is to decenter

47 Marshall Brown, "Scenariograms: A Video Technique for Visionary Urbanism" (2014), 1.

48 Mabel Chan et al., "Meat Up," (2014) http://www.core77designawards.com/2014/recipients/meat/ (accessed June 22, 2015); https://www.id.iit.edu/projects/critical-loop (accessed June 22, 2015).

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024

the human and simultaneously consider the role(s) and perspectives of nonhumans. This shift in point of view can raise provocative and imaginative questions about ways of approaching complex socio-technical dilemmas and concerns.

A deeper engagement with theories from STS (and the development of corollary methodologies) may improve the capacity of designers to play an important role in charting the ethical and political challenges posed by emerging technologies. Designers can introduce codesign and speculative design as strategic resources for collaborative citymaking to build networks, constituencies, publics, and alliances around pressing policy issues. Experiments, prototypes, and demonstrations in hybridity and liminality that defy existing categories can serve to showcase productive collaborations between human and nonhuman actors that will shape hopeful, alternative possible urban futures.

Laura Forlano is assistant professor of Design and director of the Critical Futures Lab at the Institute of Design at Illinois Institute of Technology.

Downloaded from http://www.mitpressjournals.org/doi/pdfplus/10.1162/DESI_a_00398 by guest on 29 March 2024