

In this forum we highlight innovative thought, design, and research in the area of interaction design and sustainability, illustrating the diversity of approaches across HCI communities. — Roy Bendor, Editor

‘Everything in the Forest Is the Forest’: A Decade of the Sustainability in (Inter)Action Forum

Roy Bendor, Delft University of Technology, Lisa P. Nathan, University of British Columbia, Matthew Louis Mauriello, University of Delaware, Oliver Bates, Lancaster University

The Sustainability in (Inter)Action forum first appeared in *Interactions* in 2011 (May–June, Vol. 18.3). It sought to create a space for highlighting innovative thought, design, and research in the area of interaction design and sustainability, welcoming a diversity of approaches to the topic across human-computer interaction (HCI) communities. Whether aimed at small fixes or grand solutions, based in academia or industry, taking place in neighborhoods or studios, the work featured in the forum aimed to inform, inspire, and provide hope that more sustainable ways of designing and being in the world are not only possible but already emerging.

Over the past decade, the forum showcased 25 efforts to bring sustainability into interaction design—not as an afterthought but as a core requirement—positioning sustainability as the sine qua non of design in Anthropocenic times. Forum articles embodied the sustainability human-computer interaction (SHCI) community’s desire to reach beyond itself to new members and communities; to explore novel ideas, practices, and tool kits; and to demonstrate ways that the designerly imagination can cultivate, enact, and embolden transformative change. The forum challenged the rhetoric of “greenwashing” and the logic of extractivist practices, and debated methods to reduce consumptive lifestyles and increase the efficiency of industrial practices. It showcased solutions aimed at individual choices and more-collective paths for change,



highlighted material fixes and creative practices, and provided insightful ways to foster community engagement and build bridges to other research and practice communities. Taken as a whole, the articles exhibit not only the wealth of sustainable approaches already available to designers but also the community’s willingness to critically reflect on its own roles and responsibilities as catalysts of more sustainable futures. Our hope that such futures are within reach rests on several promising directions for design, summarized here.

From control of nature to designing with, for, and from nature. Insofar

Many now see design as a means of working with, for, and from nature.

as contemporary design emerged in tandem with the industrial order, design has been implicated in various ontological distinctions, dominant among them the belief that humans stand over and against nature. But where designers used to understand their work as part of the need to protect humans from the forces of nature, many now see design as a means of working with, for, and from nature. Designers, in other words, are rediscovering—or rather unforgetting [1]—that humanity is part of nature, thus drawing on design not only to prevent environmental degradation but also to regenerate eco-social entities.

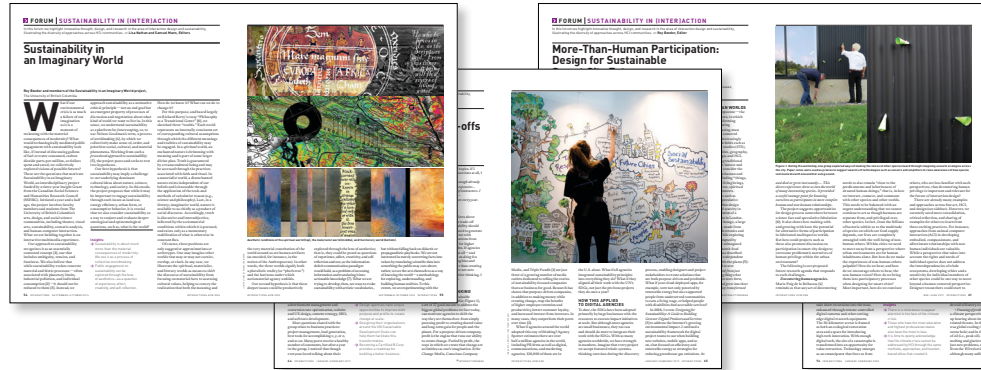
We can sense this shift with the introduction of design strategies such as biomimicry, and with the increasing use of organic, renewable materials such as bamboo and mycelium in the construction of new artifacts and built environments. But no less important is the inclusion of nonhumans as active participants in design processes. This change of attitude—from seeing the relations between humans and nature as adversarial to synergistic—provides an antidote for both human-centrism and ecomodernist approaches that seek to decouple humans from nature. It also means, however, that designers will sometimes choose to stand back and observe, respect, and learn from knowledge systems that recognize humanity is already part of nature. If we understand design as intentional action toward a specific outcome, the decision *not to design* is, as paradoxical as it may sound, no less designerly.

From affirmative to transformative design. While in many instances design

SUSTAINABILITY RESOURCES

Whether or not they are already involved with sustainability, readers may find the following list of resources and initiatives useful for pursuing sustainability in and through design:

- *Sustainability and climate chairs* are often nominated at ACM conferences such as CHI, MobileHCI, CSCW, and UIST. CHI recently introduced a subcommittee dedicated to critical and sustainable computing. The ACM SIGPLAN Climate Committee has created a set of useful resources for those interested in getting involved in an existing activity or those thinking about initiating an event (<https://www.sigplan.org/Resources/Climate>).
- *ICT for Sustainability (ICT4S)* is an annual gathering of technologists and sustainability practitioners dedicated to promoting sustainability in their work (<http://www.ict4s.org>).
- The annual *LIMITS workshop* is often co-located with ICT4S and provides participants with a lively space for discussing design, technology, and sustainability (<http://computingwithlimits.org>).
- The *Design Research Society (DRS)* supports a sustainability special interest group (<https://www.designresearchsociety.org/cpages/sustainability-sig>) and one dedicated to pluriversal design (<https://www.designresearchsociety.org/cpages/sig-pluriversal-design>).
- In 2019, the ACM introduced a *Carbon Offset Program* (<https://www.acm.org/special-interest-groups/volunteer-resources/conference-planning/conference-registration#h-carbon-offset-program>) and a *CO₂ Footprint Calculator for Conferences* (<https://co2calculator.acm.org/login.html>). Examples of initiatives implemented at CHI 2019 can be found here: <https://chi2019.acm.org/2019/02/22/talking-about-chi-and-sustainability/>
- To participate in conversations across the ACM about fighting climate change, join the *ACM Climate Google group* (<https://groups.google.com/g/acm-climate/>). For more conversations about HCI and sustainability, join the *Sustainable CHI Google group* (<https://groups.google.com/g/sustainable-chi>).



remains wedded to its commercial contexts, it has become increasingly clear that design’s power to affect, destabilize, and transform society can be redirected toward better ends than endless growth, consumption, and profit. With the introduction of new intelligent, data-heavy technologies, many designers are working to better understand, make visible, and reduce the ecological footprint of technological infrastructures—a task complicated by the way computation devices and services effectively conceal their true material footprint. This act of concealment can be seen clearly in the kind of metaphors used to describe computation, whereby the ecological footprint of new technologies such as AI, big data, and cryptocurrencies is all but cloud-like.

As has been said before in this space and many others, for design to become truly sustainable it must recognize both the hard limits of planetary boundaries [2] and the abundance of gifts provided to us by planetary cohabitants [3]. We must resist the drive to innovate at all costs in academic and corporate settings—or at least to rethink what innovation means and to pursue it responsibly. Every new object, computational model, or software system is the result of numerous iterations that necessitate large amounts of matter, energy, and labor. These often leave physical waste and impose social costs that may be hard to quantify but still need to be considered. By the same token, just as “letting be” doesn’t necessarily have to be reduced to standing aside, innovation doesn’t have to mean “new stuff.” Thinking about circularity throughout the process of design, manufacture, and use is no less innovative than the kind of disruption

sought by Silicon Valley entrepreneurs; and initiatives such as the “right to repair” position maintenance as equal to, if not more important than, bringing to market new, shiny objects. Like the philosophy behind the Japanese practices of *kintsugi* and *wabi-sabi*, we can allow objects to age with grace, and appreciate their value and meaning beyond mere functionality. Critical considerations of product scalability and modularity, alongside efforts to fundamentally rethink our material supply chains and to educate and empower end users to take control over their devices, are already showing the way beyond “business as usual.”

Environmental justice is social justice. An important condition for design to be able to promote sustainability is a shared understanding that environmental justice is social justice, and vice versa. Marginalized communities are not only the first to suffer the consequences of pollution and environmental degradation but are also often the ones already working to stop it [4]. Indigenous communities continue to face persecution for standing in the way of “progress”—often a signifier of extractive technologies and practices such as mining, damming, laying pipelines, and clear-cutting forests. In this sense, there is a striking resemblance between the environmental externalities of modern economics and the social marginalization of global neoliberal politics; neither count for much in the pursuit of material wealth for the few. Nonetheless, where there’s a crisis, there may be opportunity: Just as the granting of legal statute to mountains and rivers reshapes the nature-culture divide into a much more complex and flexible ontology, realignments between environmental and social



justice movements are creating new hybrid politics. Designers can support these efforts by materializing the tools, situations, and experiences that render such alliances possible.

This is already evident when designers support solidarity across sectors in and through their design processes, when they facilitate processes of participatory or co-design, promote platform cooperativism and commoning, or help build community solidarity and resilience. What Arturo Escobar helped popularize as *autonomous design* [5] is gaining traction, opening up design to myriad perspectives. When such perspectives also include more-than-humans, design can be seen as an agent of ontological malleability. And the more complex and nuanced our understanding of the world in which we act becomes, the less plausible the belief that acts of design can be isolated or insulated from global politics becomes. Designed objects, services, environments, and experiences are nodes in complex networks of practice—networks that design helps weave. If there’s hope that design will help us out of our current trajectory, it lies precisely here, in design’s capacity to re-create new entanglements, realignments, and the conditions for a broad alliance for equitable change to emerge.

What is to be done? These and other promising directions for sustainability in design can only flourish in an environment that nourishes the designer’s capacity to envision and pursue alternative futures or, in Tony Fry’s words, to counteract society’s tendency for “defuturing” [6]. If we are unable to think beyond current social, political, cultural, and economic

conditions, we are guaranteed to merely (re)produce more of the same, despite the fact that the planet and all who share it are desperate for substantial change. If sustainability is anything, it is about our ability to envision and pursue better futures. We cannot be satisfied by tinkering around the edges of our ecological crises, nor should we despair because of the scale and depth of action needed. Designers can and should help create new narratives that foreground resilience, equity, inclusiveness, humility, and responsibility.

Over the past decade, the SHCI community has moved in this direction by pushing for important measures to reduce the material footprint of the HCI community and by integrating sustainability into both new and existing initiatives. This is not enough, but we take hope from knowing that we are not alone. We would like to thank *Interactions* for providing the community a space to come together, and all the authors and editors for helping keep the forum relevant and inspiring. Although the forum is ending, the struggle for sustainability—indeed, for a better future for all—is far from over. We call upon the design community to do more to increase our chances of surviving and even thriving in the Anthropocene. There are plenty of opportunities to get involved (see sidebar) and join others who are trying to make a difference by their commitment to working toward a future in which respecting the magnificence of our planet is the first law of design, where design does not settle for doing little or no harm but rather is committed to regenerative practices, and where human

societies support diversity instead of domination. We are all in this together.

There are no individuals. There aren’t even separate species. Everything in the forest is the forest.

— Richard Powers, *The Overstory*

ENDNOTES

1. Shotwell, A. *Against Purity: Living Ethically in Compromised Times*. Univ. of Minnesota Press, Minneapolis, 2016.
2. Rockström, J. et al. A safe operating space for humanity. *Nature* 461 (2009), 472–475.
3. Kimmerer, R.W. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Milkweed Editions, Minneapolis, 2015.
4. Costanza-Chock, S. *Design Justice: Community-Led Practices to Build the Worlds We Need*. MIT Press, Cambridge, MA, 2020.
5. Escobar, A. *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*. Duke Univ. Press, Durham, NC; London, 2018.
6. Fry, T. *Design Futuring: Sustainability, Ethics, and New Practice*. Berg, Oxford; New York, 2009.

📍 **Roy Bendor** is an assistant professor of critical design in the Department of Human-Centered Design, Delft University of Technology, the Netherlands. His research explores the relations between design, culture, and politics as they unfold in such areas as smart city infrastructure, sustainability futures, and speculative design.
→ roy@digitalsustainability.com

📍 **Lisa P. Nathan** works for the University of British Columbia’s School of Information and is an uninvited guest on the traditional, ancestral, and unceded territory of the x^wməθk^wəyəm (Musqueam). She is deeply grateful to all who have contributed to (and read!) this forum over the years.
→ lisa.nathan@ubc.ca

📍 **Matthew Louis Mauriello** is an assistant professor in the Department of Computer and Information Sciences at the University of Delaware. His work focuses on applying user-centered design and computer science techniques (e.g., information visualization and machine learning) to societal challenges with an emphasis on those connected to health, education, environmental, and computing systems.
→ mlm@udel.edu

📍 **Oliver Bates** is an HCI researcher and data scientist with a passion for social and climate justice. His recent research has been on designing for gig-economy worker empowerment, collaborative and sustainable last-mile logistics, and utilizing IoT and data in the context of net-zero commercial energy.
→ o.bates@lancaster.ac.uk