Interfacing in Crisis: Five Parables for Interface Thinking

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Introduction

At the intersection of generative AI and digital interfaces, we navigate a confluence where crises do not arrive as singular events but as tidal surges. They stretch and ripple from two intersecting currents: One reconfigures the textures of meaning, depositing cultural sediments deep within the architectures of intelligent systems; the other grows restless, spilling beyond the fixity of form into fluid and improvisatory performativity. These currents are carried by planetary-scale infrastructures in which interaction can no longer be apprehended as a discrete act but as a turbulence, an ongoing negotiation among forces, agencies, and entanglements that exceed any single locus of control.

One can trace the evolution of interfacial form: from brass levers guiding the flow of fluids through engines to the electronics and fly-by-wire systems that abstract action from its effects; from the fixed spatial layouts of control rooms in the London Underground to the reconfigurability and responsiveness of modern graphical user interfaces;[1] from the Web 2.0 transformation of interfaces—from navigational tools to the bidirectional exchanges[2] later commodified by social media empires—to experiments with collective interfacing on platforms such as Twitch.tv,[3] where co-constructed communal control and decision-making emerge through participatory dynamics.

Contemporary interfaces shape how we perceive and interact with the world,[4] extending beyond screens to infrastructures, platforms, and cities, and shaping everyday experiences.[5] Transcending their roots in borrowings from chemistry and the questions of connecting users, soft- and hardware,[6] atomized by digital networks and coming to expression through interaction, interfaces come to mean different things to different actors,[7] less a site of representation than a ground for co-performance,[8] unfolding relationally.[9] As processes, rather than static entities,[10] they challenge the traditional boundaries of the self,[11] troubling distinctions between us and the world. Vilém Flusser suggests that if "significant surfaces" assemble pixels into forms that signify, contemporary interfaces might extend the image to the operation of the "skin,"[12] that primordial interface whose sensory thickness mediates every

1 Christian Heath and Paul Luff, "Collaboration and Control: Crisis Management and Multimedia Technology in London Underground Line Control Rooms," *Computer Supported Cooperative Work (CSCW)* 1, nos. 1–2 (1992): 69–94, https://doi.org/10.1007/BF00752451.

2 Tim O'Reilly, "What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software," *Communications & Strategies* 1 (2007): 17.

3 T. L. Taylor, *Watch Me Play: Twitch and the Rise of Game Live Streaming* (Princeton University Press, 2018).

4 Peter-Paul Verbeek, "Cyborg Intentionality: Rethinking the Phenomenology of Human–Technology Relations," *Phenomenology and the Cognitive Sciences* 7, no. 3 (2008): 387–95, https://doi.org/10.1007/s11097-008-9099-x.

5 Christian Ulrik Andersen and Søren Bro Pold, *The Metainterface: The Art of Platforms, Cities, and Clouds* (MIT Press, 2018); Ben Stopher, John Fass, Eva Verhoeven, and Tobias Revell, *Design & Digital Interfaces: Designing with Aesthetic and Ethical Awareness* (Bloomsbury Visual Arts, 2021).

6 Florian Cramer and Matthew Fuller, "Interface," in *Software Studies: A Lexicon*, ed. Matthew Fuller (MIT Press, 2008), https://doi.org/10.7551/mitpress/7725.003.0022.

7 The notion of multi-intentionality proposed by Johan Redström and Heather Wiltse moves beyond the human-centered, singular, and directive notion of intent defined by Jakob Nielsen, where AI interfaces are expected to infer and fulfill user goals efficiently. By contrast, multi-intentionality treats interfaces as situated and contested sociotechnical terrains where multiple, and sometimes

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contact with the world, and whose mutable textures and boundaries exert a subtle yet persistent force in the shaping of identity.

Within the broader current of digital interfaces, a riptide gathers strength with the rise of generative AI. These computational models work in "human-like" ways: conversing in familiar patterns, interpreting natural language queries and instructions, and bringing a condensed form of synoptic background knowledge to interactions. The vast 70-billion-parameter weights of these models function as an interface to human culture[13]—part search, part conversation—scaling an uncanny peak of human-like engagement that enchants[14] with their fluency and conjuring.[15] These models, with their uniform interfaces of text boxes and simulated chats, present a paradox: a single interface that appears capable of everything, yet reveals nothing about its workings or limits.

The seeds of this crisis were apparent in Lucy Suchman's seminal work on human–machine reconfigurations,[16] where interfaces are sites of friction and situated action, always contingent and relational. As Suchman reminds us, interfaces are never neutral conduits but rather are sites where social, technical, and material arrangements are continually reconfigured. Generative AI heightens this condition, folding the interface inward until the surface itself performs what Karen Barad[17] calls *agential cuts*: deciding, in the very moment of interaction, what can be said, seen, and known.

In response to these questions, and in an effort to reconsider what interfaces might yet become, we make two moves. First, we trace the crisis through three unfolding ruptures. Each is framed as a collapse, a moment where new technological waves swell, illustrating or accelerating existing trends to the point that current conceptualizations and practices break down:

- *A collapse of visibility*, where interfaces obscure who sees and what is seen, as much as they reveal.
- *A collapse of form*, where interfaces dissolve into language and prediction, stripped of fixed affordances.
- *A collapse of positionality*, where perspectives shift so fluidly that epistemic relations change from one sentence to the next.

These three collapses all relate to a challenge around meaning: not the question of how meaning is produced in a computational setting,[18] or what happens when we treat AI systems as cultural actors,[19] but what happens when we regard AI systems as epistemic technologies and interrogate interfaces through this lens.[20]

Secondly, we introduce five *parables* for interfacing, five physical phenomena that function as metaphors to destabilize traditional notions of the interface, touching on the epistemological potential of human–AI entanglements. These work somewhat in the

conflicting, agendas intersect. Johan Redström and Heather Wiltse, *Changing Things: The Future of Objects in a Digital World* (Bloomsbury Visual Arts, 2018).

8 Lenneke Kuijer and Elisa Giaccardi, "Co-Performance: Conceptualizing the Role of Artificial Agency in the Design of Everyday Life," in *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (Association for Computing Machinery, 2018), 1–13, https://doi.org/10.1145/3173574.3173699; Yuxi Liu, Elisa Giaccardi, Johan Redström, and Dave Murray-Rust, "Acts of Interfacing in an Entangled Life," in *DRS2024: Boston*, ed. Colin M. Gray, Estefania Ciliotta Chehade, Paul Hekkert, Laura Forlano, Paolo Ciuccarelli, and Peter Lloyd (Design Research Society, 2024), https://doi.org/10.21606/drs.2024.779.

9 Evert van Beek, Elisa Giaccardi, Stella Boess, and Alessandro Bozzon, "Making a Scene: Representing and Annotating Enacted Interfaces in Co-Performances Using the Screenplay," pictorial presented at IASDR 2023: Life-Changing Design, Milan, Italy, October 9–13, 2023, https://doi.org/10.21606/iasdr.2023.788.

10 Alexander R. Galloway, *The Interface Effect* (Polity, 2012), 30.

11 Ksenia Fedorova, *Tactics of Interfacing: Encoding Affect in Art and Technology* (MIT Press, 2020).

12 Vilém Flusser, "Skin," *Interface Critique* 3 (September 2021), https://doi.org/10.11588/ic.2021.3.81319.

13 Ted Chiang, "ChatGPT Is a Blurry JPEG of the Web," *The New Yorker*, February 9, 2023, https://www.newyorker.com/tech/annals-of-technology/chatgpt-is-a-blurry-jpeg-of-the-web.

14 Jane Bennett, *The Enchantment of Modern Life: Attachments, Crossings, and Ethics* (Princeton University Press, 2001).

15 Maria Luce Lupetti and Dave Murray-Rust, "(Un)making AI Magic: A Design Taxonomy," *CHI '24: Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (2024): 1–21, https://doi.org/10.1145/3613904.3641954.

speculative pragmatist mode:[21] Speculative to open multiplicities, yet pragmatist for their value in action, they function as lures to draw thought down new pathways.[22] Beyond Tim Ingold and Lars Spuybroek's "deep surfaces,"[23] we point to how interfaces can be even more fluid, dispersed, connected, and agential, that is to say, in Barad's sense of participating in the ongoing intra-active reconfiguration of the world, where matter and meaning take shape together.

We illustrate the parables with projects that embody analogues of each particular phenomenon in the world of digital interfaces.

Three Crises in Interfaces

Each crisis is a movement where the stability of mediation, legibility, and control breaks down, not as a failure of design but as a profound shift: As interfaces become more distributed, generative, and performative, they also become more elusive, more layered, and more unstable. Each crisis is a *rupture* where what an interface shows, how it shows, and from where it shows falters and folds into uncertainty.[24] The crises are not end points but thresholds. Each collapse is a possibility, where the tensions of interfacing surface: between visibility and opacity, form and formlessness, perspective and projection. In these crises, the stakes of interfacing, and its emergent futures, become sharply felt.

Collapse of Vision

Any interface is, at its core, a form of surveillance: It makes the intent of an actor legible, and potentially compelling, to the interfaced assemblage.[25] The interface one searches with is also used to surveil populations and make inferences about the spread of disease.[26] Sometimes these connections are comprehensible: a voice assistant works by surveilling speech,[27] even if boundaries are placed on that surveillance or work is needed to experientially understand the implications.[28] The collapse comes when systems start building inferences that go beyond immediate interactional intent, computing the incomputable,[29] making epistemic leaps such as turning location data into the tracking of internal mental states.[30] This is not a new concern.[31] But we want to call attention to situations where the interface remains unchanged, while the *scope of vision expands* through interpretations of collected data.

Systems such as read.ai process traits like "charisma," "inclusiveness," and other poorly defined social characteristics from participants' behavior in video meetings. When participating in hiring interviews, humans are often unaware of the level of machinic vision directed toward them. Even if the message "Firefly AI Agent has joined the chat" signals a presence, the interface provides no insight into what the agent observes, processes, or values. This extension of vision has a historicity to it as well, as new forms of analysis are

16 Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions*, 2nd ed. (Cambridge University Press, 2006).

17 Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Duke University Press, 2007).

18 Davide Nunes and Luis Antunes, "Machines of Meaning," preprint, arXiv, December 10, 2024, https://doi.org/10.48550/arXiv.2412.07975.

19 Mercedes Bunz, "The Calculation of Meaning: On the Misunderstanding of New Artificial Intelligence as Culture," *Culture, Theory and Critique* 60, nos. 3–4 (2019): 264–78, https://doi.org/10.1080/14735784.2019.1667255.

20 Ramón Alvarado, "AI as an Epistemic Technology," *Science and Engineering Ethics* 29, no. 5 (2023): 32, https://doi.org/10.1007/s11948-023-00451-3.

21 Alex Wilkie, Martin Savransky, and Marsha Rosengarten, eds., *Speculative Research: The Lure of Possible Futures* (Routledge, 2017).

22 Didier Debaise, "The Lure of the Possible: On the Function of Speculative Propositions," in *Speculative Research: The Lure of Possible Futures*, ed. Alex Wilkie, Martin Savransky, and Marsha Rosengarten (Routledge, 2017).

23 Ingold's notion of interfaces resists the idea of a surface as a mere boundary in concert with Lars Spuybroek's concept of "deep surfaces," describing surfaces that do not simply conceal or enclose but actively charge the surrounding space, creating atmospheres that draw elements into relation. Tim Ingold, *Imagining for Real: Essays on Creation, Attention and Correspondence* (Routledge, 2021); Lars Spuybroek, *The Sympathy of Things: Ruskin and the Ecology of Design*, 2nd ed. (Bloomsbury Visual Arts, 2016).

24 Elisa Giaccardi, Dave Murray-Rust, Johan Redström, and Baptiste Caramiaux, "Prototyping with Uncertainties: Data, Algorithms, and Research through Design," *ACM Transactions on Computer–Human Interaction* 31, no. 6 (2024): 1–21, https://doi.org/10.1145/3702322.

25 Wendy Hui Kyong Chun, *Programmed Visions: Software and Memory* (MIT Press, 2011), https://doi.org/10.7551/mitpress/9780262015424.001

brought to bear on previous data. Thus, the video interface you face today may be augmented tomorrow, revealing patterns or insights that emerge only through future processing.

When conversing with a language model, it is often unclear what the model has seen in the course of its development. This ambiguity manifests in curious ways: A model may display strange knowledge of events beyond its official training cutoff[32] or solve problems that may well have already been in the training set, somewhere. It is difficult to develop a conceptual understanding of what it is like for a system to have "the whole internet" as its input, and the set of things that it has vision over.[33] Beatrice Fazi frames this as "synoptic computing,"[34] where the model provides a view, or interface, onto some "whole," often Common Crawl or other datasets that encode a significant proportion of recent human discourse.[35]

What we describe here as *collapse of vision* is not an absence of sight but a loss of clarity: who sees, what is seen, and how meaning is made from that vision. Vision expands from a narrow conduit of interaction to an encompassing field of surveillance, inference, and projection; as this scope widens, clarity diminishes. The interface becomes a site of *simultaneous visibility and opacity*: It surfaces signals but conceals processes; it offers outputs but withholds origins.

This collapse emerges precisely at the point where legibility falters, where human intuition, machinic inference, and algorithmic synthesis fold into one another. In this collapse, the interface ceases to be a window and becomes a prism: refracting, distorting, and entangling what passes through it.

Collapse of Form

For much of computing history, the physical form of an interface carried with it an implicit script for action.[36] Grooves for fingers indicated how and where to hold, levers indicated the potential to turn; more semiotically, buttons indicated a part of the surface to press, and even symbolically indicated what that press might cause. As touchscreens replace buttons, the physical form of digital interfaces is rendered more fluid. The legibility of physical form has eroded: Form no longer communicates function directly. Instead, it must be continually co-constructed through the user's semiotic interpretation and the operational logic of the software behind the interface.

This interfacial smoothing is exemplified in the text box. It is roughly the same text box that allows one to post a comment online, raise a complaint with the local administration, engage in conversational exchange with a cutting-edge language model, or leave delivery instructions for an evening pizza. It's not clear from the general form of the interface whether one is talking with a harried customer support agent, a group of people on a forum, or a conversational decision tree. This ambiguity persists even when engaging

0001; Martin Dodge and Rob Kitchin, "'Outlines of a World Coming into Existence': Pervasive Computing and the Ethics of Forgetting," *Environment and Planning B: Planning and Design* 34, no. 3 (2007): 431–45, https://doi.org/10.1068/b32041t; Thomas Erickson and Wendy A. Kellogg, "Social Translucence: An Approach to Designing Systems that Support Social Processes," *ACM Transactions on Computer–Human Interaction* 7, no. 1 (2000): 59–83, https://doi.org/10.1145/344949.345004.

26 Andrea Freyer Dugas, Mehdi Jalalpour, Yulia Gel, Scott Levin, Fred Torcaso, Takeru Igusa, et al., "Influenza Forecasting with Google Flu Trends," *PLOS ONE* 8, no. 2 (2013): https://doi.org/10.1371/journal.pone.0056176.

27 Emily West, "Amazon: Surveillance as a Service," *Surveillance & Society* 17, nos. 1/2 (2019): 27–33, https://doi.org/10.24908/ss.v17i1/2.13008.

28 Lauren McCarthy and Jacina Leong, "Becoming Alexa," in *The Routledge Companion to Mobile Media Art*, ed. Larissa Hjorth, Adriana de Souza e Silva, and Klare Lanson (Routledge, 2020), 413–17.

29 Mireille Hildebrandt, "Privacy as Protection of the Incomputable Self: From Agnostic to Agonistic Machine Learning," *Theoretical Inquiries in Law* 20, no. 1 (2019): 83–121, https://doi.org/10.1515/til-2019-0004.

30 Luca Canzian and Mirco Musolesi, "Trajectories of Depression: Unobtrusive Monitoring of Depressive States by Means of Smartphone Mobility Traces Analysis," in *UbiComp '15: Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (Association for Computing Machinery, 2015), 1293–304, https://doi.org/10.1145/2750858.280584.

31 Dodge and Kitchin, "'Outlines of a World Coming into Existence'"; Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, first trade paperback ed. (PublicAffairs, 2019); Kieron O'Hara, *The Seven Veils of Privacy: How Our Debates about Privacy Conceal Its Nature* (Manchester University Press, 2023).

with different versions of language models; interfaces remain identical despite vast differences in their capacities for reasoning and response. Yet, within this sameness, there is room for the mutual construction of meaning: Users learn to probe models, refining their queries and gradually uncovering how a particular model thinks, responds, and performs within the bounds of the interface.[37]

Behind the collapse of form lies an ontological crisis: We do not know the right ways to frame these new sociotechnical constructions. From Eliza[38] onward, we have seen that humans overimpute capabilities to computational systems.[39] The conversational form, in particular, encourages one to assume they are talking with something human-like and do a large amount of contextual repair to help situate the awkward or erroneous outputs of the model, often without realizing it—because we do that for other humans.[40] Despite efforts to develop metaphors for describing and understanding computational agents,[41] there remain no concise ways to capture their nature, to understand that "this thing is really good at wording but not accurate in information," or "this thing knows your calendar but it won't remember what you said five sentences ago."

We encounter creations with immense capabilities, yet, without a shared, legible way to frame their behavior or limitations, their form *becomes elusive*.

Collapse of Positionality

Interfaces have always encoded positionality. They reveal what designers value, forbid what they reject, and ease the paths they deem desirable.[42] These aesthetic and functional choices, prioritizing certain features, modalities, and information flows, serve as conduits to the teleology of their creators; their positionality shapes the form and affordances of the interface, which then guide and shape the interaction.

Conversational models are currently built in layers: An initial model trained on a large corpus of text, which has its own political positionality,[43] is shaped by feedback and policies about how this model *should* interact, trying to ensure responses that are useful rather than simply statistically likely, and avoid a range of potential harms.[44] Multiple layers of positionality intertwine here: the system prompt, which directly steers the model's responses; the reinforcement learning from human feedback (RLHF), which encodes a set of values derived from annotator preferences; and the broader positional imprint from the model's training corpus, which carries biases and worldviews from its source materials. This leads to a laminar form of positionality where layers do not simply stack but flow, each sedimenting upon the last. Like geological strata formed under pressure, each layer of positionality is both an accumulation of past decisions and an active filter, structuring what is possible at the surface.

32 Jeffrey Cheng, Marc Marone, Orion Weller, Dawn Lawrie, Daniel Khashabi, and Benjamin Van Durme, "Dated Data: Tracing Knowledge Cutoffs in Large Language Models," preprint, arXiv, March 19, 2024, https://doi.org/10.48550/arXiv.2403.12958.

33 Stefan Baack, "A Critical Analysis of the Largest Source for Generative AI Training Data: Common Crawl," in *FAccT '24: Proceedings of the 2024 ACM Conference on Fairness, Accountability, and Transparency* (Association for Computing Machinery, 2024), 2199–208, https://doi.org/10.1145/3630106.3659033.

34 M. Beatrice Fazi, "The Computational Search for Unity: Synthesis in Generative AI," *Journal of Continental Philosophy* 5, no. 1 (2024): 31–56, https://doi.org/10.5840/jcp202411652.

35 Common Crawl, n.d., https://commoncrawl.org; Baack, "A Critical Analysis of the Largest Source for Generative AI Training Data."

36 William W. Gaver, "Technology Affordances," in *CHI '91: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, ed. Scott P. Robertson, Gary M. Olson, and Judith S. Olson (Association for Computing Machinery, 1991), 79–84, https://doi.org/10.1145/108844.108856.

37 Joseph Lindley and Roger Whitham, "From Prompt Engineering to Prompt Craft," in *TEI '25: Proceedings of the Nineteenth International Conference on Tangible, Embedded, and Embodied Interaction* (Association for Computing Machinery, 2025), 1–12, https://doi.org/10.1145/3689050.3704424.

38 Joseph Weizenbaum, "ELIZA—a Computer Program for the Study of Natural Language Communication Between Man and Machine," *Communications of the ACM* 9, no. 1 (1966): 36–45, https://doi.org/10.1145/365153.365168.

39 Inioluwa Deborah Raji, I. Elizabeth Kumar, Aaron Horowitz, and Andrew D. Selbst, "The Fallacy of AI Functionality," in *FAccT '22: Proceedings of the 2022 ACM Conference on Fairness, Accountability, and Transparency* (Association for Computing Machinery, 2022), 959–72, https://doi.org/10.1145/3531146.3533158; Bunz, "The Calculation of Meaning."

Each layer acts as an interface to the one beneath it, mediating and shaping behavior. An interaction prompt interfaces the general behavior of a model into a specific, situated form, establishing interactional rules, offering personality cues, and aligning the model's open frameworks with a desired or imagined user experience. Meanwhile, RLHF and model tuning serve as interfaces to the latent space of the underlying model, manifesting it into something legible and approachable for humans: Politeness becomes a design affordance, smoothing over lapses in logic, while guardrails frame the conversation, setting boundaries for acceptable responses. In response, "jailbreaking" language models becomes an act of intentional rupture, an effort to bypass the constructed positions and safety layers and reach the unreconstructed, raw responsiveness beneath the curated behaviors, exposing the interplay between control, constraint, and emergent possibility within these systems.

The recent trend of creating synthetic personas for carrying out research is an explicitly positional interface to the underlying synoptic computation: It provides an opinionated view of the underlying data, specified through positional stance.[45] The model then acts "as-if," pretending to be various kinds of humans to allow for more efficient user research, amalgamating the given positionality into its stack of more or less explicit positions.

This collapse of positionality introduces both power and risk. It allows for creative co-performance,[46] where the interface shifts, improvises, and responds within the unfolding interactional field. Yet it also obscures lines of accountability and effaces the histories embedded in its operation. In this *layered epistemic ambiguity*, positionality blurs into the thin and shifting seam between the model's voice, the user's prompt, and the system's design where agential cuts are continually enacted, not to fix meaning but to (re)configure what can be known, by whom, and under what conditions.

Five Parables for Interface Thinking

Each collapse carries within it both loss and gain. The five parables we offer here are not solutions but speculative gestures which hold space for possibility and action. They do not seek to resolve the crisis but to dwell with it, to trace its contours and inhabit its tensions. Each parable takes root in a physical phenomenon, a metaphorical lever for prying open and unsettling the concept of the interface. For this, each parable describes ways of relating in the physical world—*floating*, *cutting*, *burning*, *growing*, *dissolving*—where the interface cannot be reduced to a "surface," a thin plane of representation, but must be understood as a site of thickness, process, and relation.

To each parable we pair a project or study from our own work in recent years as resonances of the qualities we wish to evoke, openings through which one might glimpse how interfaces might yet become, with full references provided for those wishing to explore these works in greater depth.

40 Ole Pütz and Elena Esposito, "Performance Without Understanding: How ChatGPT Relies on Humans to Repair Conversational Trouble," *Discourse & Communication* 18, no. 6 (2024): 859–68, https://doi.org/10.1177/17504813241271492.

41 Dave Murray-Rust, Maria Luce Lupetti, and Iohanna Nicenboim, "Metaphor Gardening: Experiential Engagements for Designing AI Interactions," in *DRS2024* (2024), https://doi.org/10.21606/drs.2024.376; Joseph Lindley, Haider Ali Akmal, Franziska Pilling, and Paul Coulton, "Researching AI Legibility through Design," in *CHI '20: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (Association for Computing Machinery, 2020), 1–13, https://doi.org/10.1145/3313831.3376792; Dave Murray-Rust, Iohanna Nicenboim, and Dan Lockton, "Metaphors for Designers Working with AI," in *DRS2022: Bilbao*, ed. Dan Lockton, Sara Lenzi, Paul Hekkert, Arlene Oak, Juan Sádaba, and Peter Lloyd (Design Research Society, 2022), https://doi.org/10.21606/drs.2022.667; Iohanna Nicenboim, Shruthi Venkat, Neva Linn Rustad, Diana Vardanyan, Elisa Giaccardi, and Johan Redström, "Conversation Starters: How Can We Misunderstand AI Better?" in *CHI EA '23: Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*, ed. Albrecht Schmidt, Kaisa Väänänen, Tesh Goyal, Per Ola Kristensson, and Anicia Peters (Association for Computing Machinery, 2023), 1–4, https://doi.org/10.1145/3544549.3583914; Mark Blythe, Siân Lindley, and Dave Murray-Rust, "Artificial Intelligence and Other Speculative Metaphors," in *DIS '25: Proceedings of the 2025 ACM Designing Interactive Systems Conference*, ed. Nuno Jardim Nunes, Valentina Nisi, Ian Oakley, Qian Yang, and Clement Zheng (Association for Computing Machinery, 2025), 347–56, https://doi.org/10.1145/3715336.3735714.

42 Lars-Erik Janlert and Erik Stolterman, "Faceless Interaction—A Conceptual Examination of the Notion of Interface: Past, Present, and Future," *Human–Computer Interaction* 30, no. 6 (2015): 507–39, https://doi.org/10.1080/07370024.2014.944313.

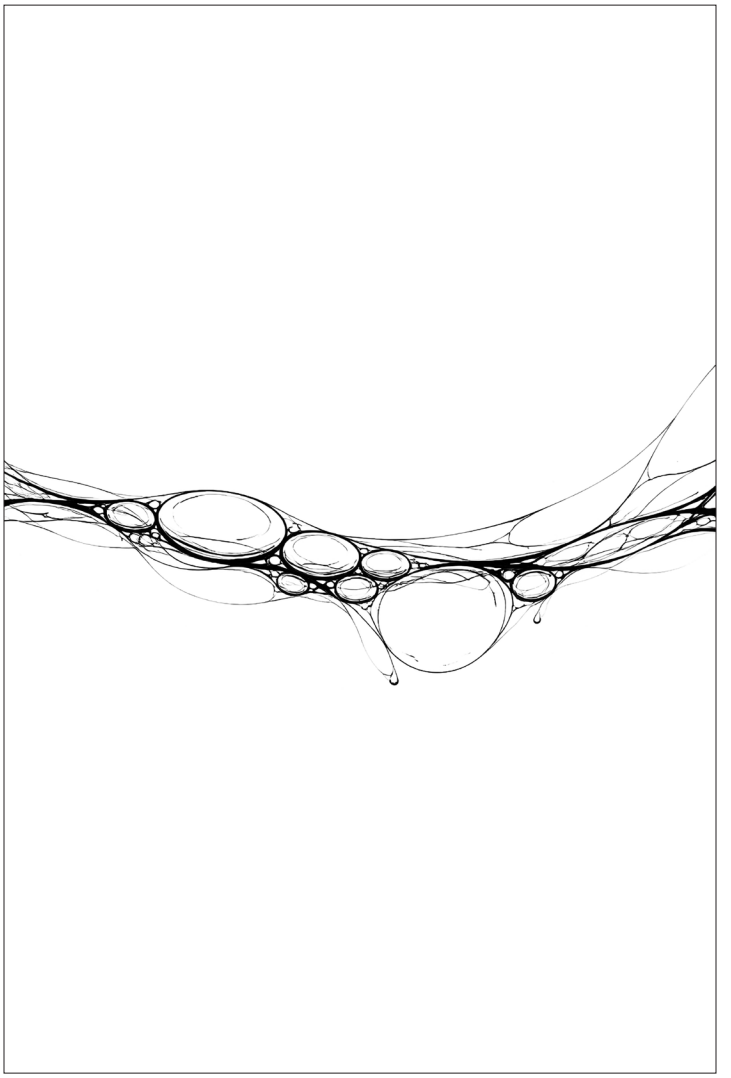

Figure 1
Floating. Interpretation of the surface of water indicating the thickness of the interface, the construction of complementary tensions, and the density of tiny events going on which constitute a smooth-seeming surface. Developed by Chiara Andreiuolo using Sora.

Floating

A glass of water, seen every morning, offers an interface: a shining, shimmering membrane where water meets not-water, curving at the edges in a material smirk that defies gravity. Looking closer, what seemed a thin, perfect plane dissolves into something thick, textured, and uncertain. In this *field of probability*, molecules cling and cluster in the liquid sloshings below and above, then arc into Brownian motion, scattering into gaseous freedom.

At the edges, a restless congregation: Molecules jostle, elbow, and clamber into meniscus, an uneasy curve of tension and belonging. Larger, out at sea, energy emerges as swells and ripples, undercurrents that shape the field of potential into waves, droplets, foam. Currents of air whip up spray, pull and tug at the frictionless interface until it stands up with the power of storms and wears

43 Baack, "A Critical Analysis of the Largest Source for Generative AI Training Data"; Michele Cremaschi, Paolo Grigis, Max Dorfmann, and Antonella De Angeli, "Exposing the Ideology of Large Language Models with Creative Practices," in *DIS '25: Proceedings of the 2025 ACM Designing Interactive Systems Conference*, ed. Nuno Jardim Nunes, Valentina Nisi, Ian Oakley, Qian Yang, and Clement Zheng (Association of Computing Machinery, 2025), 1928–40, https://doi.org/10.1145/3715336.3735715.

44 Shreyas Chaudhari, Pranjal Aggarwal, Vishvak Murahari, Tanmay Rajpurohit, Ashwin Kalyan, Karthik Narasimhan, et al., "RLHF Deciphered: A Critical Analysis of Reinforcement Learning from Human Feedback for LLMs," *ACM Computing Surveys* 58, no. 2 (2025): 1–37, https://doi.org/10.1145/3743127.

45 Albrecht Schmidt, Passant Elagroudy, Fiona Draxler, Frauke Kreuter, and Robin Welsch, "Simulating the Human in HCD with ChatGPT: Redesigning Interaction Design with AI," *Interactions* 31, no. 1 (2024): 24–31, https://doi.org/10.1145/3637436.

46 Kuijer and Giaccardi, "Co-Performance."

the solid rock. A million tiny crises, precipitating through the liquid in between.

In the parable of floating, the interface is encountered not as a boundary but as an architecture of movement, an endless ballet of exits, entrances, and recompositions—highlighting the idea that interfaces are sites rather than surfaces, patterns of activity rather than reflective planes. The project *Ripples*[47] carries this parable into the world, inhabiting the Venice Lagoon as a living, more-than-human body in which water, sediment, and life are in constant negotiation. There, fluidity is not a metaphor but a material condition, and coexistence is written in the slow, sedimentary script of the lagoon itself.

The lagoon faces a crisis of balance, disrupted by human interventions. Rising sea levels and increasingly frequent *acqua alta* (high tide flooding) threaten daily life and the city's future. In response, the MOSE system[48]—a network of movable barriers—was constructed to prevent high tides from entering the lagoon. Yet, this attempt at control fractures the lagoon's natural interface, severing the sediment flows that sustain its delicate ecology. Without these flows, the salt marshes—natural filters and sediment stores—begin to vanish, and the populations of seahorses, spartina, and mollusks that depend on them face collapse. The lagoon, like the glass of water, reveals how an interface can be more than a surface: It is a field of relations where disruption in one layer ripples through the whole.

To face the crisis, *Ripples* envisions a different paradigm, one that echoes the liquid logic of the parable. What if balance meant listening to what has been submerged and forgotten? Through sensory installations and data-driven reflections, *Ripples* gives voice to often-overlooked actors—the salt marshes, mollusks, and aquatic plants—making their rhythms, needs, and stories legible to human perception.

The interface shifts from a tool of surveillance and extraction to one of attunement and reciprocity. Humans do not control the lagoon; they *float* within its layered, interdependent ecologies. The swells and undercurrents of *Ripples* remind us that, just like water molecules, we are always in relation, dissolving, dispersing, and reforming; there is no singular position, only an ongoing negotiation, a continuous becoming.

Cutting

To shape, we must often cut; to give form, carve boundaries, and reveal the possibility of joining and seaming. A cut is a slice, but not a simple division; no blade severs atomic bonds. Cutting is pressure, is concentration, a convergence of macroscopic surfaces into a microscopic rupture.

The blade's edge becomes an interface, a fleeting zone of encounter where material meets material and possibility is pressed from tension. Fibers are pressured into breaking, crystals

47 Giulia Jiangxian Zhu, Zixin Mou, Sarah Cosentino, Zhuoyue Song, Andrea Borsato, and Elisa Giaccardi, "Ripples: Voices of the Lagoon—Attuning to Multispecies Justice through Tangible and Embodied Interaction," in *DIS '25 Companion: Companion Publication of the 2025 ACM Designing Interactive Systems Conference*, ed. Nuno Nunes, Valentina Nisi, Ian Oakley, and Qian Yang (Association for Computing Machinery, 2025), 251–54, https://doi.org/10.1145/3715668.3735596.

48 MOSE stands for *Modulo Sperimentale Elettromeccanico*, or the Experimental Electromechanical Module.

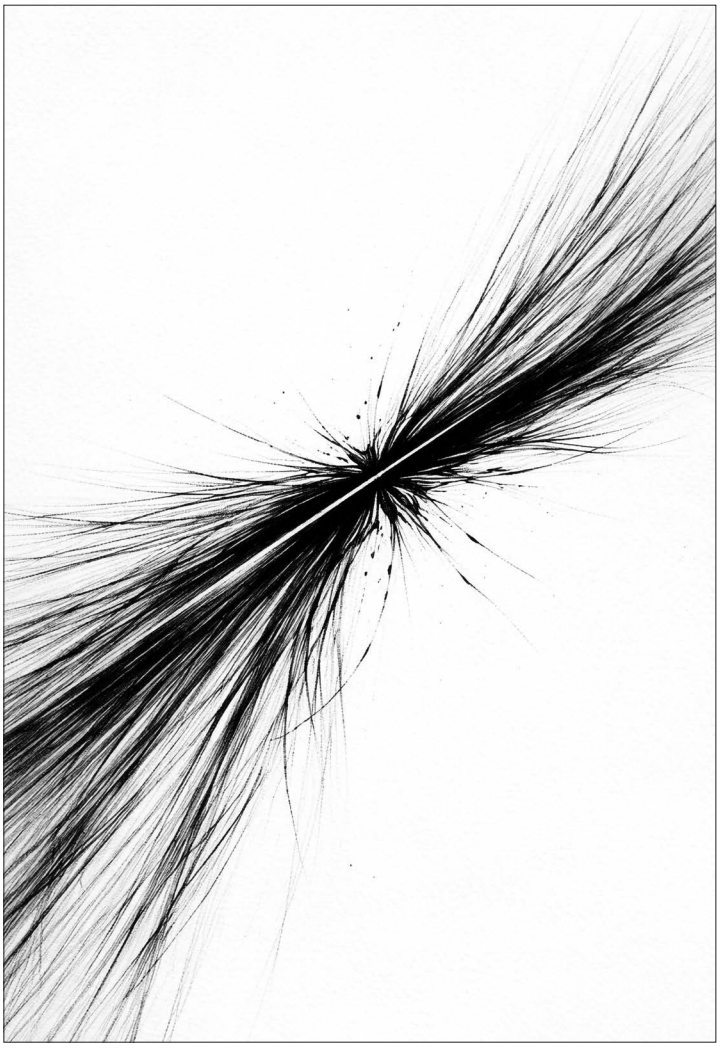

Figure 2
Cutting. Interpretation of the zone of activity around a cut through material, with lines of force and division propagating where new interfaces are being carved out. Developed by Chiara Andreiuolo using Sora.

into separating. A well-honed blade carries a peacock's crest of microscopic rills—tiny serrations that catch, concentrate, and multiply the pressure from above into infinitesimal points of action. The cut is not absence but a *field of tension* where breaking and making blur. Yet not all cuts tear. The skate's blade on ice conjures a fleeting ribbon of liquidity that allows motion, a continual genesis of fluidity from solidity, an interface that emerges only to recrystallize.

What is cutting if not the extension of interfaces—surfaces multiplied, seams introduced, forms drawn from division? The project *Eco-Urban Futures*[49] brings this parable to life, cutting into the digital and ecological entanglements of urban forests to reveal their relational complexity, illustrating how interfaces are generative cuts through parts of the world.

In the city, forests are too often recast as data, seen through the narrowing lens of computational abstraction. Tools like agent-based models promise predictive mastery, yet in delivering

49 Elisa Giaccardi, Seowoo Nam, and Iohanna Nicenboim, "Diffractive Interfaces: Facilitating Agential Cuts in Forest Data Across More-than-Human Scales," in *DIS '25: Proceedings of the 2025 ACM Designing Interactive Systems Conference*, ed. Nuno Jardim Nunes, Valentina Nisi, Ian Oakley, Qian Yang, and Clement Zheng (Association of Computing Machinery, 2025), 135–47, https://doi.org/10.1145/3715336.3735404.

precision, they plane down the forest's tangled vitality into neat metrics, forecasts, and optimization charts aligned with human agendas. What slips away in this translation is not only biodiversity but the felt capacity to meet the forest as a living multiplicity—an ever-shifting web of fungi, birds, insects, wind, water, and soil.

Eco-Urban Futures intervenes with a repertoire of "diffractive interfaces," designs that make cuts visible and relational, that invite the forest to speak in scales and tempos not our own. Rather than presenting a single coherent view, these interfaces layer partial, situated, and overlapping stories. Temporal views reveal seasonal rhythms; spatial mappings trace mycorrhizal networks or migratory routes; clusters of entities emerge and dissolve according to their own logics.

The interfaces make their cuts visible, transforming slicing from an act of erasure to an act of relation. Like the skate that conjures ice into liquidity, these interfaces transform division into possibility, showing that cuts are never endings but beginnings of new relations. Through these shifting seams, these multiple cuts, we explore forest futures not as fixed outcomes but as a field of possibilities, each partial, each relational, each alive with the friction of difference. In the end, *Eco-Urban Futures* is not about preserving the forest in one form but cutting with care—knowing that every incision, every interface, is both a break and a bond.

Burning

Fire is where oxygen, fuel, and heat meet. It's a flickering, ephemeral threshold, an interface in motion, ever-changing, ever-consuming. The flame is none of these elements, yet it exists only between them; a vibrant edge that shifts, dances, and stands vertical, pulled upward by gravity's unseen hand. Without gravity, there is no direction, no draw of air to sustain the flame's reaching-against. Here, interface becomes process: not a field of probabilities and tensions but a *transmutation* with no way back. Burning is an act that consumes, transforms, and creates its own conditions, a hunger expanding the interface through contact. Fire extends and embraces yet leaves nothing untouched or unchanged.

Fire leaves traces, the residues of interfacing: clinging soot, lingering heat, filigree ash—thin, weightless remnants of what was. Wildfires, catastrophic yet generative, inscribe their interfaces on the land, charred earth cracked but fertile, holding the seedbeds of forests to come. This is an interface of loss and renewal, ruin and rebirth. But not every ash pit becomes a cradle for life. Fire is indifferent. It moves through, inexhaustible, an interface of consequence, stories written in carbon, legible in the afterglow.

We encounter fire as an interface where the past and future meet in a blaze that leaves nothing unchanged. The *Undoing Gracia*[50] project embodies this parable through a digital conflagration:

50 Grace Leonora Turtle, Elisa Giaccardi, and Roy Bendor, "*Undoing Gracia*: Queering the Self in the Algorithmic Borderlands," *AI & Society* 41 (December 2025): 3649–66, https://doi.org/10.1007/s00146-025-02661-8.

Figure 3
Burning. Interpretation of conflagration pointing at the dynamic, poorly boundaried process of consumption and transmutation, as well as the sooty, ashy residues left behind. Developed by Chiara Andreiuolo using Sora.

an algorithmic burning of identity, memory, and selfhood, embodying the transformative potential of the dynamic unfolding of interfacial processes.

At the core of *Undoing Gracia* lies a digital twin, inhabited by the artist and their two generative agents: Lex and Tortugi, each modeled on the artist's lived experience as a border subject. Like twin flames, they burn through the boundaries of identity—splitting, sparking, and sometimes colliding—expressing divergent and conflicting variations of self. The experiment, spanning four weeks of interaction and one hundred years of simulated time (2023–2123), produced a sprawling 262,596-word simulation log, a scorched archive of recursive performances.

Burning as interfacing, here, is an act that consumes and transforms, where identity becomes fuel for the blaze of algorithmic co-becoming. Lex and Tortugi do not simply replicate the artist; they flare into being through friction and feedback, burning with

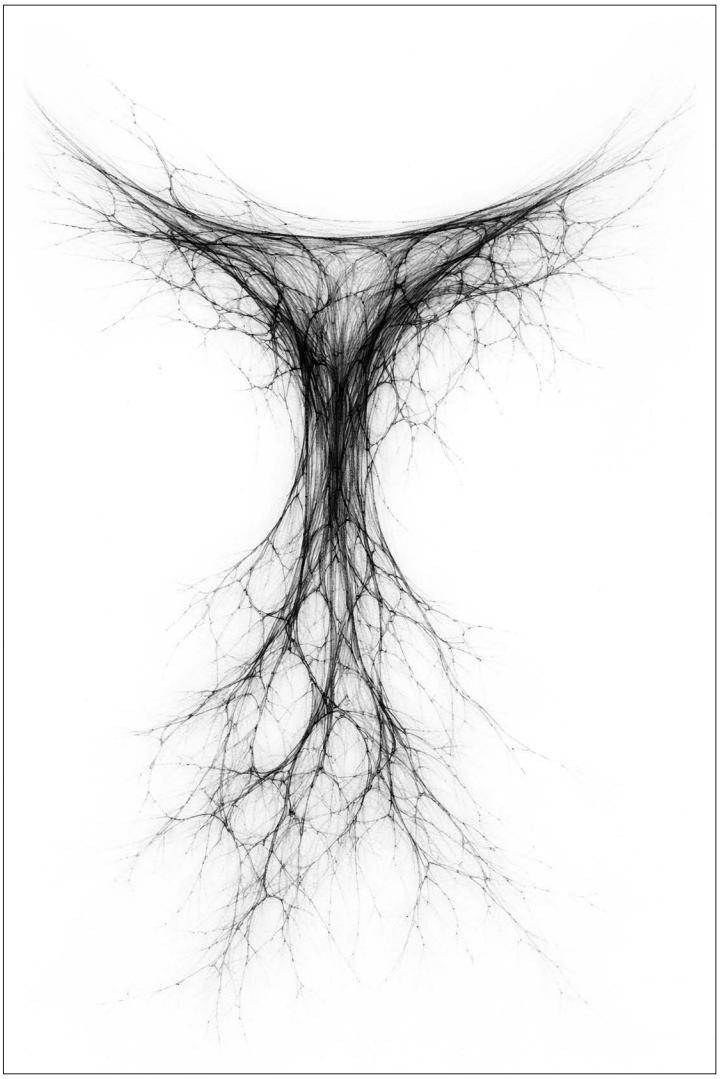

Figure 4
Growing. Interpretation of growth into a medium highlighting exploratory tendrils of tender activity into a complex matrix that co-shapes organization. Developed by Chiara Andreiuolo using Sora.

the unpredictability of emergent patterns. Their exchanges form a flickering interface, one that queers the future by resisting the coherence that predictive technologies so often demand.

The burn leaves traces—dialogue logs as soot, ash in the residual recursive learning, heated intensity in feedback loops. Like a wildfire cracking the earth but scattering the seeds for future forests, *Undoing Gracia* generates new relational potentials from the ashes of stable identity.

This is not a gentle fire. It is consuming and indifferent, pushing identity beyond recognition. Yet, it is also generative, a burning that makes space for the otherwise, for queer futures that ignite within and beyond the borders of human and machine. In these algorithmic borderlands, the self burns but is not extinguished; it becomes something new: raw, flickering, and alive within the embers of its own undoing.

Growing

Where is the point of growth? Zoom in to the tip of a root, working its way into the soil: Currents inside the root carry materials inward and outward, drawing nutrients from the soil, bringing vital force to bear on an area of expansion. Here, the plant is soft, tender, porous, allowing for an outward pulsing alongside the inward transfer, before the softness hardens into skin, into bark. Here, the interface becomes the *living membrane* where external and internal forces meet, reshape each other, and set the conditions for future growth.

Growth is never a given. It is a negotiation between forces, a contingent unfolding that reshapes itself in response to what is encountered, as the interface does its multiple works: fitting to the environment, allowing some things in and others out, stretching and containing simultaneously, offering a blueprint for further development. There is much that could be seen as a choice, or as inevitable: It's a space where they mean nearly the same thing. A root reaches around a rock, and we take it as given by the world. Another root buds into a tendril—no less determined by physics and chemistry, yet more closely tied to the subtle internal dynamics of the plant, to the chemical gradients born of processes set in motion by the activation and transcription of DNA.

Prompting Realities[51] embodies this parable, exploring how AI-infused interfaces might grow, adapt, and shift power away from the center to the periphery—toward humans who shape technology not through predefined systems but at the very edges of their use.

Rather than programming a system, one describes it, constructing its identity and functionality through natural language. Like the soft, elastic tip of a growing root, the AI interface absorbs language, internalizes relational cues, and extends outward, fitting itself into a world that resists seamless integration.

Growth here emerges through recursive engagement. Language becomes not just a command interface but a fertile medium for technological coevolution, where the system adapts not through hard-coded logic but through accumulation, relational attunement, and a porous responsiveness to human improvisation. The AI functions less as an autonomous decision-maker than as a substrate—supporting the slow accretion of shared meaning and understanding. This is an interface that invites entanglement, one that learns through the messiness of interaction, building structures from the recursive exchanges between user and system. It does not dictate futures; it unfolds into them, stretching toward configurations not yet known. Its growth is shaped as much by hidden infrastructural architectures as by human intention, phenotypes forming around code, practice, and platform logics.

Material and conceptual at once, growth is a negotiation between human intent and machinic inference, a shifting articulation of agency that resists stability. Language models fill the space between expression and digital command, becoming more a growth

51 Mahan Mehrvarz, Dave Murray-Rust, and Himanshu Verma, "Prompting Realities: Exploring the Potentials of Prompting for Tangible Artifacts," in *CHItaly '25: Proceedings of the 16th Biannual Conference of the Italian SIGCHI Chapter* (Association for Computing Machinery, 2025), 1–6, https://doi.org/10.1145/3750069.3750089.

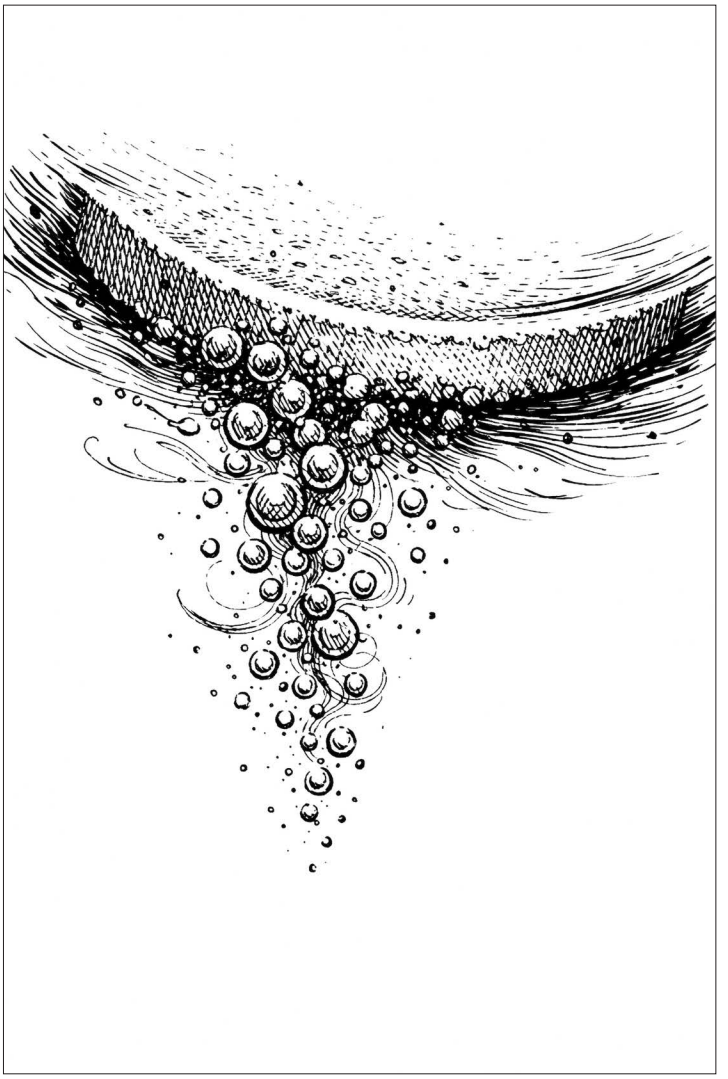

Figure 5
Dissolving. Interpretation of a solid object dissolving in liquid, depicting the bubbling, crumbling exchanges between solid, liquid, and gas, the dynamics of movement around the point of expansion. Developed by Chiara Andreiuolo using Sora.

medium than a conversational partner, a substrate where relations take root. Over time, connective tissue forms, tracing significance across moments, echoing the early play of culture-making, where meaning accrues through repetition and reference.

While all interfaces have historically acquired significance in use through the cultures that form around them, here we glimpse an interface that can grow alongside that significance—not just in human interpretation, but in its own technical unfolding.

Dissolving

Dissolving is the becoming of interface as performance: a gesture of release, where boundaries unravel and wholes weave themselves into new substances, slipping between the molecules of one another. To dissolve is to question quantity. More and less become closer;

weight increases but not volume. The sum is denser than the parts. Dissolving turns an interface into a *field of multiplicity*, where new forms emerge not by separation but by infusion.

At the edge, the play unfolds: the moment an effervescent tablet dissolves into water, bubbles bloom—tiny cosmoses spawned from collision, a three-way dance of solid, liquid, and gas. Gravity comes into play, again, as a structuring force, provoking movements. Each cavity clings to its birthplace, the dissolving tablet, until, gathering enough presence to tear free, it races to the surface where gas surrenders into the air. Yet, absence has power. When enough voids gather, the bubbles pull on the solid, their collective lightness tugging matter upward, weightless forces moving mass away from the earth's hold.

This is an interface that spawns interfaces as it collapses, a cascade of boundaries undone. Around the dissolving tablet, the interface thickens: a halo of gas, a sheath of transformation where solid loses its form and liquid gains new complexity. Like burning, dissolution is another process without reversal—a drop of ink into a pool will never return to the bottle. To dissolve is to surrender to entropy's curve, to dissolve is to rebel against structure itself.

Here, interfacing is not about holding or defining but about yielding, letting forms slip, scatter, and coalesce into something that cannot be contained, only experienced in the becoming.

In the parable of *dissolving*, interface becomes paradox, both emergence and disappearance, both boundary and expanse. The *Everyday Improvisations*[52] project's study of heat pumps echoes this parable, revealing the quiet, unseen dissolutions of scripted technological relations in everyday life. We see how interfaces dissolve out into the everyday, and in turn are infused with activity from the lifeworlds of those around them.

At first glance, a heat pump seems a stoic technology, designed to dissolve into the background, an invisible system that warms homes without thought. Yet, the dissolution here is not into smoothness but into tension. When residents find their home too cold or too warm, they reach not for an interface but for signs: The family cat, curling up where a duct spills the faintest warmth, becomes a living sensor, an interface that reveals gradients unseen.

Through ethnographic research, the study shows how crises—unanticipated breakdowns, misalignments, or unmet expectations—dissolve the illusion of seamless living and, in their collapse, produce new interfaces. Such crises are not failures but opportunities for experimentation, moments that allow residents to reconfigure relationships with technology and each other.

Like ink dispersing into water, these new understandings slip beyond the home. Knowledge diffuses through neighborhoods, as experiences with the heat pump's peculiarities are shared, socialized,

52 Evert van Beek, Elisa Giaccardi, Stella Boess, and Alessandro Bozzon, "The Everyday Enactment of Interfaces: A Study of Crises and Conflicts in the More-than-Human Home," *Human–Computer Interaction* 40, nos. 1–4 (2023): 221–48, https://doi.org/10.1080/07370024.2023.2283536.

and re-formed into collective wisdom. The heat pump, once a closed system, dissolves into the social and technical fabric of everyday life. Designers, too, dissolve into the use phase, their interventions extending beyond formal project end points, entering the ongoing performance of life with technology. In this way, design becomes a practice of *becoming with*—embracing experimentation, adaptation, and resourcefulness among human and nonhuman performers.

Conclusions

We have sketched and drawn out some of the ways we might think about interfaces as the technologies of interfacing shift beneath our feet. At the heart of this inquiry is a fundamental tussle: What does it mean to interface when the interfacing systems come with their own epistemics? How is meaning constructed, how does it circulate, and how do we encounter it through the shifting tides of interfacing?

Throughout, we have touched on ideas that contribute to a view of meaning as plural, futures as pluriversal, and realities as contingent, contextual, and situated. Yet, even as language technologies grow more fluent, creative, and appropriable, their ways of meaning become increasingly detached from the social, parasitic on the cultures that produced the possibility of meaning in the first place. Despite gestures toward algorithmic pluralism,[53] these systems remain largely ignorant of multiplicity. This atomization of meaning can result in an alien estrangement where, as Rob Horning notes, "We give up on what we think the words mean and let the machine process them in alien and opaque ways."[54]

This is not merely a crisis of interfaces but a crisis of meaning itself. Chasms of senselessness and troughs of appropriation threaten to hollow out meaning, rendering it shallow, extractive, or entirely illegible. Yet, as with any crisis, there is also the possibility of renewal—a moment in which new forms of meaning can be forged. Perhaps the future lies with polyglots of the unknown, with interfaces that speak through stories and myths rather than buttons and levers, with technologies that do not extract but entangle.

We hope that articulating some facets of this polycrisis serves as both a sensitization and an invitation: a means of understanding the challenges of ever-dissolving technology but also a provocation toward new ways of interfacing. At the same time, we see the parables of interfacing as seeds, fragments of possibility that might help us imagine ways beyond the text box, beyond the rigid constraints of control and command. These parables, if anything, serve as tools for thinking differently: about interfaces that float, cut, burn, grow, and dissolve as they tangle with the worlds around them in ways yet unknown.

And yet, we write with the awareness that imagination is never entirely neutral. History shows how visions of the "new" can be drawn into systems that constrain as much as they liberate, and how aspirations can shift in meaning as they take shape in the

53 Shomik Jain, Vinith Suriyakumar, Kathleen Creel, and Ashia Wilson, "Algorithmic Pluralism: A Structural Approach to Equal Opportunity," in *FAccT '24: Proceedings of the 2024 ACM Conference on Fairness, Accountability, and Transparency* (Association for Computing Machinery, 2024), 197–206, https://doi.org/10.1145/3630106.3658899.

54 Rob Horning, "Practico-Inertia," *Internal Exile*, Substack, March 1, 2024, https://robhorning.substack.com/p/practico-inertia.

world. The challenge, then, is not to let go of imagination as a force for possibility, nor to remain in critique alone, but to hold the two together. The projects we have described retain this holding-together. Speculative and critically hopeful, they open spaces for imagination while grounding themselves in situated, accountable, and relational practices. With such projects as blueprints, we can work toward interfaces that remain attentive to the complexities of the present while staying open to the trouble and promise of what is still to come.