ARTISTS' ARTICLE

From Data Doubles to Data Demons

Reflections on a CripTech Collaboration

LAURA FORLANO AND **ITZIAR BARRIO**

ABSTRACT

This article describes a collaboration between the authors around a series of robotic sculptures that were created by Barrio with data from Forlano's "smart" insulin pump and sensor system. Forlano, a type 1 diabetic for over 10 years, expands upon previous writing about her experience as a "disabled cyborg." As CripTech art, the robotic sculptures, discussed here as *data demons*, complicate and expand contemporary discourses on artificial intelligence and design. By engaging themes such as data as labor, data as material, and data as relations, this article ultimately argues that both people and technologies are disabled.

Dressed in black from head to toe, I (Forlano) pause just outside of Smack Mellon (Fig. 1 and Color Plate A), a gallery in the DUMBO neighborhood of Brooklyn, NY, on a Saturday evening in mid-March to take a photo.

ON VIEW
March 11–April 23, 2023

GALLERY ONE
Itziar Barrio
did not feel low, was sleeping

reads the white lettering on the window [1]. The artist (coauthor Barrio) and I met about three years earlier in September 2020 through the New Museum's NEW INC art and technology incubator event that was held over Zoom. Throughout the early months of the pandemic and the subsequent few years, we have met about once a month, often outside on cold winter days, to talk about cyborgs, artificial intelligence, the posthuman, and Legacy Russell's *Glitch Feminism*, which was just published in 2020. Russell, writing about the performance artist boychild, describes a "cyborgian turn" in which "the artist intentionally embodies error, a sort of system-seizure that borrows from the machine in an AFK [away from keyboard] resistance"[2].

Laura Forlano (social scientist, design researcher), Art + Design and Communication Studies at the College of Arts, Media and Design, Northeastern University, U.S.A. Email: l.forlano@northeastern.edu. ORCID: 0000-0002-3997-7180.

Itziar Barrio (interdisciplinary artist), U.S.A. Email: itziarbarrio@gmail.com. **Web: http://www.itziarbarrio.com/**

See https://direct.mit.edu/leon/issue/57/2 for supplemental files associated with this issue.

DISORIENTATIONS AND DISABILITY

Now, back on the corner in DUMBO, I am immediately disoriented. I step into the already-crowded gallery. It is 6 p.m., the exact time of the exhibition's formal opening to the public. I have been to the gallery only once before, about 20 years earlier. During that earlier visit, I participated in the installation of the gallery's Wi-Fi network as a doctoral student at Columbia University, when I began studying the relationship between technology and society. Now, for the first time, I enter the gallery as a "disabled cyborg," a term that I use as an identity as well as to argue that both humans and technologies are disabled [3,4]. For the past 10 years of my life as a type 1 diabetic, I have used an insulin pump and sensor system to "manage and control" my blood sugar, a topic that I have written about frequently as a way of understanding what it means to live with machines [5–7].

In fact, as I write this piece, I am "plugged in"—I am charging my computer, my cell phone, and my "smart" insulin pump at the same time; all of them require electric power to operate. After about 30 minutes of charging, I'm now powered at 100%, meaning that I can get up from the couch, which is close to the power strip, to get my notebook to continue writing. While the pump powers relatively quickly and I have never completely drained the battery (unlike those of my cell phone or 13-year-old Mac PowerBook), I'm constantly aware that forgetting my charging cable while traveling or a 24-hour blackout might result in a life-or-death emergency. Such is life as a disabled cyborg.

Disability is an important lens through which to view art and design, as well as technologies that depend on data, software, and computing, such as AI. These technologies are enacted as social and political infrastructures, both constraining and supporting our aspirations toward futures that embrace heterogeneity and human difference [8–10]. With respect to art, in 2010, Tobin Siebers defined disability aesthetics as "the presence of disability in the tradition of

 https://doi.org/10.1162/leon_a_02488

Fig. 1. Itziar Barrio, *did not feel low, was sleeping*, solo exhibition, 2023 (Smack Mellon, New York City). Gallery entrance opens to a visitor seated on a bench facing a large screen, with the wall vinyl to their left. Barrio draws the exhibition's title from collaborator Laura Forlano's annotated data, which are also printed on one of the robotic sculptures. (© Itziar Barrio. Photo: Etienne Frossard.)

aesthetic representation" and "a unique resource discovered by modern art and then embraced by it as one of its defining concepts," writing that it "embraces beauty that seems by traditional standards to be broken, and yet it is not less beautiful, but more so, as a result" [11].

While disability aesthetics might be found in work by disabled and nondisabled artists, CripTech art deliberately centers disabled people as "knowers and makers," building on the definition of "crip technoscience" by Aimi Hamraie and Kelly Fritsch. Crip technoscience bridges "crip theory," with its affirmative understanding of disability as an asset, and feminist technoscience, with its belief in the value of both knowledge and practice. In addition to crip knowing/making, their Crip Technoscience Manifesto outlines commitments to "access as friction," "interdependence as a political technology," and "disability justice" [12].

A CripTech approach to thinking about and working with data, software, and computation resists reductionist, universalist, and solutionist impulses that assume that dematerialization or the collection of more and more data about the world (sometimes referred to as "big data" and "data doubles") will lead to a greater and more perfect understanding of the world, a longstanding belief in computer science and engineering [13–15]. CripTech questions these assumptions—instead valuing imperfection, uncertainty, and friction—while paying attention to the material work of access and care, the importance of small and thick datasets that are situated and local, and the ways in which disabled people must work against individualism by cultivating communities of mutual aid and interdependence. With respect to current discourses around AI, disability scholar Louise Hickman writes that "Crip AI" explores "the potential to train data sets to make space for transgression, dissent, and refusal" and "interrogates the utility of artificial intelligence and data driven systems from outside a horizon set by the promises of tech solutionism" [16].

Along these lines, I have argued elsewhere that disability and technology are complementary in that both humans and technologies are, by definition, disabled [17]. Similarly, human-computer interaction scholar Rua Mae Williams writes that "all robots are disabled," referring to the ways in which robots are continually measured against and fail to achieve human capabilities [18]. These lines of argument are essential for countering current (incorrect and misleading) narratives and metaphors about technology. CripTech art is a vital practice for rehearsing and demonstrating alternative narratives and, importantly, the ways in which the world might be designed otherwise.

Back in the gallery, I move past a bench where several people, including a few friends, are watching a video that is part of the more than seven years of Barrio's work assembled in the gallery for the solo show (Fig. 2). I walk toward a corner of the gallery where a few of the works that I recognize are installed. Many people are bending over to peer at the text on the circuit board that powers the piece, which is mounted on the wall. The text reads:

> Day 29—July 29
>
> 2:25am Auto Mode max delivery. Auto Mode has been at maximum delivery for 4 hours. Enter BG to continue in Auto Mode. [Auto mode cannot do a dual bolus and cannot be at max delivery for more than 4 hours, this wakes me up because it cannot make it through the night without alerting me]
>
> 2:25am BG required
>
> 3:57am BG required
>
> 10:25am Calibrate now
>
> 12:01pm Lost sensor signal
>
> 6:30pm Alert on low
>
> 10:40pm Calibrate now

I'm once again disoriented. You see, I remember those nights in July 2019, the nights when I "did not feel low, was sleeping." But now my data, my field notes, my experiences,

Fig. 2. Itziar Barrio, *did not feel low, was sleeping,* solo exhibition, 2023 (Smack Mellon, New York City). Gallery view of 3 large screens mounted at different angles, flanked on the right by pedestals and a bench with sculptures. (© Itziar Barrio. Photo: Etienne Frossard.)

and even my self have been transformed. They are still recognizable to me *as me* but they have also traveled and been transmuted, reaching other people, other times, and other places altogether.

Beyond my own experience, I wonder about my multiple roles in the project, blurring between subject and object: as an expert, a collaborator, a subject, a data source, or maybe even a kind of "digital muse." While autoethnography, autotheory, crip theory, and art are generally comfortable with these complex identities, they often complicate the usual categories around authorship in existing institutions such as universities, news media, and art galleries [19]. My disability, my (academic) labor, and my data all play a role in bringing these sculptures to life in the gallery through subtle movements such as twisting/writhing and inflating/deflating. The sculptures both offer new intimacies with my disability, my data, and my experiences and, at the same time, invite me to gain some critical distance from the experience of sleep deprivation—the result of a specific design of my insulin pump and sensor system at the time—that dominated much of my life during the years 2018–2022. Yes, the sculptures are somehow me but, at the same time, *very much not me*.

DATA DOUBLES AND DIGITAL SELVES

Current discourses about computing are fixated on the ways in which data about people, things, and places in the world create "data doubles," "digital twins," "digital doppelgangers," and "proxies" that stand in as representations of humans for the purposes of simulation, replication, and extraction (often to realize a profit) [20]. With respect to health and medical data related to type 1 diabetes, doctors and device manufacturers use patient data from devices such as insulin pumps and sensor systems to better understand health conditions as well as to improve the design of medical technologies and treatments. Data—about individuals as well as in the aggregate—must stand in as proxies, legible understandings of what is going on in the world for the purpose of building knowledge (and turning that into new products and increased profit), raising critical questions about privacy, surveillance, and control.

Recent work by social science and humanities scholars aims to both understand as well as complicate these accounts about the role of data in the world. Media and technology historian Dylan Mulvin writes: "Proxies function as the necessary forms of make-believe and surrogacy that enable the production of knowledge. . . . To interrogate the use of proxies is to ask: *to whom or to what do we delegate the power to represent the world?*" [21].

As a disabled cyborg, I experience mediation of access to the data of my "smart" insulin pump and sensor system through a number of different applications on my phone. This allows me to access my own data but also allows my doctor to access it, as long as I am willing to share the 24/7 data flows with the companies that manufacture the devices. The system is considered "smart" because an algorithm is entrusted with making small dynamic adjustments in the amount of insulin delivered to my body 24 hours a day. The data that is essential for the system to work is sensor data that measures my blood glucose (BG) as a number. But the system is not completely automatic; the software still cannot, for example, *guess* what a person is eating for lunch. Type 1 diabetics are always intimately and actively engaged with the work of keeping the system running—inputting data about carbohydrates, interpreting data about BG, refilling insulin cartridges, and charging the devices.

Proxies are only representations or models of the world; *they are not actually the world.* We can never be reduced to our data. Yet we must acknowledge that *data is designed* by human engineers in ways that shape what is represented and seek to understand how those representations shape our own experiences and relationships to ourselves, referred to by social scientists as "data selves," "digital selves," and "digital others" [22–25]. These terms emphasize mutual construction (or the ways in which we shape our data and our data shapes us). At a recent workshop at Data & Society,

an independent nonprofit research organization, scholars engaged questions such as:

> How do our digital doubles allow us to know ourselves and each other? What questions do they raise about representation, authenticity, and impersonation? How are the doppelgangers extracted from us, constructed, and used in ways that go against our own interests? How might we construct our doubles in desirable ways, and how might we perform them for algorithms? In what ways do these digital doubles have the capacity to help or hurt our offline selves? How are digital doppelgangers involved in the ways power, surveillance, and control are exercised? [26]

Social science and humanities accounts of data and computing—known as critical data studies—investigate the ways in which data is inherently local, contextual, situated, "cooked" (rather than raw), political, and infrastructural [27–30]. Social imaginaries about AI—the stories that we tell about computing and the metaphors that we use—rarely acknowledge these perspectives. Living with these devices as well as with our data selves reveals a reality that is more complex, rife with error and betrayal—the human body, especially the disabled body, always spills out of the spreadsheet. Humans will never be fully computable, despite the allure of the latest science fiction film or news headline. Art (and design) have a distinct role to play in these conversations as artists and designers engage more directly and generatively with data and computing as materials and methodologies in their work. As such, artists and designers participate in *critical data making* in a wide range of forms, including data physicalization [31–33].

We have discussed these themes frequently over the past few years, with me drawing on my expertise in the social studies of technology as well as living with a difficult disease and, perhaps, an even more difficult device, and with Barrio excited about the generative potential for the practice of art that she explored in a subsequent project using an early version of ChatGPT.

While I may seek a certain kind of legibility in my writing about this experience as a social scientist, engaging with this topic through conceptual art has a very different purpose. Social scientists seek to make compelling arguments about the ways in which the world functions or fails to function, often studying the dynamics around well-known demographic categories such as gender, race, and class. In doing so, it is important to draw on relevant scholarship, to explain phenomena accurately and clearly, and to make one's theoretical and/or methodological allegiances clear so that others can follow your line of thinking (and, one hopes, cite your work in the future). In contrast, conceptual art might more likely be abstract or obscure, while at the same time maintaining an openness about its aims, thereby allowing for a wider range of possibilities, questions, and perspectives to come into view.

One summer day, we sat on a bench in Tompkins Square Park while I took out a resealable bag full of plastic parts that I had been collecting for several weeks. I slowly and carefully took out each piece of the system—lancets, test strips, inserters, plastic waste—and demonstrated what it meant to calibrate the sensor system and, for example, how the tubing was inserted into my body every three days. While I was excited about the prospect of realizing the robotic sculptures, I was particularly intent on the critique of these systems, given my experience of four years of sleep deprivation. I had upgraded to the "smart" version of the system in January 2018, a system that required frequent human calibration to ensure its accuracy. I've come to understand my experience as evidence of the real-world impact of AI harms today amid the breathless promises of the AI future. However, in the case of the robotic sculptures, my disabled cyborg body had given life to a new kind of body, a body of work by an artist.

DID NOT FEEL LOW, WAS SLEEPING

Barrio's work has been described as uncanny, multilayered, and mysterious. When I visited her studio at the Clemente Center in December 2020, her choice of materials and sculptural forms suggested an alternative way of thinking about computing. Black spandex hanging on the wall—taken from her own wardrobe—illustrated a recognizable feminist bent, and concrete sculptures communicated an obvious materiality connected to themes around labor, care, and infrastructure (in contrast to the dematerialization prevalent in popular discourses around computing and "the digital") (Fig. 3). Barrio embraces these themes in her work as a resistance to more didactic forms as well as a problematization of simplistic binary categories such as human versus machine, digital versus physical, nature versus culture, etc.

Fig. 3. A pedestal features Itziar Barrio's sculpture *Laying your eyes on me* (2023) composed of concrete, metal, and spandex. Barrio's concrete creations communicate a materiality connected to labor, care, and infrastructure. (© Itziar Barrio. Photo: Etienne Frossard.)

Fig. 4. *Through the night* (2023) is a sculptural object placed on the gallery floor; it is powered by a servo motor that twists spandex at different angles. (© Itziar Barrio. Photo: Etienne Frossard.)

In the press release coauthored with us about the exhibition, curator Rachel Vera Steinberg writes:

> the sculptures invoke desire and an uncanny sense of bodily intimacy through their subtle mimicry of human forms and movements. The title further divulges the exhaustive toll of capitalist labor systems on the body by machines that are increasingly essential for human survival. Following a blurring of boundaries between humans and machines, mechanistic behaviors are internalized into bodily functions as we continuously adapt to technological upgrades [34].

For example, in the piece *through the night* (2023), Barrio worked with programmer Josh Corn to translate 33 days of my "alert and alarm" data into a 30-minute loop in order to power a servo motor that twists spandex at different angles (Fig. 4). The concrete organic forms speak honestly about the process of their making, as one can observe plastic textures reminiscent of lighting filters. The wrinkles and folds in the spandex reflect those in the concrete, not making clear at first sight which materials might move. The movements are subtle, uncanny, and sexy at times.

To me, the twisting of the spandex recalls the writhing of my own sleepless body after many months of sleep deprivation that I experienced as a disabled cyborg using a "smart" insulin pump that required constant human labor in order to function, even in the middle of the night, as my recent writings have illustrated.

In another piece, *while driving to vacation* (2023) (Fig. 5), pumps inflate and deflate, echoing the quiet inhalation and exhalation of human lungs, sometimes imperceptible amid the buzz of everyday life. But, once again, at night in a dark bedroom, these sounds and sensations become ever more noticeable. The inflation and deflation of the three pairs of spandex leather pants—cut below the waist—are choreographed based on the material's qualities, the time they take to inflate and deflate, and the sounds they make. They do not follow a specific dataset; in this case, Barrio programmed the movement by listening and attending to the material's qualities. The movement takes place in the crotch area of the pants.

In May 2023, one month after the closing of the exhibition, Barrio and I finally sat down to discuss what we had learned from the collaboration. While the sculptures may be cryptic, they are powerful examples of CripTech art around four specific themes: data demons, data as material, data as labor, and data as relations.

DATA DEMONS

The robotic sculptures are decidedly not didactic "data doubles" but rather, while they contain traces or echoes of the human and the machine from which they are derived, they are by design abstract, obtuse, illegible, and even somewhat monstrous (a theme that has been critically and creatively engaged by science and technology studies scholars, queer theorists, and artists—including disabled artists) [35–37]. In her memoir *Golem Girl*, disabled artist Riva Lehrer writes, drawing on Latin etymology, "*Monstrum monstrare.* Monsters reveal. They strip away our assumptions about reality and unveil the fears of our era. Disability is the great billboard of human truth. Add it to any discourse, and we can see what humanity truly values" [38]. Lehrer interprets the novel *Frankenstein* as a story of "a disabled child and its parent." Aesthetically, the robotic sculptures are monstrous in that they challenge traditional notions of beauty and perfection in line with disability aesthetics. Using *Frankenstein* as a cautionary tale about the relationship between technology and society, anthropologist and philosopher Bruno Latour writes that we should *love our monsters* by taking responsibility for the technologies that we bring into the world. Ethically, the subtle movements of the robotic sculptures are monstrous in that they engage technology not in order to introduce efficiencies (as is typical in discourses around automation) but rather to take our gaze away from the screen as well as to deliber-

Fig. 5. *While driving to vacation* (2023) is a wall and floor installation of pumps that inflate and deflate three pairs of spandex pants; the pumps are connected to wires and tubes attached to the wall. (© Itziar Barrio. Photo: Etienne Frossard.)

ately slow us down and ask us to notice the world around us. Drawing on the work of feminist science and technology studies scholars Donna Haraway and Susan Leigh Star, sociologist John Law introduces his book *A Sociology of Monsters,* about technology and power—specifically, presenting sociotechnical, heterogeneous, and nonreductionist accounts of inequality—with a call for "hopeful monsters," writing, "We are *all* monsters, outrageous and heterogenous collages" [39]. Politically, the robotic sculptures, with their engagement with data, computation, and disability, are monstrous in that they invite questions about the relationship between society and technology as well as the nature of human agency and human difference. The philosopher Paul Preciado takes up the theme of monsters with respect to the transgender body: "The monster is one who lives in transition. One whose face, body and behaviors cannot yet be considered true in a predetermined regime of knowledge and power. . . . To transition is to come to a machinic arrangement with the hormone of some other living code—the code may be a language, a music, a gesture, a plant, an animal or another living creature" [40]. Philosophically, the robotic sculptures are monstrous in that they live at the intersection of digital and physical and their movements are drawn recursively from traces of both human and machine data. Similarly, South Korean artist Lee Bul's *Cyborgs and Monsters* series juxtaposes high-tech cyborgs with lumpy organic monsters [41].

Fig. 6. Barrio's *was on low* (2023) is a robotic concrete sculpture placed on the floor and interlaced with wires; Forlano's insulin pump data is overlaid in a black circuit board on top. (© Itziar Barrio. Photo: Etienne Frossard.)

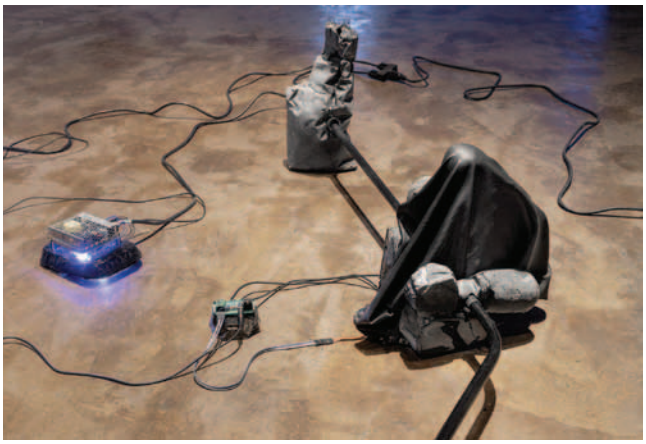

Fig. 7. *Calibrate now* (2023) is another spandex-covered robotic sculpture that incorporates Forlano's insulin pump data that connects to a custom circuit board and LED lights on the floor. (© Itziar Barrio. Photo: Etienne Frossard.)

Ultimately, in this project, the robotic sculptures argue that society must resist its systematic reduction into datasets and, rather, experimentally engage with other possibilities of a life with machines. Just as I was disoriented in the gallery—not knowing my place or position, so to speak—art must continually serve to disorient, to lay out other paths, new meanings, different questions, and alternative practices. Rather than "data doubles," the sculptures are *data demons*, animating these diverse and devious modes of understanding computing. Barrio's film *A Demon that Slips into Your Telescopes While You're Dead Tired and Blocks the Light*, included in the same exhibition, uses the theme of the demon to discuss "specters and substances to demarcate the potentials and limits of human sensing" [42].

The robotic sculptures, viewed through the lens of disability, are no strangers to these discourses, yet they have a very different aim as conceptual art. They are at home among disabled cyborgs. Derived from my data, they are not merely doubles; *they are kin* [43]. As CripTech art (Figs 6 and 7), the sculptures, in their imperfection, embrace the understanding that disability is an expansion of what it means to be human and that resisting a politics of extraction and exploitation is a humanizing gesture. Making art with data can expand and deepen our relationships with ourselves, with our machines, and with each other.

DATA AS MATERIAL

Rather than prioritizing scale and quantity through an imperative toward the collection of "big data" (for the purpose of profit), art can engage with *small and thick* data—situated, local, and contextual ways of meaning-making [44]. The sculptures engage with my *data as material* in two ways: first, as data that instructs the movements of the sculptures, and second, as text printed on the circuit boards. The data that drives the robotic sculptures as well as the text on the circuit boards consists of "alert and alarm" data from my "smart" insulin pump and sensor system. It includes both information about my blood glucose (BG), e.g. "Alert on low," and information about the needs of the machine, e.g. "Calibrate now."

Fig. 8. Itziar Barrio, *Artefact II,* 2023. A framed shadow box of Forlano's insulin data hangs on the wall. It contains white lettering etched on a black circuit board, which presents the data as both text and material. (© Itziar Barrio. Photo: Etienne Frossard.)

The material choices—spandex, concrete, tubing, pumps, and data—convey a CripTech aesthetic. The spandex is from Barrio's own clothing, giving it a direct relationship to the body. The concrete—unlike the glossy, rectangular surfaces of the latest Apple products that are intentionally designed to disappear into the background of everyday life—is stubbornly materialist: heavy, misshapen, and permanent. The tubing and pumps are reminiscent of the actual tubing and pump that I use.

The data, used both as material and as text, complicates the traditional categories used on wall labels in galleries and museums. Specifically, these labels typically contain information only about materials, such as wood or glass, acrylic or pastels, in addition to the date, dimensions, provenance, and author (Fig. 8). For the robotic sculptures, the data is material that requires specific details to be listed on the labels; for the static sculptures, the data is considered as text and, as such, provenance is not required.

DATA AS LABOR

The sculptures make evident the multiple forms of (mainly invisible and uncompensated) labor—by disabled people, by artists, and by society—that are required in a world with AI, data, and machines. As a disabled cyborg, I was woken in the middle of the night many times to care for the machines, the stories of which are told by the text inscribed on the circuit boards. The following questions serve to break down and trace the ways in which data is made (rather than found) [45]. *Who decided that it was acceptable or desirable to wake up disabled cyborgs many times per night in order to calibrate the machine?* As autoethnographer, I have carefully transcribed, annotated (and not simply downloaded automatically), and coded that same data to make it useful for the project. *Who has access and how does one get access to the data?* As expert, I explained the significance of the data in the context of recent debates about computing. *Who is able to build new knowledge with these datasets?* At one point, Barrio hung the 8-½-by-11 sheets with the data around her studio. *In what way does the data itself become an actor or an environment for creative work in the studio?* Barrio and Corn printed the data onto circuit boards and translated the data into software to control subtle movements. *Who can generate new relations with these datasets?* Barrio installed the sculptures along with seven years of work in the gallery. *Who gets to participate in spaces that afford a critical and creative mode of exploring questions around data and AI?* Then, as audience, I entered the gallery in mid-March and was again disoriented.

DATA AS RELATIONS

It is similar in the gallery, notes Barrio, observing that the sculptures must be tested and tweaked in response to the size of the spaces where they will be exhibited. What works in the artist's studio may not work in a gallery filled with people. Thus, the pieces require attention and care in order to perceive the movements both by the artist during the installation process and by the audience in experiencing the work. This is because installation artworks are dynamic in that the individual pieces take on meanings in relation to one another in a nonlinear narrative. The robotic sculptures will never be exhibited in exactly the same way in the same space again, echoing the importance of *relationality* as a posthuman or more-than-human expression of living with machines [46–47].

A NOTE ON CRIPTECH AUTHORSHIP

One tension that emerged through the collaboration was around the incommensurability between the open and generous spirit of the project and the requirements of the solo show, which celebrates individual accomplishment. As referenced above, with respect to the question of CripTech access as well as public understanding of the artworks, it is important to consider what details are included in the description of the works. The use of data complicates authorship of the sculptures, because while the sculptures are considered collaborative works, artists and scholars (with the exception of certain disciplines and fields) are still often evaluated primarily in terms of single authorship. As such, the de facto forms of attribution that are typical of a solo show do not make room for collaborative works of this kind. Yet despite a general alignment and agreement on the nature of the collaborative works and their placement in the solo show, these tensions were not explicitly clear until after the works were installed in the gallery.

A CripTech approach to authorship might reveal an emphasis on a politics of generosity, mutual aid, and solidarity, which are often emphasized and practiced among disabled people and in disability activism [48]. For without each other, we might actually die. Both scholarship and art still have much to learn from disability.

CONCLUSION

To revisit some of the traces of this discussion on narratives about AI, data, and computing, if corporate data doubles are dehumanizing representations and *extractions*, and sociological digital selves are ways of reinterpreting and reclaiming our relationship to our data (as a *mutual shaping*), then sculptural data demons, as both cryptic and CripTech art, are further *expansions* of what it means to be human: They *disturb and disorient*; they use (small and thick) *data as material*; they attend to the *labor and care* of disability, of machines, and of art practice; and, they are *relational* and *interdependent* as an installation rather than as individuals.

In closing, if we accept Leah Lakshmi Piepzna-Samarasinha's proposition that *The Future Is Disabled* or that the majority of people will be disabled in the future and that this might actually be a good thing, we can begin to build a society that does not seek solace in ableist narratives around human perfection [49]. CripTech art challenges the myths of universalism and perfectionism along with our related obsessions with dematerialization (turning everything into data while ignoring who is doing data work), scale (collecting as much data as possible), and solutions (fixing disabled bodies with technology). The data demons in this project remind us that it is not only humans but also technologies that are disabled, offering a hopeful way of caring for our monsters, a crip future that is worth working toward.

Acknowledgments

We thank the New Museum's NEW INC art + technology incubator for creating a space for interdisciplinary connections that allowed us to meet in 2020, a period of both greater difficulty in finding opportunities for collaboration and, in some ways, greater receptivity to spontaneous, organic projects such as this one. We also recognize Northeastern University for supporting this research.

References and Notes

1 This article is written in the voice of the disabled cyborg. Forlano's autoethnographic vignettes throughout the article are in *italics*.

2 L. Russell, *Glitch Feminism: A Manifesto* (London: Verso, 2020).

3 L. Forlano, "Data Rituals in Intimate Infrastructures: Crip Time and the Disabled Cyborg Body as an Epistemic Site of Feminist Science," *Catalyst: Feminism, Theory, Technoscience* **3**, No. 2, 1–28 (2017).

4 L. Forlano, "Living Intimately with Machines: Can AI Be Disabled?," *interactions* **30**, No. 1, 24–29 (2023).

5 L. Forlano, "Hacking the Feminist Disabled Body," *Journal of Peer Production* **8** (2016).

6 L. Forlano, "Maintaining, Repairing and Caring for the Multiple Subject," *continent* **6**, No. 1, 30–35 (2017).

7 L. Forlano, *The Danger of Intimate Algorithms* (Public Books, 2020).

8 L.L. Piepzna-Samarasinha, *The Future Is Disabled: Prophecies, Love Notes and Mourning Songs* (arsenal pulp press, 2022).

9 R.M. Williams, *All Robots Are Disabled* (IOS Press, 2023).

10 L. Winner, "Do Artifacts Have Politics?," in *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (University of Chicago Press, 1986).

11 T. Siebers, *Disability Aesthetics* (Ann Arbor, MI: University of Michigan Press, 2010).

12 A. Hamraie and K. Fritsch, "Crip Technoscience Manifesto," *Catalyst: Feminism, Theory, Technoscience* **5**, No. 1, 1–33 (2019) pp. 7, 10, 12.

13 E. Finn, *What Algorithms Want: Imagination in the Age of Computing* (Cambridge, MA: MIT Press, 2017).

14 P. Dourish, *The Stuff of Bits: An Essay on the Materialities of Information* (Cambridge, MA: MIT Press, 2017).

15 D.K. Rosner, *Critical Fabulations: Reworking the Methods and Margins of Design* (Cambridge, MA: MIT Press, 2018).

16 L. Hickman, "Crip AI," in *Chimeras: Inventory of Synthetic Cognition,* I. Manouach and A. Engelhardt, eds. (Onassis Foundation, 2022).

17 Forlano [3].

18 Williams [9] p. 229.

19 L. Fournier, *Autotheory as Feminist Practice in Art, Writing, and Criticism* (Cambridge, MA: MIT Press, 2021).

20 D. Gelernter, *Mirror Worlds: Or: The Day Software Puts the Universe in a Shoebox . . . How It Will Happen and What It Will Mean* (Oxford Univ. Press, 1993).

21 D. Mulvin, *Proxies: The Cultural Work of Standing In* (Cambridge, MA: MIT Press, 2021).

22 J. Cheney-Lippold, *We Are Data* (New York Univ. Press, 2017).

23 C. Koopman, *How We Became Our Data: A Genealogy of the Informational Person* (University of Chicago Press, 2019).

24 K.D. Haggerty and R.V. Ericson, "*The Surveillant Assemblage*," *The British Journal of Sociology* **51**, No. 4, 605–622 (2000).

25 D. Lupton, *Data Selves: More-than-Human Perspectives* (Cambridge, U.K.: Polity, 2020).

26 "Digital Doppelgangers: A Workshop on Our Digital Others" (2023): www.datasociety.net/library/digital-doppelgangers/.

27 Y.A. Loukissas, *All Data Are Local: Thinking Critically in a Data-Driven Society* (Cambridge, MA: MIT Press, 2019).

28 L. Gitelman, ed., *"Raw Data" Is an Oxymoron* (Cambridge, MIT Press, 2013).

29 D. Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* **14**, No. 3, 575–599 (1988).

30 C. D'Ignazio and L.F. Klein, *Data Feminism* (Cambridge, MA: MIT Press, 2020).

31 M. Ratto, "Critical Making: Conceptual and Material Studies in Technology and Social Life," *The Information Society* **27**, No. 4, 252–260 (2011).

32 S. Huron et al., eds., *Making with Data: Physical Design and Craft in a Data-Driven World* (A K Peters, Ltd./CRC Press, 2021).

33 D. Offenhuber, "What We Talk About When We Talk About Data Physicality," *IEEE Computer Graphics and Applications* **40**, No. 6, 25–37 (2020).

34 I. Barrio, *did not feel low, was sleeping*, Smack Mellon, Brooklyn, NY (2023).

35 J. Law, ed., *A Sociology of Monsters: Essays on Power, Technology, and Domination* (Routledge, 1991).

36 R. Lehrer, *Golem Girl: A Memoir* (One World, 2021).

37 H.M. Collins and T. Pinch, *The Golem: What You Should Know about Science* (Cambridge Univ. Press, 1998).

38 Lehrer [36].

39 Law [35] p. 18.

40 P.B. Preciado, *Can the Monster Speak?: Report to an Academy of Psychoanalysts*, F. Wynne, trans. (Cambridge, MA: MIT Press, 2021) pp. 41–42.

41 S. Rosenthal, *Lee Bul: Crash* (Walther König, 2018).

42 Barrio [34].

43 D.J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, NC: Duke Univ. Press, 2016).

44 T. Wang, "Big Data Needs Thick Data," *Ethnography Matters* **13** (2013).

45 Gitelman [28].

46 R. Braidotti, *The Posthuman* (Boston: Polity, 2013).

47 L. Forlano, "Posthumanism and Design," *She Ji: The Journal of Design, Economics, and Innovation* **3**, No. 1, 16–29 (2017).

48 Hamraie and Fritsch [12].

49 Piepzna-Samarasinha [8].

Manuscript received 26 June 2023.

LAURA FORLANO, *a Fulbright award–winning scholar, is a writer, social scientist, and design researcher. A professor of Art + Design and Communication Studies in the College of Arts, Media and Design at Northeastern University, she is the author (with Danya Glabau) of* Cyborg *(MIT Press, 2024) and coeditor of* Bauhaus Futures *(MIT Press, 2019),* digitalSTS *(Princeton Univ. Press, 2019), and* From Social Butterfly to Engaged Citizen: Urban Informatics, Social Media, Ubiquitous Computing, and Mobile Technology to Support Citizen Engagement *(MIT Press, 2011). Forlano has served as a mentor with the New Museum's NEW INC art + technology incubator since 2018.*

ITZIAR BARRIO *is an interdisciplinary artist working in the intersections of art, film, and technology. Her long-term research-based projects including different collaborators have been shown internationally at art institutions and events including the 14th Shanghai Biennale, PARTICIPANT INC (NYC), MACRO (Rome), MACBA (Barcelona), Museum of Contemporary Art (Belgrade), Museo del Banco de la República (Bogotá), Salzburger Kunstverein (Salzburg), and the Havana Biennial. Barrio was a 2018–2019 Spanish Academy in Rome Fellow and has been a member of the New Museum's NEW INC incubator since 2020.*

COLOR PLATE A: **FROM DATA DOUBLES TO DATA DEMONS: REFLECTIONS ON A CRIPTECH COLLABORATION**

Itziar Barrio, *did not feel low, was sleeping,* gallery entrance, solo exhibition, Smack Mellon, NYC, 2023. (© Itziar Barrio. Photo: Etienne Frossard.) (See the article in this issue by Laura Forlano and Itziar Barrio.)