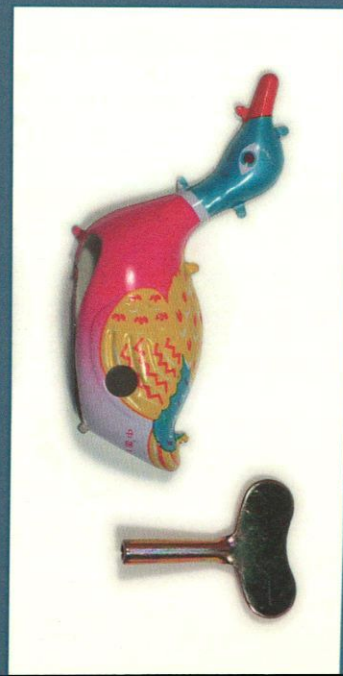
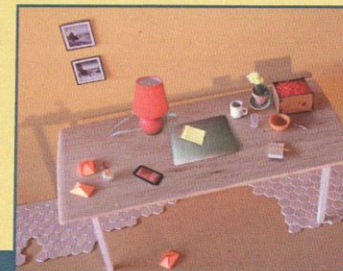
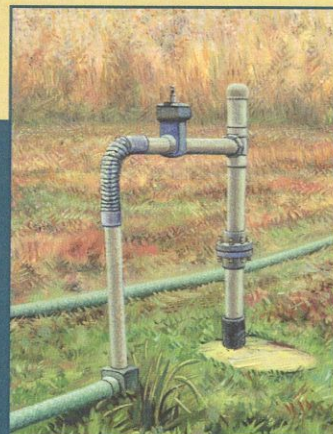
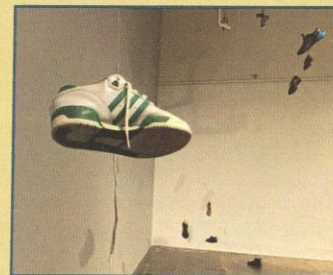
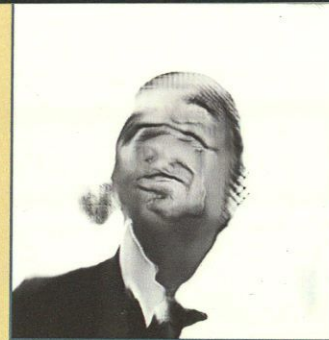


PULLED APART



Terry Berlier, Adam Chin, Cynthia Hooper,
Carrie Hott, and Gail Wight

Introduction

When we at the Thacher Gallery first announced a focus on systems for the 2020–21 exhibition season, none of us had a glimmer of how relevant such discussions would become in the months ahead. As the global pandemic revealed the challenges in our governmental structures and millions spoke out with Black Lives Matter against the violence of systemic racism, the exhibitions for this year also invited visitors to interrogate the institutional infrastructures in which we all participate.

For *Pulled Apart*, the gallery has collaborated with five artists and the University's new Engineering Program to continue this investigation, shifting our focus to physical and cyber systems. Using the mechanisms of gadgets, scientific instruments, and computer technologies, these artists' practices bring our awareness to the seen and unseen systems that help shape society.

Each artist approaches engineering in a unique way. Terry Berlier adapts mechanical systems, microcontrollers, and software to build kinetic sculptures and installations that explore the precarity of human relationships. The works seen here playfully suggest that we are at the brink of something. Levers move, but the wheels do not turn. The self-leveler *almost* tips over. The shoes fall and then rise again.

Using Machine Learning neural networks trained on databases of actual photographs, Adam Chin creates portraits that exist between the real and the imitation. Whether it be an iconic president or a self-portrait, the machine's inaccuracies ask, "how do we recognize one another?"

The detailed paintings and videos by Cynthia Hooper show human infrastructure intersecting with the natural environment, while Carrie Hott's videos of an evolving miniature room bring us indoors to explore how constant connectivity and hidden networks inform our decisions. With images of landfills, waterways, scientific instruments, as well as a cluttered desk, both artists draw our attention to the overlooked yet ubiquitous structures and grids we've built around us.

Finally, through Gail Wight's anatomical studies of mechanical toys we see the uncanny ways that nature and the human-made reflect each other. These prints suggest the play, curiosity, dissection, manipulation, symmetry, and assembly that are so much a part of both art and design.

Together, these five artists' works illuminate a subjectivity that we do not always associate with the STEM disciplines. Whether it be the use of the 16th century Cardan Gear or 21st century computer algorithms, each artist's approach reminds viewers of the possibilities of engineering as well as our complex relationship with the systems we've created.

—Glori Simmons, Director, Thacher Gallery

Artists

Terry Berlier

Installation view of *Waiting for the Other Shoe to...*

2020

shoes, motors, Arduino, pulleys, ethernet cable, electronics, and wood

30' x 15' x 20'

photo credit: Terry Berlier

(Installation photo from Stanford Art Gallery)

Terry Berlier is an interdisciplinary artist who investigates the evolution of human interaction with queerness and ecologies. She has exhibited in solo and group shows in North America, Europe, Asia, South America, and Australia, including at the Yerba Buena Center for the Arts, The Contemporary Jewish Museum in San Francisco, and Contemporary Art and Spirits in Osaka, Japan. Berlier is an Associate Professor and Director of the Sculpture Lab in the Department of Art and Art History at Stanford University.



Terry Berlier

In my practice, I interweave movement and sound to investigate the evolution of human connections with queerness and ecologies. This results in kinetic and sound-based sculptures and multimedia installations that work as metaphors for both harmonious and dissonant interactions. Emphasizing the essential roles played by cultural memories and environmental conditions in the creation of our identities, I excavate material objects to challenge our understanding of progress and reveal how history is constructed within a cultural landscape. Orienting, disorienting, and reorienting, my work provides tools to recover and reanimate our faltering connections with self, queerness, nature, and society, often through humor. My collaborators include engineers, composers, architects, and natural scientists.

I approach my creative practice as a playful, open-ended, experimental process. Whether taking apart an instrument, toy, everyday object, or an old technology, I look for ways to reappropriate systems to speak to my queer body experience. This way of working is a queer phenomenological approach which, for me, speaks to my ways of working, and how I understand and orient myself towards the systems I take part in and use in my practice.

Most recently I have been using desire lines, the landscape architecture term for marks left on the ground when one veers from the normative path, as a point of departure to explore queer persistence. These deviations leave temporary paths that, when used repeatedly, change the landscape. They address the small and particular ways we move, delineate, and protect ourselves amidst environmental and political crises. I'm interested in calling attention to forced invisibility together with attempts to see oneself, to be seen.

Through research in queer archives, I examine collective responses to political threat and those repeated micro-actions and interactions enacted in everyday life. Conceptually, my work weaves between world instability with overlapping environmental, political, social crises to queering the possible, an enduring, even grasping, pursuit of a sense of completion. I utilize a variety of tactics including humor, failure, and altered mechanical systems to emote human interactions and idioms. My work lends form and visibility to those things that are often felt but unseen.

—Terry Berlier, 2021

Left: Installation view of *Waiting for the Other Shoe to...*, 2020, 30' x 15' x 20', shoes, motors, Arduino, pulleys, ethernet cable, electronics, and wood

Photo credit: John Janca

(Installation photo from Stanford Art Gallery)

Right: Installation view of *Waiting for the Other Shoe to...*, 2020, 30' x 15' x 20', shoes, motors, Arduino, pulleys, ethernet cable, electronics, and wood

Photo credit: Terry Berlier

(Installation photo from Stanford Art Gallery)

Project Team:

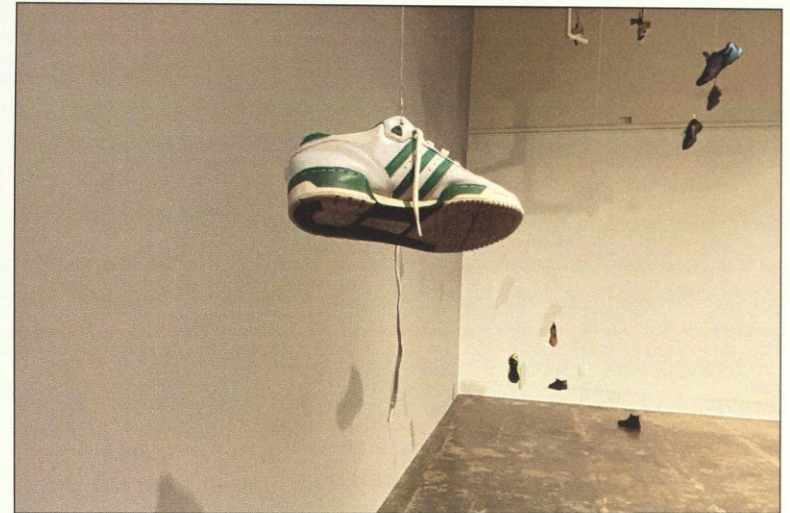
Eric Rawn: 20+ networked and programmed motor units, developed code, electronics, built, and tested the units

Tom Trzpit: Motor system



"Our country moving closer to its own truth and dread, its own ways of making people disappear." —Adrienne Rich

Here, I have continued ongoing threads in kinetic and sound sculpture with humor and political critique, using the common American saying "waiting for the other shoe to drop" (referring to a sense of impending doom) as my departure point. Gestures between silence, waiting, and collapse suggest the tension between stasis and action. The illusion of progress, which lulls us to complacency, is interrupted by dissonance and a clearer call to action. I selected a variety of my own and my family's shoes. Each shoe developed its own character through color, weight, and gravity. For example, the high heels slowly fall and surprisingly often land upright while a steel toed boot slams loudly on the floor and rolls. Similarly to their fall, they each wake up and rise up, rolling over to lift up into the air again. The shoes rise and fall intermittently seemingly on their own and gather, hover, and hang every fifteen minutes before falling as a crescendo. All are controlled by an Arduino and a series of twenty mechanical motor and pulley systems.



Originally exhibited in early 2020, the exhibition closed two weeks early and remained inaccessible for six months due to another shoe dropping, a worldwide pandemic and Stanford's campus lockdown. The shoes originally referenced global political and social instability leading to mass migration, environmental decline, and the persistent stripping away of human rights for BIPOC, queer, and trans individuals—all tragically highlighted as COVID-19 ran unbound on the world.

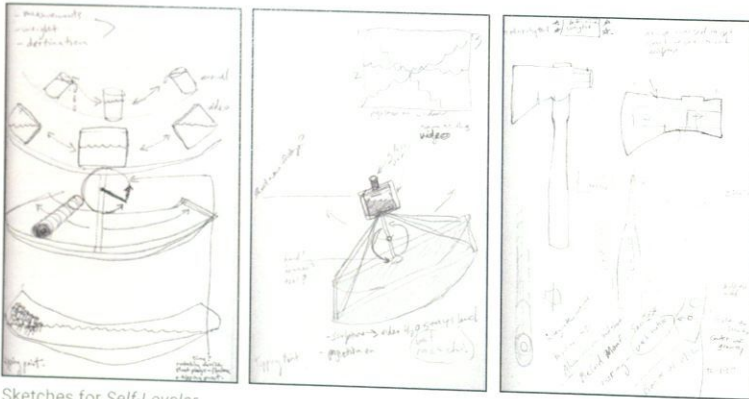
(Adrienne Rich quotation from the poem, "What Kind of Times are These," *Dark Fields of the Republic: Poems 1991-1995*)

Engineer's Insight

Terry Berlier's work first struck me as beautiful examples of combining art, physics, and engineering. Beyond being visually striking, her art provides inspiration for an engineer's work. She focuses on collapse within our world—climate change in *Tipping Point* and the general idea of collapse in *Waiting for the Other Shoe to...*—and comments on our wastefulness by using reclaimed materials. Exposing these issues through art provides a new means of motivating all of us, engineers included, to try and prevent these collapses from happening. The solutions to these problems will undoubtedly be complex and will only be accomplished through interdisciplinary collaboration. We are reminded of this key fact when we realize that Terry's thought-provoking art is also the result of collaboration between seemingly disparate areas including sculpture and computer programming.

As I looked past the big concepts of her work I began to see more subtle lessons and was drawn in further. A key mantra to my teaching is "learn to be comfortable being uncomfortable." Rarely do impactful ideas/inventions come from a place of comfort. They come from pushing oneself in directions that are new and unexplored and therefore, associated with a sense of discomfort. There is an uneasy feeling that comes with viewing Terry's art. Whether it's the fear of the *Tipping Point* going too far, the anticipation as you Wait for the other shoe to..., or the confusion of watching wheels move without making progress as in *Third Wheel*, there is a sense of disquietude. I can't help but feel that through her art, Terry is teaching all of us to embrace discomfort. Her brilliant and playful weaving of art, technology, social commentary, and dissonance can educate and inspire all of us if we let it.

—Gennifer Smith, PhD, Professor, Department of Engineering



Sketches for Self-Leveler

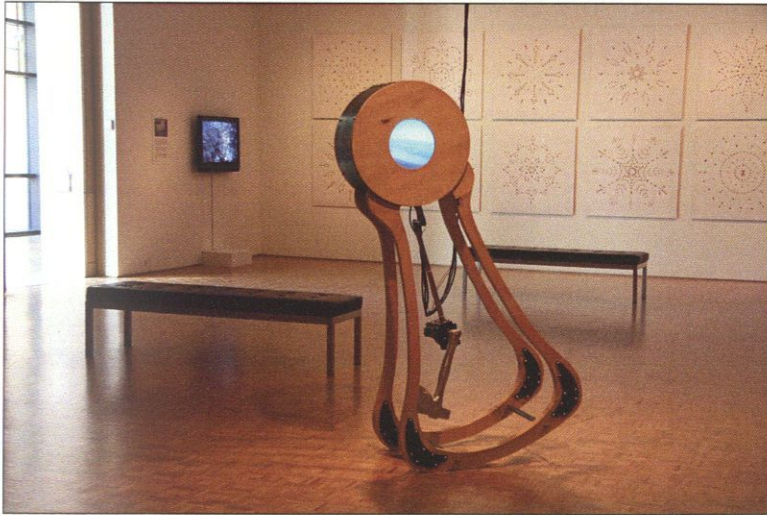
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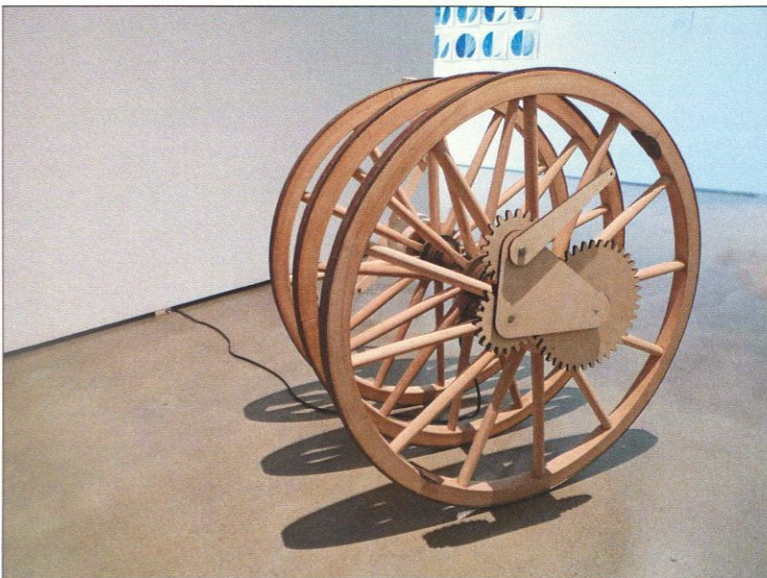
Morton, Timothy. *Dark Ecology*. Columbia University Press, 2016.

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Self-Leveler (aka Tipping Point), 2009, wood, metal, computer, wii remote, monitors, cables, video, motor, aluminum axe, and MAX, 6' x 3' x 20"
 (Installation photo from Iris & B. Gerald Cantor Center for Visual Arts)
 MAX programming: Ricardo Rivera

In order to capture the moment of catastrophe, the human-made "tipping point," this work creates an uncomfortable situation where the sculpture appears to almost fall over. I used MAX programming and a Wii remote's potentiometer to keep the video water level while the sculpture rocks back and forth with the axe's counterbalancing force. I jumped in the ocean and tried to capture a horizon line of ocean and sky. The water references rising sea levels against what scientists refer to as the point of no return. The rotating axe below references an early tool used by humans to first alter the land and extract resources. I carved a wooden pattern to sandcast the axe form in aluminum. This is one of the earliest casting processes dating back to 1300 BCE and commonly used in tool production and manufacturing. Here, a symbol of technical progress is also emblematic of environmental decline.



Third Wheel, 2013, wood, metal, motors, and hardware, 36" x 30" x 28"
 (Installation photo from Institute of Contemporary Art San Jose)

Three vintage wagon wheels are rendered stationary while two kinetic movements perform. The Cardan Gear is a 16th century invention used to convert rotation motion to reciprocating linear motion without using linkages or slideways, while the four bar linkage on the opposite side draws an infinity symbol. The wheels were found at Recology San Francisco during a residency from a thrown away Levis store display and parts of the spokes were reconstructed by the artist. This sculpture alludes to the felt sense of exclusion in intimate groupings, when you recognize that you are not moving in the same ways despite being closely connected.

Engineer Biographies

Christopher Brooks is a professor in the Department of Computer Science at USF, with a joint appointment in the Department of Engineering. He joined USF in 2002 after completing a PhD in computer science at the University of Michigan. He also holds an MS in computer science from San Francisco State University, and a BA and JBA in English and journalism, respectively, from the University of Wisconsin. Professor Brooks's research examines the ways in which human and computational agents learn in shared environments, particularly when learning is difficult or costly. He also develops new techniques for effective teaching of computer science and AI, and is deeply invested in addressing issues at the nexus of social justice and computing.

Although Professor **Elizabeth Mickaily-Huber's** degrees are in chemical engineering, her specialty is in computational fluid dynamics (CFD). Over the years, besides using CFD to solve real-world problems, she has taught engineering and mathematics at the University of San Francisco, San Francisco State University, the Swiss Federal Institute of Technology at Lausanne (Switzerland), and CSU Los Angeles.

Gennifer (Genna) Smith received her BS in electrical engineering with a double major in biology from the University of New Mexico. While pursuing her BS, Professor Smith conducted research at Sandia National Laboratories where she worked on a point-of-care device for tuberculosis detection. She then continued to research low-cost medical devices as part of her PhD in electrical engineering at Stanford University. In particular, she developed a portable urinalysis device capable of analyzing the chemical and cellular makeup of a sample, which can be done by untrained personnel. Her postdoctoral research, also at Stanford University, focuses on assay development for cell-free DNA testing. In particular, she is designing a blood-based test for early detection of atherosclerosis.

Julia Thompson has a passion for integrating the soul's work into the engineering design process and technology. She is driven to help students, and people in general, look at technology as a pathway toward healing of earth and unjust social structure. Julia did her undergrad in chemical engineering at UC Berkeley and her PhD in engineering education at Purdue. Her research interests focus on how engineering design practices impact the relationships that engineering programs create with the community. Dr. Thompson's curriculum utilizes project-based service learning to engage passionate students.

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