

# Amplifying Collective Resilience in *Breakwall*

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## ABSTRACT

*Breakwall* is a public venue and responsive site for learning and unlearning in community. The work's interactive design amplifies collective action and individual agency through a shared exploration of natural materials, resonance, and embodiment inspired by the Earth's hydrosphere. It takes its name from the piles of rubble, wood, or caisson offering a first line of defense against shoreline erosion in coastal areas. Those breakwater forms, and especially their distributed structures, provide a biomimetic model for its interactive design. Performers and participants explore the sonorous properties of sand, wood, and paper while specialized piezo sensors and custom software process and broadcast an assemblage of sonic textures. The soundscape features repetition and contrapuntal patterns driving the non-linear experience. This case study outlines key design choices and conceptual undercurrents. It provides insight into the work's ensemble devising methods and influences from social justice movement work. Participants find resilience in patience, fortitude, and shared memory; they find each other in the whispers between the noise.

## CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); HCI theory, concepts and models.

## KEYWORDS

Embodied Interaction, Max/MSP, Social Practice, Queer Theory

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## 1 INTRODUCTION

*Breakwall* is a public venue and responsive site fostering a shared exploration of natural materials, sonic resonance, and full body engagement. The work takes its name from the piles of rubble, wood, or caisson offering a first line of defense against shoreline erosion in coastal areas. Those breakwater forms, and especially their distributed structures, provide a biomimetic model for its interactive design.

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Figure 1: Software testing, documentation by Megan Young.

Originally premiering in 2013, it has since been staged in a range of formats from theatrical performances to gallery installations and community workshops. Producer and curator, Amy Wilson commissioned the piece for Dance in the Annex (DITA) in Grand Rapids, Michigan as part of a performance series pairing composers with choreographers. I dissolved those oft-siloed roles into one collaborative design exercise, inclusive of performers Angela Luem and Caitlin Rafferty. Throughout an iterative process of co-creation, we developed a custom interface honoring the body as instrument, both in the musical sense and in reference to individual actions supporting communal belonging. (Figure 1)

After *Breakwall*'s theatrical premiere, subsequent iterations served to expand and deepen viewers' roles as participants and co-creators. This case study outlines prominent junctures along that creative journey and provides context for key design choices. Sharing these accounts, alongside their conceptual underpinnings, offers insight into the participatory strategies of this ensemble devising process. The creative methods and outcomes demonstrate resilience through adaptation from individual and communal perspectives.

## 2 CONCEPTUAL UNDERCURRENTS

*Breakwall* operates as a social critique situated along the intersections of feminist, posthuman, and post-structuralist thought. Its amorphous shape draws from collective organizing principles and, within aesthetic bounds, can be understood as social practice or socially engaged art. [5, 12, 14, 19] Such projects necessarily resist ready-made architectures. Instead, they commit time and labor to prototyping in community. Moilola defends the "fit for purpose" design approach [12] as necessary given the inadequacy of formalized structures and taking into consideration Simone's theory that people are our most adaptive infrastructure. [17]

Social practice artists are known to accentuate process, transparently showcase invested labor, and respect lived experience or

embodied knowledge as valuable forms of expertise. [14] These tactics can also be seen in recent developments within participatory design [1, 14] and human-computer interaction (HCI). [11] In crafting her influential feminist HCL framework, Bardzell describes “agency, identity, and empowerment” as ideal aims. [3] She reproaches earlier methods that claim universal usability is possible, then indicates women’s lived experiences are excluded from generic standards. Her research makes strides in addressing what is missing from earlier HCL models, but her essentialist stance presents women as a monolithic and ultimately knowable category. Further, it stresses what is missing rather than capitalizing on the richness of what is present.

Pei et al reflect those limitations as they retell a now frequently posed design inquiry, “Who is privileged, and who is rendered invisible?” [15] Their essay shows why it is not enough to simply acknowledge exclusion and inequality by stating who or what is excluded. Instead, they introduce an assets-based methodology. Assets-based approaches take form as mapping, archiving, or play activities. Much like socially engaged artist practices, they shapeshift into arrangements encouraging historically marginalized, or “minoritized” collaborators [15] to express their distinct values, perspectives, and talents via affirming circumstances. It functions as a celebration of strengths, providing opportunities for both learning and unlearning in community.

Akama et al articulate the value of the above and other human orientated research practices though they challenge actions arising from a desire to control agents beyond ourselves. [1] Far from discrediting embodiment knowledge, they ask what can be learned from the interrelationship of humans and environment, humans and animals, or humans within networked systems. By repositioning humans as participants interacting with those and other “more-than-human” agents [1], they speculate how we may uncover previously discounted ways of being and becoming. Key et al echo similar posthuman theories [11] and explore many of the “tensions” arising from such a stance. Decentering humanity within the Anthropocene, even conceptually, requires radically reframing our embodied perspectives.

Contemporary dance and somatic practitioners offer some tactics in that regard. Interactive designers have begun pulling from those systems to retrain humans within technologically rich environments. Tactics of defamiliarization [7], disruptive improvisation [2], and use of avatar imagery [8] provide a few examples. A survey completed by Zhou et al highlights ten additional attempts to generate novel physical responses during interactive experimentation. [20] Though, a quick analysis of similar trends shows digital systems are typically developed to interact with codified movement structures rather than as tools of open physical exploration. [7] Within the subset of those that do not rely on existing techniques, movements are often situated around predetermined outcomes or tasks. [10] Françoise et al showcase a particularly riveting application of autoethnographic research supporting embodied experience in technologically-mediated dance experiments. [9]

Carlson et al draw inspiration from Merce Cunningham’s systems of randomization in dance as part of his attempts, dating back to the 1950’s, of deprogramming personal habits from his choreographic lexicon. [7] Callahan describes Cunningham’s chance

procedures as a means to “abdicate agency and ego” while championing the “unplanned choreomusicality” of his compositions. [6] Perhaps, rather than abdicating agency outright, it is more appropriate to consider these designs as decentering the human within distributed systems which exceed rational understanding. Cunningham’s groundbreaking work in dance, and into HCI through experimentations with *LifeForms* (1989) [7], are some of the most well-known examples of deconstruction and post-structuralism in contemporary artistic processes.

Given Cunningham’s extended personal and professional partnership with celebrated composer, John Cage, a queer theoretical perspective of those artists’ contributions provides additional insight. [4, 6] Cage was known for engaging methods of indeterminacy in composition. After exploring numerous protocols, indeterminacy offered what Morris calls a “final technical solution to the problem of memory and desire.” [13] Morris’ rhizomatic text never fully resolves why Cage rejected memory or desire, but he does give examples of intentional ambiguity and destabilization from Cage’s repertoire of published scores. These and countless additional examples show how Cage and Cunningham’s individual and collaborative practices abandon normalcy and encourage nonconformity through creative praxis. [4, 13] Those are some of the established traits cataloged within queer theory, [18] which explores the oppressive power of dominant norms and the inability, or outright refusal, to live within hostile binaries. [18]

Though not exhaustive, these contributions highlight many broad conceptual undercurrents influencing *Breakwall*’s development. Overlapping and entangled concepts of representation and agency are addressed throughout the iterative design process. The project places questions of control, disorientation, power, and dissonance on view.

### 3 ITERATIVE DEVELOPMENT

Initially, *Breakwall* functioned as a closed system featuring Luem, Rafferty, and myself in conversation within a structured score of permissive conjuring. That score began with a loose formation of dancers midstage, atop brown craft paper with three small piles of sand positioned near three directional microphones (Figure 2). Working in Max, a visual programming language for real-time multimedia interaction design, I created a custom patch gathering audio inputs from those three sources. Sounds made by the dancers’ feet flicking, gliding, and squishing the sand were processed with variable operations including signal amplification, audio pass filters, and a timed system of delays. Samples were overlaid into irregular looping patterns, creating waves of subtly shifting audio paired against the live visuals.

We developed *Breakwall*’s movement language through experimentation and play. Inspired by grassroots organizing throughout history, we devised physical actions around themes of endurance, labor, rest, and deep listening. From those ideas, and others associated with activist engagement, we designed a choreographic system whereby our footwork created a range of patterns and sounds. Rather than maintaining a stationary stance, we allowed the shifting motions of the feet to ripple up our legs into the spine and torso. This choice mirrored the audio score, in that each sensation became magnified through scale and duration. The movements

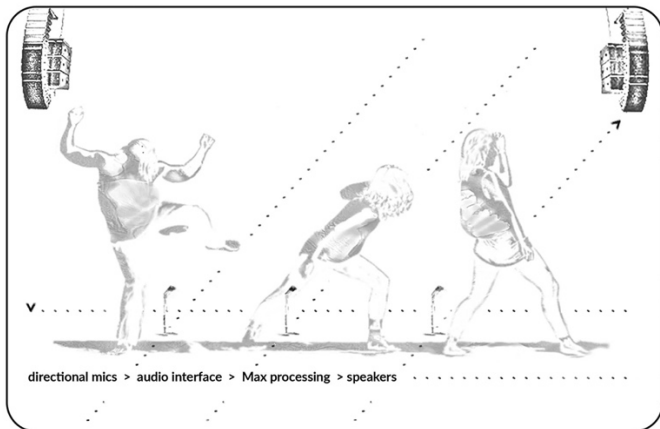


Figure 2: *Breakwall* theatrical staging diagram and documentation by Motley Cat Studio courtesy of DITA.

took us off our center and into extremes of instability, following emergent pathways of least resistance. What arose was an accumulation of pliant gestures seemingly floating above, through, and beyond their auditory origins.

The layering of so many individualized actions produced a swell of sonorous textures, the lilting wake of which could be felt receding long after triggering ceased. Upon witnessing the piece, Wilson noted its ability to command attention even through prolonged stillness and silences. Years later, she recalled its transformative impact. Within the moments of quiet respite, she became more attuned to her physical posture and sensations. By slowing her breathing to match the dancers, Wilson released her tense limbs and embraced the unmoored oscillations as if processing the unknown. *Breakwall*'s irregular modulation set the stage for a kind of kinesthetic training for physical release. The performance illustrated how relinquishing absolute control opened new opportunities for sensorial connection.

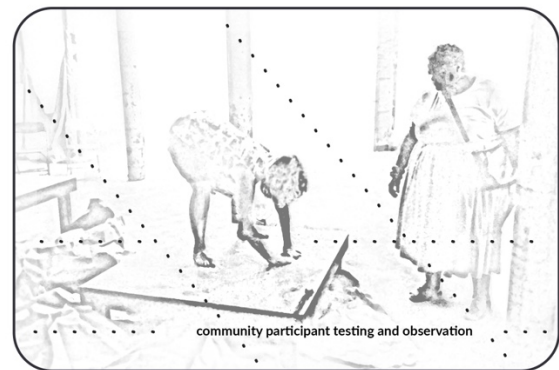
### 3.1 Open Format

Subsequent iterations for Columbia College Chicago (2014), Figment Chicago (2014), and Chicago Arts District (2014) took on workshop style formats. Participants were introduced to the concepts and explored the text-based scores. As in my earlier experiments considering choreography as a form system design, [16] participants programmed their embodiment to mirror the Max software operations. They explored notions of delay by pausing their responses for a set duration, and sampling by selecting a portion of another person's movement to repeat multiple times. Beyond fulfilling the prompts, participants were encouraged to listen and respond to physical impulses. That led to new scores around ideas of spreading, gathering, shouting, and floating.

Taken from an improvisational dance perspective or with consideration to HCI, none of the techniques employed within the participatory workshops were especially novel. Still, they engaged participants across five cardinal learning modalities, through: kinesthetic, visual, auditory, and tactile processing. Moreover, they connected those forms through a computational interface operating



Figure 3: Workshop exploration, documentation by Megan Young.



in conversation with their actions. Participants surprised the facilitators by using their hands to make sounds across the floor's surface (Figure 3), by performing unprompted self-revelatory solos, and by their dedication to extended periods of repetition (as an example, some participants performed variations of a single action for upwards of twenty-minutes). Everyone came away with a better understanding of their individual instincts and how to devise solutions as a collective.

### 3.2 Site-Responsive Installations

In 2015, Wilson invited me to return to Michigan and remount the work. This iteration would include an installation with engagement activities as part of the Rumsey Street Project produced by SiTE:LAB (2015). Under Wilson's curation, we filled a twenty-two by fourteen-foot installation space with beach sand, driftwood, and embedded sensors (Figure 4). A looping projection at the rear of the space featured many of the previously devised foot movements as a subtle invitation for play. The venue hosted over a dozen performances with a rotating ensemble of eight dancers. What's more, viewers could sign up to join me in development workshops on-site.



**Figure 4:** *Breakwall* (2015) presented by Rumsey Street Project, documentation courtesy SiTE:LAB.

*Breakwall* held special significance in West Michigan. Those who came of age on the shores of Lake Michigan understood that summer on the water could feel like the ultimate freedom, though the threat of the undertow loomed large. Then also, there were Grand Rapids residents who had never seen the lake only 30 miles away from their home. Many lived next door to the Rumsey Street project. Small children would sit on wood stumps and create sand drawings imagining the lake as audio echoes accompanied their efforts.

All those influences changed the interactive structure. In workshops with residents, we shifted the interactive design so the audio could more directly mirror the physical inputs. That is, you could hear the conceptual weight of every footstep without delay. We removed most of the randomizing operations from the Max patch. Also, we normalized the audio amplification, so it never went well above or below comfortable listening levels. These were community directed changes, but we maintained them within the performances. Computation stepped into a supporting role, with predictable results, and the dancers responded by seeking more unison. This iteration was quiet, gentle, and patient. It felt like a tentative inhale.

In 2017, Ingenuity Cleveland commissioned a new iteration of the project as part of their annual Festival. *Breakwall* took over a converted factory interior spanning more than fifty by forty feet. Three wooden platforms wired with piezo sensors served as dual purpose performance stages and interactive zones of variable height (Figure 5). We learned from the experience in Michigan and ensured more unstructured space and time with community participants. When no performance facilitators were present, viewers could activate the audio interface by sliding their hands along the sand on the platforms.

Viewers and participants seemed to need less introduction to the concept. Many had marched in protest of the 2016 presidential election and subsequent immigration bans. They had their own ideas about collective action. Over and above exploring the interactive compositional elements, participants wanted to learn how to program in the Max environment or how to make their own custom electronics. The interest was so great that we launched an extended series of media performance workshops as part of the Ingenuity Labs initiative, teaching those skills through directed exercises. This time, the work felt like an explosion.



**Figure 5:** *Breakwall* at Ingenuity Festival (2015), documentation by Black Valve courtesy Megan Young.

### 3.3 Reflections

The *Breakwall* project embodies resilience by adapting to changing needs, perspectives, and motivations. It achieves that through a variable interactive interface, customized to each venue and with input from curators, performers, participants, and collaborators. The Max environment has been a critical contributor to that success. It is so nimble, in fact, that the audio processing can be adjusted mid-performance or within a workshop. Its opensource ethos welcomes user-initiated developments and implements user recommended updates. It remains useful within the rapidly changing media landscape.

*Breakwall* demands much from its viewers. It requires focused attention over extended durations, positive risk taking, and trust. If this seems contrary to designs offering instant gratification, it may be important to also note the rewards. It validates our strange and unique perspectives all while allowing us to explore our sense of self in concert with others. The textual prompts and loosely directed scores offer some structure, though performance facilitators demonstrate ways of existing beyond those bounds. For these, and many reasons, the work has already achieved its aim. It provides a visual, experiential, and conceptual framework for collective resilience, bridging disparate groups in collective action.

## 4 ARTIST PROFILE

Megan Young's interdisciplinary practice affirms embodied action, collective listening, and radical archiving. She combines a background in media performance and immersive installation to create new commissions for notable venues including ISEA (Hong Kong), Art Souterrain (Montréal), Open Engagement (Chicago), and SPACES (Cleveland, OH). Recognition includes features in *Hyperallergic*, *The Atlantic*, and on NPR as well as a Knight Foundation technology grant and CEC ArtsLink Art Prospect residency in Armenia. Young holds a BFA in dance from Ohio University; MFA in interdisciplinary art+media from Columbia College Chicago. She is a Lecturer and Digital Art Area Head at Indiana University.

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