KINESTHETICS:
ART IMITATING LIFE

Pratt

Kinesthetics:
Art Imitating Life

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Pratt Manhattan Gallery
144 West 14th St
New York, NY 10011

U-RAM CHOE
CASEY CURRAN
CHICO MACMURTRIE
REUBEN MARGOLIN
MERIDITH PINGREE
ALAN RATH
ADRIANA SALAZAR
BJÖRN SCHÜLKE
CHE-WEI WANG
ZIMOUN

A video showing all of the artworks in this exhibition in motion can be viewed at vimeo.com/63742061. Video by Kay Hines.

Left: installation shot by Aram Jibilian

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Movement + Time; Change + Art

It is more difficult to stand than to move. —Moshe Feldenkrais

As human beings, we are constantly changing. On a cellular level, our metabolic processes are always at work, making us digest and grow—transforming our very being. On a social level, we move to find food, escape pain (both physical and emotional), to expend built-up energy, for exercise, play, and simply for physical pleasure. *Merriam-Webster* has more than 20 definitions for the word "life," many of which allude to just this sort of moving, animated spirit. On a subatomic level, string theory postulates that, quite literally, everything in the universe is vibrating. The basis for this is that elementary particles (electrons and quarks) are not zero-dimensional, but rather are composed of one-dimensional oscillating strings. The future development of string theory is leading towards "a theory for everything"—one that also is based on vibrations or movement.

If science can conclude that movement is elemental to everything, might not we also conclude that movement is elemental to life?

Movement, time, and change are joined like links in a chain. We perceive movement over time. In order for movement to take place, it requires four dimensions: three dimensions associated with space, and the fourth being time. Isaac Newton, who developed three laws of motion (which still hold true today), believed that time was merely a measure of cycles of change within the world. His perception of time was linked to movement; an object moving in space was simply changing its relation and orientation to the space over time.

By the early part of the last century, many philosophers who were following theories established by Henri Bergson equated movement with change. They also viewed immobility to be the abstract with mobility being the concrete. Bergson and others believed that one of the basic problems of philosophy was that of the immobile versus the mobile. "Intuition arises from movement," Bergson wrote, "posits it or rather notices it as reality itself, and sees nothing in immobility but an abstract, instantaneous moment which our mind has singled out of mobility." Early twentieth-century philosopher and ontologist Alphonse Chide, author of *Le Mobilisme Moderne*, shared the views of Bergson when he wrote, "the motionless was once at the very heart of the world, but for modern science it has become a mere illusion that arises from categories vitiated at their very basis."

Artists, fascinated by this state of affairs, have been folding movement into their visual language since the beginning of civilization, flattening time and space and depicting change via formal shorthand. The earliest known cave drawings at Lascaux included animals traveling in herds and hunters in pursuit. The ancient Egyptians often depicted figures in stone carvings in a walking motif with one foot in front of the other. Later, the Greeks mastered the representation of movement in their friezes and other sculptures, capturing twisting gestural movements of the figure and chronicling historic events in series, via decorative reliefs. Moving further along historically, other scholars like historian of art and technology Frank Popper link kinetic art to the work of the Impressionists, who sought to capture "visual data" along with formal elements like light, color, and line—and by extension, movement, and color vibration. Later, early twentieth-century artists, most famously the Futurists, were so "enthralled" by technology that they centered the manifesto they penned around the dynamic power and speed of the machine.

Be it compositionally intuited or proclaimed outright, movement was, quite literally, everywhere in European art. The Cubists devised a pictorial shorthand for portraying three-dimensional subjects and objects from simultaneously competing angles—hence, during different states in time. (Viewers could almost feel themselves moving around the figure.) The Automatists exploited and recorded the movements of the hand (ultimately leading to the action painting of the 1950s and its transformation of paint into performed gesture). Vladimir Tatlin, Man Ray, Alexander Rodchenko, and most famously of all, Alexander Calder, made "mobile" sculpture—though it was Duchamp who created the first kinetic sculpture with his *Bicycle Wheel*, 1913, and who is credited with first coining the term "mobile," using it to refer to Calder's work. More than 50 years later, Jean Tinguely, Fletcher Benton, Alice Aycock, and Jonathan Borofsky carried the torch of movement further into classical museum space, but it was the seminal exhibition *Cybernetics Serendipity*, which opened in London in 1968, that galvanized the public's awareness. Including as it did all aspects of computer-aided creativity beyond the plastic artists—music, poetry, dance, sculpture, and animation—it ranks as the first blockbuster museum art exhibition and was a huge public success. *Cybernetics Serendipity* anticipated, as did Marshall McLuhan, the blurring of boundaries between art, science, technology, and entertainment. Even though, at the time, software and hardware were expensive and difficult to come by, the exhibition served as a jumping off point for media art. Technology and computers in the postwar era became "cool" and were even embedded into the British leadership's vision of the future.

More than half a century after McLuhan and *Cybernetics Serendipity*, this exhibition picks up where what we now accept as "kinetic" in the fine arts intersects with recent advances in technology. Boundaries between the plastic arts and performance—even, we might say, between artistic imagination and scientific fact—have become porous once and for all. Why try to discern between choreography and cinematography, the movement of the body or the eye of the camera? Thanks to this new mode of computer-aided creativity, lines are "officially" blurred.

Before introducing the artists, let's take a moment to look at what it means to traverse boundaries for us as well. For instance, the viewer should note that kinetically-based work, as "fast" and engaging as it may initially sound, requires an investment of time—and patience—on the viewer's part for it to properly unfold. There are many such examples in this show. In Alan Rath's *Lala ZaZa* 2006, a string of choreographed movements emerge as a series of pheasant feathers, activated by mechanical arms, sweep into the air one by one, only to group together and turn in sequence. This sounds simple, yet it's mind-boggling, as there are so many possible sequences that to re-create them mathematically and exactly would be almost impossible. Chico MacMurtrie's *Inflatable Architectural Body*, a large sculpture comprised of fabric tubes, first begins its movement sequence, (oddly enough) by hanging from the ceiling in lifeless, indiscernible form. Forced air from an off-site air compressor brings the sculpture to life as it slowly unfolds, accompanied by the eerie hissing sound of the forced air. The joint system designed by the artist allows for some variation with each inflation. The overall effect of such incredibly variegated movements is that we start to perceive this *"Body"* as an animated, living entity rather than a lifeless sculpture or machine. In short, the "character" or identity of a kinetic work emerges much like a character develops in a book: over time. Once you get to know these works, they take on a life of their own, creating a veritable altered "presence" in the room.

In a way, kinetic art asks a great deal of us. Following it, as we do, with our eyes, our bodies, our powers of concentration, we must leave a place of stasis and comfort. We have to come along for the ride. Kinetic art may be slower to unfold, but the rewards for staying with it are great: we get a tactile, irrefutable understanding of our own potential; an on-site portrait of ourselves as beings who, by their very nature, are on the clock, moving through time.

About the artists and artworks in the show:

Sculptor Reuben Margolin has been studying waveforms of many kinds through his artwork, from classic waves in water to the sorts of complex math involved in describing waveforms as a whole. His work demonstrates how simple movements, when overlapped and multiplied at various angles and degrees, can create the illusion of more complex motion. Margolin also equates the rhythmic ebb and flow he achieves with his work with our own biorhythms and other life cycles.

Che-Wei Wang also explores life cycles with his work *3.16 Billion Cycles*, 2009. Wang creates a model for his own movement and change through time, genrerating, in essence, a self-portrait composed of interlocking metal gears and rings of varying size. Larger gears represent sweeping movements and are juxtaposed with smaller, faster-moving gears that represent more fine intervals. "By straying from our biological clocks," the artist explains, "we've managed to extend our waking hours, shuffle our sleep patterns, and divorce social cycles from biotic rhythms." *3.16 Billion Cycles* points out the necessity of both the fine and grand movements in our lives. Wang has even predicted his own demise in this work: the largest ring of the sculpture, moving, as it does, slowly and almost imperceptibly, is rigged to come crashing down at a moment he has calculated as his last.

Casey Curran, inspired by the work of nineteenth-century philosopher, naturalist, and

biologist Ernst Haeckel, has been studying the movement of animals and translating those movements into sculptures that resemble scientific models and specimen trays. His *Expansion*, 2012, explores the expanding and contracting of a puffer fish. By multiplying the effect of 12 simple hand cranks in *Serpent*, 2012, he replicates the more elegant and complex motion of a slithering snake. The mechanics of the model are exposed and displayed adjacent to the working model of the moving skeleton. In this way, he helps us to understand the organic movement of the snake in a non-linear way. His works are also a metaphor for life and death since he re-animates the skeletons of these once-living beings both with movement and through the hand cranks, which viewers are invited to activate.

Adriana Salazar's material subjects include logs, feathers, dead birds, and tree branches and, using only the most simple technologies (little more than motor and thread), she animates them into compelling, near-Frankensteinian dioramas. Salazar believes that by limiting herself to basic machines she is better able to explore the components of time, movement, pace, and mechanics. The results are elegant, hypnotic, and almost cinematic. *Plant #26*, 2013, is "literally a tree moving in the wind"—the metaphor Marcel Duchamp used to describe Calder's work. Elsewhere, Salazar gets her quotidian subjects to replicate ordinary human tasks such as threading a needle and tying shoelaces. The machines struggle to reproduce what humans seem to do effortlessly—to both poignant and frustrating effect.

Korean artist U-Ram Choe, the son of sculptors and grandson of a scientist who designed early automobiles, creates a menagerie of moving sculptures that foreshadow a futuristic, sci-fi-style biomorphic machine culture. His work, a hybrid of machine and animal or machine and plant, traces imaginary evolutionary processes. He goes so far as to title his works with pseudo-scientific Latin genus titles and even creates both female and male counterparts of his creations, implying that perhaps, one day, they might reproduce independently of the artist. Choe is a master of machinery and robotics. Even though the mechanical parts of his work are exposed, the stainless steel is masterfully machined to a high level of sophistication and polish. The movements he achieves with these beautiful and sometimes frightening works are elegant and highly articulated.

German sculptor Björn Schülke's works range from the charming to sinister and offer us a glimpse of a future technological society. The dark and suspicious *Spider Drone #2*, 2012, a hybrid of machine, camera, and spider, lurks high in the corner of the gallery just above the heads of visitors, waiting and watching, much like a real spider. Motion detectors sense the presence of the viewer and suddenly the drone activates, pointing its delicate arms (more than a little accusingly) at us. The head of this creature is a camera lens. To whom—or what—might it be recording and reporting our actions? *Solar Kinetic Objects*, 2007, another body of work by Schülke, consists of small and playful objects that are powered by light. These tiny robots are the antithesis of his menacing machines. The diminutive scale and movement is non-threatening, and they exist much like pets, alive even as they are unpacked from their shipping crate.

Alan Rath, who studied electrical engineering, believes that all art is technology and perhaps vice versa. His inspirations range from Apollo rockets to Jimi Hendrix's guitar. Known for his early work with digital video in the 1980s in which he animated (static) close-ups of absurdly accented facial expressions, Rath went on to work with actual movement in 1995 when computer technology caught up with his aspirations. Recently, Rath has been producing a series of comical robots that dance, tickle, and tease. His ingenious choice of combining feathers with motors amplifies the simple movements of the mechanisms through the elastic nature of the natural, resilient material. Rath, with the aid of software, choreographs the vaudevillian performances of the kinetic works. The illusion is that his robotic works are autonomous and are interacting with each other or with the viewer rather than performing a set of pre-determined movements.

Swiss artist Zimoun demonstrates how movement is linked to the creative act through his series of motorized sculptures. With *50 prepared dc-motors, filler wire 1.0mm,* 2009—a linear and elegant system of 50 simple motors with wire tentacles that tap on the wall—he explores the machine's ability to mimic the creative acts of making sounds and marks. This work is unlike others in the exhibition in that it amplifies motion by duplicating it to hypnotic effect. Many of Zimoun's installations have included hundreds of motors filling entire galleries.

Utilizing motion sensors, motors, and such DIY materials as Plexiglas, fabric, and craft objects, Meridith Pingree creates quirky, attitude-filled sculptures that track and respond to the behavior of gallery visitors. *Yellow Star*, 2007, is a circular work suspended from the ceiling, composed of nine motion sensors and motors that act as joints for a series of yellow Plexiglas shafts. The motion sensors respond to the movement of viewers, causing the sculpture to expand and contract in an amoeba-like fashion. The work visualizes the ebb and flow of gallery foot traffic. "My work exists as amplifications of this subtle energy, creating unconventional, complex portraits of people and spaces," the artist says.

Chico MacMurtrie, the founder and artistic director of Amorphic Robot Works (ARW) along with other artists, scientists, and engineers, has been creating machine-sculptures that investigate the nature of movement since 1992. Currently operating out of Brooklyn, ARW originally created robotic sculptures of steel and other rigid materials that played and interacted in gallery environments. Lately MacMurtrie has been pioneering a series of lightweight, inflatable fabric sculptures. By employing a series of inflatable tubes joined by an innovative node system, MacMurtrie has been able to transcend the mathematical and engineering constraints of higher density constructions. The unique fabric coupling and joint system allows sculptures to react to stresses, eliminating the need for structural calculations and thus allowing for more creative flow between the artist and the work. Expanding, changing, and moving as the sculptures inflate, their range of movements is as broad as our own skeletomuscular system. MacMurtrie views the constructions of this series as being reflective of the minute geometric constructions that underlie all life.

Nick Battis
Director of Exhibitions
March 2013

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Stepping Off the Pedestal

Kinesthetics: Art Imitating Life is an exhibition that examines the expressive possibilities of kinetic movement in sculpture and suggests what the outcome of such possibilities might be. These possibilities include: futuristic beings who "fail" much like ourselves; automata with fluid choreography in their mechanical souls; machines that talk, not only to us, but to each other; and "clocks" that, once set in motion, may far outlive their human makers.

This exhibition is akin to a choreographed performance. Each of the sculptures in the show reveals a kind of persona that evolves over time. Some are playful, some pensive, some menacing, each unique. These hybrid works combine elements from the natural world with mechanical parts such as wires, motors, strings, pulleys, hydraulics, and fabric. And yet they have begun to transcend their artificiality. Their gestures are no longer the clumsy gestures of the automata of yesteryear. The movements of these new machines have become graceful and fluid. As we watch life breathed into these sculptures, we begin to ask ourselves what it means to be alive.

As the great masters of kinetic sculpture have long understood, movement has great expressive possibility. All of the sculptures in *Kinesthetics: Art Imitating Life* move and evoke life. Some imitate life by attempting to perform quotidian tasks like tying shoes. Others seem sentient, responding to our very presence by moving their articulated joints as we approach them.

We meet U-Ram Choe's "creatures," sparkling automata that are every bit machine, yet still seem like sentient beings, their "ribs" rising and falling with each breath; Alan Rath's *Lala ZaZa,* 2006—part elegant dancer, part preening bird—which seems to beckon to us as if in a mating rite; and Chico MacMurtrie's newest generation of soft robotic sculptures, Inflatable Architectural Bodies, made of high-tensile fabric that makes us feel as though we are at one with a robot, journeying inside its body.

Movement, Increment, and Scale

Thus far, the scale of movement we've discussed has been largely proportional to that of human beings. But other scales are at work in kinetic sculpture, referencing subjects as abstract as microscopic life and as vast as time itself.

The sculptures' movement can be barely perceptible, as in Adriana Salazar's *Plant #26*, 2013, whose marionette-like plant fronds shift ever so slightly each time the motor pulls its strings. Or, as in the case of Rath's *Lala ZaZa*, in which tiny motor movements result in the broad sweep of elegant feathers, the small and large gestures are interconnected and hierarchical.

Reuben Margolin's work exemplifies a sweeping range of movement. His work exists in multiple scales, ranging from a single raindrop to weather patterns. His undulating wooden sculpture, *Single Raindrop*, 2012, is a mechanical reflection of the wave patterns of a single drop of rain hitting water. This work seeks to capture an essential aspect of the natural world. Waves exist in anything that cycles because they are (mathematically) based on the circle. Margolin was originally inspired to make wavelength sculptures after observing a little green caterpillar moving (in a sine wave).

The temporal scale of movement is another variable in kinesthetic sculpture. The speed and rates at which things move can evoke lifelike characteristics. What's more, precisely because these works are time-based, they require time to experience.

Che-Wei Wang's *3.16 Billion Cycles*, 2009, provides a fine example of this. The work is full of poetic resonance. In it, giant, beautifully crafted circular forms made of steel move in relation to one another like the gears of a clock. So slowly does Wang's piece make its way through its cycle that a human lifetime would span only a single increment.

Movement evokes the appearance—and often the absurdity—of life

While none of the works in this show are directly anthropomorphic, many are zoomorphic or phytomorphic.[1] Others have evolved into more abstract forms. But one fascinating aspect of an artistic re-creation of life is the potential for humor. The artists' eye for the creepy, uncanny, or simply camp nicely offsets our dystopian fears of technology. As critic and novelist Susan Sontag so aptly tells us in her famous essay "Notes on Camp," humor is a more essential ingredient than we might expect. "One can be serious about the frivolous, frivolous about the serious," according to Sontag.[2]

Take, for example, Björn Schülke: his works are always beautifully crafted with strong formal connections to both Alexander Calder (the father of kinetic sculpture) and Jean Tinguely. His *Spider Drone #2*, 2012, a robot that lurks high in one corner of the gallery, veritably bristles with humor and all sorts of startling surprises. We are being watched and the watcher seems sinister until we notice that it has a funny little spinning propeller sticking out of its body.

Casey Curran's cybernetic *Serpent*, 2012, animates a hybrid, mechanical snake with the turn of a crank. Adriana Salazar's (*Plant #26)*, 2013, contorts as tiny motorized threads pull dying branches around and around like a slow-moving marionette. Both appear lively enough, at first glance, but it's a macabre sort of life, given that both are crafted from forms that are fairly well desiccated, and dead.

Salazar's shoe-tying robot, *Machine That Tries to Tie Two Shoelaces Together,* 2006, never actually succeeds in its task. It is a perpetually failing machine. The irony here is that, by repeating itself, the action it performs ultimately loses its meaning. Failure is in the artist's very design. Salazar calls the movements that *Machine* performs a "re-enactment."[3] It reminds us of the futility of many of our daily activities and of our own human fragility.

Are we the minds behind the artworks, or are we the artworks' minders?

Given that cybernetic machines communicate, they may ultimately develop intelligence independent of us and become creative themselves. So where does that leave us? The *Oxford English Dictionary* defines cybernetics as "the science of communications and automatic control systems in both machines and living things." It was in the 1950s that mathematician Norbert Wiener developed the theory of cybernetics, which inspired many scientists and artists to explore kinetics and robotics for years to come. "The machine appears now, not as a source of power," wrote Weiner, "but as a source of control and communication. We communicate with the machine and the machine communicates with us. Machines communicate with one another."[4] What does this mean for art that uses technology as material?

In his classic book, *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of This Century,* art theorist, critic, and curator Jack Burnham posits: "As the Cybernetic Art of this generation grows more intelligent and sensitive, the Greek obsession with 'living' sculpture will take on an undreamed reality. The physical boundary which separates the sculptor from the results of his endeavors may well disappear altogether." [5]

Sculptures can now communicate with each other as much as they communicate with us (if not more so). In this show, however, we eschew the more dystopian anxieties that this power might inspire, and instead look at the vision of our own humanity that these robots can show us. What does it means to be human in the twenty-first century? We are bystanders observing U-Ram Choe's choreographed mating rituals between the male and female creatures in his pantheon of automata.

One such mating, mechanical creature is the *Urbanus*. The male *Urbanus* lingers around his mate waiting for the precise moment when she will offer herself to him. The female *Urbanus* releases energy from her body by opening up her flower-like petals and shining light towards the male Urbanus who responds by fluttering and opening his own petal-like appendages to receive the female's emission.[6]

In her *Cyborg Manifesto*, feminist theorist and philosopher of science and technology Donna Haraway offers this take: "Organisms and organismic, holistic politics depend on the metaphors of rebirth and invariably call on the resources of reproductive sex. I would suggest that cyborgs have more to do with regeneration and are suspicious of the reproductive matrix and of most birthing."[7]

Chico MacMurtrie's *The Ancestral Path Through the Amorphic Landscape*, 2000 (as illustrated in MacMurtrie's drawing, Untitled, 10 x 23 1/4), was arobotic performance depicting a creation myth in which the life cycles of a

1 Think of such ancient Greek precedents as Pygmalion and Galatea; the Golem of seventeenth-century Prague; and Mary Shelley's much-loved nineteenth-century monster in *Frankenstein*; or *The Modern Prometheus.*

2 The essay "Notes on Camp" is from Susan Sontag. *Against Interpretation and Other Essays* (New York: Farrar, Straus and Giroux. 1961.)

3 Adriana Salazar's artist statement.

4 Norbert Wiener. "Men, Machines, and the World About, Medicine and Science." *New York Academy of Medicine and Science.* (1954): 13-28.

5 Jack Burnham. *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of This Century* (New York: George Braziller, 1968), 77

6 Eds. Ri, Roh Yu and Hee, Choi Young *U-RAM CHOE* (Seoul; U-Ram Studio, 2010)

7 The piece "Cyborg Manifesto Science, Technology, and Socialist-Feminism in the Late Twentieth Century" is from Donna Haraway. *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991.)

hundred different robotic creatures play out as they promenade across an inflatable landscape. The robots interact with one another, trying (and often failing) to perform such tasks as playing catch, beating drums, and doing somersaults.

Amorphic Robot Works[8] company tour director Mark Ruch observes:

> "As there is beauty and elegance in movement itself, there is equally potent experience in watching a machine (human or organic form), struggling to stand, attempting to throw a rock, or playing a drum. These primal activities, when executed by machines, evoke a deep and sometimes emotional reaction. It is the universality of emotional experience which intrigues us, and it is the contrapuntal use of machines as artistic medium and organic movement as form, which perhaps ironically, combine to provoke these reactions most readily."[9]

Not content with "intramural" sociability, many of the sculptures in the exhibition reach out and communicate with us, exhibiting some behaviors that respond directly to the presence of the audience—behaviors which make them seem distinctly "intelligent." They "learn" and are able to perform actions based on what they have "learned." As mentioned before, Alan Rath's generative program controls the changing choreography of *Lala ZaZa*'s movement. Chico MacMurtrie's *Inflatable Architectural Body* uses sensors and controls to caress and move the audience through the inside of the soft robot. And do not be fooled by the DIY, deceptively bare-bones material construction of Meridith Pingree's *Yellow Star*, 2007. It is a sophisticated, amoeba-like sculpture whose articulated joints are each equipped with motors and motion detectors. Its shape-shifting gestures are reactions to people's movement in its environment. The gestures continue recursively as the sculpture's own movement (responding to others) elicits further patterns of movement.

Pingree's sculpture speaks to Wiener's prediction that machines would speak to one another as well as Burnham's prediction that they would be able to communicate with their creators. And what's more, in this case, we can also say that the sculpture speaks to itself.

Self-taught, Bern-based artist Zimoun's *50 prepared dc-motors, filler wire 1.0mm*, 2009 (its title describes its medium), makes a kind of residual music as it moves.[10] The motors rotate individual wires which spin and brush against a hollow wall. In so doing, they create a drawing as well as sound. This work is in effect a creative entity, independent of Zimoun. "'Living' might be the right word to describe them, " says Oscar Gomez Povina of *50 prepared dc-motors* in *Vnfold Magazine*. "The sculptures function as a microcosm, bound by the cadence of their initial organization but growing and evolving beyond the control of their creator."[11]

Where will cybernetics take us?

As with all classic art forms, kinetic artists create "life forms" that can outlive them; but perhaps more poignantly, as is the case of Wang's *3.16 Billion Cycles*, 2009, kinetic artists can also use their work to measure limitations, or more specifically, a human lifetime. (We come full circle, from early clockwork automata to Wang's elegant, contemporary clockwork.) Here the movement is calculated and almost imperceptible. It measures time in human biotic increments—a temporal Vitruvian man—in an attempt to reconnect our conception of time to our own biological rhythms. At the end of the "lifetime" (a 100-year cycle) the large arc falls off of the sculpture, self-destructing, albeit slowly, much in the way that Jean Tinguely's *Homage to New York* self-destructed.

Wang's is one automaton that probably won't outlive its creator. But if *3.16 Billion Cycles* will eventually end, this genre of art, as a whole, will go on far into the future. Not simply the stuff of trickery or amusement, the kinetic aspects of artistic expression run deep, past anthropomorphism and amusement, past what it is that we can easily accept. The notion that an art object can, in effect, come off the plinth and into our world—observe us, interact with us, learn from us, and perhaps one day, even think—is powerful. Artists of centuries past, who once had the job of holding up a mirror to life, now give us living, "breathing," animated objects: artworks that, in a sense, step into the mirror and show us a world beyond.

So where will cybernetics take us? Further, perhaps, than even the current artistic imagination can say.

Linda Lauro-Lazin
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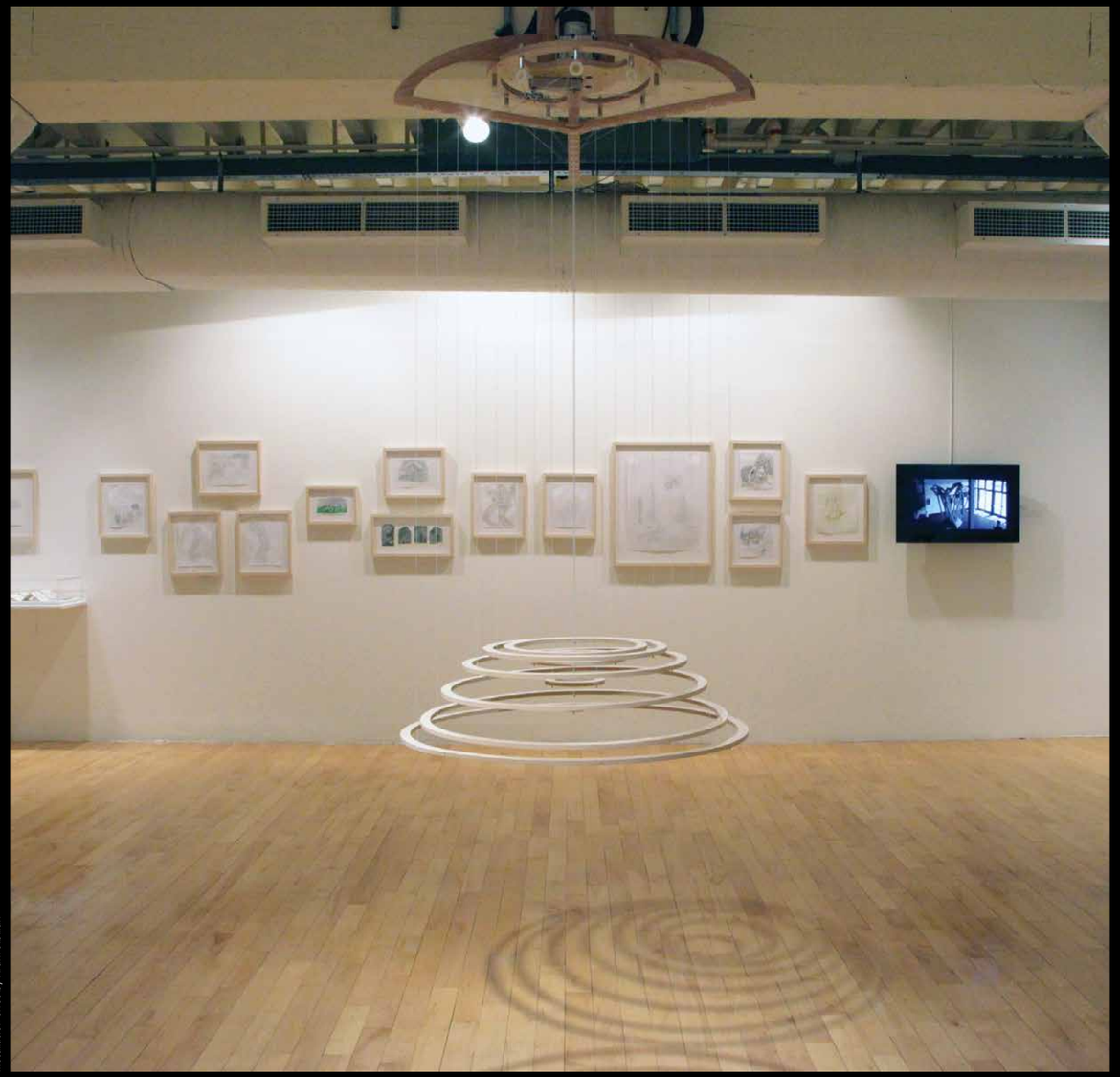
8 Founded by Chico MacMurtrie in 1991, Amorphic Robot Works (ARW) is a collective of artists, scientists, and engineers who are dedicated to the study and creation of robotic movement.

9 Steve Dixon. *Digital Performance* (Cambridge, MA: MIT Press, 2007), 290

10 Zimoun's work is visually reminiscent of Naum Gabo's *Kinetic Construction (Standing Wave)* 1919-20 which was, in effect, the first kinetic sculpture.

11 Oscar Gomez Poviña, "Noise Structures," *Vnfold Magazine,* July 2012

Installation shot by Aram Jibilian



Installation shot by Aram Jibilian

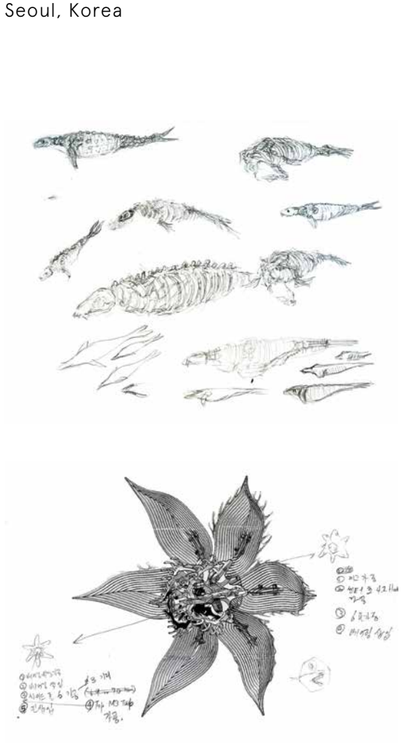
About the curators

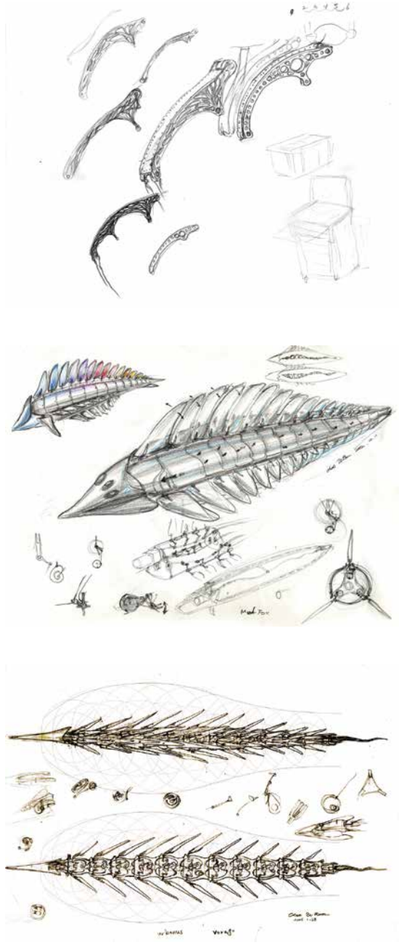
Nick Battis is the director of exhibitions at Pratt Institute. He has been involved in organizing and curating exhibitions for more than 22 years. He has coordinated numerous exhibitions of fine arts, architecture, and design in Pratt's Manhattan and Brooklyn galleries. He has also had solo exhibitions of his paintings in New York, Chicago, and Los Angeles. His vision for the Pratt Manhattan Gallery includes the themes of sustainability, social responsibility, and cross-disciplinary works explored through recent exhibitions such as *Party Headquarters: Voting is Just the Beginning* (2008), *Ethics + Aesthetics = Sustainable Fashion* (2009), and *Envelopes* (2010), which explored architectural surfaces' new ecological and sustainable potential.

Linda Lauro-Lazin is a professor in the Department of Digital Arts at Pratt Institute. She is a Fulbright scholar, a lecturer, and an artist and has been exhibiting her artwork for more than 35 years in the U.S. and Europe. In 2008, she curated the Pratt Manhattan Gallery exhibition *Impermanent Markings*. Other exhibitions she has curated and organized are *Digital Visions* (1995) at the Muroff Kottler Art Gallery at SUNY Ulster, Stone Ridge; and *Threading Time* (2005) and Computer Animation Festival Concept Artwork (2005) at SIGGRAPH 2005 in Los Angeles. She co-curated a series of international, multi-site live performances on the Access Grid (2005). She has also served on many international art juries.

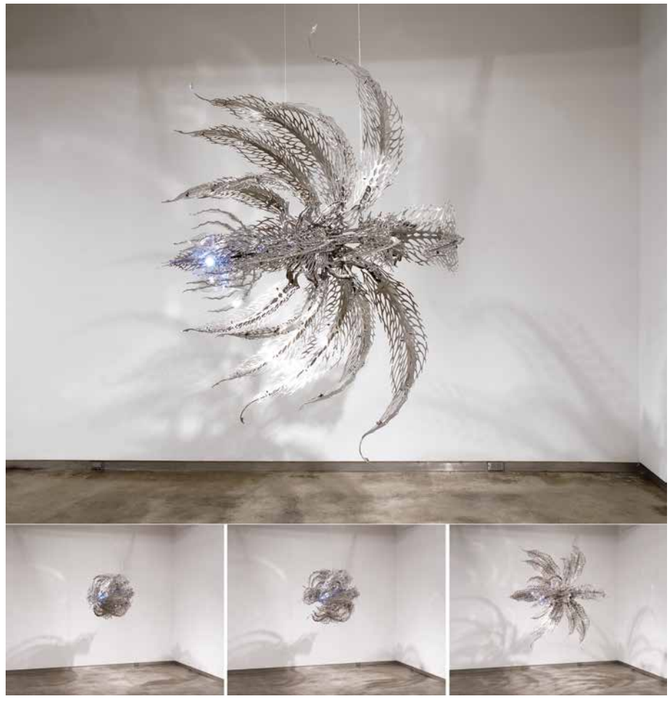
U-Ram Choe

Seoul, Korea





U-Ram Choe
Studies for various kinetic sculptures,
including *Urbanus Male*,
Ultima Mudfox,
and *Una Lumino Portentum*

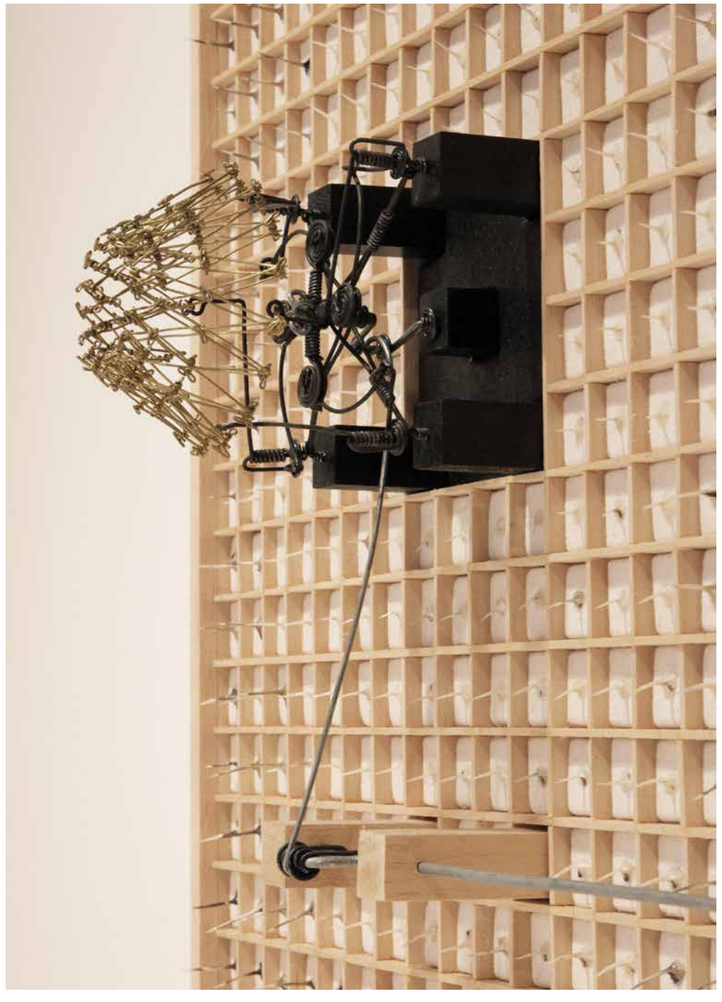


U-Ram Choe
Varietal Urbanus Female, 2006
Scientific name: Anmopista volaticus floris uram
Etched stainless steel, motors, metal halide lamp, custom software,
circuits, CPU board, cable, motors
30 x 30 x 56 inches closed, 85 x 85 x 54 inches open,
Edition of 5
Photo: David Plakke; courtesy bitforms gallery NYC

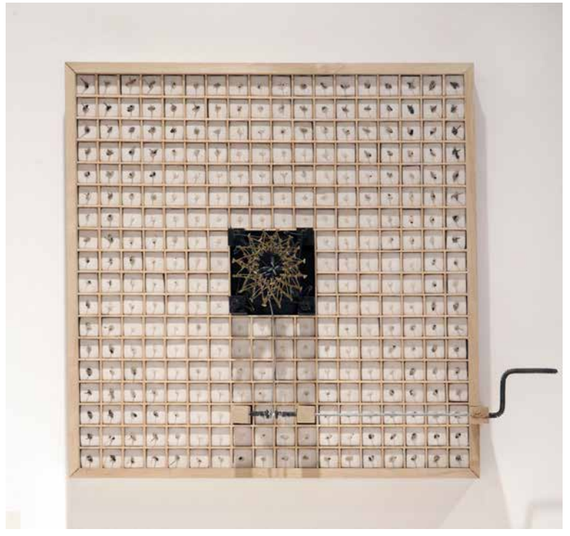
U-Ram Choe
Varietal Urbanus Male, 2006
Scientific name: Anmopista volaticus
floris uram
Installation view at Mori Art Museum
Stainless steel, aluminum, brushed
acrylic, custom software, CPU board,
cable, motors
10 x 10 x 110 inches,
Edition of 5
Photo: Kioku Kiezo; courtesy bitforms
gallery NYC

Casey Curran

Seattle, Washington



Detail of Casey Curran,
Expansion, 2012
Photo: Aram Jibilian

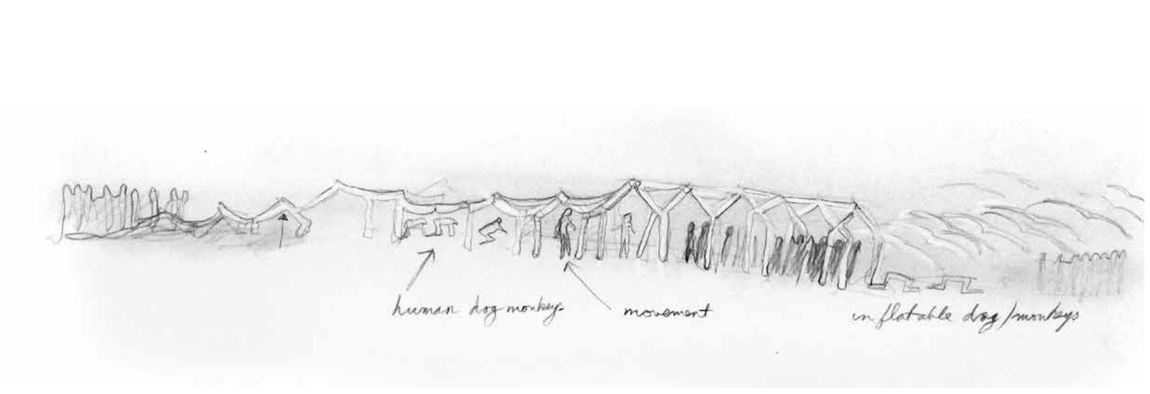


Casey Curran
Expansion, 2012
Puffer fish, wood, wire, fabric
21 x 25 x 6 inches
Courtesy of the artist
Photo: Aram Jibilian

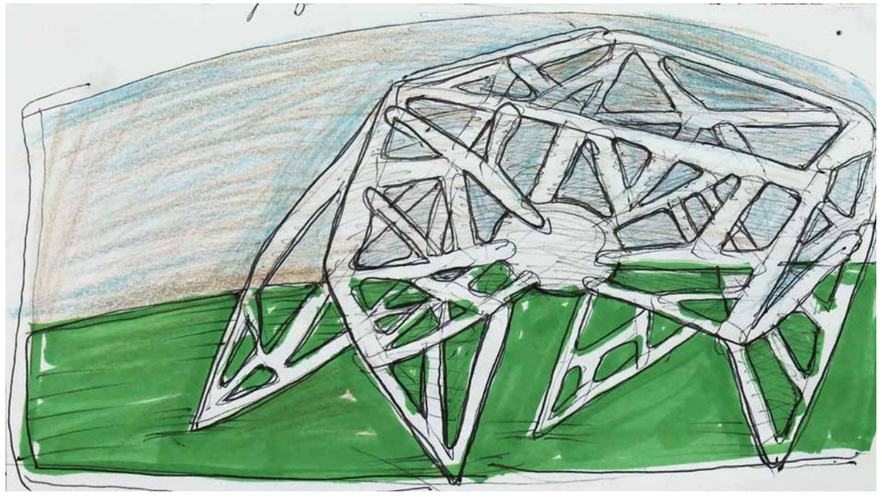
Casey Curran
Serpent, 2012
Rattlesnake skin, wood, wire, fabric
33 x 23 x 7 inches
Courtesy of the artist

Chico MacMurtrie

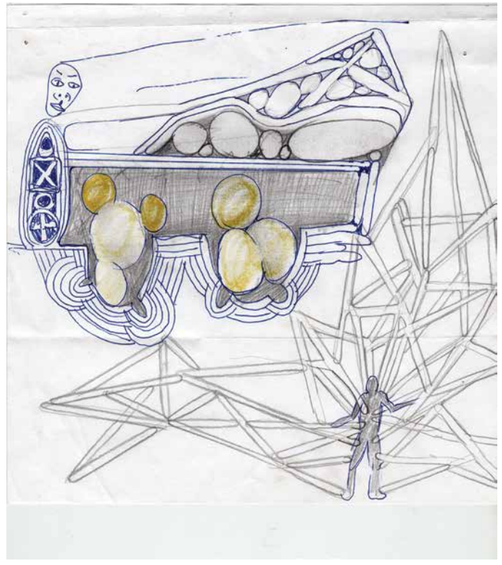
Brooklyn, New York



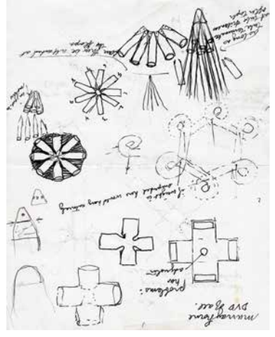
Chico MacMurtrie/Amorphic Robot Works
Untitled
10 x 23 ¼ inches
Pencil on paper
Courtesy of the artist



Chico MacMurtrie/Amorphic Robot Works
Untitled
10 x 23 ¼ inches
Pencil on paper
Courtesy of the artist

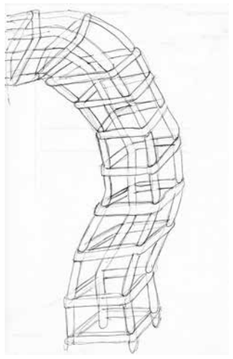


Chico MacMurtrie/Amorphic Robot Works
Untitled, 2012
Pen, pencil, and crayon on paper
8.5 x 8.5 inches
Courtesy of the artist



Chico MacMurtrie/Amorphic Robot Works
Untitled, 2011
Pen on paper
11 x 8.5 inches
Courtesy of the artist

Installation view, Chico MacMurtrie
/Amorphic Robot Works,
Inflatable Architecture Inner
Space, Beall Center
for Art + Technology,
Irvine, CA, 2011
© Chico MacMurtrie / ARW; Photo:
David Familian, UC Regents



Chico MacMurtrie/Amorphic Robot Works
Untitled, 2010
Pen on paper
11 x 8.5 inches
Courtesy of the artist

Reuben Margolin

Oakland, California

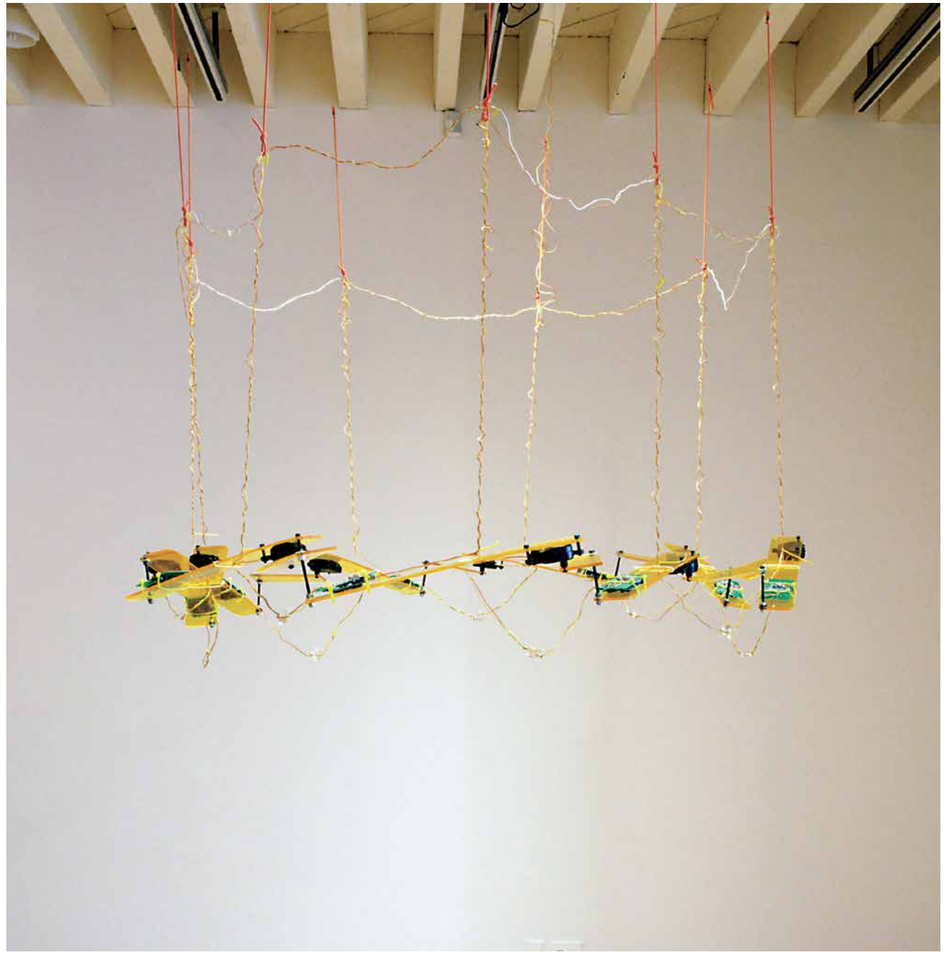
Reuben Margolin
Single Raindrop, 2012
Wood, string, electric motor
37 inches in diameter
Courtesy of the artist
Photo: Aram Jibilian

Detail of:
Reuben Margolin
Single Raindrop, 2012
Wood, string, electric motor
37 inches in diameter
Courtesy of the artist

Detail of:
Reuben Margolin,
Single Raindrop, 2012
Photo: Aram Jibilian

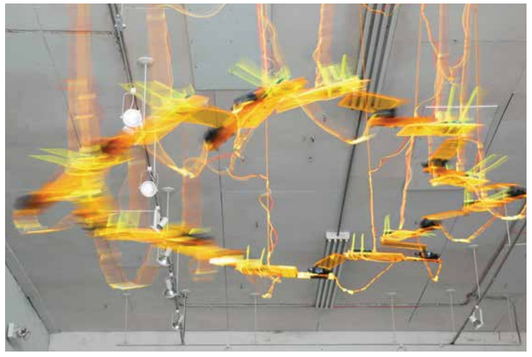
Meridith Pingree

Brooklyn, New York

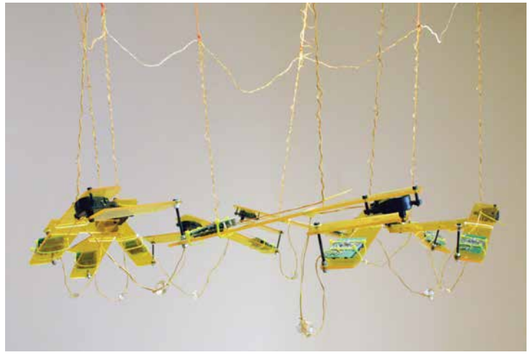


Meridith Pingree
Yellow Star, 2007
Acrylic, motors, motion sensors, wire, hardware
Approximately 5 feet in diameter
Courtesy of the artist
Photo: Aram Jibilian

Meridith Pingree,
Yellow Star, 2007



Meridith Pingree,
Yellow Star, 2007

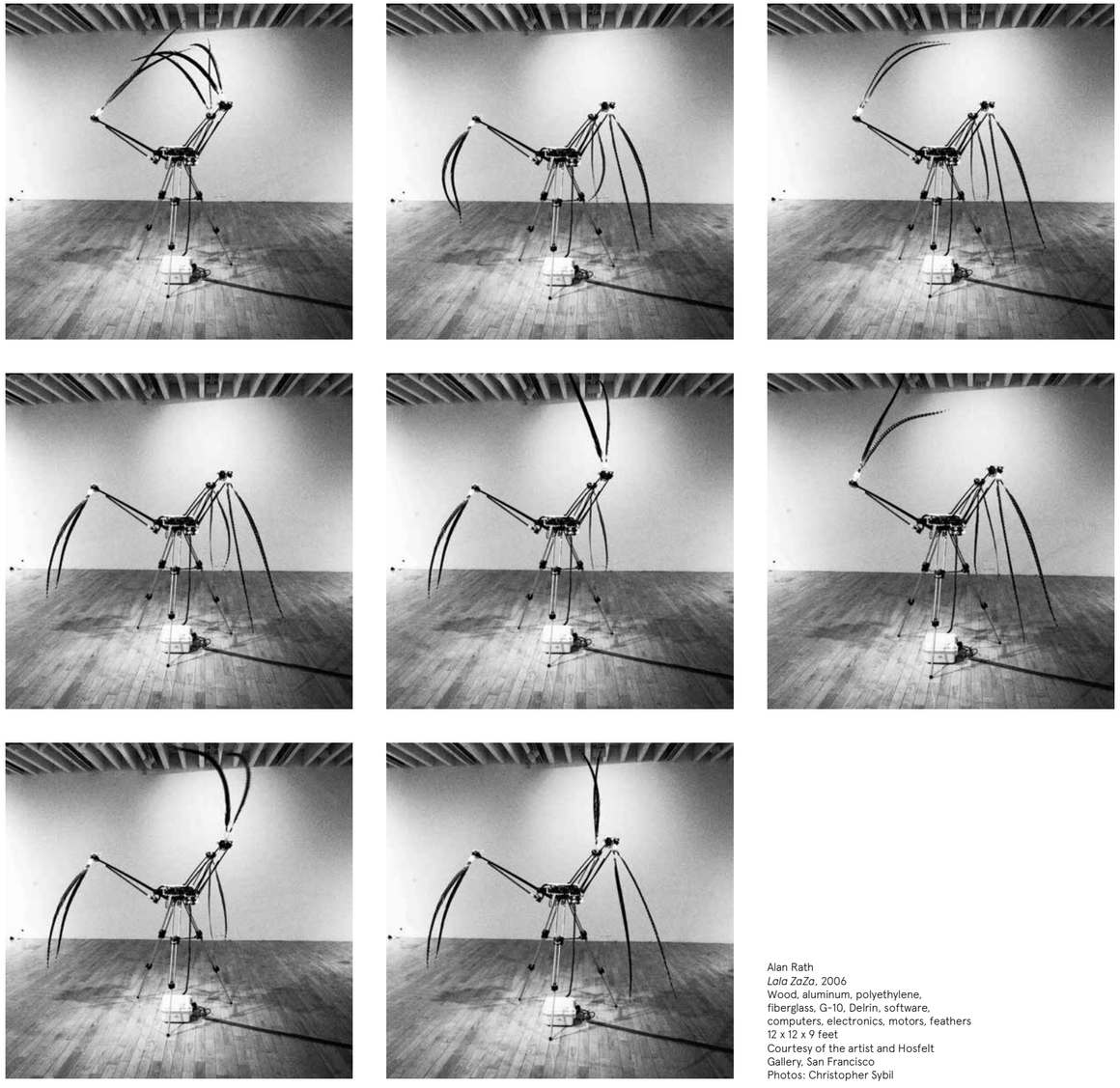


Meridith Pingree,
Yellow Star, 2007
Photo: Aram Jibilian

Alan Rath

Oakland, California

Alan Rath
Lala ZaZa, 2006
Wood, aluminum, polyethylene, fiberglass, G-10, Delrin, software, computers, electronics, motors, feathers
12 x 12 x 9 feet
Courtesy of the artist and Hosfelt Gallery, San Francisco
Photo: Hosfelt Gallery, San Francisco



Alan Rath
Lala ZaZa, 2006
Wood, aluminum, polyethylene, fiberglass, G-10, Delrin, software, computers, electronics, motors, feathers
12 x 12 x 9 feet
Courtesy of the artist and Hosfelt Gallery, San Francisco
Photos: Christopher Sybil

Adriana Salazar

Bogotá, Colombia

Adriana Salazar
Machine That Tries to Tie Two Shoelaces Together, 2006
Found object and mechanisms
7 x 9 x 15 inches
Courtesy of LA Galeria Arte (Contemporanea)
Bogotá, Colombia

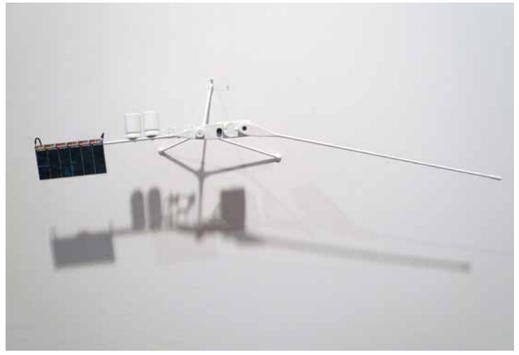
Adriana Salazar
Plant #26, 2013
Installation
59 inches in diameter x 59 inches high
Courtesy of the artist
Photos: top, Aram Jibilian, bottom Christopher Sybil and Monica Seldow

Adriana Salazar installing *Plant #26* at the Pratt Manhattan Gallery
Courtesy of the artist
Photo: Linda Lauro-Lazin

Björn Schülke

Cologne, Germany

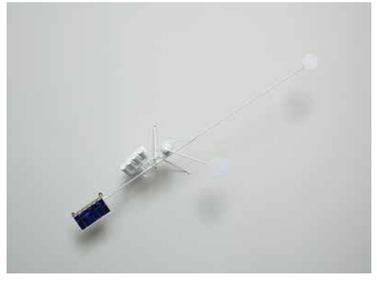
Björn Schülke
Spider Drone #2, 2012
Wood, carbon fiber, two cameras, TFT video display, motors, motion sensors, custom circuits
21 x 22 x 24 inches
Courtesy of bitforms gallery NYC
Photo: John Berens; courtesy of bitforms gallery NYC



Björn Schülke
Solar Kinetic Object #59, 2007
Brass, motor, electronics, solar cell, paint
16 x 2 x 3 inches
Courtesy of bitforms gallery NYC
Photo: John Berens; courtesy of bitforms gallery NYC

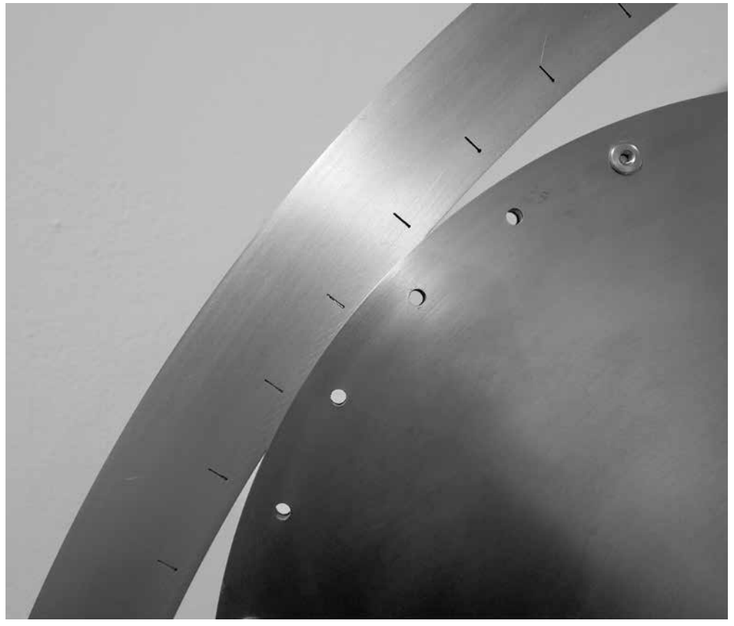
Björn Schülke
Transmitter, 2011
Wood, brass, steel, circuits, motors, LED, guitar string, solar cells, paint
17.72 x 9.84 x 7.09 inches
Courtesy of bitforms gallery NYC
Photo: John Berens; courtesy of bitforms gallery NYC

Björn Schülke
Solar Kinetic Object #64, 2007
Brass, motor, electronics, solar cell, paint
17 x 2 x 1 inches
Courtesy of bitforms gallery NYC
Photo: Jon Berens; courtesy of bitforms gallery NYC

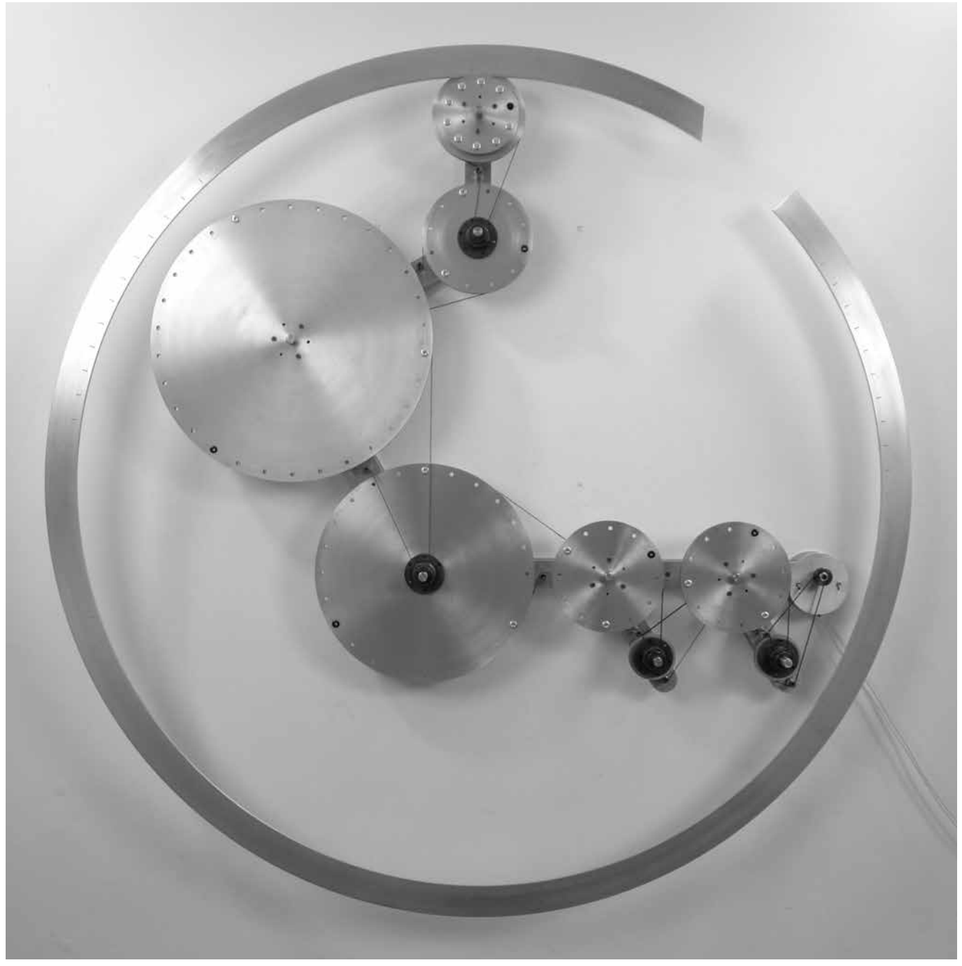


Che-Wei Wang

Brooklyn, New York



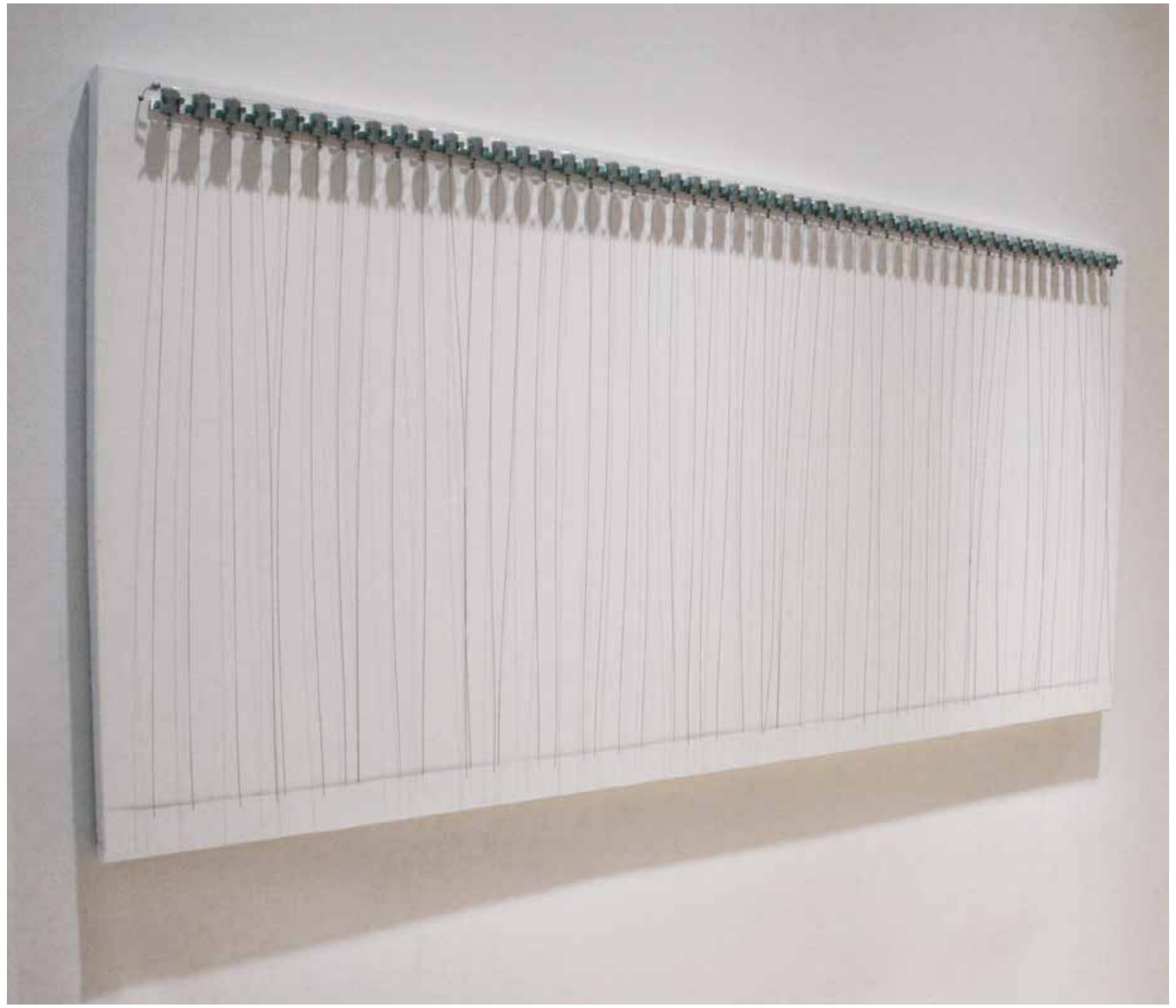
Detail of:
Che-Wei Wang
3.16 Billion Cycles, 2009
Aluminum, AC sync motor,
rubber belts
46 inches in diameter x 6
inches deep
Courtesy of the artist



Che-Wei Wang
3.16 Billion Cycles, 2009
Aluminum, AC sync
motor, rubber belts
46 inches in diameter x 6
inches deep
Courtesy of the artist

Zimoun

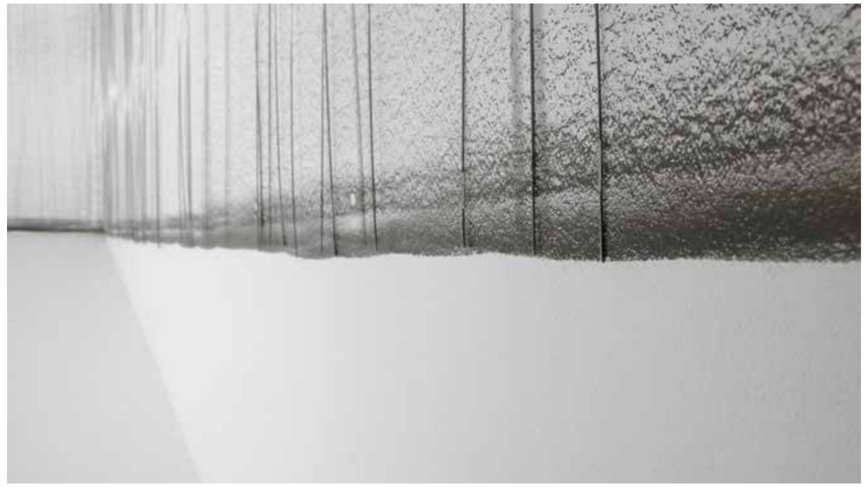
Bern, Switzerland



Zimoun
50 prepared dc-motors, filler wire 1.0mm, 2009
Motors, steel, power supply, aluminum profile
39.4 x 78.7 x 2 inches
Courtesy of bitforms gallery NYC
Photo: Aram Jibilian

Detail of:
Zimoun
50 prepared dc-motors, filler wire 1.0mm, 2009
Motors, steel, power supply, aluminum profile
39.4 x 78.7 x 2 inches
Courtesy of bitforms gallery NYC
Photo: Zimoun

Detail of:
Zimoun
50 prepared dc-motors, filler wire 1.0mm, 2009
Motors, steel, power supply, aluminum profile
39.4 x 78.7 x 2 inches
Courtesy of bitforms gallery NYC
Photo: Zimoun



Detail of:
Zimoun
50 prepared dc-motors, filler wire 1.0mm, 2009
Motors, steel, power supply, aluminum profile
39.4 x 78.7 x 2 inches
Courtesy of bitforms gallery NYC
Photo: Zimoun

Exhibition Checklist

U-Ram Choe

Video documentation of the exhibition *New Urban Species*, Frist Center for the Visual Arts, 2010

Digital reproductions of sketches for the following installations:

Ultima Mudfox, 2002

Varietal Urbanus Female, 2006

Opertus Lunula Umbra (Hidden Shadow of the Moon), 2008

Una Lumino Portentum, 2009

Custos Cavum, 2011

Scarecrow, 2012

Casey Curran

Serpent, 2012
Rattlesnake skin, wood, wire, fabric
33 x 23 x 7 inches
Courtesy of the artist

Expansion, 2012
Puffer fish, wood, wire, fabric
21 x 25 x 6 inches
Courtesy of the artist

Chico MacMurtrie Amorphic Robot Works

All works courtesy of the artist

Notebook (blue cover), 2005
4.5 x 3.5 x .5 inches

Notebook "118" (no cover), 2011
4.5 x 3.5 x .5 inches

Untitled, 2012
Pen, pencil, and crayon on paper
8.5 x 8.5 inches

Untitled, 2012
Pen, wash, and coffee on paper
9.5 x 8.5 inches

Untitled, 2011
Pen on paper
11 x 8.5 inches

Untitled, 2011
Pen, crayon, and felt marker on paper
4.5 x 7.75 inches

Untitled, 2012
Pencil on paper
8.5 x 11 inches

Untitled, 2012
Wash on paper
11 x 8.5 inches

Untitled, 2006
Pencil on paper
7.5 x 10.25 inches

Untitled, 2012
Pen and coffee on paper
11 x 8.5 inches

Untitled, 2012
Coffee on paper
12.25 x 10.5 inches

Untitled, 2010
Pen on paper
11 x 8.5 inches

Untitled, 2010
Pen on paper
11 x 8.5 inches

Untitled, 2009
Group of four drawings
Wash on paper
5.5 x 3.5 inches each

Untitled, 2007
Pencil on paper
10 x 23.25 inches

Untitled, 2008
Pencil on paper
23.5 x 18 inches

Video documentation of:

Sixteen Birds, Experimental Art Foundation, Adelaide, Australia, 2006

Inflatable Architectural Body, Museo de la Reina Sofia, Madrid, 2008

Inflatable Architectural Growth, SF Fine Art Fair, San Francisco, 2010

Architectural Body "Inner Space", The National Gallery of Macedonia, Cifte Amam, Skopje, 2010

Reuben Margolin

Single Raindrop, 2012
Wood, string, electric motor
37 inches in diameter
Courtesy of the artist

Meridith Pingree

Yellow Star, 2007
Acrylic, motors, motion sensors, wire, hardware
Approximately 5 feet in diameter
Courtesy of the artist

Alan Rath

Lala ZaZa, 2006
Wood, aluminum, polyethylene, fiberglass, G-10, Delrin, software, computers, electronics, motors, feathers
12 x 12 x 9 feet
Courtesy of the artist and Hosfelt Gallery, San Francisco

Adriana Salazar

Plant #26, 2013
Installation
59 inches in diameter x 59 inches high
Courtesy of the artist

Machine That Tries to Tie Two Shoelaces Together, 2006
Found object and mechanisms
7 x 9 x 15 inches
Courtesy of LA Galeria Arte Contemporanea, Bogotá, Colombia

Björn Schülke

Solar-Space-Mobile, 2007
Solar cells, motor, brass wire, circuits, paint
Edition 3/3
96 inches, maximum diameter, 48 inches, length of each arm
Courtesy of bitforms gallery, NYC

Spider Drone #2, 2012
Wood, carbon fiber, two cameras, TFT video display, motors, motion sensors, custom circuits
21 x 22 x 24 inches
Courtesy of bitforms gallery, NYC

Solar Kinetic Object #59, 2007
Brass, motor, electronics, solar cell, paint
16 x 2 x 3 inches
Courtesy of bitforms gallery, NYC

Solar Kinetic Object #64, 2007
Brass, motor, electronics, solar cell, paint
17 x 2 x 1 inches
Courtesy of bitforms gallery, NYC

Transmitter, 2011
Wood, brass, steel, circuits, motors, LED, guitar string, solar cells, paint
17.72 x 9.84 x 7.09 inches
Courtesy of bitforms gallery, NYC

Che-Wei Wang

3.16 Billion Cycles, 2009
Aluminum, AC sync motor, rubber belts
46 inches in diameter x 6 inches deep
Courtesy of the artist

Zimoun

50 prepared dc-motors, filler wire 1.0mm, 2009
Motors, steel, power supply, aluminum profile
39.4 x 78.7 x 2 inches
Courtesy of bitforms gallery, NYC

Acknowledgements

This exhibition and its programming would not have been possible without the dedication of the Pratt Department of Exhibitions staff: Olivia Good, Assistant Director; Travis Molkenbur, Installation Manager; Rich Miller, Installation Technician, and our student assistants.

I would like to thank the artists for their participation: U-Ram Choe, Chico MacMurtrie, Casey Curran, Reuben Margolin, Meridith Pingree, Alan Rath, Adriana Salazar, Björn Schülke, Che-Wei Wang, and Zimoun.

Many thanks to my collaborator Professor Linda Lauro-Lazin for her expertise and commitment to this exhibition.

The assistance of the following individuals is greatly appreciated:

Pratt Institute Staff

Amy Aronoff
Senior Media Relations Manager

David Dupont
Production Manager

Cedric Jackson
Building Operations Facility Manager

Design

Hannah Bardwell
Student Designer

Student Assistants

Catherine Best

Regina Dubin

Navid Ghaffarian

Pamela Lum

Aria Marco

Hyunyi Park

Fatoma Rad

Monica Seldow

Christopher Sybil
(a special thanks for the photos he contributed to this catalog)

Other Individuals

Laura Blereau
Director, bitforms, NYC

Younghee Choi
U-Ram Choe Studio

Todd Hosfelt
Director, Hosfelt Gallery, San Francisco

Luise Kaunert
Chico MacMurtrie Studio

Kay Hines

Elaine Komorowski

Lucy Ross
Registrar, bitforms, NYC

Steve Sacks
Founding Director, bitforms, NYC

Sarah Schmerler

David Stroud
Registrar, Hosfelt Gallery, San Francisco