

Special Section

Art Embodies A-Life: The VIDA Competition

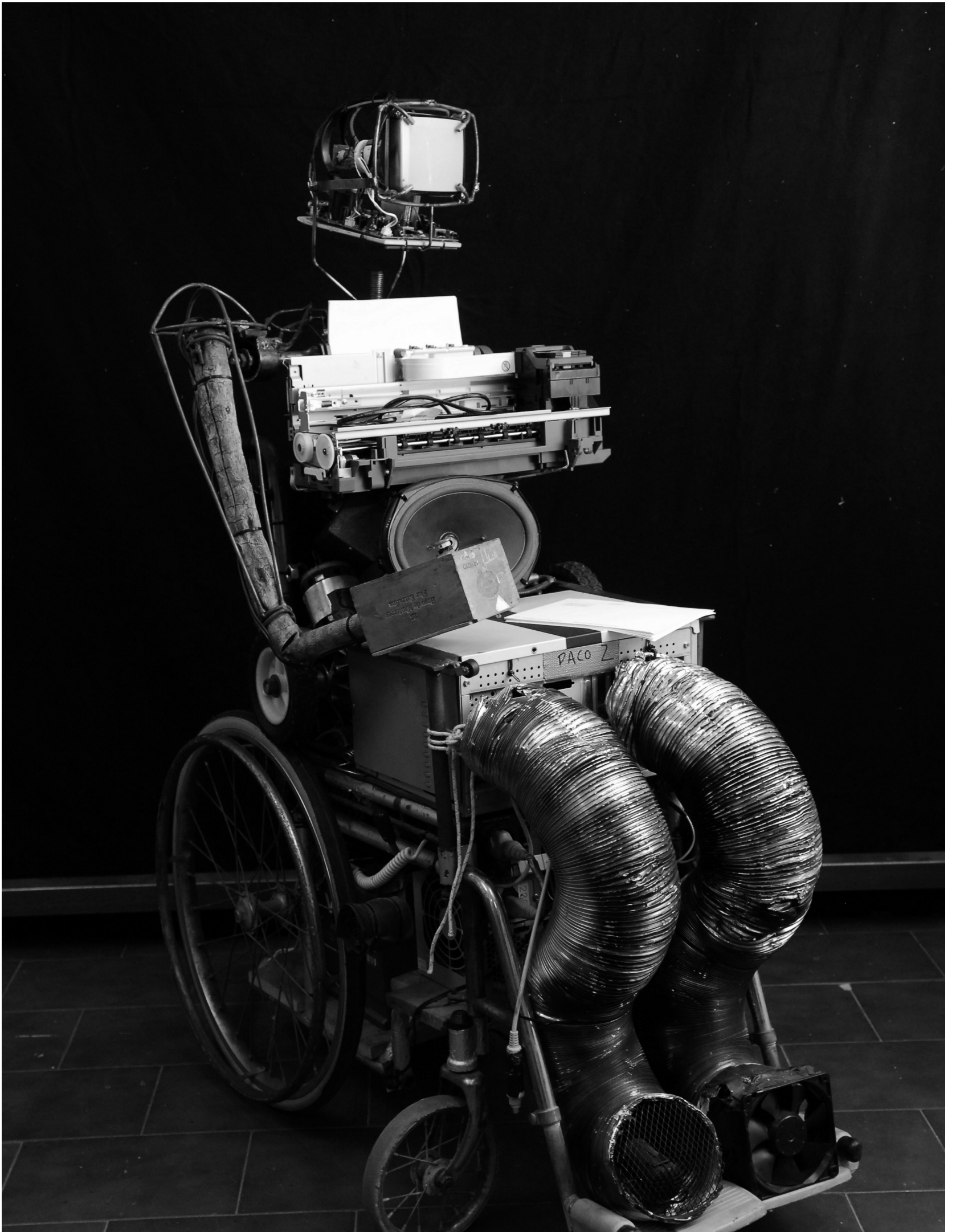
Nell Tenhaaf, curator

Daniel Canogar, artistic director, VIDA

VIDA is an international competition that rewards excellence in artistic creativity in the fields of artificial life and related disciplines, such as robotics and artificial intelligence. Funded by Fundación Telefónica in Spain, this award promotes the convergence of art, science and technology. Celebrating its tenth anniversary in 2007–2008, VIDA has awarded artistic projects using autonomous robots, avatars, recursive chaotic algorithms, knowbots, cellular automata, computer viruses, virtual ecologies that evolve with user participation and works that highlight the social side of artificial life. The artists who created these unique works of art are interested in how the “synthetic” and the “organic” are becoming increasingly intertwined in the electronic era.

DANIEL CANOGAR

More information at: <www.telefonica.es/vida>.



Art Embodies A-Life: The VIDA Competition

Nell Tenhaaf

There is no single feature that characterizes the unique nature of Artificial Life (A-Life) creativity in art. Rather, there is a set of characteristics, some of which will appear in any given work. For example, A-Life artworks might have behaviors, while other artworks do not; they are not static but dynamic and may evolve over time in relation to their environments; or they might incorporate both natural and artificial elements, calling into question the boundary between the living and the nonliving. These are A-Life research concepts that, through A-Life art, find their way into people's imaginations in a way that they otherwise could not and in a form that allows them to be directly experienced and readily understood. A-Life art is a synthesis of different cultural inputs: the technological buzz of the moment, ideas from research that are sometimes highly specialized, and whatever artistic strategies must be called upon to mold these diverse forces into an artifact that has both aesthetic power and social relevance.

While labs are not a part of most people's everyday lives, many of the applications that arise from them and that are used in industry are. Technologies developed in relation to A-Life, artificial intelligence (AI) and robotics research [1] have become familiar to people in daily life through forms of entertainment. Examples are the virtual pet phenomenon (Tamagotchi; Dogz, Catz and other Petz; Seaman; Furby; AIBO), virtual characters that "learn" through AI in video games, or functional electronic interfaces such as bank machines and smart user interfaces for mobile communications technology. People bring such encounters from their everyday worlds into the gallery and into their experience of A-Life artworks.

EVERYDAY TECHNOLOGIES

Art embodies A-Life research in a way that connects it to everyday lived experience. Marcel Duchamp's revolutionary concept of the Readymade particularly lends itself to creative A-Life practices [2]. When he declared the famous urinal and bottle rack to be artworks, Duchamp was asserting that the industrial connotations and everyday use value of such objects determined their artistic life as Readymades. Unlike with

Nell Tenhaaf (artist, educator), York University, 4700 Keele St., Toronto, Canada M3J 1P3.
E-mail: <tenhaaf@yorku.ca>.

Article Frontispiece. Carlos Corpa and Ana María García Serrano, *PaCo—Poeta Automático Callejero Online*, wheelchair, humanoid sculpture with computer, printer, cards, etc., voice synthesizer, video monitor, custom software, 2004. (© Carlos Corpa) Shared Third Prize, VIDA 7.0. Project web page: <<http://www.isys.dia.fi.upm.es/PaCo/>>.

ABSTRACT

Artificial Life artworks hold a unique place in the art world, one that has been largely mapped by the VIDA international competition through its annual recognition of outstanding works based on A-Life. Works that have received awards since the VIDA competition began in 1999 (25 prize-winning artworks and 56 honorary mentions) have gained viewer appreciation and popularity at the same level as any other kind of art. Yet these works define a territory of their own, delineated here through characteristics of A-Life art that arise from both the artist's studio and the research lab and that mark the 25 awarded artworks. Following this article, the Leonardo VIDA Gallery presents a selection of eight prize-winning works that show the breadth of the competition to date; each is discussed here.

the objet trouvé of the surrealists, the insertion of a Readymade into the art gallery was a gesture intended not to discover and amplify its hidden beauty but to provoke an interest in the absurdity of institutionalized art preoccupied only with eternal values and blind to either current social conditions or the daily preoccupations of the vast majority of people. After Duchamp and the ensuing dadaist phenomenon turned the Readymade into common artistic currency, gallery-goers could immediately grasp the

need to connect art to the social conditions of living. Several VIDA prize-winning works discussed here operate as Readymades, alerting us to the nature and impact of the industrial objects that now permeate our lives: electronically driven gadgets that tend to take over rather than just extend our capabilities. They are substitutes for life processes, not just add-ons, which is why we have started to think of them as having some kind of life of their own. They present a challenge to our pre-existing notions of what is "human," "natural" and "alive."

Tickle (1997, VIDA 2.0, see Gallery) by Netherlands artists Erwin Driessens and María Verstappen, is a small autonomous robot that walks on the human body to generate a pleasing tickling sensation. When it encounters a slope that is too steep, it will steer in another direction until a safely level surface is found and then continue on its way. This behavior is implemented using a hardware-instantiated finite state machine. *Tickle* has qualities of the Readymade in its bridging to the commodity fetishism that surrounds us. It reminds us that we fervently desire the gadgets that might bring us pleasure, especially if they are smart in their form of delivery.

The same artists made an installation called *Tickle Salon* (2002, 5.0) which consists of a robot attached to the ceiling and a bed below it on the floor. The interactant lies down on the bed. In between the bed and the ceiling is a suspended feeler made of silky thread and a metal ball, whose movement is determined by sensor feedback from its collisions with the skin surface. As the robot explores, it gently strokes the surface of the body while at the same time creating and updating the shape of that body in its virtual imagination.

The two *Tickle* works suggest various kinds of everyday consumer items that could potentially be programmed for sensitivity to our needs, to ease our lives, entertain us, connect us socially, etc. In contrast, France Cadet's installation *Dog*



Fig. 1. Shih Chieh Huang, *EX-DD-06*, household products and mixed electronics, 2006. (© Shih Chieh Huang. Photo: Tom Powell, courtesy Virgil de Voldere Gallery, New York.) Third Prize, VIDA 9.0. Artist's web page: <www.messymix.com/>.

[*LAB*]01 (France, 2003, 6.0, see Gallery) is an overt retooling of a commercial product, a classic Readymade for our time, in which Duchamp's gesture that the art world rebuffed in 1917—signing the urinal with the pseudonym R. Mutt to make the artwork *Fountain*—is now translated into the hacker strategy of reprogramming a consumer product. Composing the installation are *Copycat*, *Dolly*, *GFP Puppy*, *Xenodog* and *Jellydoggy*, five transgenic and chimerical animals that have been transformed from robot dogs; all are based on real cloning experiments. They retain the robot's basic morphology, but are augmented with attributes such as a bovine color and horns, skin made of a jelly-like material or other alien substances, or bleating or meowing, all to express mixtures of various “genetic” information, including that of dogs, cats, ewes, cows, sheep, pigs and jellyfish. The artist's technical method is to install a customized chip and flash memory card into each robot so as to program the robot's 16-motor drive for altered movement, sounds, lighting of the eyes and reading of the various sensors.

A work with more literal Readymade

qualities in its adaptation of ordinary kitchen equipment is *LiveForm: Telekinetics*, or *LF:TK* (2004, VIDA 8.0, see Gallery). This work usurps both the use value and the brand value of commodities to generate pockets of collective, local and rather chaotic creation. Artists Jeff Mann and Michelle Teran, Canadian artists living in Germany, build sensors and motors into cutlery, plates, bowls, scissors, corkscrews, etc., to endow them with highly animated expressiveness. These retrofitted items are used for multiple physically separated dinner parties that are networked together, preferably through the free Wi-Fi hotspots that now dot many cities: Picnickers in one spot run custom software that collects sensor data from the gestures of eating and sends it live to identical objects in another location that could be on the other side of the world. In his *EX-DD-06* (2006, VIDA 9.0) (Fig. 1), Shih Chieh Huang (Taiwan/U.S.A.) uses very simple electronics, such as light bulbs and TVs, combined with gaudy inflatable plastic tentacles and many hanging wires to make a quasi-biological world that is both alien and quotidian.

OTHER EMBODIMENTS

An A-Life artwork has by definition an embodiment, a materialization that a viewer can perceive and respond to. VIDA has been open to many different kinds of embodiments, including forms that have often diverged quite radically from those found in the A-Life research world. There, artificial entities with animal-like or human-like qualities are simulated in the form of pixel clusters on a screen, animated characters or robots—or hybrids of these embodiments. VIDA has recognized many works that address A-Life research not through its representational methods but through the broader cultural issues that it raises. Several VIDA works probe the intersections of biology and artificiality to reveal hidden suppositions about the technologization of life processes. American artist Paul Vanouse's *Relative Velocity Inscription Device* (2002, VIDA 5.0) (Fig. 2) considers eugenics through the funny-sounding but troubling trope of a “race race”: he uses previously extracted and amplified DNA fragments from each of his parents, his sister and himself (who are a

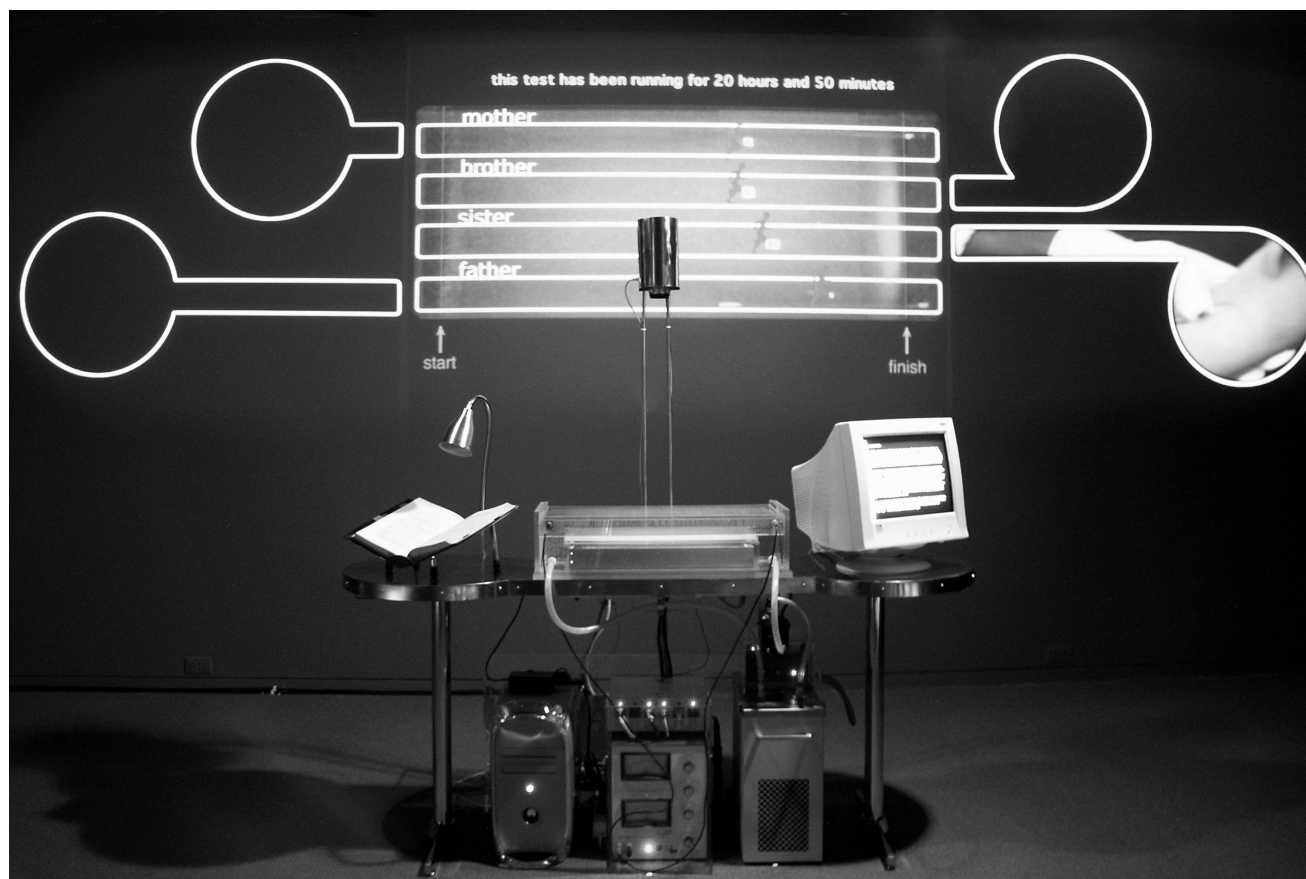


Fig. 2. Paul Vanouse, *The Relative Velocity Inscription Device*, live scientific experiment/installation, 2002. (© Paul Vanouse)
Shared Second Prize, VIDA 5.0. Project web page: <www.paulvanouse.org/rvid.html>. Artist's web page: <www.paulvanouse.org>.

biracial family) to drive running-figure avatars in a real-time performance that runs for 2–3 days. From Spain, *Novus Extinctus* (2001, VIDA 4.0) by Transnational Temps (Andy Deck, Fred Adam and Verónica Perales), is an Internet artwork whose central message is that the expansion of human presence on the World Wide Web, measured via the number of domain names registered daily, climbs in a deadly parallel with the number of species that go extinct. The site has a strong element of marketing spoof as well, linking Latin species names to commercial sites such as TigerDirect that use the names of exotic animals.

Death and the human desire for immortality are looked at in two very different ways in *Levántate* (2002, VIDA 5.0) by Spain's Mariela Cádiz (with the collaboration of Kent Clelland) and in *Concrete Music* (2003, VIDA 6.0) (Fig. 3) by Ethan Bordeaux, Ben Recht, Noah Vawter and Brian Whitman (U.S.A.). *Levántate* confronts the viewer with the image of a female body in a perpetual state of “digital decomposition,” as a result of image processing, and projected onto a sarcophagus. Viewers tend to cluster

around this sculptural element as for a funerary ritual. Simultaneously, a soundtrack of digitally decomposed voices plays in the space and is continuously re-recorded and mixed with the voices of the audience, to haunting effect. In *Concrete Music*, immortality is both encapsulated and epitomized. Inside a concrete slab, the artists have embedded hardware that supports a 30-year song program. On startup, the system loads the program and executes it. From preset parameters, the song composes itself as it slowly drifts away from its base state by means of recursive remixing of its own flow. With each boot of the system, the song starts over at zero. For a user to hear it all, the piece has to be powered up for the full 30 years, after which time the song will end.

AGENCY: ARTIFICIAL BUT ACTUAL

The longevity of *Concrete Music* aside, the rapid rate of obsolescence of electronically run gizmos and their ubiquity in the world mean that, in one way or another, many people are in constant negotiation

with them. The sense, then, that these things have a kind of agency is now intuited on a broad scale. As far back as the early 1980s, actor-network theory (ANT) theorized that non-living but dynamic objects have the status of “actants.” ANT has spread throughout the academic world since its emergence from the discipline of science studies, so that the attribution of agency to non-living things is still much discussed in fields from information systems research to political science. In essence, ANT says that existence is about action rather than the intrinsic nature of a phenomenon or entity: All actants have a history, and it is only through their action in the world that they have an identity. Moreover, non-living actants convey the actions of the living: “I live in the midst of technical delegates; I am folded into nonhumans” [3]. The attribution of agency to technical delegates is, in the contemporary world, both pervasive and preconscious, that is, it happens for most people spontaneously without thinking about it rationally. A-Life artworks take up this complicated loop when the intentions and thought process of an artist are trans-



Fig. 3. The DSP Music Syndicate, *Concrete Music*, custom hardware music processor, cement mixture, 2003. (© Ethan Bordeaux, Ben Recht, Noah Vawter and Brian Whitman. Photo © Brian Whitman.) Third Prize, VIDA 6.0. Project web page: <<http://dspmusic.org/>>.

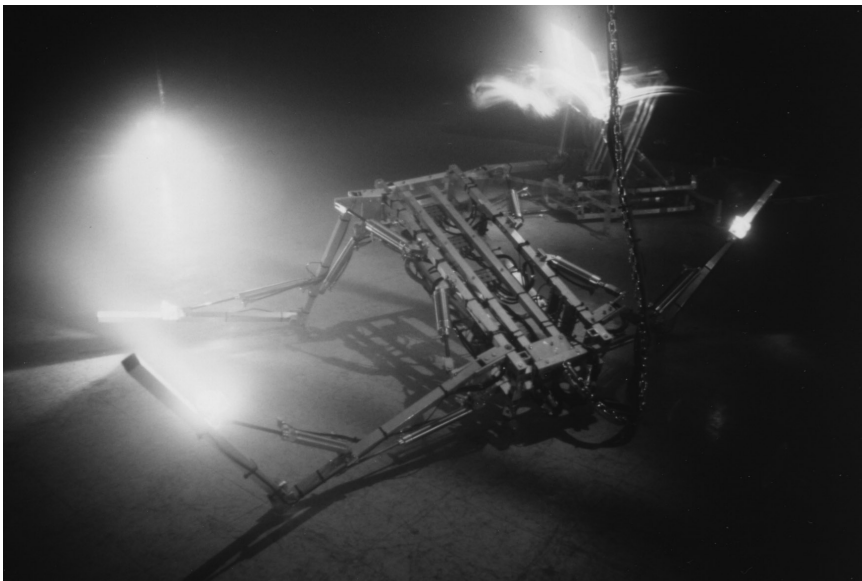
lated into action and delegated to a dynamic system to live on in it as an event or interaction. The dynamic that the work presents to the viewer is the prompt, or cue, by means of which agency is attributed by the viewer to the nonhuman and nonliving artwork.

A-Life art is intensively engaged with this concept of artificial agency—how to elicit it for the viewer and how to establish imaginative and meaningful relationships with it.

Classic artificial agents in the art domain involve those created by U.K. artists Jane Prophet and Gordon Selley in *TechnoSphere*, a real-time 3D simulation

of an environment populated by virtual creatures launched in 1995. VIDA 2.0 awarded this project an honorary mention as a pioneering work [4]. The creatures were created by on-line users from a menu of body parts; they could eat, grow, compete, mate, produce offspring and of course die, all under the watch of their creator. *TechnoSphere* was on-line until 2002, by which time over a million creatures had been generated by users. In Japanese artist Haruki Nishijima's *Remain in Light* (1999, VIDA 4.0, see Gallery), artificial creatures are made by capturing sounds from the electromagnetic spectrum in the atmosphere

Fig. 4. Bill Vorn and Louis-Philippe Demers, *La Cour des Miracles*, interactive robotic installation, 1997. (© Bill Vorn) Shared first prize, VIDA 2.0. Artist's web page: <<http://billvorn.concordia.ca>>.



(made by radios, cell phones, etc.) using an “insect net,” which is really an antenna. The recorded sounds are entered into a computer and their frequencies correlated with a color scheme to generate projected globes of light. These “electronic insects” then float around the screen; when they hit its edge, where they tend to cluster when someone comes into the space, they emit their respective sounds. Bits of sound data that float imperceptibly in urban space are given visible and audible insect-like behavior, suggesting that they have swarm behavior that we merely cannot detect.

Robots tend to foreground autonomous behaviors such as mobility and sensitivity to their environment and to mimic the sensory responses of humans or animals. However, A-Life robotic artworks are invariably different from robots found in research, even if they investigate many of the same questions about agency and artificial embodiment. Unlike research robots that are studied to gain quantifiable data, robotic artworks call attention to relationships between robots and humans, whether those humans are the creators of a work or members of the public. It is not simply a question of objective or subjective points of view; it is a question of the robotic artist wanting to elicit narrative elements and affective responses that complicate a viewer's response to the work. In the lab, those narratives may be present but are set aside. For example, Bill Vorn and Louis-Phillipe Demers's *La Cour des Miracles* (Canada, 1997, VIDA 2.0) (Fig. 4) presents 30 robotic entities that each demonstrate a dysfunction, in a combination of physical and mental suffering, much like the cripples, beggars and criminals of the medieval “court of miracles.” The robots show an unquestionable power in their abrasive clamor for attention, even with their very limited repertoire of movements and behaviors. Because of their visual and behavioral references to hybrid species, France Cadet's retooled robots in *Dog [LAB]01* are replete with topical news stories and evoke the wariness associated with potentially unregulated genetic engineering.

In the case of Carlos Corpa and Ana María García Serrano's *PaCo—Poeta Automático Callejero Online* (Spain, 2004, VIDA 7.0) (Article Frontispiece), the artists' concept is to explore the replacement of humans with machines. Here, however, the machine is not designed as an improvement on human capacities, but is a wheelchair-bound robot that recites and prints out computer-generated poems. The robot holds out a “hand”



Fig. 5. Ken Feingold, *Head*, silicone fiberglass, wood, steel, electronics, software, approx. 18 × 18 × 50 in, 1999–2000. (© Ken Feingold. Collection Kiasma Museum of Contemporary Art, Helsinki. Photo: Pirje Mykkömen. Photo © The Central Art Archives, Finland.) Third Prize VIDA 3.0. Artist's web page: <www.kenfeingold.com/>.

in the form of a coin box with a slot, which clearly invests it with the persona of a beggar—rather like the robots of Vorn and Demers, but without a historical reference. Ken Feingold's *Head* (U.S.A., 1999, VIDA 3.0) (Fig. 5), although not a robot but a realistic animatronic sculpture, considers the quest of AI to replicate human cognitive functions in artificial media, functions that are exemplified by listening and responding. *Head* does

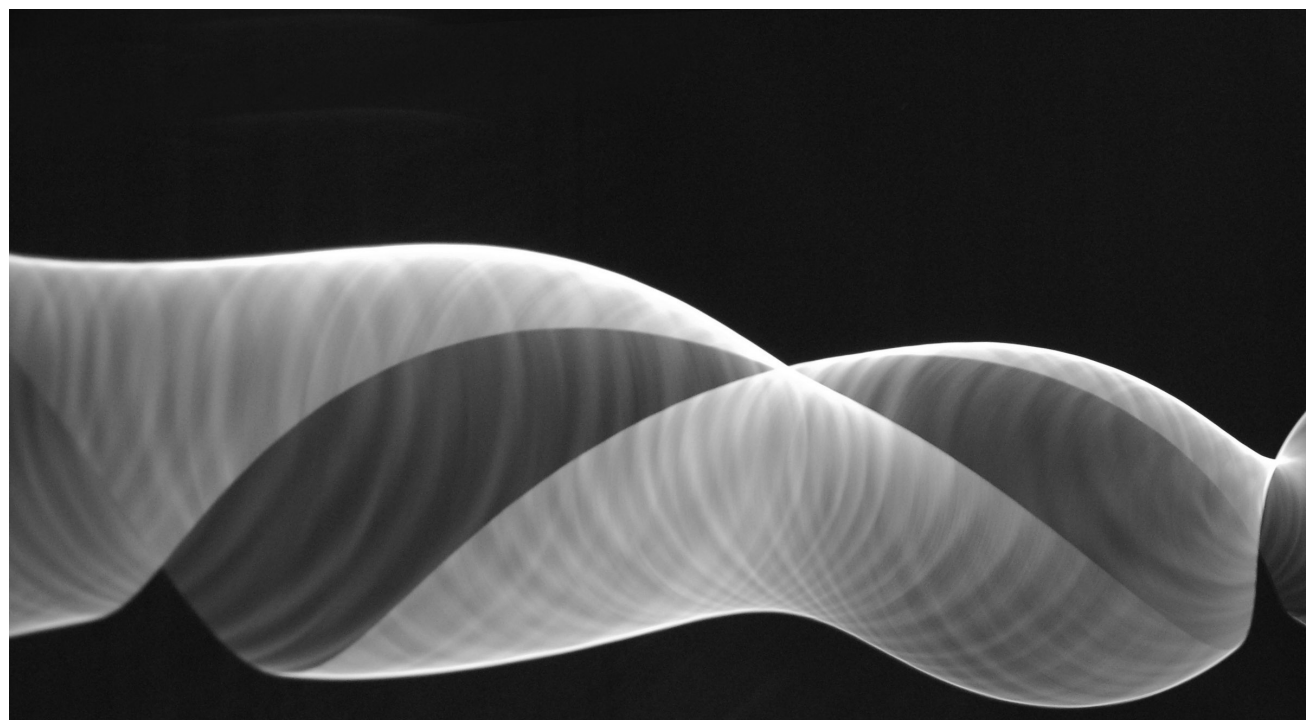
poorly at those activities, letting us know in its own circuitous way that cognition is embodied knowledge that does not work well when even partially disembodied.

Artificial agency holds another kind of fascination when it parallels investigations in biochemistry, where the line between natural and artificial methods of research is a thin one. An “autonomous agent,” in the biochemical sense, means the smallest organic unit that is self-sus-

taining and self-replicating—like a cell. However, life at the cellular level is largely revealed in the modeling of its dynamics using computing and digital imaging, because those dynamics are impossible to piece back together from information gleaned from isolated entities observed in a lab [5].

Several works recognized by VIDA focus on agency as a function of systems that, like living cells, are always in process. Even if the mechanics, the physics or the algorithms that generate the visible processes in these artworks are not readily understood, viewers are invited to experience them as metaphorically alive. From the U.S.A., Scott Draves's *Bomb* (1994, VIDA 2.0) suggests a biochemical/biophysical definition of agency in its patterns of flow and connectivity. *Bomb* is an “eye candy” program of imagery generated through non-linear iterated systems, such as video feedback. *Dripping Sounds* (2002, VIDA 7.0, see Gallery) by Federico Muelas of Spain is an image- and sound-generating apparatus that is always in flux, never repeating its sequences. It has a Dripping Machine, through which ink is dripped into water, disperses and is then optically projected, and a Sound Screen, where the moving image projected on its surface is translated into sounds of varying pitch and frequency. Daniel Palacios Jimenez's *Waves* (Spain, 2006, VIDA 9.0) (Fig. 6) is based

Fig. 6. Daniel Palacios, *Waves*, two motors in steel cylinders, elastic rope, pedestals, sensors, electronics, 2006. (© Daniel Palacios. Photo © David Cuartielles. Photo licensed under CC-2.5-SA-NC.) Second Prize, VIDA 9.0. Artist's web page: <www.stopantplay.com>.



on a long piece of elastic string that twirls between two motorized chambers to produce a sine-wave simulation when a viewer walks nearby.

BRIDGING WORLDS

Research into artificial agency has many different facets, from data-mining agents to affective robots that can act on their emotions. A-Life artworks, whether in a gallery setting or not, allow artificial agents to be instantiated and tested outside the lab. Even in research, the concept of anthropomorphism has often been invoked to account for how agency is attributed. A-Life art shows that, although anthropomorphism has commonsense appeal, it is much over-used and really does not explain very much. In particular, it assumes that attributing agency to something nonliving is always the same kind of process and happens in the same way for everybody. Anthropomorphism is useful if the uniqueness of each person's experience is also recognized. To accomplish the attribution of artificial agency, A-Life artworks have

to play with the viewer's state of mind and engage her or his cognitive capacity to hold two simultaneous but contradictory ideas: the rational knowledge that one is anthropomorphizing the artwork and the willingness to be completely overpowered by the sense of the piece as having its own autonomous behaviors and possibly even intentions.

A-Life artworks that are interactive present a special case in how agency and autonomy are attributed, because the viewer (here, more accurately described as the interactant) is caught up in a direct experience of the work's dynamics, often involving an "entrainment" phase in which the interactant learns effective responses to the work's behaviors. Interpretation at a semiotic or conceptual level is not necessary. When an artist conceives of an interactive work, modes of contact between its programmed behaviors and the physical presence of the interactant are given great attention, because bridging the gap between the affective context of the interactant and the agent(s) in the work, as well as the overall environment, is a primary con-

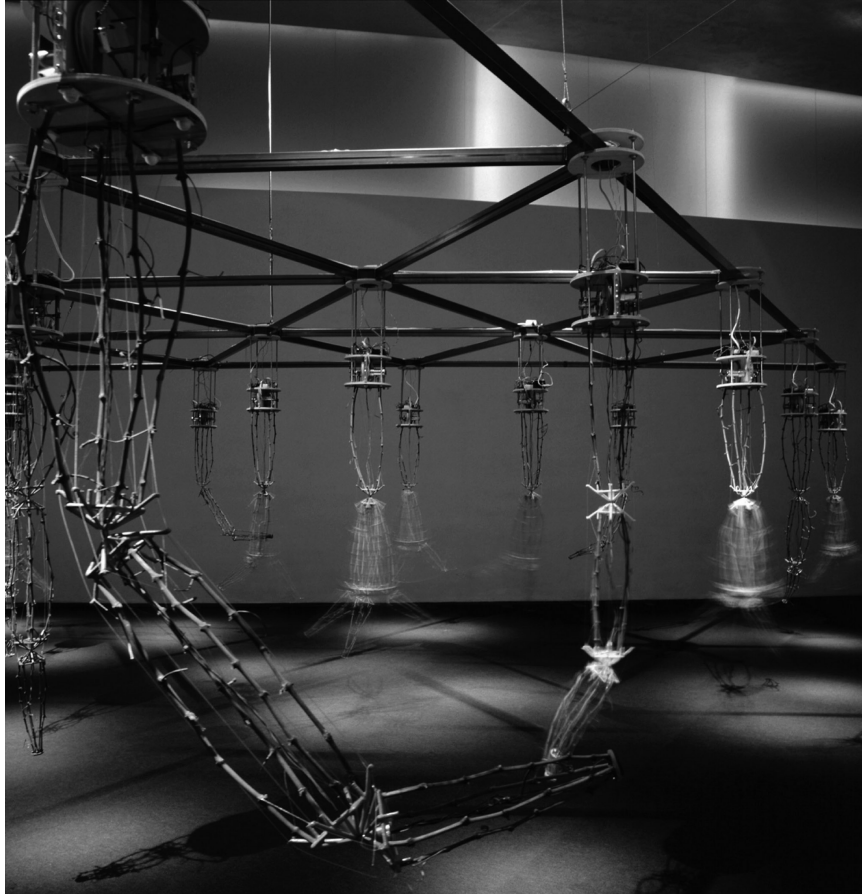
cern. For example, in each of the two *Tickle* works by Driessens and Verstappen, a strong sensory connection between the person and the machine is an understanding shared by all interactants, even if the experience itself is unique to a particular person. The sense of connection is extended even to observers who are watching the interaction.

Paula Gaetano is a young Argentinian artist who explores the concepts of embodiment and autonomy, which are key to robot building, by reducing their overt features to bare essentials. Her robot is called *Alexitimia* (2006, VIDA 9.0, see Gallery), after a term that means the incapacity to verbalize emotions. The robot is perversely minimal (a soft rubbery blob mounted on a low pedestal) and has no mobility or apparent articulators such as limb-like parts, sounds or lights that indicate responsiveness to its environment. Interactants have no explicit information about how to interact with the object, but when they touch it out of curiosity, *Alexitimia* "sweats": there are touch sensors embedded in its surface, which cause water in a tank hidden in the base of the work to run out through small punctures in the latex skin. The minimalism of this work permits the interactant to recognize the instant that the sculpture responds, which is the instant of attribution of agency to it, and also allows each interactant to realize that her/his performance with the work is a unique one.

The *Universal Whistling Machine* (Canada/U.S.A., 2004, VIDA 7.0, see Gallery) is a wall-mounted interface that consists of a speaker, camera and microphone embedded in a neutral white surface. The *U.W.M.* senses the presence of living creatures in its vicinity and attracts them with a signature whistle. Given a responsive whistle, *U.W.M.* counters with a composition based on a time-frequency analysis of the response. The artists, Marc Böhlen and J.T. Rinker, prefer to install their machines in quiet, low-traffic spaces of exchange and transition such as restrooms, corridors and elevator lobbies, so that they catch people by surprise. The *U.W.M.* shows how the transcultural and transtemporal character of whistling extends quite naturally to the machine world. The agency of the machine and its initiatory role in eliciting the satisfaction of the whistle exchange are immediately understood [6].

In U.S. artist Ken Rinaldo's *Autopoiesis* (2000, VIDA 3.0) (Fig. 7), interactants walk among a group of 15 robotic sound sculptures whose collective behavior changes over time. Each arm-like sculpture, suspended from the ceiling, can

Fig. 7. Ken Rinaldo, *Autopoiesis*, Cabernet Sauvignon grapevines, urethane plastic, sensors, motors, cameras, custom electronics, 2000–2005. (© Ken Rinaldo. Photo: Yehia Eweis. Photo © Kiasma Museum, Central Art Archives, Finland.) First Prize, VIDA 3.0. Artist's web page: <<http://kenrinaldo.com/>>.



individually detect and respond to an interactant through smart sensor organization, moving its tip toward the person but never touching him or her. At the same time, the entire group sends its data to a central state controller for coordination of group behavior. The interactant intuitively grasps that the behavior of the sculptures is more agitated, complex and probing when a person is present, while it is more serene and in a state of “waiting” when being observed from the outside. At the tip of two of the arms, lipstick cameras project what they see onto the walls of the space, giving the interactant a sense of being observed as much as of observing.

In A-Life artworks, the artistry of materials, aesthetics and concepts is employed to induce participants into relationships with experimental systems and apparatuses. The human must establish a relationship with a technological system rather than simply controlling it, and the system itself can suggest interpretations of what it is doing and how it is running. If there is any single goal for these strategies, it is awareness of the

elicited relationships as social exchanges, with an increased consciousness of one’s biases and experience (from novice to expert) upon entering and leaving the exchange. This builds a compelling case for the idea of the co-evolution of humans and our technologies: Both the humans and the machines become actants who have agency and inform each other, resulting in composite societies of agents that include both natural and artificial members.

Even if A-Life artists do not explicitly engage the research areas in AI and A-Life that investigate social intelligence in mixed populations of human and artificial agents, one phenomenon that has emerged in the VIDA artworks is the creation of social worlds in which the process of networked computation itself has its own kind of agency. *Electric Sheep* (U.S.A., 1999, VIDA 4.0, see Gallery), also by Scott Draves, generates a network of contributor clients who together build MPEGs in the form of “animated fractal flames.” These can be subsequently downloaded and viewed as continuously changing abstract image sequences. *Electric Sheep* al-

lows us to think about how a creative social grouping in the digital commons can make a shared visual space for a collective virtual life-form. Stanza’s *The Central City* (U.K., 1997–2003, VIDA 6.0) (Fig. 8) gives us an interactive representation of such networks as they might be implanted in urban locales, where they would grow organically and bleed into the city. Using generative processes, this work visually and sonically interconnects information networks (including surveillance systems) with urban networks (blocks of streets, grids of services, etc.) to make a constantly transmuted environment. *LF:TK*’s networked dinner parties also intervene as actants by calling for new social protocols for participants to explore.

In the development and study of artificial social intelligence, empathy is a key concept, because it links emotion and cognition together in a way that involves making a mental model of someone else’s state of mind. It is an instance of embodied cognition. Our ability to attribute empathy to an A-Life agent as a function of its design generates a positive feedback

Fig. 8. Stanza, *The Central City*, interactive Internet artwork, 1997–2003. (© Stanza) Shared First Prize, VIDA 6.0. Artist’s web page: <www.stanza.co.uk>.

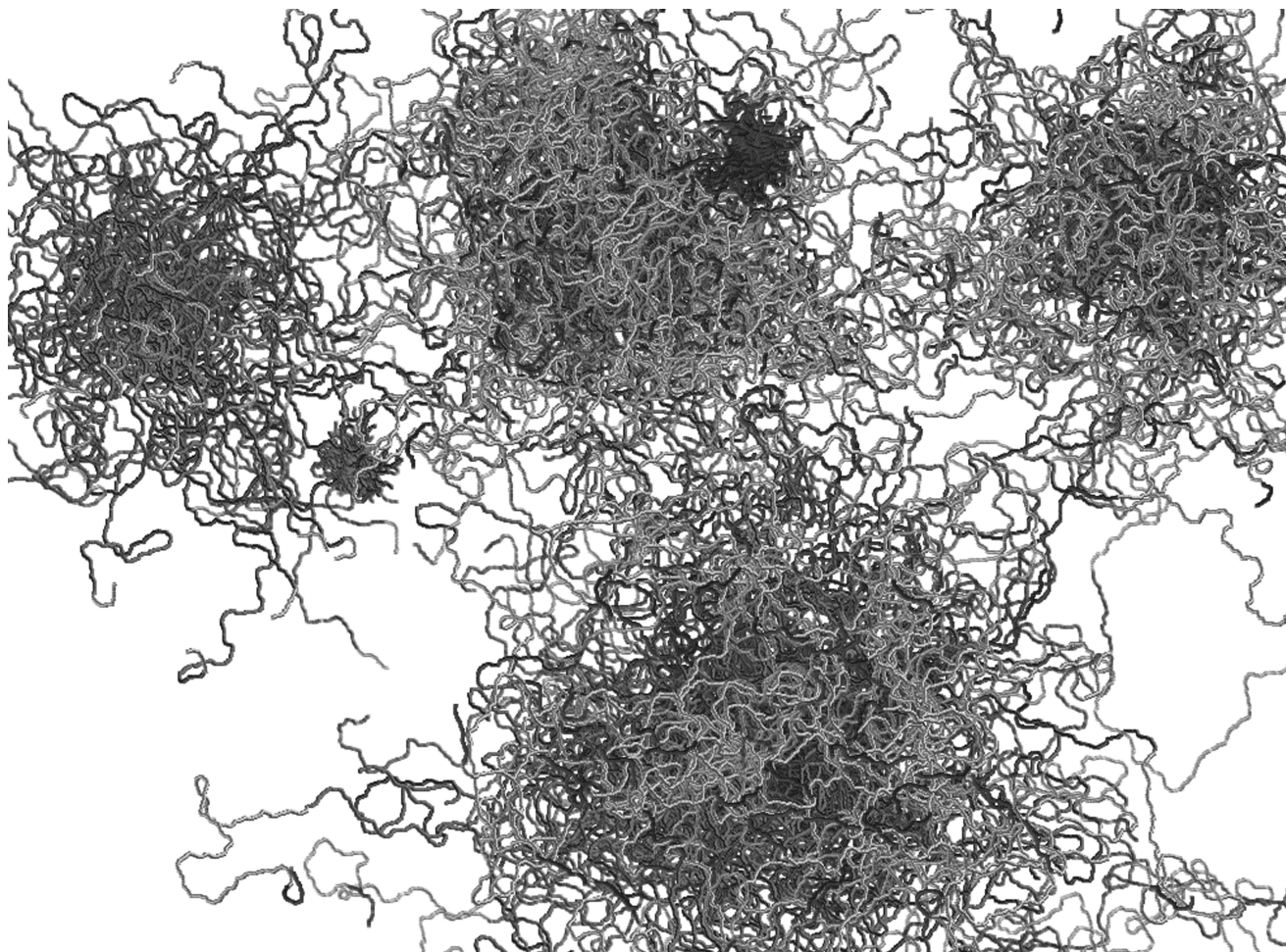




Fig. 9. Willy LeMaitre and Eric Rosenzweig, *The Appearance Machine*, metal, plastic, vibrators, motors, computer, cameras, garbage, 1997. (© Lemaitre & Rosenzweig) Third prize, VIDA 3.0. Artists' web page: <www.w----e.net/>.

loop because it elicits a corresponding state in the person interacting with that agent and thereby calls upon empathy as a framework for interpreting the whole exchange that takes place. This is an example of social learning and it occurs in several of the VIDA works. For instance, we could say that the robot arm holding the lit candle in Netherlands artist Erik Olofsen's *Divine Methods/Hidden Motives* (2005, VIDA 8.0) exhibits empathy for the believer who is determined to hold onto her/his belief. Or the empathy could be read as directed toward the skeptic who sees the contortions that believing requires. Either way, the work draws out empathy from a viewer toward itself and builds a powerful empathetic exchange that synthesizes knowing and feeling. *Head* and *La Cour des Miracles* are other works that elicit empathy and flesh out a communicative exchange that is not controlled by either humans or artificial entities but lies in a space between the beings involved.

ETHOS/RESPONSE

Because of the lifelike qualities of embodiment and behavior that A-Life researchers pursue as a guiding principle, artifacts from A-Life research as well as

A-Life artworks can be said to embody technology itself—at least in psychiatrist and cultural theorist Jeanne Randolph's definition of technology as a repository of our preconscious desires and fears. Her *technological ethos* is sited "in our preconscious, making its judgments about what we will value, what we will not value, what we think we are seeing, what we feel we are seeing" [7]. Those embedded values, including quantification, efficiency and economy of means, tend to be highly instrumental. Such deep-seated attitudes about technology are invoked when A-Life artworks are deployed or enacted by their audience. This accounts for why inefficient, dysfunctional forms of technology have held so much appeal for artists.

Because works that are autonomous artificial agents become metonyms for technology itself (the part stands for the whole), their dysfunctionality or defiance of instrumental purpose truly stands in protest against the instrumental values we have realized in technology. *The Appearance Machine* (1997, VIDA 3.0) (Fig. 9), by Willy LeMaitre and Eric Rosenzweig, Canadian artists living in the U.S.A., is an accident-generating machine fed by detritus from the streets of New York City, where it is physically located. The ma-

chine's perpetual and solitary activity is to spin bits of garbage on its turntable for image capture as well as image analysis that generates sounds, outputting a live video/audio stream that is networked to a remote site. The resulting display is a highly tongue-in-cheek subversion of the industrial entertainment complex. In contrast, *AP0201* (2004, VIDA 8.0) by Martin Howse and Jonathan Kemp of the U.K., is meant to be installed in harsh, preferably remote conditions, where its key relationship is to be with the environment. Three constructions of small solar panels mounted on upright metal studs, three small LCD screens and electronics for wireless communication constitute the parts of *AP0201*. There is no useful data that an observer can glean from these "self-display devices," which look as if they should be doing important work, whether meteorological or military. They simply show the code that they are processing as they pick up data from their surroundings, code that is then modified and shared among them. *Spore 1.1* (2004, VIDA 7.0), by S.W.A.M.P. (Douglas Easterly/Matt Kenyon) of the U.S.A., uses a rubber tree purchased from Home Depot tended by a computer connected to the Internet via a wireless connection and programmed with open source

software to check weekly the value of Home Depot's stock on Yahoo. Through a mechanized watering system, the plant gets watered if share values are up and suffers drought if the stock goes down. If the plant dies, it goes back to the store under its one-year guarantee and is replaced by a new one—consumer protection at its ironic best.

This is not to say that the opposite holds true, that “functional” A-Life artworks (or A-Life research artifacts for that matter) uphold our preconscious, irrationally idealized expectations of technology. Artists who study, collaborate with or otherwise derive their ideas from research are working more in parallel with technological developments, but usually ironically and in the DIY mode of art practice that gives ordinary people entry points to the technology.

These are all areas in which we can readily see the richness in the territory of A-Life art. This is not just a one-way street, however: The A-Life research community has become interested in A-Life artists over the past few decades precisely because of their deployment of research concepts in public space. Their artworks call attention to the role of the “participant subject” and invite the recognition that one of those subjects is the researcher her- or himself—albeit an expert one rather than a novice. A-Life artworks can explicitly explore the bound-

ary between the researcher and the subjects of the experiment: “This researcher will have to allow for—perhaps even explore—other emotions than those of the ideal distanced witness” [8]. This kind of shift in thinking, and the exchange of interests and working methods in general, continues to be one of the most fruitful areas of art and science crossover. In its 10th year of life, the VIDA competition continues to define the characteristics that make A-Life art distinct and interesting to a new generation of both artists and gallery-goers.

Acknowledgments

Thanks to Melanie Bajjko, York University Computer Science Department, for research and co-authorship of articles that informed this text. Thanks to Fundación Telefónica and Santiago Munoz-Bastide, Director of Cultural Activities, Fundación Telefónica, Madrid. Thanks to Daniel Canogar and to Rafael Lozano-Hemmer and Susie Ramsay for the VIDA concept.

References and Notes

1. A-Life can be said to embody AI, with robotics being a particular hardware form of embodiment. This thinking follows from Rodney Brooks's embodied AI, based on principles of subsumption architecture for robotics (layers of simple behaviors that lead to complex behavior). Specific concepts of embodiment pervade A-Life and AI: for example, Justine Cassell's Embodied Conversational Agent (ECA), which is a virtual human capable of interacting with humans using both language and nonverbal behavior.
2. I have previously proposed that biology operates as a Readymade in A-Life research and artworks. See Nell Tenhaaf, “As Art Is Lifelike: Evolution, Art, and the Readymade,” *Leonardo* 31, No. 5, Special Issue “The Sixth Annual New York Digital Salon,” 397–404 (1998).
3. Bruno Latour, *Pandora's Hope* (Cambridge, MA: Harvard Univ. Press, 1999) p. 189.
4. There have been five special prizes given over the years, for pioneering work in A-Life art, innovation in A-Life research, and special mentions by the jury. Note also that 15 incentive awards for new production to artists residing in Iberoamerica (Spain, Portugal and Latin America) have been awarded, beginning with VIDA 4.0 in 2001.
5. See Stuart A. Kauffman, *The Origins of Order: Self-Organization and Selection in Evolution* (New York: Oxford Univ. Press, 1993).
6. See also Mark Böhlen and J.T. Rinker, “Experiments with Whistling Machines,” *Leonardo Music Journal* 15 (2005) pp. 45–52.
7. Jeanne Randolph, *Psychoanalysis and Synchronized Swimming and Other Writings on Art* (Toronto: YYZ Books, 1991).
8. Lars Risan, “Why Are There So Few Biologists Here?—Artificial Life as a Theoretical Biology of Artistry,” in Phil Husbands and Inman Harvey, eds., *Proceedings of the Fourth European Conference on Artificial Life* (Cambridge: The MIT Press, 1997).

Nell Tenhaaf is an electronic media artist and writer. She has exhibited widely and published numerous reviews and articles. A survey exhibition of 15 years of her work on biology, biotechnologies and A-Life, entitled Fit/Unfit, was presented at the Robert McLaughlin Gallery in Oshawa, Ontario, from April to June 2003, and is still touring. Tenhaaf is jury head of VIDA and has been involved with the competition since its inception. She teaches in the Visual Arts Department of York University, where she is currently an Associate Dean of Fine Arts.

Happy 40th Birthday, Leonardo!

Forty years ago in Paris, a group of artists, scientists and engineers got together and decried the lack of professional venues where emerging work bridging the two cultures could be presented, debated and promoted. **Frank Malina**, himself a research engineer and a professional artist, convinced publisher **Robert Maxwell** of Pergamon Press to take on the challenge of publishing a peer-reviewed scholarly art-science-technology journal, the first time such a project had been attempted.

To date we have published the work of 5,538 artists, researchers and scholars; we wish we could bring this community together for a celebration, but in keeping with our networked times, we are collaborating with groups around the world on a variety of events:

Leonardo Celebrates Leonardo da Vinci

Special Section of Leonardo, 2008, edited by David Carrier

What, building upon Leonardo's ways of thinking, can artists and scientists tell each other today? Full call for papers: <leonardo.info>. Inquiries and proposals: David Carrier: <david.carrier@cwru.edu>.

Leonardo in New York (February 2007)

Panels, events and exhibition organized by the Leonardo Education Forum at the 2007 College Art Association meeting: <leonardo.info/isast/educators.html>.

Mutamorphosis: Challenging Arts and Sciences (Prague, 7–10 November 2007)

Leonardo co-sponsors a conference and exhibitions in Prague, organized by the International Centre for Art and New Technologies (CIANT) <ciant.cz>. See <www.mutamorphosis.org>.

Lovely Weather in Republic of Ireland

We have initiated a 3-year collaboration with Regional Cultural Centre Letterkenny, Donegal County, Republic of Ireland, to host a Leonardo 40th Anniversary exhibition and to collaborate on an Art and Climate Change project, "Lovely Weather." See <www.donegalculture.com/>.

Leonardo in India

Leonardo/Olats is working with groups in Bangalore, India, on a symposium and workshop; we welcome contact with Indian artists and scientists who might wish to be involved: <olats.org>.

Leonardo in North America (2008)

We are planning a final anniversary symposium and celebration in North America. Further details will be announced on <www.leonardo.info>.

Leonardo in Spain: Expanding the Space (October 2006)

We were pleased to co-sponsor Expanding the Space, a conference and workshop on space exploration and the arts: <expandingthespace.net>.

All 40 Years of Leonardo Articles Now Available On-Line

Volumes 1-33 available through JSTOR: <jstor.org>.

Volumes 34-39 available through MIT Press: <mitpressjournals.org>.

If you are interested in being involved, or have ideas of how we can celebrate the work of the new Leonardos, send e-mail to <rmalina@prontomail.com>.

WHAT YOU CAN DO TODAY

We know what Leonardo da Vinci could have used for his 40th birthday in Milan: **a gift membership in the Leonardo organization and subscription to the Leonardo journal**. If you know any budding Leonardos, buy them a gift at <leonardo.info/members.html>.