2010 • Press

Golan Levin

Select books, critical reviews, published interviews, and press clippings.

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004 Hart, Hugh. "Decode Exhibition Points Way to Data-Driven Art". *WIRED.com,* 1/25/2010.
006 Simanowski, Roberto. *Digital Art and Meaning: Reading Kinetic Poetry, Text Machines, Mapping Art, and Interactive Installations.* Univ Of Minnesota Press, 2010.
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CHRIS SALTER

foreword by Peter Sellars

ENTANGLED

TECHNOLOGY AND THE TRANSFORMATION OF PERFORMANCE

Almost overnight, artists, collectives, and scenes appeared organized mainly around common Max-based software platforms becoming digital bricoleurs. Collectives interested in improvisation within the live performance context—such as 242.pilots (a collective started by H. C. Gilje, Kurt Ralske, and Lukasz Lysakowski and named for an object in nato.0+55), the Vienna- and Berlin-based farmersmanual, Brussels-based Telcosystems, as well as dozens of other individual artists from North America (Sue Costible and Joshua Clayton, Scott Arford, Scott Pagano, and Chris Musgrave all in San Francisco, and Johnny DeKam, Kurt Ralske, Benton Bainbridge, Golan Levin, and Zachary Lieberman in New York), Canada (PurForm, Ray-XXXX, Defasten, Louis Dufort), Europe (TeZ, Semiconductor, Coldcut, Visual Kitchen, Rechenzentrum, Otolab, Signal, Byetone, Frank Bretschneider, Scanner, Untitled Sound Objects), Eastern Europe and Russia (Domnitch and Gelfand), Japan (Ryoichi Kurokawa, Responsive Environments), Australia, and elsewhere engaged in manipulating live video feeds and signals or building algorithmically driven "patches" (graphic-based object programs) and performance instruments that would enable combined machine and human improvisation.

The aesthetic range of this real-time video movement cannot be summarized in a few sentences for like other audiovisual forms, a plurality of approaches appeared with no one dominant idea or technique. 242.pilots, for example, was inspired by the musical process of jamming; what video artist and cofounder H. C. Gilje called "the making of a live film with a soundtrack at the same time."[51]

Another major aesthetic force driving the real-time video scene was the obsession with software code, a movement mirrored in the fact that an entire subsection of real-time video practice was gestated by next-generation artist-geeks schooled in computer science, electronic music, and engineering, which helped generate aesthetic practices around meta explorations of code and data itself.

Audiovisual performance based in the aesthetics of code most notably emerged in the works of artist-engineer Golan Levin. Levin, who trained under designer John Maeda at the MIT Media Lab's Aesthetics and Computation Group, developed software tools that enabled the real-time manipulation of computer graphics and audio and made his audiovisual performance projects such as *Scribble* (2000), *Dialtones: A Telesymphony* (2001), and *Messe de Voce* (2005) mainstays at digital media festivals like Ars Electronica during the 2000s. Creating "painterly interfaces for audio-visual performance," Levin's *Audio-Visual Environmental Suite* (1998–2000) comprised what the artist called "an inexhaustible and dynamic audiovisual substance" (Levin 2000): code that enabled a performer to treat image and sound in a highly abstract, textual manner that gave fluid life to digital floating lines, skeins, blobs, and tendrils, all in real time.

Another movement within the audiovisual coding scene amplified its processual characteristics through the revealing and subsequent use of errors and glitches. This aesthetics of data was represented in performance by screens filled with broken *ASCII* code, visual aliasing, bit placement errors, and similar artifacts of the computational age. Discussion

HUGH HART CULTURE 01.25.10 12:00 AM

DECODE EXHIBITION POINTS WAY TO DATA-DRIVEN ART

The cryptic works on display at London's *Decode: Digital Design Sensations* exhibition manipulate raw data as a kind of virtual pigment, finding form and fun amid the sensory overload that threatens to overwhelm the 21st-century hive mind.

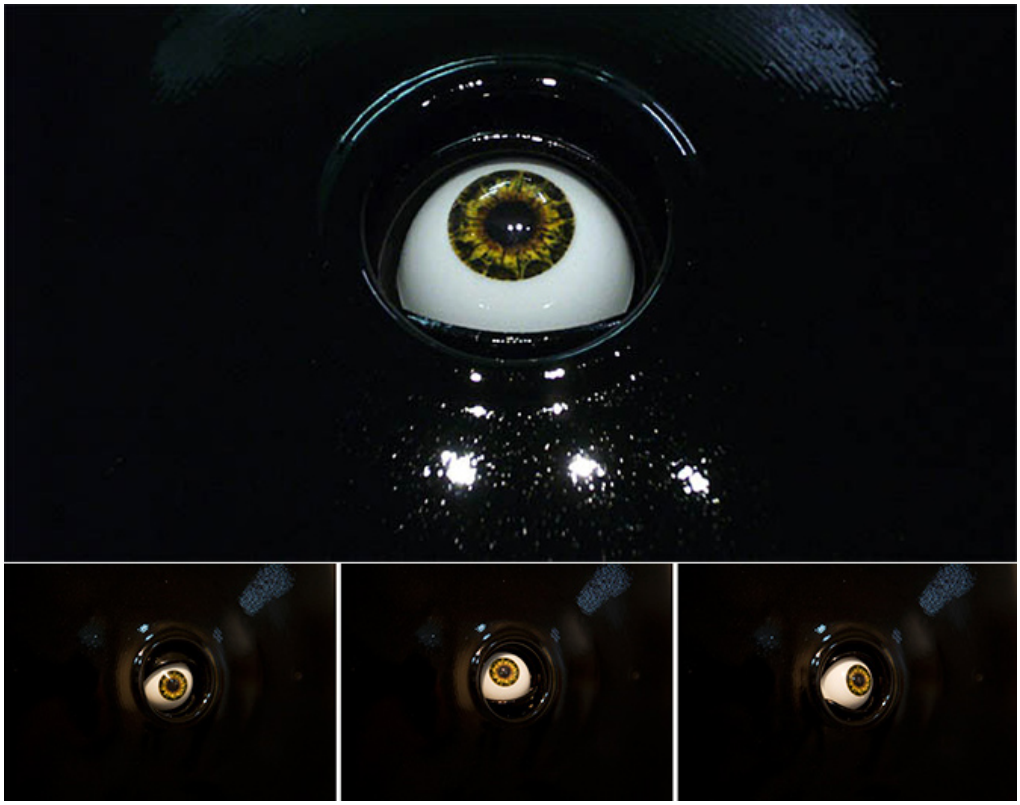
Several exhibition pieces showcased at Victoria and Albert Museum depend on human presence to produce their full effect. A motion-detecting eyeball, for examples, blinks each time a visitor blinks. In another piece, a video screen enables visitors to "paint" smears of color through the power of their gyrations.

Other installations, on display through April 11, strip-mine data streams from Twitter, translate a day's worth of flight routes into animated abstract art and hurl text-message fragments onto dozens of tiny display screens. Building on video art experiments that took root in the '80s at Ars Electronica, Siggraph and other events, *Decode* contributors experiment with programming languages to toy with questions about man, machine and the data that binds.

"*Decode* is about demystifying the black art or magic of digital while showing that this work can be poetic, emotional and poignant," show co-curator Shane R.J. Walter told Wired.com in an e-mail interview. Walter, creative director for the OneDotZero digital arts site, said the exhibition pieces "highlight issues in our everyday lives such as the overabundance of information and how we deal with this through data visualization." The *Decode* artists, he writes, "use code as a material to work with just as sculptors work with clay."

In addition to the curated works, the exhibition hosts the Recode project, which invites programmers to repurpose custom software featured in U.K. designer Karsten Schmidt's animated video (embedded above) as a foundation for their own variations. Dave Price, for example, reconfigured the original programming language to make *Eye Like Recode* (embedded below). Some of the user-generated videos will be presented as public art in the London Underground subway system.

Wired.com conducted e-mail interviews with 10 artists to gain insight into the uses of software as a creative visual medium. Browse this gallery for a sampling of their thoughts and images from *Decode: Digital Design Sensations*.



OPTO-ISOLATOR II

What: The sculpture presents a solitary mechatronic blinking eye, at human scale, that responds to the gaze of visitors with a variety of psychosocial eye-contact behaviors. It looks the viewer directly in the eye, then looks away if it is stared at for too long. Also, the eyeball blinks precisely one second after its visitor blinks.

How: Fabricated from motors, cameras and a computer, the *Opto-Isolator*'s mechatronic design and fabrication is by Greg Baltus of Standard Robot Company, Pittsburgh.

Why: Inventor Golan Levin says he wanted to address the "spectatorship" question: "What if artworks could know how we were looking at them? And, given this knowledge, how might they respond to us?"

Who: Massachusetts Institute of Technology Media Lab graduate Levin directs the Studio for Creative Inquiry at Pittsburgh's Carnegie Mellon University and has exhibited at the Whitney Biennial, the New Museum of Contemporary Art in New York and Ars Electronica Center.

digital art and meaning

Reading Kinetic Poetry, Text Machines, Mapping Art, and Interactive Installations

and thus are not very convincing from an aesthetic point of view. This does not change if they reveal interesting information, as is the case with *They Rule* and to a lesser extent with *Making Visible the Invisible.* Content does not make up for aesthetic deficits. As we have seen in the case of *Black and White*—and as Whitelaw convincingly argues with respect to Dragulescu's *Spam Architecture*—an apparently absolutely arbitrary visualization can offer a specific perspective by the artist in a highly symbolic and complex way. The same is true for *Ping Body,* in which the artist chose exactly the form of visualization he needed to convey his own perspective on reality. Can the first subgenre of mapping art, focusing more on the disclosure of data, present those data in a similar poetic way, or would this inevitably obscure the underlying data?

An example of a poetic disclosure of data is Golan Levin's *The Secret Lives of Numbers* (2002), which presents a graph of every number from zero to one million, showing the popularity of each number according to statistics gathered from a Google search (Figure 20).[33] Similar to *Making Visible the Invisible,* this work offers precise information about the data mapped and obtains with the graphic visualization of the numbers' rank a clear oneness of content and form. Nevertheless, the aesthetics of *The Secret Lives of Numbers* is poetic rather than naturalistic (or positivistic). The artist undertakes in a way an anthropomorphization of numbers and suggests that we see the ranking of numbers according not to their natural

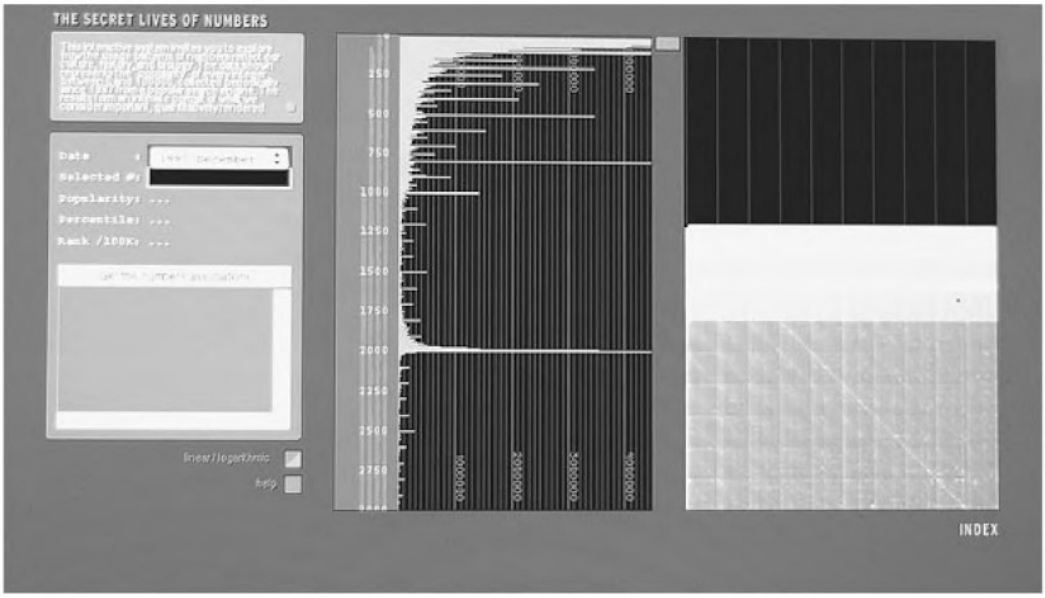


Figure 20. Golan Levin **et al.,** ***The Secret Lives of Numbers*** **(2002).**

ordering system but rather their "fame." The artist teaches us to see the world (of numbers) in a different way and is present in his work not through a specific form of visualization but by the content chosen. The choice itself represents a poetic relationship to the world and is reminiscent of the humor applied in German realism.[34]

A similar form of "poetic statistic" may, after all, be found in *Making Visible the Invisible*. Visualization form IV, "KeyWord Map Attack," collects main words from the checked-out titles and adds keywords associated with the titles to the list (Figure 21). The words—those that have nine or more hits and are present in at least two Dewey subcategories—are then "thrown on stage" one at a time, with white lines showing their Dewey connections. The result is a mix of words that triggers a reflection about the places they take in the Dewey system, words that somehow hang loosely in the air because the white lines—thin and overlapping—are not really traceable. Here exactness has been sacrificed for a poetic image. The artist has eventually overcome the statistician.

While Levin's *The Secret Lives of Numbers* is a convincing example of poetic statistic, Graham Harwood's *Lungs: Slave Labour* (2005) clearly steps away from revealing precise information towards generating a striking image. *Lungs* computes—depending on age, sex, and height—the vital lung capacity of 4,500 slave laborers in an ex-munitions factory in Karlsruhe, Germany, during World War II and emits a breath of air for each worker through a speaker system.[35] Harwood describes *Lungs* as a "software poem memorial" that bridges the gap between the perception of data and social experience: "The aim is to take computer records of local events or

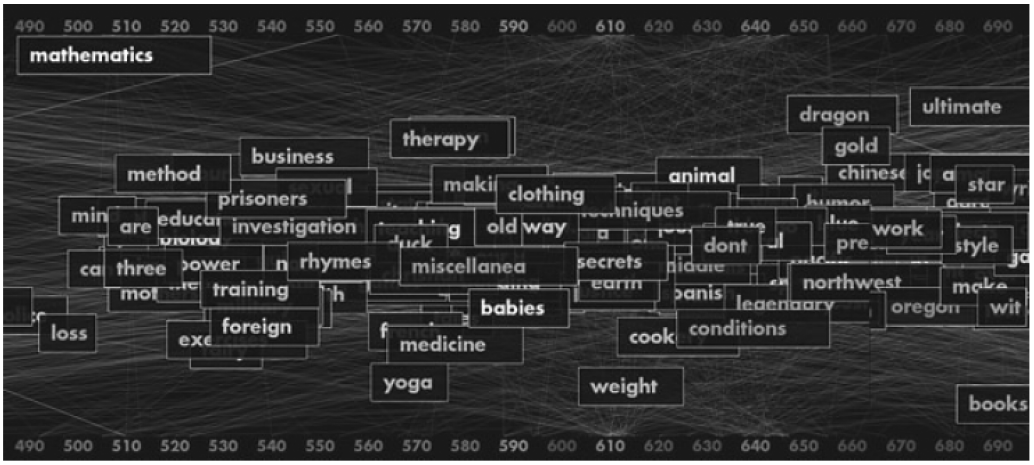


Figure 21. George Legrady et al., *Making Visible the Invisible* (2005). "KeyWord Map Attack." Copyright George Legrady.

It carries a symbolic depth that clearly makes the artist—his personal perspective, objection, and vision—visible in the piece.

The effect of *Monument* and *Lungs*—as well as of *The Secret Lives of Numbers, Ping Body,* and *Black and White,* as well as similar noncognitive visualizations—rests in the distance to the naturalistic paradigm of mapping. It is, as Wright concludes, about data visualization, "its ability to put cognitive and affective modes of perception into creative tension with data structures and with each other, and to articulate the gap between the processing of data, social life and sensory experience that will allow visualization to reach its full potential, both as a scientific and as an artistic technique" (2008, 86).

Mapping Postmodernism

As much as naturalism intended a convergence of art with science, so does mapping art—regarding its naturalistic subgenre—more than a century later. Both phenomena point to an art that oppresses the artist's subjectivity in favor of a trustworthy account of reality. Naturalism developed from the zeitgeist of the last decades of the nineteenth century, which was characterized by the advances of science and positivism. Does mapping art come out of a zeitgeist as well?

Manovich (2002b) rightly points out that modern art—despite its role of "data-epistemology" with which it enters "in completion with science and mass media to explain to us the patterns behind all the data surrounding"—always plays a more unique role than science and mass media by showing us other realities embedded in our own. Manovich implicitly endorses an aesthetics represented by Adorno and Camus and concludes that the real challenge of data art is not to map abstract and impersonal data into something meaningful and beautiful—as economists, graphic designers, and scientists do—but to "represent the subjective experience of a person living in a data society." However, according to Manovich, "the data mapping new media projects" miss portraying "our new 'data-subjectivity,'" our "being 'immersed in data.'"

The question Manovich raises is crucial for the discussion of our concept of art. It needs more discussion and ultimately calls for a similar, paradoxical answer as his earlier question regarding the unity of content and form. In this case, I argued that the seemingly purely motivated way to map a specific set of data is motivated by the subject itself—remixable data—and hence represents the lacking oneness of content and form. I

BRUCE STERLING 04.08.10 4:41 AM

THE COMPUTATIONAL AESTHETICS SCENE

*WELL, THIS IS pretty much everybody who's anybody in that racket, and now you know where to go if you need to learn more about this.

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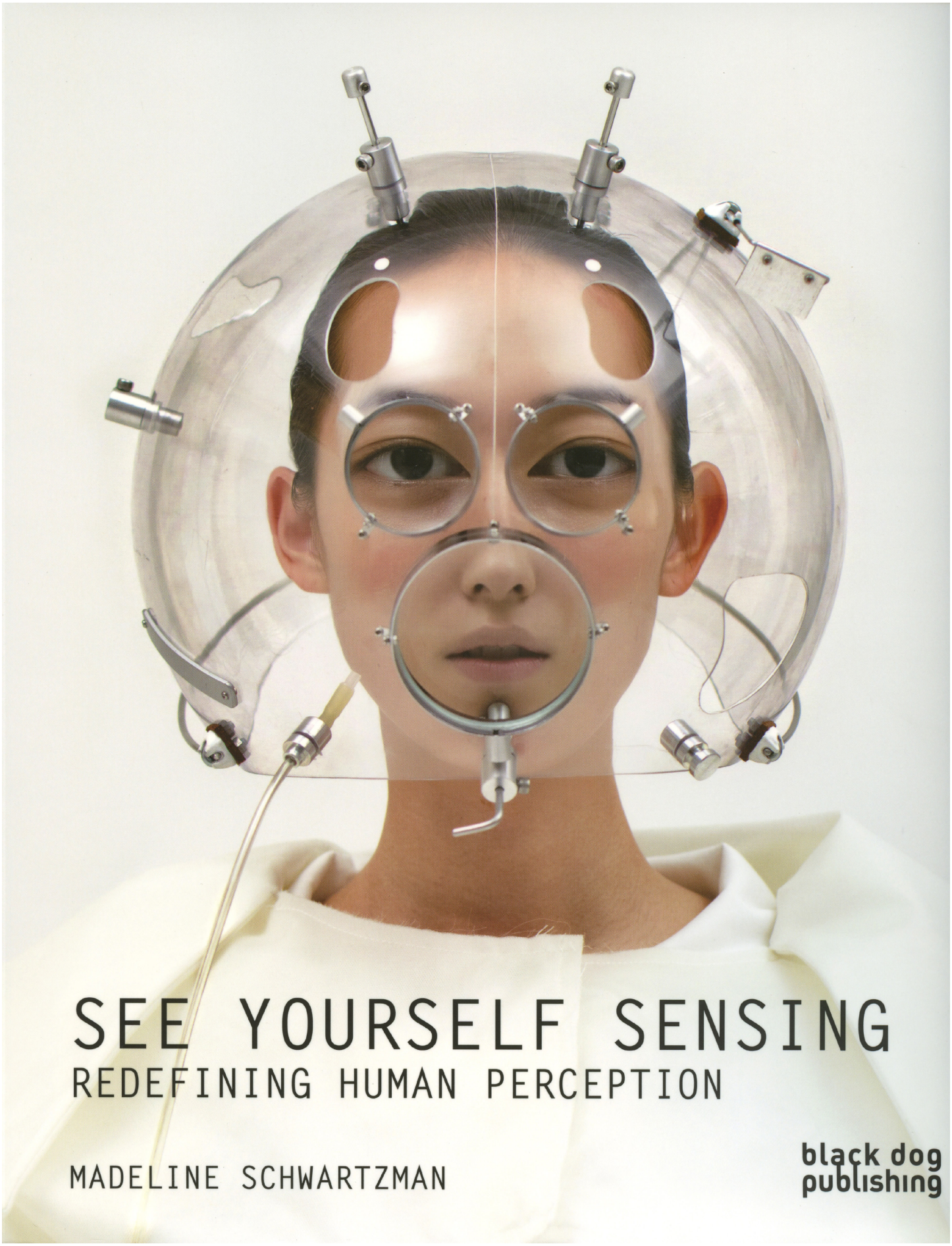
Aaron Koblin, Aaron Siegel, Alex Dragulescu, Alexander Calder, Andy Lomas, Aranda/Lasch (Benjamin Aranda, Chris Lasch, Clay Coffey), ART+COM, Arup, Atari, Ben F. Laposky, Ben Fry, Ben Shneiderman, Bill Cheswick, Bridget Riley, Catalogtree, Charles A. Csuri, Cornelia Sollfrank, Cory Arcangel, David Dessens, David Em, David Small, Daniel Sauter, Douglas Hofstadter, Edward Zajac, Elena Manferdini, Emil Ruder, Emily Gobeille and Theodore Watson, Enrico Bravi, Erik Natzke, Erwin Driessens and Maria Verstappen, Frieder Nake, George Legrady, Gerhard Mantz, Golan Levin, Gramazio & Kohler, Architecture and Digital Fabrication, ETH Zurich, Granular-Synthesis, Greg Lynn FORM, Hal Burch, Harold Cohen, Ivan Sutherland, James Paterson, Jason Salavon, Jasper Johns, Jean-Pierre Hébert, Jennifer Steinkamp, Jim Campbell, John F. Simon, Jr., John Maeda, Jon McCormack, Jonathan Harris, Jonathan McCabe, John Rehling, Julius Popp, Jürg Lehni, Jussi Ängeslevä, Kai Wetzel, Karl Sims, Karsten Schmidt (PostSpectacular), Keith Tyson, Ken Knowlton, Kenneth A. Huff, Khoi Vinh, Kokkugia, Larry Cuba, Laura Wattenberg, LeCielEstBleu, Leon Harmon, LettError, Lia, Lillian Schwartz, Lisa Strausfeld, Manfred Mohr, Marcos Weskamp, Marius Watz, Mark Wilson, Martin Wattenberg, Masaki Fujihata, Michael Najjar, Mike Silver, Mikkel Crone Koser, MIT Media Lab Personal Robotics Group, Xitome Design, Moh Architects, Morphosis, MOS Architects, NASA, Nervous System, Osman Khan, Pablo Valbuena, Paolo Palma, Peter Cho, Peter Pearce, Philip Beesley, R&Sie(n)+D, Rafael Lozano-Hemmer, Richard Dawkins, Robert Hodgin and Nando Costa, Robert Lazzarini, Ross Cooper, Roxy Paine, Ryoji Ikeda, Schoenerwissen/OfCD, SHoP, Skidmore Owings & Merrill (SOM), Sol LeWitt, Sosolimited (Eric Gunther, Justin Manor, and John Rothenberg), Stamen Design (with Scott Snibbe, Amy Balkin, Gabriel Dunne and Ryan Alexander), Stefan Sagmeister and Ralph Ammer, Steven Wolfram, Tale of Tales, Telcosystems, Testa & Weiser Architects, The Barbarian Group, The OpenEnded Group, Theo Jansen, THEVERYMANY (Marc Fornes and Skylar Tibbits), ThinkMap, Tom Betts, Tom Carden, Tom Friedman, Toyo Ito & Associates Architects, United Visual Artists, Vasa Mihich, Vera Molnar, Yoko Ono, Yoshi Sodeoka, Yunsil Heo and Hyunwoo Bang, Zaha Hadid Architects, Zuzana Licko



SEE YOURSELF SENSING

REDEFINING HUMAN PERCEPTION

MADELINE SCHWARTZMAN

black dog publishing

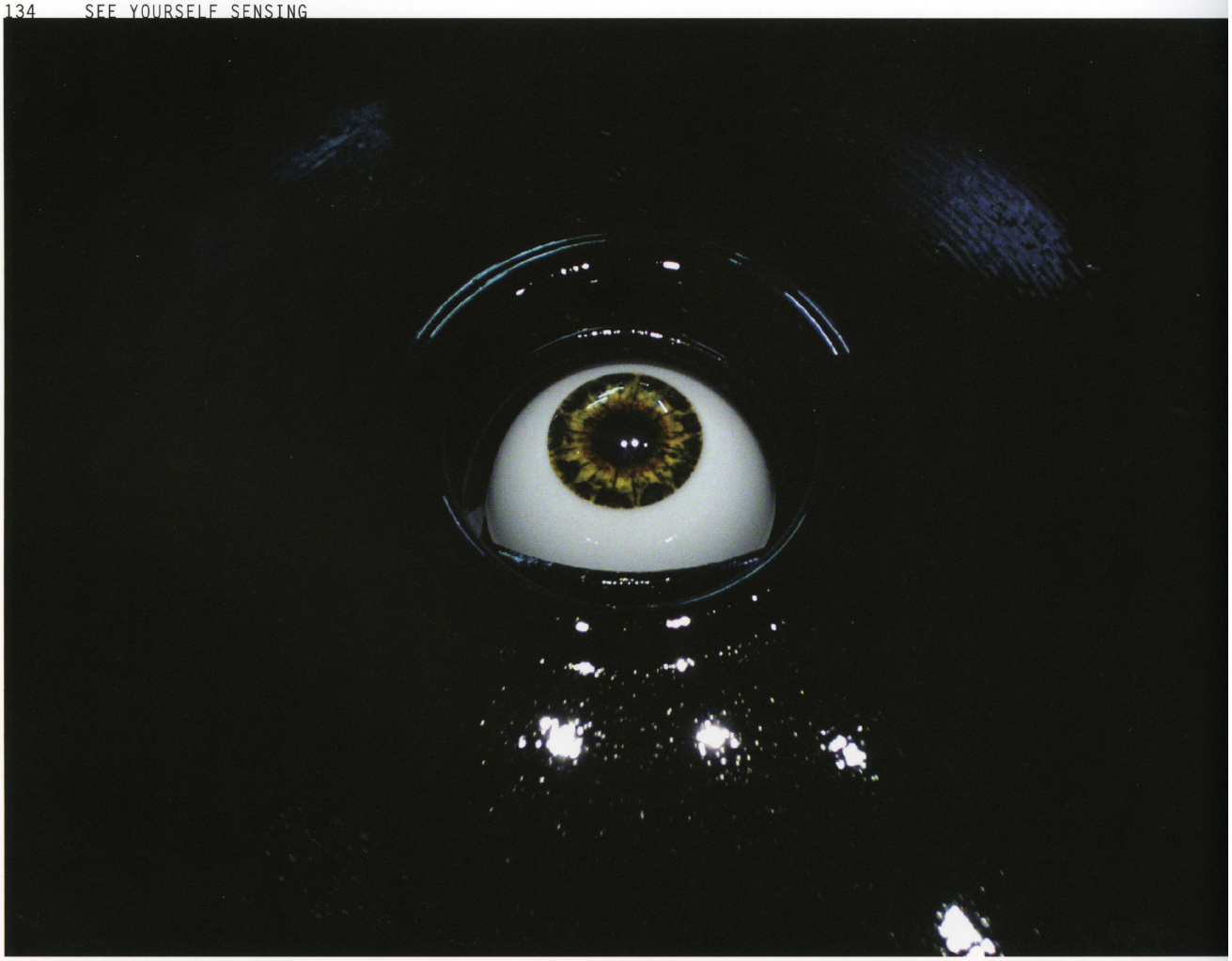
Mehmet Akten, *Body Paint*, 2009. Image courtesy the artist.

More than 30 years later such explorations of dislocation and out-of-phase self-reflection continue to appear in contemporary new media, often as versions or watered down versions of Campus' seminal investigations, despite the passage of time and the advancements of technology. So pervasive is interactivity that we have come to expect it. We look for more and more of ourselves to be mirrored in surrounding objects and spaces. We are quick to be delighted, quick to be addicted, bored and to want the next cool thing. We step into museums and wave our hands, touch parts, and clap, waiting for evidence of our sensorial empowerment. Museums, in turn, seem to supply such work indiscriminately, succumbing to entertainment over concept. The exhibition Decode: Digital Design Sensation at the Victoria and Albert Museum, London, escaped this tendency by presenting the work of artists like Mehmet Akten, whose lush interactive installation *Body Paint*, allows visitors to create improvised expressionist paintings that change with each movement of the body. Finally we are allowed to throw paint without making a mess, and to paint and repaint without muddying the colours.

Then there are artists who manage to use technology to do something we have never seen before. Fast forward from Campus' work of the 1970s, to 2007. In a typical gallery space a sleek square black box protrudes from the wall. It is about the size of the human head and it is mounted at eye-level. You see a white object in the middle. Curious, you approach. The white spot in the middle turns out to be an eye. You go closer. The eye looks at you. You blink. The eye blinks back. You stare. The eye looks away in discomfort. Uncomfortable, you look away. This is the experience of encountering Golan Levin's *Opto-Isolator*, a project also exhibited at Decode. The *Opto-Isolator* is an unnerving human-scaled mechatronic eyeball—a robot of sorts that responds to the gaze of the observer. It mimics and reacts to a fundamental element of our museum-going rituals, and in doing so it makes the viewer conscious of his or her own gaze. Here it is the artwork whose embodiment and selfhood is called into question. Sight and vision are questioned too. Part Hal from *2001: A Space Odyssey*, part peeping portrait, Levin's piece is at once nightmarish and normative.

Then there are the eyes of Krzysztof Wodiczko's *Dis-Armor*, a wearable prosthetic device and helmet that allow one to see through one's back. Wodiczko's *Dis-Armor*, like Auger and Loizeau's *Interstitial Space Helmet*, deals with alienated users for whom normative modes of behaviour and rules don't apply. While the *Opto-Isolator* is a robot that dares to confront and stare, *Dis-Armor* is designed for socially withdrawn Japanese youths —mostly dropouts—who shun interaction, speech or expression. Wodiczko addresses cultural disaffection, technological alienation and societal intolerance. He gives these youths a chance to reconnect with society by allowing them mediated communication. The form itself is empowering; *Dis-Armor* is a muscular warrior suit with a detached headpiece that makes one look like a super hero.

The wearer's exaggerated eyes appear in two LCD monitors affixed to the metal exoskeleton at the top of the back. Metal eyelids effectively and dramatically begin and end conversations. They can be controlled by the wearer from the helmet, and they make a satisfying electronic noise as they open and close. The voice is amplified through a speaker positioned below the screens. The wearer has access to a rearview mirror, a microphone, a video camera and headphones so that they can see behind them, and hear and talk as well. The piece promises indirect communication, and ultimately, a way out of silence and seclusion. A video of *Dis-Armor* in action reveals a conflict between being on the go and conversing. Though the conversation happens backwards, movement is still forward and perhaps too direct. One must then make an awkward 180 degree turn in order to engage one's back into conversation. Nonetheless *Dis-Armor* has gravity. In an



Golan Levin with Greg Baltus/Standard Robot Company, *Opto-Isolator*, 2007. Photo John Berens. Image courtesy the artist.

era of narcissistic exploration, *Dis-Armor* emerges as a work of art, as a playful costume-cum-sensory device, as a new piece of urban infrastructure (like a traffic light), as a psychological tool, and a societal remediator.

Mediation can be instructive, enlightening, hypnotic, playful, magical, addictive, social or isolating. But will it make us more human or less? If machines write the sequel to this book in 2040 then we will know the answer. Meanwhile the contributors to this chapter provide a range of mediated sensory experiences that evolve our interactions with machines, cities and each other.

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ART NUMÉRIQUE ET CONSERVATION

LE RÔLE DU MARCHÉ DE L'ART

C.E.B. Reas, T1, 2004 (custom software, computer, projector, wooden discs, dimensions variable, edition of 5)

PHOTOS © COURTESY BITFORMS GALLERY NYC

Quel rôle joue le marché de l'art dans la conservation des œuvres d'art numérique ? Pour qu'une œuvre soit conservée, il faut qu'une valeur lui soit attribuée. De plus, s'il y a une valeur marchande, il y a nécessairement de la valeur esthétique, et réciproquement.
La valeur de l'art est le résultat de l'interaction de plusieurs acteurs : le marchand d'art, le conservateur de musée, l'historien de l'art, le critique. La valeur qui est donnée à une œuvre induit sa conservation, et vice-versa. Le marché est un des lieux d'échanges de l'art, même dans le cas d'œuvres dont l'accès est gratuit (comme dans le cas du net art).

Rematérialisation

Le marché de l'art numérique se calque sur le modèle historique du marché des arts visuels, avec des frictions, propres à ces pratiques artistiques, autour des questions de l'unicité, de l'originalité, de l'authenticité et de la contemporanéité de l'œuvre. Les artistes et les galeries expérimentent différents modèles pour la cession des œuvres ; sans qu'un véritable marché de l'art de ce type d'œuvres ne se soit encore mis en place, même si ça bouge dans ce sens depuis quelques années.

Un peu tôt pour parler d'un véritable marché de l'art numérique mais on constate depuis quelques années une évolution dans ce sens. L'exposition *Holy Fire, Art of the Digital Age* qui a eu lieu du 18 au 30 avril 2008, au Centre iMAL (Interactive Media Art Laboratory, dédié aux cultures numériques et à la technologie), à Bruxelles, en est un bon exemple. Faisant partie du programme "off" de la foire d'art contemporain ArtBrussels, c'est une exposition dont la thématique même est la monstration d'œuvres numériques "collectionnables" et présentes sur le marché de l'art, soit dans des galeries, soit chez des collectionneurs.

Le but des deux commissaires d'exposition, Yves Bernard et Domenico Quaranta, était de présenter des œuvres d'art numérique hors du "ghetto" de ses circuits de diffusion habituels (festivals, lieux et sites web spécialisés) et directement en dialogue avec un événement d'art contemporain. Cette exposition a déclenché une petite polémique chez certains artistes et critiques, agacés de la rematérialisation d'œuvres logicielles ou conçues pour être en ligne. Ce qui était montré dans l'exposition était, à quelques exceptions près, des objets autonomes à poser au mur qui réagissent au visiteur, des impressions, des captures de performances, des installations vidéos sans interactivité ou extension participative, même si la plupart des 27 artistes ou collectifs présents dans l'exposition ont développé un travail interactif, souvent du net art…

GoLan Levin & Zachary Lieberman, Reface (Portrait Sequencer), 2006 (LCD screen, custom software, computer, camera, plexiglass enclosure, edition of 6)

Le commissaire d'exposition et critique Domenico Quaranta développe dans le catalogue de l'exposition les raisons pour lesquelles le marché lui semble très important dans la carrière des œuvres d'art, au-delà du financement de la création des artistes qui permet à ceux-ci de continuer à produire : *le marché quand il fonctionne correctement, joue un rôle décisif comme tampon entre la liberté d'expérimentation des artistes et l'historicisation des œuvres. D'un côté, il y a une entière liberté, de l'autre, une série de pré-requis (matériels, économiques et culturels) indispensables pour qu'un travail subsiste dans le temps. Le résultat de cette collision est appelé "œuvre d'art"*(1). L'exposition rassemblait des œuvres de quelques galeries spécialisées en art numérique, telles que Bitforms et Postmasters à New York, DAM à Berlin ou Numeris Causa (dont la galerie parisienne a fermé courant 2009).

Raréfaction

Qu'achètent les collectionneurs ? D'après Steven Sacks, ancien entrepreneur du web et créateur de start-up qui a monté la galerie Bitforms à New York (avec une succursale à Séoul), *les acheteurs, des collectionneurs aux entreprises, préfèrent encore un objet matériel à un logiciel*(2). Il a d'ailleurs lancé en 2005 le projet *Software ART space* qui vendait en ligne pour 125$ des œuvres pour écran (en série limitée de 5000 exemplaires) sur support cédérom. Cette expérience n'a pas duré. Les œuvres, même lorsqu'elles sont purement logicielles ou en ligne sont souvent vendues en tant qu'objet, c'est-à-dire un ordinateur sur lequel se retrouvent les fichiers de l'œuvre (ou un accès à son serveur), un écran dédié à cette œuvre uniquement qui joue le rôle du cadre d'un tableau. Le prix, bien évidemment, n'est pas le même que des fichiers sur un serveur mais l'argent ne semble pas entrer en ligne de compte.

La définition juridique de l'œuvre d'art s'appuie sur le concept de rareté. La photographie d'art et de l'art vidéo, parmi les précurseurs de l'art numérique, ont tous les deux suivi le modèle du marché des arts plastiques, au lieu par exemple de celui de l'édition. L'exemple de l'art vidéo est particulièrement utile pour faire un parallèle. Au début de l'art vidéo, au début des années 1960, à la suite de la démocratisation des caméras (notamment avec le Portapak), il s'agissait pour les artistes de mettre en forme une utopie, l'idée qu'il pouvait y avoir des images produites hors des mass média, de manière spontanée, avec peu de budget et une diffusion immédiate.

L'idée d'une distribution limitée était étrangère à cette démarche. Le phénomène de raréfaction des œuvres n'a pas eu lieu à ce moment-là, mais avec la commercialisation de l'art vidéo dans les années 1980. Il prend essentiellement deux formes : d'une part, la limitation du nombre de copies et, de l'autre, l'émergence de l'installation vidéo qui associe bandes vidéo et mise en espace; ainsi qu'éventuellement d'autres objets, voire l'intervention possible du public. La limitation du nombre de copies est effectuée de manière arbitraire et non pas due à la technologie. Cette stratégie vise à la fois les collectionneurs privés et publics. Avec l'installation vidéo, il s'agit plutôt d'un marché à destination de l'institution muséale, au vu des contraintes d'exposition, de stockage et de conservation.

Reproduction

Les débuts du net art ou du software art par exemple sont assez similaires à ceux de l'art vidéo, ils ont en commun la spontanéité et l'immédiateté de la création, la possibilité de créer et de diffuser les œuvres à moindre frais. Cependant, ces œuvres sont numériques, alors qu'une grande partie de la production vidéo est analogique, ce qui signifie une perte de qualité avec la reproduction des supports analogiques. Généralement, pour le marché des épreuves vidéo, plus l'image et le son sont riches d'informations (avec des supports de meilleure qualité, comme le Beta), plus le nombre de copies est limité, plus le prix est élevé.

A contrario, le prix baisse si les copies sont multipliées sur un support dont le rendu est de moindre qualité (comme les cassettes vidéo VHS). En ce qui concerne les œuvres sur support numérique, il n'y a pas de différence de qualité entre les fichiers originaux et ses copies, et la différenciation de sa valeur n'est que convention. Pour les œuvres sur Internet, il ne peut être question de rareté ni du côté de la production, ni de celui de la diffusion. La conservation de certaines pièces dans une situation où l'obsolescence est attendue, voire programmée, permet d'introduire de la rareté, la fragilité technique des arts numériques les rapprochant de l'objet unique mis en avant par le marché. Les œuvres qui "survivront" prendront de fait une certaine valeur.

Hors des galeries, les stratégies des artistes pour vendre leurs œuvres diffèrent sensiblement de celles des marchands; elles sont souvent plus proches de l'industrie culturelle et de l'édition que de l'œuvre unique vendue en galerie. Par exemple, pour certaines formes d'art numérique, l'artiste peut proposer à la vente le téléchargement d'une œuvre tout en laissant en ligne une version accessible gratuitement (comme le projet *Godlove Museum* d'Entropy8Zuper) ou bien il peut faire payer, sous forme d'abonnement, l'accès à une partie de son site, comme Mark Napier et son *Waiting Room*. Certains ont opté pour la production de "produits dérivés", comme Nicolas Frespech et ses livres à la demande. D'autres artistes ont, quant à eux, créé leurs propres galeries commerciales pour vendre leurs œuvres. C'est par exemple le cas de l'Electroboutique lancée par les artistes Alexei Shulgin et Aristarkh Chernyshev. Ils ont conçu une série d'œuvres colorées et pop, à brancher, ouvertement à consommer, du "Media Art 2.0". Ils portent un regard ironique sur le marché, tout en y participant pleinement.

(1) Yves Bernard & Domenico Quaranta (sous le commissariat de), *Holy Fire, art of the Digital Age* (iMAL, Bruxelles / Belgique, 2008).
(2) www.digicult.it/digimag/article.asp?id=480

ANNE LAFORET

+ D'INFO :

〈 www.bitforms.com 〉

〈 www.electroboutique.com 〉

〈 www.imal.org/HolyFire/fr/ 〉

〈 www.numeriscausa.com 〉

〈 www.postmastersart.com 〉

〈 http://softwareartspace.com/ 〉

SEE THIS SOUND

AUDIOVISUOLOGY
COMPENDIUM

An Interdisciplinary Survey of Audiovisual Culture
Edited by Dieter Daniels and Sandra Naumann

Ludwig Boltzmann Institute
Media.Art.Research.

create and perform visual music resembling the geometric abstract films of Oskar Fischinger or Norman McLaren. *Motion Phone* records its participant's cursor movements and uses these to animate a variety of simple shapes (such as circles, squares, and triangles), producing silent but expressive computer graphic animations.[21] A related artwork, Golan Levin's *Audiovisual Environment Suite*, or *AVES* (2000), presents a collection of cursor-based interactions by which a user can gesturally perform both dynamic animation and synthetic sound, simultaneously, in real time. Based on the metaphor of an "inexhaustible, infinitely variable, time-based, audiovisual 'substance' which can be gesturally created, deposited, manipulated, and deleted in a free-form, nondiagrammatic image space," Levin's system uses recordings of the user's mouse gestures to influence particle simulations, and then applies time-varying properties of these simulations to govern both visual animations and real-time audio synthesis algorithms.[22] Amit Pitaru's *Sonic Wire Sculptor* (2003) likewise produces both synthetic sound and animated graphics from the user's mouse gestures, but shifts the representational metaphor from a 2-D canvas to a 3-D space populated by the user's ribbonlike drawings.[23] Josh Nimoy's popular *BallDroppings* (2003) departs from free-form gestural interaction, presenting instead an elegant mouse-operated construction kit wherein "balls fall from the top of the screen and bounce off the lines you are drawing with the mouse. The balls make a percussive and melodic sound, whose pitch depends on how fast the ball is moving when it hits the line."[24] Nimoy articulately summarizes the hybrid nature of such work: "*BallDroppings* is an addicting and noisy play-toy. It can also be seen as an emergence game. Alternatively this software can be taken seriously as an audio-visual performance instrument."

Another genre of performative audiovisual software dispenses with drawing altogether, in favor of a screen space populated (usually a priori) with manipulable graphic objects. Users adjust the visual properties (such as size, position, or orientation) of these objects, which in turn behave like mixing faders for a collection of (often) prerecorded audio fragments. This can be seen in *Stretchable Music* (1998), an interactive system developed at the Massachusetts Institute of Technology by Pete Rice, in which each of a heterogeneous group of responsive graphical objects represents a track or layer in a precomposed looping MIDI sequence.[25] Other examples of this interaction principle can be seen in John Klima's interactive *Glasbead* artwork (2000), "a multi-user persistent collaborative musical interface which allows up to 20 online players to manipulate and exchange sound samples,"[26] or more recently in *Fijuu2* (2004–2006) by Julian Oliver and Steven Pickles, whose adjustable graphical objects allow for audio manipulations that are even more dramatic.

The systems described above were designed for use with the ubiquitous but limited interface devices of desktop computing: the computer mouse and the keyboard. The use of comparatively more expressive user interface devices, such as video cameras and custom-tangible objects, considerably expands the expressive scope of instrumental audiovisual software systems, but it also pulls them towards the formats (and physical dimensions) of performances and/or

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21 Scott Snibbe, "The Motion Phone," in *Proceedings of Ars Electronica '96*, ed. Christine Schöpf; http://kultur.aec.at/lab/futureweb/english/prix/prix/1996/E96azl-motion.html.

22 Golan Levin, *Painterly Interfaces for Audiovisual Performance* (master's thesis, Massachusetts Institute of Technology, 2000); http://www.flong.com/texts/publications/thesis.

23 Amit Pitaru, *Sonic Wire Sculptor*, 2003; http://www.pitaru.com/sonicWireSculptor/.

24 Josh Nimoy, *BallDroppings*, interactive software, 2003; http://www.balldroppings.com.

25 Levin, *Painterly Interfaces*.

26 John Klima, *Glasbead*, interactive networked software, 2000; http://www.cityarts.com/glasbeadweb/glasbead.htm.

technology approaches the primeval synesthesias of the human senses postulated by anthropologists and color and sound researchers in the 1920s.

The centuries-old dream of "eye-music," for which synesthesia has often been used as a metaphor, has thus mainly arrived in the reality of appliances since the rise of electronics. Without human associations or artistic interpretations having to be involved, it is possible to generate images and sounds automatically from the same signal, and to transform them into one or the other.[22] As in the case of optical sound, the means to transform images and sounds was not the goal of electronic media technology, which was actually designed for audiovisual production and reproduction. But from this basic technical principle a creative spin-off and artistically innovative use of electronics developed with its own, fascinating history. This ranges from the use of the oscilloscope for visual music in the 1950s films of Mary Ellen Bute, Hy Hirsh, and Norman McLaren, to Nam June Paik's TV experiments of the 1960s (in which he fed the audio signal of an audiotape into the cathode-ray tube of a television set), and then onward to an entire generation of artist-inventors, who in the 1960s and 1970s worked with audio and video synthesizers on special effects and manipulation techniques.[23] Finally, in the 1990s, digital signal processing enabled the mapping of images onto sound or sound onto images, as well as their simultaneous generation according to the same parameters. This created precisely what Golan Levin describes as "inexhaustible, infinitely variable, time-based, audiovisual 'substance'" that can be manipulated in real time.[24] In contrast to the mainstream history of technological progress, these artistic and experimental applications link back to the long history of ideas of visual music. Such creative use of electronics for purposes other than those intended thwarts their actual industrial and commercial functionality and the ostensible naturalism of audiovisual high definition.

The artistically motivated image and sound experiments in visual music during the 1920s, in intermedia art during the 1960s, and in media art during the 1980s have entered the hybrid culture of digital mass media as standard procedures. The now fluid technical boundary between image and sound has far-reaching effects on all established genres (e.g., image-sound montage in cinema films and television, live concerts with visuals, audiovisual ambience, and art installations). Its subliminal efficiency often has more significant consequences than are demonstrated manifestly in a direct image-sound transformation. The hybridization of the technical basis of all audiovisual media is of fundamental importance both aesthetically and economically. Because there is no longer any differentiation between the channels of distribution, models of marketing, and output media of sound and vision, the synthesis of the arts that the avant-garde movements of the nineteenth and twentieth centuries called for is no longer a question of technical feasibility. Instead, today the artistic genres are separated again more distinctly at the cultural surface than was envisaged by the new spirit of optimism surrounding visual music in the 1920s or in the intermedia euphoria of the 1960s. The theories of intermedia art and the Gesamtdatenwerk (integrated data work) may be technically realizable through digitalization, but they forfeit their character of a cultural utopia.[25] Unlike the

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22 On the different approaches and processes to connect visual and auditory arts or phenomena, see the second section of this volume with its chapters "Conceptual Correlations" by Sabeth Buchmann and Rainer Bellenbaum, "Montage" by Hans Beller and Jörg Lensing, "Parameter Mapping" by Tina Frank and Lia, "Color-Tone Analogies" by Jörg Jewanski, "Synchronization" by Jan Philip Müller, and "Transformation" by Jan Thoben.

23 See the chapter "Video" by Yvonne Spielmann in this volume.

24 See the chapters "Software Art" by Golan Levin and "Interactive Art" by Katja Kwastek, both in this volume.

25 See the chapter "Gesamtkunstwerk" by Barbara John in this volume.

music"—a term that is based on the title of a live performance event during the Ars Electronica Festival (2000), where *Scribble* (2000) by Golan Levin, Gregory Shakar, and Scott Gibbons and *Small Fish Tales* (2000) by Kiyoshi Furukawa were presented. *Small Fish Tales* uses the software developed for *Small Fish* for a performance before an audience. *Scribble* is based on Golan Levin's *Audiovisual Environment Suite (AVES)*, a collection of seven different interactive systems that were developed especially for the real-time performance of abstract computer-generated animations and sounds. The *AVES* instruments also represent an experimental investigation of innovative interfaces that, although they are intuitively accessible, provide great variability and countless individual settings for performers.

The music interface *fijuu* (2004) by Julian Oliver and Pix appears as an innovative and independent work that is aware of its proximity to computer games, but explores new approaches to the interaction between image, sound, and users beyond the realm of direct modding or appropriation.

Following early variants in the classical avant-gardes, the first art projects inviting spectators to interact with audiovisual systems date back to the 1950s and 1960s. Participatory assemblages, performance art, action art, kinetic art, and cybernetic art all called the traditionally object-oriented conception of the artwork into question, favoring a more process- and event-oriented understanding. This led to a greater degree of stimulated activity on the part of the recipient of the work, as well as the incorporation of mechanical elements and electronic media. The first systems offering possibilities for technically supported interaction were based almost exclusively on acoustic input that generated movement, light, and/or sound as output. In the 1960s and 1970s, the spread of video technology, on the one hand, created possibilities for real-time playback and manipulation of motion images; on the other, the advances made in computer technology enabled real-time interaction between humans and computers as well as the first graphical images. This paved the way for digital systems with elaborately programmed feedback processes, such as those developed by Myron Krueger and David Rokeby in the 1970s and 1980s. While these artists still focused on the manipulation of either visual or acoustic information, since the 1990s interactive art projects have been created that involve the joint manipulation of acoustic and visual information by the users. Artists such as Toshio Iwai, and Golan Levin and Zachary Lieberman have since developed a range of interactive art projects based on mainly abstract, at times also associative relations between sounds, colors, and forms, which are activated, manipulated, or indeed newly created during the interactive process.

real-time system that directly sonified visual forms. In this system, figures are drawn on a graphics pad and their shapes then prescribe the pitch, while their positioning determines the tone sequence or tone variation.[13] Likewise in the 1970s, the diffusion of video technology led to the development of various systems that used live video images as the input for the generation of sound, for example Erkki Kurenniemi's *Dimi-O* systems[14] and the *Cloud Music* project created by Robert Watts, David Behrman, and Bob Diamond (1974–1979), in which a video camera recorded cloud movements, and an analysis of the brightness at six points of the image was used to manipulate sound canals.[15]

Audiovisual Interactions in the Digital Medium: Pattern Playback

It was not until the 1990s that participating visitors in interactive art projects were able to engage in joint manipulation of acoustic and visual information. One of the methods used to achieve image sonification was based on the principles of pattern playback. In 1995, Toshio Iwai created *Piano as Image Media*, an installation in which visitors use a trackball to draw shapes and patterns that are then projected onto a screen and interpreted as musical notation. The individual pixels of the patterns first move slowly line by line toward a real piano, accelerating from a particular threshold onward as they approach the keyboard, which then independently plays the corresponding note. The pixels now appear to traverse the keyboard, only—this time on a vertical projection screen—to stream out of the piano, changing into colored, geometric objects as they flow.

In his work *Audiovisual Environment Suite* (1998–2000), Golan Levin also experimented with directly drawing the sounds, using a standard interface consisting of a mouse and a monitor. He is interested in the idea of a painterly metaphor for interfaces: "This metaphor is based on the idea of an inexhaustible, extremely variable, dynamic, audiovisual substance which can be freely 'painted,' manipulated, and deleted in a free-form, non-diagrammatic context."[16]

Sonification

In the first application of the *Yellowtail* (1998–2000) series, the sonification of the shapes drawn with the mouse and set into motion by the system is still achieved by means of an axis that repeatedly sweeps from the bottom to the top of the image, triggering a sound as soon as it makes contact with a pixel (the horizontal position determines the tone, the brightness determines the volume). In his project *Loom* (1999), Levin dispenses with this axis and generates the sound directly from the shape drawn by the user, mapping the time axis straight onto it. Thus, for example, a thicker line generates a louder note, while a change in direction increases the brightness of its timbre. The movement dynamics of the drawing are recorded and then played back repeatedly.

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13 See Golan Levin, "The Table Is The Score: An Augmented-Reality Interface for Real-Time, Tangible, Spectrographic Performance," in *Proceedings of the International Conference on Computer Music 2006 (ICMC'06)*, New Orleans, November 6–11, 2006, http://www.flong.com/storage/pdf/articles/levin_scrapple_20060320_1200dpi.pdf.

14 See Titti Kallio et al., "Design Principles and User Interfaces of Erkki Kurenniemi's Electronic Musical Instruments of the 1960s and 1970s," in *Proceedings of the 2007 Conference on New Interfaces for Musical Expression (NIME07)*, New York, 91, http://itp.nyu.edu/nime.old/2007//proc/nime2007_088.pdf.

15 See David Dunn, *Eigenwelt der Apparate-Welt* (Linz: Ars Electronica, 1992), 152–153.

16 Golan Levin, *Painterly Interfaces for Audiovisual Performances*, M.S. Thesis, MIT Media Laboratory, Cambridge 2000, 56, http://www.flong.com/storage/pdf/articles/thesis600.pdf.

Audiovisual Interactions in the Digital Medium: Interactive Widgets

Another means for the visual manipulation of sound is its symbolic representation through objects activated within the framework of an interactive process. Golan Levin calls such objects "interactive widgets."[17]

Between 1992 and 1994, Toshio Iwai developed a system called *Music Insects*, in which visitors use a mouse to create drawings on a monitor. He assigned musical notes to the lines and shapes based on the colors in which they were drawn. Then he chose various insects to represent different musical instruments and programmed them to run across the screen. As soon as an insect makes contact with a drawing, the corresponding note is sounded, while white and gray color tones change the direction in which the insects move.[18] The groundbreaking thing about this work is that it turns away from a linearly understood notation toward a system of notation organized in space. A similar direction is taken in *Small Fish*, created by Kiyoshi Furukawa together with Wolfgang Münch and Masaki Fujihata in 1998/1999. The fifteen different variants of this system almost all work on the basic principle that one or several pick-ups, usually in the form of simple dots, move across the screen and activate notes and change direction when they collide with each other, with sounding graphical elements, or with the boundaries of the window frame. The user can move the elements around in order to manipulate the composition.

Golan Levin criticizes many of these systems for the very limited freedom the user enjoys to influence the acoustic output, which is partly a consequence of the fact, he says, that not the sound object itself but only its environment or direction of movement can be altered interactively.[19] With their *Manual Input Workstation* (2004–2006), he and Zachary Lieberman succeeded in developing a fully intuitive system in which the visitor can both create and manipulate shapes and notes at the same time by using hand gestures in a kind of shadow play. The use of human gestures means there is no equipmental level that creates a distance between input and output. Form and color are immediately generated by the hands.

Audiovisual Interactions in the Digital Medium: From the Mixing Console to the Music Table

Other systems proceed from the concept of the mixing console to visually create or manipulate sound. In particular, (commercial) audio software (software sequencers such as Digital Performer, for example) often imitate the optics and functionality of analog mixing consoles, while more experimental systems attempt to better this functionality by means of other graphic forms of representation.[20] Further improvements have been achieved by new forms of music tables that visually depict the sounds, frequencies, and rhythms that can be or have been created, and also give them a spatial association. One highly sophisticated and complex example of the many music tables that exist is the *reacTable*[21]—a round table on which various marked building blocks are

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17 Levin, *Painterly Interfaces*, 41.

18 See "A Short History of the Works by Toshio Iwai," http://www.vanriet.com/doors/doors1/transcripts/iwai/iwai.html.

19 Levin, *Painterly Interfaces*, 41f.

20 E.g., in various *Soundscape* projects created by the Interval Research Cooperation. See Levin, *Painterly Interfaces*, 37.

21 Cf. the overview at http://reactable.iua.upf.edu/?related.

positioned and can be activated at the same time.[22] These building blocks adopt the function of generators, audio filters, controllers, control filters, audio mixers, and global objects (e.g., a metronome), although the user does not in any way need to know or be able to identify their function in order to create sequences of sound. The positioning of the building blocks with respect to each other determines their reciprocal influence. While the individual sound components are still depicted by symbols, their interaction is shown through connecting lines that visualize frequencies and rhythms. What is interesting about the *reacTable*—in addition to its truly vast range of possibilities for intuitive, real-time musical production and visualization—is its potential for collaborative improvisation between several users.

New Experiments in Interactive Sound Visualization

Over the last ten years, the visualization of sound produced by recipients, which had already been experimented with in the 1950s and 1960s, has also been further developed. Thus, Levin and Lieberman added sound components to installations based on real-time analysis and projection of shadows. In their installation *re:mark* (2002), a voice-recognition system attempts to transform visitors' speech into writing which then—taking its cue from the visitors' shadows—moves across a screen. The similarly constructed installation *messa di voce* (Voice Placement, 2003), on the other hand, converts sound into abstract shapes.[23]

In 2002, the two artists together with the Ars Electronica Futurelab developed a completely new approach in their installation *The Hidden Worlds of Noise and Voice*. Spoken exchanges are made spatially visible: the voices of or noises made by different users sitting at a round table are converted into virtual sound sculptures by means of 3-D technology. The forms that emerge can be observed, on one side, through special 3-D spectacles, while on the other they are projected as shadows onto the table, so that observers standing next to the users can also follow the visualized process of communication.

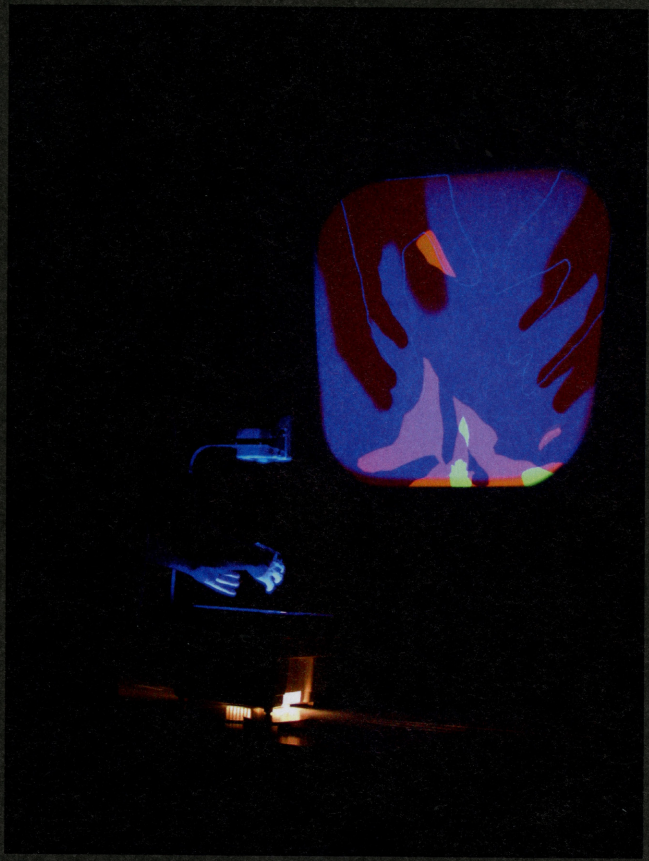
Another type of translation of sound and image is produced when the sounds are interpreted at a symbolic level rather than visualized. For example, in Vincent Elka's installation *Shout* (2007), the projection of a woman's face reacts to the acoustic input produced by the visitors. The system attempts to read emotions from their voices and induces the woman to react to them both through her facial mimics and her language.[24] Here, Elka is referring back to concepts of a linguistic communication between humans and technology that are relevant in AI (artificial intelligence) research, but because they are based on symbolic systems cannot be considered sound-image transformations in the narrow sense. As has been shown, these transformations are mostly dedicated to abstract, and also often associative relations between sounds and colors and forms. As interactive art projects, they also invite the visitor to actively explore them.

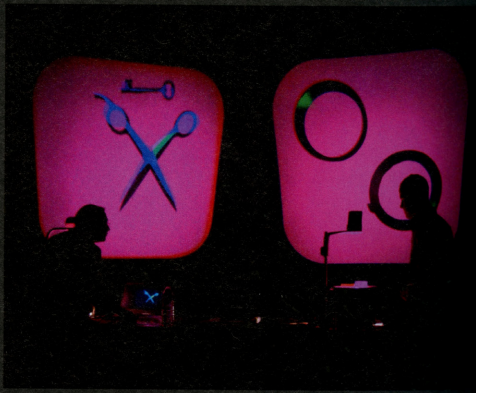
Transformation

22 See Sergi Jordà et al., "The reacTable: Exploring the Synergy between Live Music Performance and Tabletop Tangible Interfaces," http://mtg.upf.edu/reactable/pdfs/reactable_tei2007.pdf.

23 Cf. Golan Levin and Zachary Lieberman, "In-Situ Speech Visualization in Real-Time Interactive Installation and Performance," in *Proceedings of The 3rd International Symposium on Non-Photorealistic Animation and Rendering*, Annecy, France, June 7–9, 2004, http://www.flong.com/storage/pdf/articles/messa_NPAR_2004_300dpi.pdf.

24 See the project website: http://shout.emosmos.com.





– Photographs of a performance of *The Manual Input Sessions* (2004) by Tmema (Golan Levin and Zachary Lieberman).
© Tmema, courtesy the artists.

Tmema (Golan Levin and Zachary Lieberman)
Manual Input Workstation (2004)

Manual Input Workstation is an interactive installation for the manipulation of images and sounds. Its appearance is that of an ordinary overhead projector that invites the visitor to place and position adjacent rubber shapes on its glass surface. The images are not simply projected, however. They are also simultaneously recorded by a video camera attached to the ceiling, and then transformed, animated, and superimposed via data projection onto the overhead projection. The visitors soon realize that it is possible to interact with the apparatus using more than just the shapes provided. Movements and gestures made with their own hands offer other, more sophisticated ways of creating shapes in a kind of shadow play.

Different programming modes—of which just two examples will be described here—enable different types of sound production. The NegDrop mode invites the creation of closed contours to generate negative spaces that the system then fills with colored positive shapes. When the contour is broken, the positive shape drops as a sounding object to the lower boundary of the projection, where it bounces repeatedly, each time triggering a sound that varies according to the size, form, and fall velocity of the shape. The InnerStamp mode immediately sonifies the shapes created by the user and allows the sound to be constantly modified by altering the shapes. When a shape is released, the sound sequence that has been created is played back in a loop. The possibility of direct manipulation of the sounding objects means that the interplay between shape and sound can be precisely observed. The factors that contribute to the generation of a tone—volume, pitch, and timbre—are directly assigned to the basic characteristics of shapes—volume, contours, and position. The transformation of shapes and sounds in real time thus enables an explorative reflection of fundamental visual and acoustic phenomena. The use of human gestures eliminates any "equipmental" level that would create a distance between input and output. The forms and colors are created directly by hand. The artists themselves highlight the novelty of this system "in which the hands are used to simultaneously perform both visual shadow play and instrumental music sound."[1]

1 Golan Levin, Zachary Lieberman, "Sounds from Shapes: Audiovisual Performance with Hand Silhouette Contours in The Manual Input Sessions," in *Proceedings of NIME '05*, Vancouver, May 26–28, 2005, 1.

SEE THIS SOUND

AUDIOVISUOLOGY 2
ESSAYS

Histories and Theories of Audiovisual Media and Art
Edited by Dieter Daniels and Sandra Naumann

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basis, the goal of *Audiovisuology* is to somewhat reduce this gap between theory and contemporary practice.
Just how topical the cited historical characteristics of hybridity are for current practice is illustrated by this quotation from Golan Levin's contribution on software art from the first *Audiovisuology* volume:

> Such works are produced for diverse social contexts and can serve a variety of objectives. In the field at large, and in the examples discussed in this article, software artworks serve some of the same aims as do cinema, performances, installations, interior design, games, toys, instruments, screensavers, diagnostic tools, research demonstrations, and even aids for psychedelic hallucination—though many projects blur these boundaries to such an extent that categorization may not be very productive. Likewise, audiovisual software artworks continue to emerge from plural and only occasionally intersecting communities of research scientists, new media artists, software developers, musicians, and isolated individuals working outside the institutions of the laboratory, school, museum, or corporation.[60]

Again, let us call to mind the multiplicity of applications and contexts that Castel envisaged for his ocular harpsichord. Two and a half centuries later, the genuine hybridity of devices and artefacts at the interface between hearing and seeing reaches far wider circles and contexts. Yet their acceptance is by no means a foregone conclusion. A deliberate rejection of self-classification is still subject to strong pressure in art, science, and media technology. Latour describes the following paradox: "The modern Constitution allows the expanded proliferation of the hybrids whose existence, whose very possibility, it denies."[61]

The many hybrid devices, which emerge at the interface between the acoustic and the visual, are exemplary for this conflict in the modern era. On the one side they are part of the positivist history of progress and the ongoing process of differentiation in art, science, and technology in the narrative of the modern era. The propositions discussed above that aim to operationalize the arts as electrical oscillations, are symptoms of such a belief in technocratic feasibility. On the other side, the contexts of the creation of these artefacts frequently reveal a longing to recover a pre-modern wholeness. This also drives the success of image/sound synthesis in pop culture and the great interest in scientific research on synesthesia. The search for wholeness can turn back to holistic models of world harmony and lead to a theological, occult, spiritual, or drug-induced escape attempt from modernity.[62] As the essay by Chris Salter in this volume illustrates, however, recent theories of neuroplasticity posit a dynamic, sensorimotor concept of the interlacing of body, self, and environment, which has been demonstrated for the cross-modal circuitry of vision and hearing.[63]

Thus the thematic field's genuine hybridity also transcends the opposition of modern and anti-modern. The goal of *Audiovisuology* is not to establish a new scientific discipline, but to outline a model for dealing with this hybridity, to sustain it with open eyes and ears, and to withstand the temptation to construct fallacious syntheses.

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60 Golan Levin, "Audiovisual Software Art," in: Daniels and Naumann, *See This Sound: Audiovisuology Compendium*, 270–277, here 270.

61 Latour, *We Have Never Been Modern*, 34.

62 In the section "A Perverse Taste for the Margins," Latour describes how the moderns and antimoderns "frighten each other by agreeing on the essential point: we are absolutely different from the others, and we have broken radically with our own past." Latour, *We Have Never Been Modern*, 124.

63 This is not only found in persons who have lost a sense faculty through injury, but can also be demonstrated in non-impaired test persons; see the essay by Chris Salter in this volume.

in this case feedback processes between the recipient and the system are combined with feedback processes between images and sounds. The recipient can either activate these processes, as, for example, with the interactive software in *Small Fish* (by Kiyoshi Furukawa, Wolfgang Münch, and Masaki Fujihata, 1998/1999), in which sounding graphic elements and/or effectors (taking the form of simple dots) can be moved with the mouse in order to modify musical sequences; alternatively, the recipient can "paint" sounds with the mouse or other input media, for example in Toshio Iwai's *Piano—As Image Media* (1995) and *Music Insects* (1996/1997), and in Golan Levin's *Audiovisual Environment Suite* (2000), where—unlike in Iwai's work—different parameters of the "drawing" are actually translated into sound. On the other hand again, one parameter of the image/sound interaction might remain entirely on the recipient side, whose input (in the form of gestures or noises) then produces the image or sound. The works *Manual Input Workstation* (2004) by Tmema (Golan Levin and Zachary Lieberman) and *Very Nervous System* (1986–1991) by David Rokeby are examples of projects in which visually interpretable parameters are created by means of gestures. In *Manual Input Workstation*, the superimposition of a video system on a standard overhead projection enables the direct creation and manipulation of shapes and sounds using hand gestures. The factors that contribute to the formation of a sound—volume, pitch, and timbre—are directly allocated to the characteristics that underlie shapes—volume, contour, and position.

Very Nervous System, by contrast, dispenses altogether with two-dimensional images and allows gestures and sounds to "communicate" directly. The movements of the recipient are recorded with a video camera and analyzed by a computer which responds with sound sequences that simultaneously provoke new movements.[2] Other works are based on the input of sound or text. Examples are Vincent Elka's *SHO(U)T* (2007), in which the speech or sounds emitted by visitors are translated into emotional reactions shown on an enormous projected face, and Tmema's installation *Messa di Voce* (2003), which visualizes speech input through abstract shapes.

In audiovisual interactive art, therefore, interaction between a recipient and a system developed by an artist creates or modifies an interplay between images/gestures and sounds, which results in a perceptible audiovisual outcome. The question is where exactly the artwork is located in this intricate system of reciprocation—in the system, in its operation, or in the outcome? The aim of this essay is to determine the complex ontological status of such works through a comparison of different types of devices. "Device" is used here as a generic term for diverse systems that translate, modify, or transform materials and information, and especially for the apparatus, the tool, the instrument, and the musical instrument. Each of these devices has its own characteristics, and by comparing these we can gain a better understanding of audiovisual interactive art. Another question posed in the course of this essay is whether and under which conditions such devices may be said to assume the status of an artwork.

Audiovisual Instruments?

A work of art is traditionally defined as anything that seeks to convey an idea or provoke reflection by means of an individual representation. More recent attempts to define the concept of the work of art take account of twentieth-

2 For a detailed discussion of the development of audiovisual interactive art, see Katja Kwastek, "Sound-Image Relations in Interactive Art," in *See This Sound: Audiovisuology Compedium,* eds. Dieter Daniels and Sandra Naumann (Cologne: Walther König, 2009), 163–169.

particular scores.[17] The resistance described above can thus be inherent both in the technical structure of the instrument and in the score. The score enables or requires a temporal separation between composition and performance, allowing for a practice period in between.[18] Only in improvisation do the two occur together. Heinz von Loesch points out that successful improvisation has at times also been described as virtuoso. He writes that the benchmark is then only the technical mastery of the instrument, independent of a score that demands particular proficiency. Aden Evens even goes so far as to characterize the musical score as a limitation: "How much more difficult it is to discover the music's ownmost possibility when the correct note has been specified in advance. How can the musician become one with his instrument when a score stands between him and the music, mediating his experience of it?"[19] However, Evens adds that in improvisation there is a higher risk of failure, for example in the form of a dull result. For this reason, musicians seek out methods that bring unpredictable or random elements into play, such as the modification of an instrument or the incorporation of random operators. According to Evens, improvisation thus often actually focuses on strengthening the degree of resistance, for as soon as the musician's technique is perfect, playing becomes a habit, whereas during the learning process it is an experiment.[20]

The concepts of virtuosity and improvisation are alien to the visual arts. In the latter genre, invention and execution usually go hand in hand, so that the aesthetic categories of interpretation (in the musicological sense) and performance—to which virtuosity and improvisation are closely related—become irrelevant. In interactive art, by contrast, the recipient enters into a role that can be profitably compared with that of the musical interpreter.

Interactive Art: The Resistance of the Apparatus

The way that recipients deal with interactive art seems appropriately defined by the term "experiment" as used by Evens, but perhaps better again by the word "exploration," as there is an absence of a predefined objective. Interactive art also eschews scores or manuals. However, the recipients of interactive art are unprepared in two respects, given that they are not even familiar with the workings of the apparatus. On the contrary, one motivation for the interaction is to explore how the apparatus works and which actions it enables. The resistance of the apparatus as a kind of black box and the accompanying explorative action of the recipient are thus existential for the functionality of the interactive artwork.

Because the interactive system is unknown to the recipient, the latter cannot be expected to master it technically. The intuitivity of the system thus plays an important role, for it allows the recipient to act even without prior knowledge or terms of reference. Golan Levin and Zachary Lieberman emphasize the importance of a combination of simplicity and complexity for successful interaction between human beings and audiovisual systems: "The system's basic

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17 Heinz von Loesch, "Virtuosität als Gegenstand der Musikwissenschaft," in *Musikalische Virtuosität: Perspektiven musikalischer Theorie und Praxis*, Klang und Begriff, vol. 1, ed. Heinz von Loesch, Ulrich Mahlert, and Peter Rummenhöller (Mainz: MDS, 2004), 11–16, here 12.

18 The need for practice is often used as a defining criterion for the musical instrument. As Christoph Kummer says: "Pocket noise is a real instrument. You have to practice." See the interview with Christoph Kummer by Tilman Baumgärtel in Tilman Baumgärtel, *net.art 2.0: Neue Materialien zur Netzkunst* (Nuremberg: Verlag für moderne Kunst, 2001), 246–251, here 248.

19 Evens, *Sound Ideas*, 147.

20 Ibid., 159–161.

principles of operation are easy to deduce and self-revealing; at the same time, sophisticated expressions are possible, and true mastery requires the investment of practice."[21] Thus, the two artists develop systems that react consistently to user input but at the same time are inexhaustible because they register every slightest variation in input. The aim is to have the recipient operate the system intuitively without becoming bored. Flusser argues in the same vein, albeit from the opposite point of view: "The program of the camera has to be rich, otherwise the game would soon be over. The possibilities contained within it have to transcend the ability of the functionary to exhaust them, i.e. the competence of the camera has to be greater than that of its functionaries."[22]

Unfortunately, Flusser denies us a more detailed explanation of how the competence of the apparatus should be understood. Dieter Mersch identifies imagination and figuration as the fundamental categories of artistic productivity. He believes that the artist either creates "out of the free power of his imagination as an inexhaustible source of infinitely new images and ideas" or "he refigures [images and ideas], recombines them, and transforms them into other forms never before seen."[23] However, Mersch's reasoning neglects the process of realization and thus the resistance of the medium. Just like the instrument and the physical parameters of sound production in music, in the visual arts the material parameters and the potential of the tool used are of fundamental importance. Artistic productivity is not a purely cerebral activity, but also a labor with the medium.

In music, it is often not the composer but an interpreter who carries out this performative realization in the sense of an encounter with resistance witnessed by the public. The composer's task, by contrast, is to anticipate and configure the resistance by means of the score. The situation is similar in interactive art. Here, too, the author does not have to overcome the resistance of the medium himself, as is normally the case in the visual arts, rather he configures it for the recipient.

One could respond to Mersch that interactive art tends to leave aspects of the figuration to the recipient, for which the artist has imagined a "figuration apparatus" in advance. It remains open, however, to what extent the figuration has already been predetermined by the apparatus or its program and to what extent the user has control over the results. It may be, therefore, that elements of visual compositions or sound sequences have been created and stored in the system for subsequent activation or selection by the recipient, as in the case of *Small Fish*. Golan Levin points out that although systems that only offer limited possibilities for the manipulation or combination of precomposed sounds guarantee a satisfying aesthetic output, they greatly restrict the recipients' ability to exert their own influence on the artistic production. If recipients have little to lose, they also have little to gain, apart from their pleasure in the artist's composition: "Canned ingredients, all too inevitably, yield canned results. The problem is fundamental and has to do with the granularity of control such systems

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21 Golan Levin and Zachary Lieberman, "Sounds from Shapes: Audiovisual Performance with Hand Silhouette Contours in the Manual Input Sessions," *in Proceedings of the 2005 Conference on New Interfaces for Musical Expression*, eds. Sidney Fels and Tina Blaine (Singapore: National University of Singapore, 2005), 115–120, here 115. Full text available online at http://www.nime.org/2005/proc/nime2005_115.pdf.

22 Flusser, *Towards a Philosophy*, 27.

23 Dieter Mersch, "Medialität und Kreativität: Zur Frage künstlerischer Produktivität," in *Bild und Einbildungskraft*, eds. Bernd Hüppauf and Christoph Wulf (Munich: Fink, 2006), 79–91, here 80.

broken by interludes when he adopts an outside perspective."[28] Thus, aesthetic experience in the process of interaction requires fluctuation between self-forgetful action and reflection on one's own behavior. In interaction, then, in the ideal case, the fusion of exploration and reception leads to a convergence of the actor and the recipient in a new dual role. Even if the occurrence of and the kind of aesthetic experience ultimately depend largely on the individual approach of the recipient, it is still the invitation to interact that initiates both the action and the reflection.

Self-Referentiality and Multimodal Reflexivity

At the beginning of this essay, I identified the decisive factor in defining an artefact as an artwork as its intention to convey something or to invite the viewer to reflect. This necessary metalevel—in the traditional sense of iconography or imagery—may exist in reference to something found outside the composition itself. However, many artworks do not refer to a meaning that is external to themselves, but rather lay bare their own functionality or mediating nature. This kind of self-referentiality has not been a widespread artistic strategy only since modernism, though it is associated in particular with the artistic avant-garde. It can occur within a particular genre (such as when Yves Klein emphasizes that his painting is founded on the materiality of the color) or across genres in the sense of the *paragone* (such as when Lucio Fontana tears the canvas in order to bring painting face to face with plasticity). The complexity and the novelty of the mediating aspect of interactive art renders such self-referentiality particularly interesting.[29] Here, the work of art does not exhibit its color or plasticity; rather, the system scrutinizes its own interactivity, or the interface design contemplates the programming language on which it is based. In the audiovisual interactive artworks described in this essay, the self-referentiality is primarily rooted directly in the image/sound relationship. The multimodality of the works allows mutual exposition and reflection of both visual and acoustic information—as well as gestural information in some cases—in the interaction process.

As pointed out already, the image/sound relationships are not physically conditioned transferences, but rather settings that have been chosen by the artist. Sound and image are allocated to each other either associatively or symbolically, such as in *Small Fish* or in Toshio Iwai's work; they are mutually translated by means of calculated transformation, as in many works by Levin and Lieberman; or they react to each other, as in Vincent Elka's *SHO(U)T* and David Rokeby's *Very Nervous System*. The aim of these relationships is not putatively neutral visualizations or sonifications in the sense of objectifiable expositions of the other modality on the one hand, actions made by the recipients, on the other. The image/sound relationships in interactive art are conscious settings, not causal reactions, and this situation is what renders their creative exploration an aesthetic experience during interaction with the artistically conceived system. In Rokeby's *Very Nervous System* and Levin and Lieberman's *Manual Input Workstation*, additional sensory faculties are addressed by means of the corporeality of the interaction. Levin and Lieberman emphasize the novelty of the system in *Manual Input Workstation*, "in which the hands are used to simultaneously perform both visual shadow-play and instrumental music sound."[30]

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28 Csikszentmihályi, *Beyond Boredom and Anxiety*, 38.

29 See, for example, Erkki Huhtamo, "Seeking Deeper Contact: Interactive Art as Metacommentary," *Convergence: The International Journal of Research into New Media Technologies* 1, no. 2 (1995), 81–104.

30 Levin and Lieberman, "Sounds from Shapes," 115.

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CONTEST

Can You "Picture" Science?

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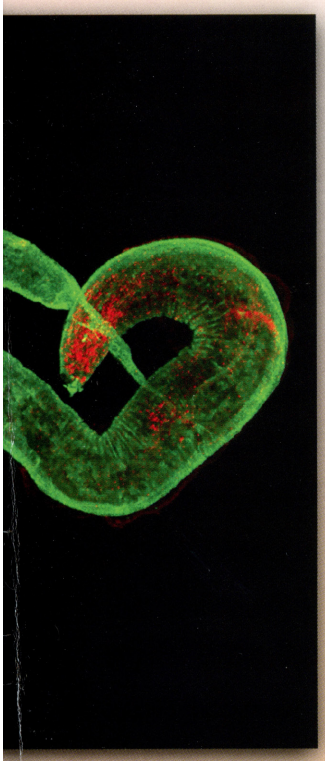

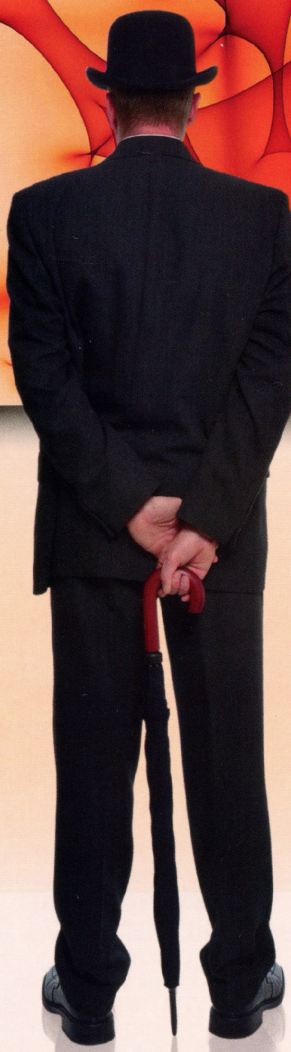

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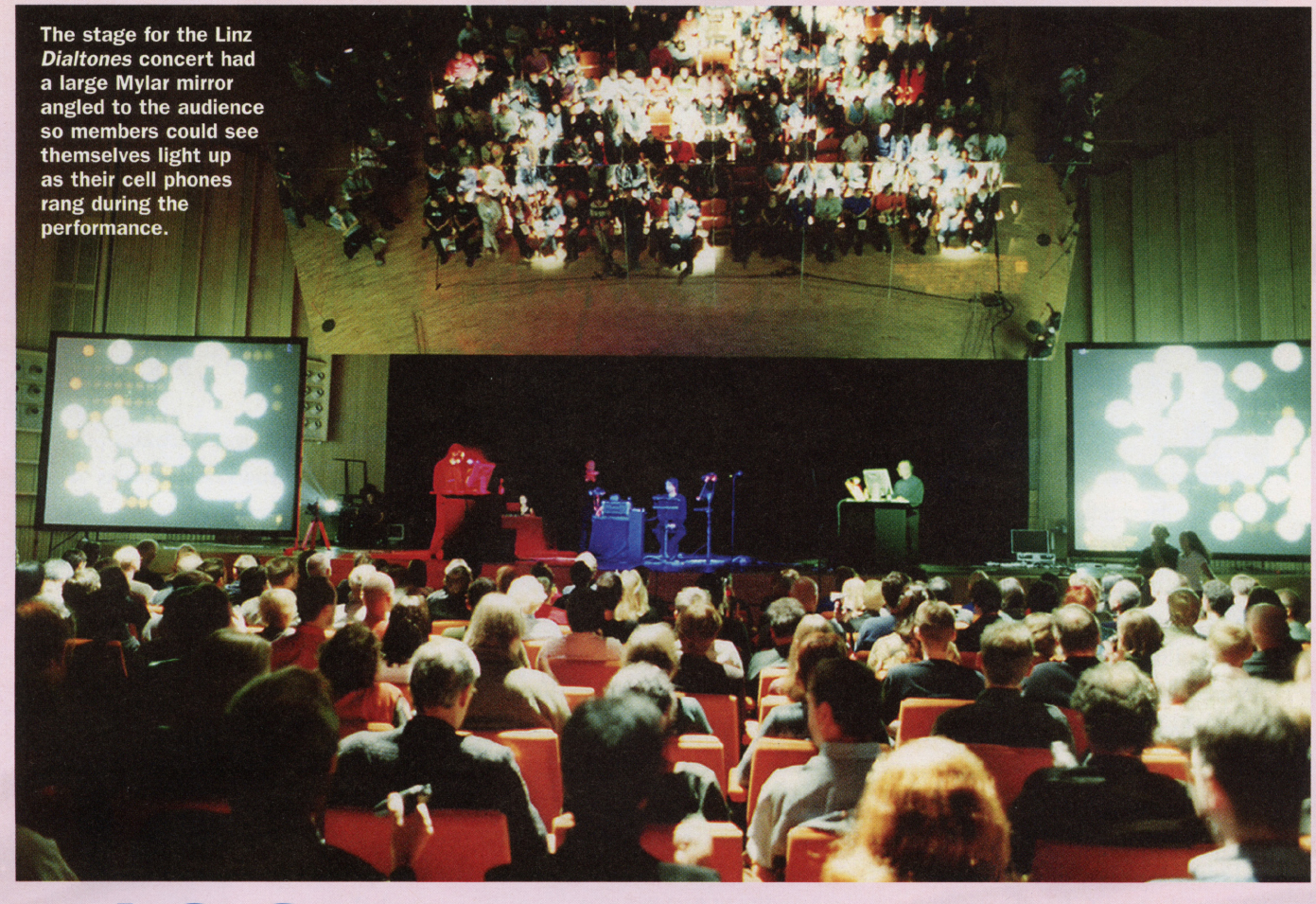
Is It *Art* or Science?



The stage for the Linz *Dialtones* concert had a large Mylar mirror angled to the audience so members could see themselves light up as their cell phones rang during the performance.

1,2,3. . .Strike Up the Cell Phones!

by Max Lindstrom

Fweeeep! Fweeeeep! A universal cell phone ring socks the walls of a darkened theater and lingers in the air. Hushed laughter washes over the crowd, blending with the familiar electronic tone. Strangely, no one rushes to silence a pocketed phone. Instead, two hundred people in the audience sit and stare at phones in their laps. Chreeep!!! A girl, bathed in a beam of light, squirms as a cell in her lap begins to play a chirpy tone. Then it's dark and silent again. The light reappears, halfway across the room this time. The audience's gaze shifts to locate it, then shifts again and again as the beam and tones dance about the room. Within minutes, a single electronic tone has become a crescendo of digital voices — twitters, drones, and pipe organ tones — a diverse and bright melodic landscape. The lucky (depending on your viewpoint) audience is experiencing *and* participating in a telesymphony — aka a cell phone concert.

Dialtones, the first telesymphony held at the Brucknerhaus Auditorium in Linz, Austria in 2001 was created by innovator and artist Golan Levin and about a dozen colleagues. (An additional 17 performances occurred in 2002 aboard a boat on a lake in Switzerland.) Levin set out to create a musical experience as unique in its interactive qualities as its choice of instruments. An associate Professor of Electronic Time-Based Art at Carnegie Mellon University in Pittsburgh, Pennsylvania, Levin describes his innovative concert: ". . .the ringing of mobile phones — ordinarily, the noise of business, of untimely interruptions, of humans enslaved to technology — is transformed into a sound of deliberate expression, *continued on p. 13*

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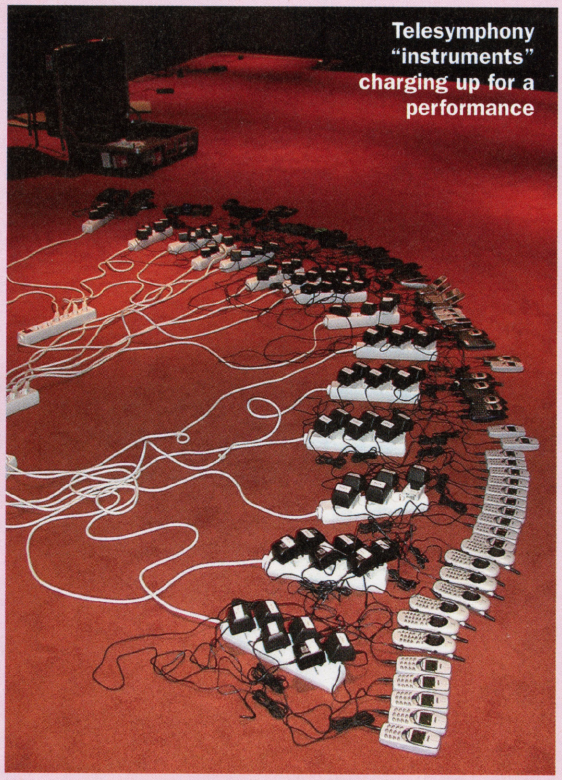
startling whimsy, and unconventional beauty." The three movements of *Dialtones* together last 28 minutes, and include a solo performance and a climactic crescendo.

Using cell phones to make music was definitely out-of-the-box thinking nine years ago. As Levin explains, "The phones at the time weren't capable of making more than a monophonic sound. They couldn't play a [musical] chord, and they couldn't play audio recordings." Levin didn't let that limit his music making, though. "People like making music together and the monophonic quality of the phones was analogous to the voices in a choir," he says. "If everyone came together with their devices, each person would be one voice in that choir."

In order for a group of random cellular phones to work together in harmony, first some work needed to be done. Yasmin Sohrawardy, lead telephony engineer for the *Dialtones* project, created software that permits live performers on a stage to dial and ring as many as 60 cellular telephones in the audience simultaneously. But to control the sound of their instruments as well as the timing, Levin and his colleagues had to devise a way to manipulate the sound each cell phone made. In 2001, the ability to download and customize ring tones to an individual's phone was a relatively new concept. Levin estimates that only about one quarter of people's phones were capable of receiving new ring tones.

As audience members entered the theater, they were asked the model of their telephone along with their phone number. "We knew, therefore, if someone had a model of a phone that could not receive our ring tone, they would be making a sound that was sort of a wild card. We knew which people would be making those sounds, but we didn't know what the sounds would be," Levin says. To eliminate the problem, Levin's team decided to ring those people first and "get them out of the way because their phones were going to sound like the "ring rings" of regular cell phones of the time. The composition team then sent 106 different ring tones it had created, in various proportions, to the remaining phones capable of receiving them. "The effect was that it (the symphony) began with sounds that you would expect and gradually transformed from there to sounds that were more and more unexpected and musical," Levin says.

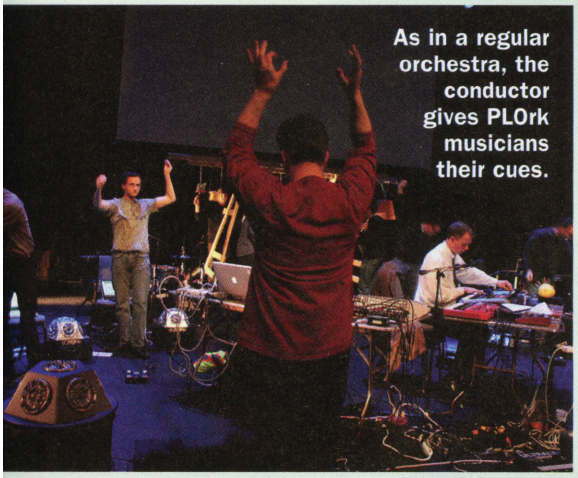


Telesymphony "instruments" charging up for a performance

Composed by Scott Gibbons, the musical score was a sequence of varied sound-textures. The musical effect was accomplished by grouping cell phones together that had been programmed with similar ring tones such as "drones, bugs, and twinklies," and then having them ring together for a minute or two. As Levin explains, "The concert was built by knowing which groups would ring when. But there was no way of achieving precisely timed rhythms." The unpredictability of the time needed to connect the more than 4,000 cellular calls placed during the concert prevented that.

The sounds of *Dialtones* isn't something that you'd put on your headphones to lay back and listen to. It's more like performance art — unique, jarring, fresh, and definitely young. You can listen at: http://www.flong.com/projects/telesymphony/. Those involved in the project are as different as the music they "play." "I wouldn't say we are scientists or artists, just people with a popular interest in cell phone technology and music," Levin says.

Since that initial telesymphony almost a decade ago, phones have become highly sophisticated and now "ring" with all sorts of melodies to match your musical taste. In September 2009, German audio technician Hans Koch staged a cell phone performance at *continued on p. 14*



As in a regular orchestra, the conductor gives PLOrk musicians their cues.

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more complex, such as using graphics pads, video game controllers, even flashlights. All that is needed is something that the musician can vary in a regular way.

The *output* (the actual sound made by the meta-instrument) is also hugely variable. Outputs used so far include everything from traditional musical tones to video game and slot machine effects. I like the ethereal violins, warbling birds, and moody forest sounds of "The Prophecy of PLOrk."

The *feedback* is perhaps the most crucial part of a PLOrk meta-instrument. The musician needs to hear what's coming from her instrument and needs to adjust it on the fly. Each PLOrk musician controls a single set of speakers. These speakers (built specifically for PLOrk) look a bit like an ancient Mayan pyramid, with five sloping sides and a flat top. Each surface contains a speaker unit, and together these units create a sound pattern that spreads out evenly in space. The musicians adjust the volume of their speakers, controlling the way their own instruments blend with the others in the orchestra.

Togetherness

This is really the essence of PLOrk. The thing that makes an orchestra, of course, is musicians playing together. So, communication among the performers is crucial. In a traditional orchestra, the communication happens mostly through the conductor, who controls the tempo of the piece, the volume of each orchestral section, and many other things. In PLOrk, a traditional conductor sometimes controls the music. But at other times, traditional conducting is replaced by communication among the performers themselves. A wireless network connection allows all members of the orchestra to communicate with one another through text messages and graphical feedback on the laptop screen itself. Yes, that's right. During some (though certainly not all) pieces performed by PLOrk, the musicians are actually texting one another. This can become a problem, Cook reports, if the texting becomes more interesting than the music itself.

Perhaps the best way to describe PLOrk is "experimental." Trueman and Cook agree that the real power of PLOrk lies not in what's been done thus far, but what might be done in the future. "There is much interesting music to be found and made with PLOrk," says Cook, "music never before possible or even imaginable."

Stephen Whitt is a science demonstrator for COSI (Center of Science and Industry), the Science Museum in Columbus, Ohio, and a frequent contributor to *ODYSSEY*.

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the NCPA Theater in Mumbai, India. He, however, decided to go back to the basics. Mobile phones are so plentiful in Mumbai that Koch told TheWorld.org reporter Linda Blake that he began thinking of the "constant honking" as a "surround-sound [musical] piece." The evening of the show, Koch had members of the audience call the phone numbers of cell phones set out on the stage and programmed to vibrate. Each one was positioned at a different angle over loose guitar strings. If you've ever placed your cell on any surface and let it vibrate, you know that it can make some rather provocative grinding and throbbing sounds. Koch's piece is a dark and mysterious blend of woofing, clanging, and croaking sounds. You can listen to it at http://www.theworld.org/tag/linda-blake/. "Music is a very wide area," Koch said of the performance.

When cell phones are the instruments of symphonies, it would be difficult to disagree with that.

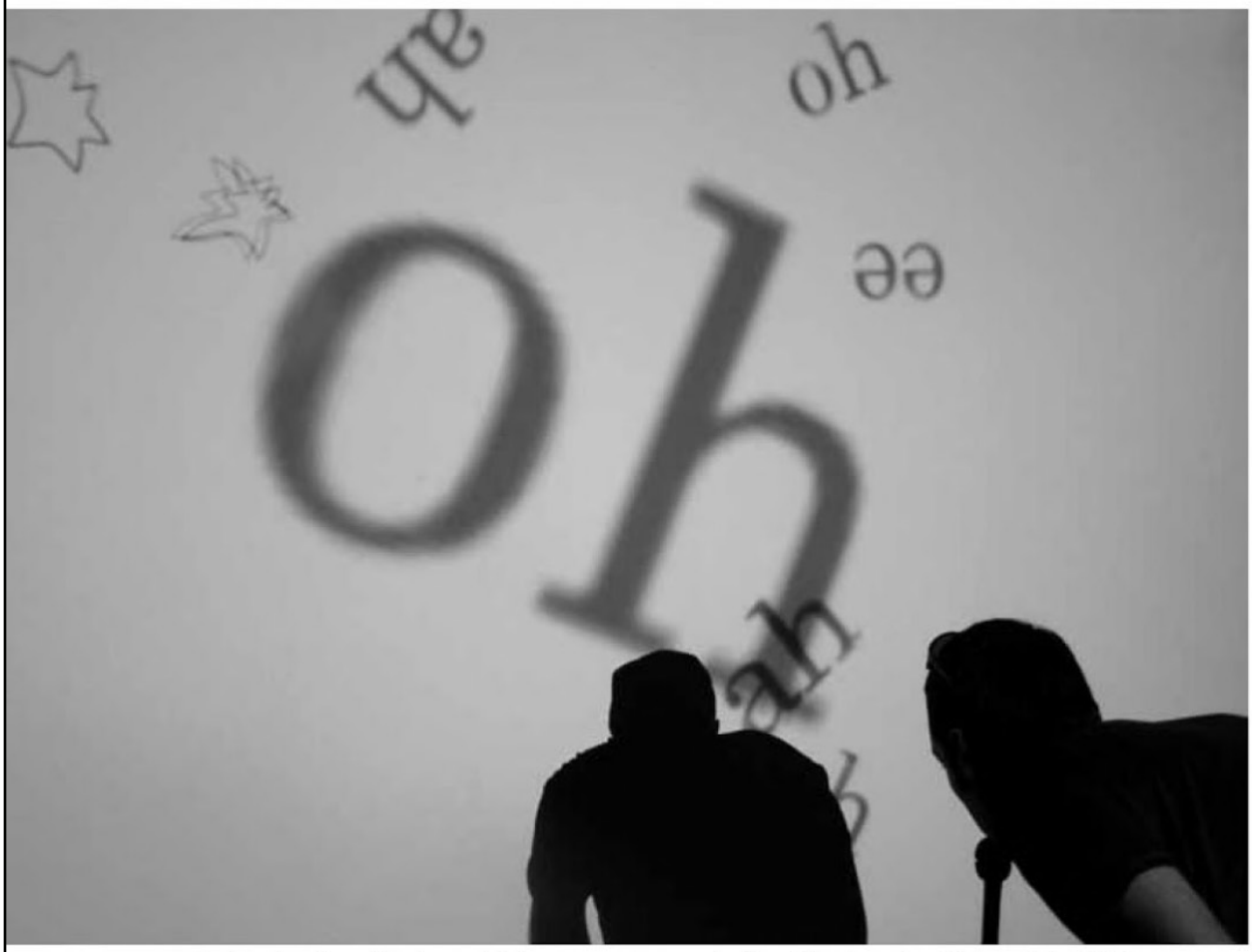
Max Lindstrom loves most music and his cell phone. This is his first article for *ODYSSEY*.

***Dialtones* soloist Scott Gibbons reaches for a phone that he will "perform" by triggering various custom ring tones.**

MEDIA
NEW MEDIA
POSTMEDIA

Domenico Quaranta

postmedia books



Golan Levin e Zachary Lieberman, *re:mark*, Ars Electronica Futurelab, 2002

far notare è che, anche se nelle pagine che seguono si alterneranno termini diversi, stiamo parlando sempre della stessa cosa. Del resto, l'incertezza terminologica è tale che spesso termini diversi ricorrono, come sinonimi, persino nello stesso testo.

Tuttavia, non è sempre la stessa cosa. L'espressione Digital Art, ad esempio, restringe il campo ai media digitali, mentre l'espressione Media Art, particolarmente in voga nella letteratura accademica di area tedesca, lo estende a tutti i media, nell'accezione mcluhaniana del termine: stampa, radio, fax, telefono, comunicazione satellitare, video e televisione, luce, corrente elettrica, cinema, fotografia, e poi computer, software, Rete e videogiochi. Come testimonia bene l'enciclopedia online Medien Kunst Netz (lanciata nel 2004 e curata dagli studiosi tedeschi Rudolf Frieling e Dieter Daniels), il termine Media Art crea una tradizione che va da Man Ray a Nam June Paik all'uso attuale della Rete e del computer, mentre Digital Art può, al massimo, fare riferimento a una storia che inizia nei tardi anni Sessanta, data a cui risalgono i primi esperimenti di uso artistico dei computer. Infine, l'espressione Digital Art si estende indebitamente verso

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PANORAMA CRÍTICO DA ARTE EM MÍDIAS MÓVEIS

"A primeira década do terceiro milênio é lembrada pelo predomínio do dispositivo digital no campo audiovisual e pelo crescente deslocamento do computador pessoal em direção aos dispositivos portáteis onde confluem o computador, o GPS, e a telefonia celular – entendidos como variantes complexos da cultura.

/.../

O critério do trabalho de compilação que orienta esta obra oferece um panorama amplo que estabelece um diálogo crítico entre os diferentes textos e autores em uma coletânea que é um trabalho de escritura, pois aborda analiticamente, em conjunto, o campo complexo das artes e meios móveis.

A desilusão diante das promessas não cumpridas das novas tecnologias vai além, nesta publicação, do discurso banal do novo, para propor um panorama analítico transcendente sobre o profundo impacto ideológico e formal das tecnologias de comunicação na arte e na cultura."

(Jorge La Ferla)

MEDIAÇÕES, TECNOLOGIA

diferentes pontos de vista sobre o contexto em que a arte para dispositivos portáteis está inserida, além de compartilhar estudos de caso relevantes e aprofundar-se em temas mais centrais da discussão. A seguir, encontra-se um breve resumo desse universo, que será progressivamente ampliado pelos demais artigos, organizados em quatro partes, tendo como critério a proximidade temática (Parte 1, Cultura Digital: Contexto e Emergência das Redes Móveis; Parte 2, Mídias Locativas: Desdobramentos Sociais e Políticos; Parte 3, Estudos de Caso: Redes em Espaço Urbano).

Em 2001, Patrick Lichty faz a curadoria de [re]distributions[6] buscando justamente explorar o potencial expressivo de aparelhos como PDAs, pagers e telefones celulares. O projeto reúne o estado de uma arte de nômades digitais, por meio de textos, imagens e vídeos criados para palms, e trabalhos que experimentam as possibilidades de linguagem dos dispositivos de comunicação sem fio. Um dos destaques de [re]distributions é o projeto Dialtones[7] (Golan Levin, Gregory Shakar, Scott Gibbons e outros), , uma telesinfonia produzida pelo som dos celulares do público, coreografados a partir de sua localização e do tipo de toque. Essas informações podem ser conhecidas previamente. Levin usou esse conhecimento prévio como base para compor, em tempo real, uma música que inverte as noções de sons públicos e privados.

Golan Levin, Gregory Shakar, Scott Gibbons, et al.

Dialtones foi apresentada pela primeira vez em dois concertos consecutivos, realizados em setembro de 2001, em coprodução com o Ars Electronica. A telesinfonia fratura os limites entre sons públicos e privados, ao transformar ringtones em fragmentos de uma composição executada em tempo real, conforme o artista telefona para a plateia

Dialtones propõe investigar de que forma as redes possibilitam a geração de padrões musicais inesperados e fenômenos sonoros imprevistos. Ao transformar

6 [re]distributions está disponível em http://www.voyd.com/ia.
7 Mais informações sobre Dialtones no site de Golan Levin: http://www.flong.com/projects/telesymphony/.

em música o burburinho de toques muitas vezes percebidos como incômodo, o espetáculo subverte o aviso de praxe: para assistir a Dialtones, recomenda-se ao público manter os aparelhos celulares ligados. Nas palavras do próprio Levin: "Dialtones inverte nosso entendimento de som privado, espaço público, etiqueta eletromagnética, e a fábrica das redes de comunicação que nos conectam"[8].

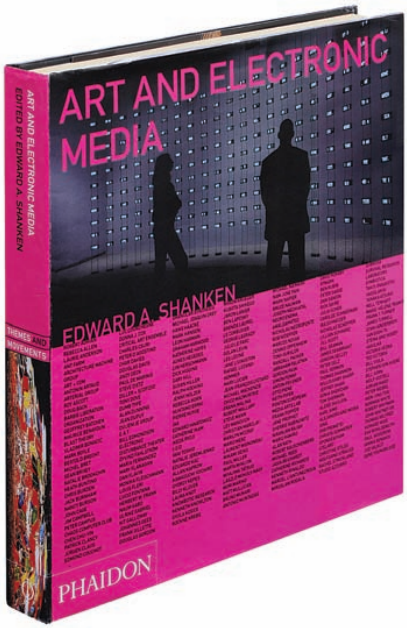
Lichty sustenta, no texto de curadoria de [re]distributions[9], que a expansão das mídias móveis "em direção a uma cultura mais ampla parece ser uma forma de intervenção por si só", na medida em que as redes de tecnologias portáteis conduzem a uma cultura da distribuição, como resultado de um desvio "da tela à palma e ao espaço"[10]. Essa abordagem será desenvolvida pelo próprio autor em "Pensando a cultura nomádica: artes móveis e sociedade", contextualizada por artigos como "Fantasmagorias, vitrines, infiltrações: ensaio sobre as tecnologias e a cidade", de Fábio Duarte e Polise De Marchi, e "Cartografias Líquidas", de Priscila Arantes.

Entre os projetos presentes em [re]distributions, está Wop Art[11], de Giselle Beiguelman, uma série de poemas criados para celulares com protocolo WAP. O trabalho explora as limitações da experiência *on-line* nos celulares da época, sugerindo formatos de leitura que emergem da fricção entre redes fixas e móveis. Beiguelman entende que o estado de dispersão criado pelas situações entrópicas em que são usados aparelhos portáteis, como palms e celulares, não é um problema, mas sim um fator a ser levado em conta. Em vez da leitura concentrada da cultura impressa, atualmente surge um formato de fruição distribuído, no qual o entorno é um elemento incluído que, portanto, precisa ser considerado durante a criação de conteúdo para essas mídias.

Outro exemplo de trabalho que explora a relação entre redes *on* e *off-line* é Node Runner[12], game criado por Yury Gitman e Carlos J. Gómez de Llarena. O jogo transforma a cidade de Nova York num campo onde duas equipes devem se logar no maior número possível de nós de internet *wireless* — os pontos são somados a partir da publicação de fotos no blog do projeto. Node Runner trata o espaço público como interface e ressalta as conexões entre as redes de informação e o ambiente urbano.

Buscando ligações similares, entre espaços virtuais e reais, na configuração de uma espécie de ambiente híbrido, o grupo britânico Blast Theory criou o Can You

8 Cf. [re]distributions, em http://www.voyd.com/ia/wirelesslevin.htm.
9 Cf. "[re]distributions. Curator's Statement", em http://www.voyd.com/ia/curator1.htm.
10 Lichty nos amplia essa visão no artigo "Towards a Culture of Ubiquity", em link a partir da apresentação de [re]distributions: http://www.voyd.com/ia/essaylichty.htm.
11 O site de wopart é http://www.desvirtual.com/Wop Art.
12 Mais informações sobre o game Node Runner na página do YouTube de Yuri Gitman (http://www.youtube.com/user/YuryGitman#play/all/uploads-all/2/7tz7sVLgoEA) e no site da med 44, em http://www.med44.com/pages/noderunner.html.



ESPACES NÉOMÉDIATIQUES

Art and Electronic Media: Firing a Canon at the History of Art

Edward A. Shanken, *Art and Electronic Media*, London: Phaidon Press Ltd, 2009.

a hard-bound, richly illustrated volume that is twice the size of a regular art manual, *Art and Electronic Media,* as the author confesses, presents itself as a canonical work[1]. Edward A. Shanken states that his goal in writing this book has been "to enable the rich genealogy of art and technology in the twentieth century to be understood and *seen,* not just as a quirky and marginal activity, but as central to the history of art and visual culture since the early twentieth century"[2]. The contextualization of art practices related to electronic media within the frame of the history of art is thus the main objective in Shanken's research. This implies looking at the past rather than the future, underscoring the work of pioneers rather than outlining the most recent works at the time of going to press, and setting a reasoned structure rather than fantasizing with futuristic speculations. The all-encompassing, art historical approach of this book is to some extent unusual given the fact that the literature on this subject generally focuses on contemporary practice (from the 90s to the present day, allocating a few pages to the "pre-history" of these "new media"), or is made up of monographic essays by different authors, roughly distributed into broad categories. Yet the volume is not aimed at a media-savvy reader who looks for recent developments in the field, but instead intends to appeal the regular contemporary art audience.

As with other titles in the *Themes and Movements* series by Phaidon, the book features a survey essay, a selection of works with illustrations and extended captions, and a documents section with edited critical writings and artist's biographies. In the publisher's words, the volumes in this series are "as exhaustive as a full-scale museum overview, presenting many of the most significant works of art associated with a particular tendency"[3]. This description, which notoriously mentions the most revered institution in the art world, speaks for itself and relates to the previously mentioned issue of the book presenting itself as canonical. Shanken already addresses this subject in his essay *Historicizing Art and Technology: Forging a Method and Firing a Canon,* in which he states that "there is no clearly defined canon of electronic art"[4]. Therefore, he has taken the task of classifying and categorizing the different modes of art production related to the use of electronic media. The result is a series of six "thematic streams", plus one chapter outlining the main exhibitions, institutions and communities in the field. The titles of these sections (just as the title of the book itself) refer to broad concepts that allow Shanken to place contemporary artworks alongside historical works from the beginning of the twentieth century under the same category, consciously avoiding popular terms such as "cybernetic", "telematic" or "digital", as well as the unfortunate term "new media". In *Motion, Duration, Illumination,* the author draws a timeline that connects the early experiments in using movement and light by pioneers such as Naum Gabo or László Moholy-Nagy with the use of neon lights in Arte Povera and Conceptual Art, the Kinetic Art movement, and contemporary artists such as Olafur Eliasson and Rafael Lozano-Hemmer. Under the title *Coded Form and Electronic Production,* Shanken reviews the conventional notion of originality and reproduction, from Pop Art to Fluxus and the first experiments with computer graphics, as well as the usually overlooked work of early computer algorists, and finally the emerging category of software art. *Charged Environments* reminds the reader that art has always been, to some extent, interactive, and that this attribute is not exclusive of electronic artworks. The works of John Cage and Wolf Vostell, among others, find their place in this section alongside Bill Viola and Tony Oursler, as well as Golan Levin's software based interactive performances and Rubin and Hansen's installation *Listening Post,* which generated some controversy after it received the Ars Electronica award for interactive art. The use of telecommunication technologies in art drives the section *Networks, Surveillance, Culture Jamming,* which connects the satellite transmission performances by artists such as Nam June Paik and Douglas Davis, Paul Sermon's telematic artworks, net art pioneers, the artivist group The Yes Men and Blast Theory's locative media projects. In *Bodies, Surrogates and Emergent Systems,* the author refers to the Greek myth of Pigmalion to link works related to the body with those that deal with artificial life and with biological art. Hence, performance artists such as Chris Burden share this section with Marcel·lí Antúnez and Stelarc, as well as Eduardo Kac or the research group Symbiotica. Finally, *Simulations and Simulacra* is probably the section with most contemporary examples, due to the fact that it focuses on artworks dealing with computer-generated environments. From Myron Krueger's pioneering work to the latest developments at the CAVE virtual reality environment, many examples are presented, although certain omissions, such as videogame based artworks, are notorious. *Art and Electronic Media* offers a broad perspective of the field and outlines its recent history, although it does not lead to a thesis or conclusion. Shanken's intention, in fact, is to pave the way by setting up a categorization of the forms of art related to electronic media. Paraphrasing the title of his essay, one can say that a canon has been fired at the history of art. Time will tell if the current research will finally lead to a revision of art history that addresses the interactions between art, science and technology.

PAU WAELDER

Pau Waelder is an art critic, curator and researcher in digital art and culture. Among his latest projects are the conferences En_lloc (Now_here), Digital Culture (Fundació Pilar i Joan Miró a Mallorca) and the exhibitions *Metalandscapes* (Deichtorcenter Hamburg) and *FLOW* (CCA Andratx). As reviewer and editor, he has collaborated with *Rhizome, Artnodes, Vernissage TV* and *Furtherfield*. His articles have appeared in magazines such as *a::minima, Magazine du CIAC* and *Leonardo*. He is New Media Editor at *art.es* magazine. www.pauwaelder.com

NOTES

[1] Shanken, Edward A. "Historicizing Art and Technology: Forging a Method and Firing a Canon", in Grau, Oliver (ed.) *Mediaarthistories*. Cambridge-London: The MIT Press, 2007. 60.

[2] Shanken, Edward A. op. cit. 2007. 60.

[3] Shanken, Edward A. *Art and Electronic Media*. London: Phaidon Press Limited, 2009. 306.

[4] Shanken, Edward A. op. cit. 2007. 60.

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The Journal *of* Wealth Management

"In the economic sphere, one must distinguish between elementary principles or relationships, and ideology, and may thus require policy actions that do not seem to aim to achieve economic optimality."

Jean Brunel - Editor's Letter

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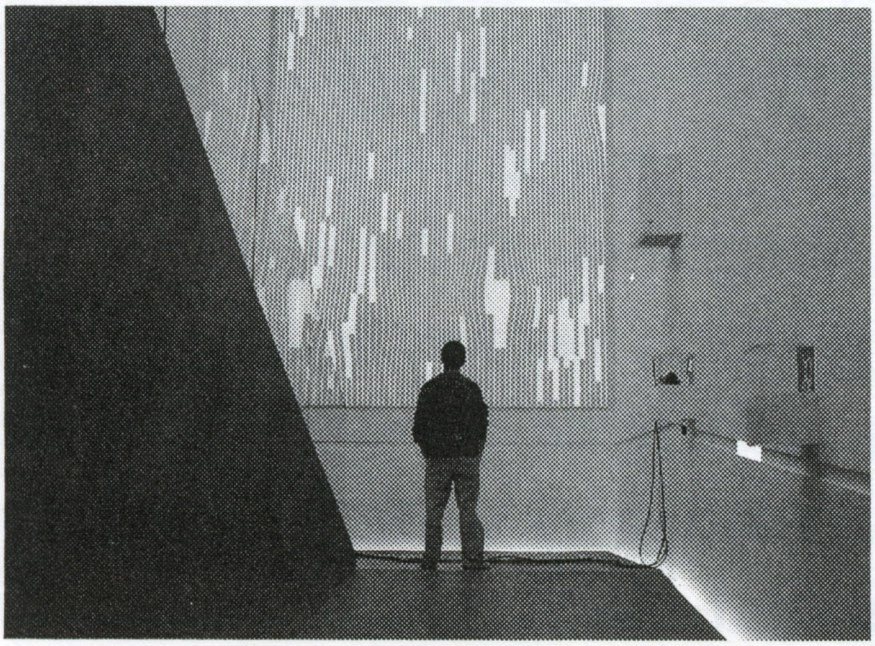
On the Cover



Motion Traces – A1 Corridor, 2004

Interactive installation combining video projection and room illumination

Work by Golan Levin combines equal measures of the whimsical, the provocative, and the sublime in a wide variety of online, installation and performance media. The performative behavior and imagery in much of his work is constructed from each artworks' own history of viewer interaction and experimentation and explore the intersection of abstract communication and interactivity. Levin has exhibited widely in Europe, America and Asia.

Golan Levin is represented by bitforms gallery nyc.
More info at www.bitforms.com and www.flong.com.

Golan Levin Interview

Submitted by Joshua Noble on Mon, 02/01/2010 - 12:00

Joshua Noble: So, some of your work is highly interactive and some of it is really more for passive viewing on the part of an audience. How do you divide those two modes of working?

Golan Levin: There's a fluid continuum for me: I have work which is intended to be audience interactive, and work that is really intended to be demonstrated or performed and an audience enjoys it as observers, and then I have stuff which is halfway in between. Messa Di Voce is an interesting case because it came full circle from one to the other. The first incarnation, *Remark*, that Zachary Lieberman and I made in 2002 was basically an installation for kids to see their speech. They would step into the light of the projector that would create the fiction that speech cast visible shadows and then they would see coming out of their heads the shadow of their speech - that's the premise. They would interact with it and they have a pure interactive artwork experience. After making this, we realized that we actually knew more about the vocal signal than we had been able to use in the installation. We realized we could invite these professional performers who could really push this system to its limits and give ourselves the research challenge of making an interactive system that was as plastic and as malleable and as infinitely variable and as expressive and as challenging as the skills that the performers had. So, the question was: could we make a professional system that could entertain and keep such professionals occupied and engaged and feeling challenged? So, we made that and we made the performance. The performance had about fifteen different scenes. Several of those scenes were specifically tuned for Jaap Blonk and Joan La Barbara or inspired by improvisations that we had with them. After the performance there were requests to show the performance again and we said, 'Well, we can't arrange it, logistically it was quite difficult, how about an installation version'. We realized that of the fifteen different scenes, about five were actually something that we could return to the public and that five year olds could play with. What was really interesting was that then we presented it to the public as an installation and just off to the side was a plasma screen or whatever showing a video of the performance and that gave a crucial connection where viewers would look at the performance first on the way in and it became a kind of an active instruction manual where they would get an idea of what the possibilities were, they would get a basic idea about the mechanics of the system and what they had to do or what they were supposed to do.

GL: The interactive arts jury of Ars Electronica has on occasion given awards to performances and in justifying why they're giving an award to a performance, as opposed to an interactive audience piece and the justification given by Erkki Huhtamo, for example, which I find very interesting, is that even though the audience themselves can't be interacting, they are a vicarious participant. They are experiencing a piece vicariously, and there is some actual merit to this idea. There is a whole part of the brain devoted towards not just empathy emotionally but actually projecting yourself into the situation of someone you're watching do something. There's like, I forget where it is, but somewhere in learning and cognitive science they talk about how you can kind of vicariously learn things by watching someone do it.

JN: Right, there have been experiments where a subject can watch another persons movements and their brain activity will mimic the brain activity of actually acting that out. It's the root of empathy and of learning my mimicry.

GL: So Erkki is claiming that we have a vicariousness of action so that interactive art is appreciated by the audience not just as a visual spectacle but actually also as an interactive spectacle through that emulation mechanism in the brain.

JN: I like thinking about how systems, artistic, aesthetic, and otherwise, can be learnable. A viewer walking in, seeing a performance using a tool, and then being presented with the tool, like you were talking about in Messa Di Voce, is essentially being trained. There's a manual of sorts. What's a learnable system?

GL: I think the key is to make systems that are self-revealing or that actually are very simple to learn by having interfaces that people can explore. It should be the default case, but it's just that there are so many bad interfaces out there that we think it's somehow special to make an interface that's easy to learn. In fact, I guess it is because there are just so many bad ones, but to me it seems like it's actually pretty obvious how to make an interface that's easy to learn.

JN: So do you have a philosophy of how the discoverable interface looks and behaves?

GL: You know, to be fair, when I really look back on it, when I was making interfaces that were very easy and self-revealing and so on, they were for things that were easy and self-revealing. I wasn't making an interface to an airplane where it does make a difference if it's ten milliseconds or fifteen that it takes you to figure something out – it's life and death. I'm interested in invention rather than in optimization of user experience; I'm just personally more interested in inventing new things than in improving old things. There's a lot of work in improving old things that goes on, I just feel like I wonder why so much effort is going into that when American industry in particular really needs more invention.

JN: One of the things that I've been thinking a lot about lately is the actual content of interactive art, what it is that's being aestheticized. One thought is that the content might be the capacity of a user to to understand what's going on within a black box of sorts. That black box can be their own head as they learn a system, a computer, a physciall reactive system, another person, and so on. At the core of this mode of making things is our ability and desire to communicate with not only people, but with things.

GL: …and understand and participate in the process. Yeah, that's an interesting point. It's a tiny, tiny, tiny bit cynical, but not in a bad way, in a charming way. I mean, it might be true. There's a quote that I like from an article by Gabriella Hima

> 'If once literature turns from an Aufschreibsystem into an Umschreibsystem, Myron Krueger's allusion to McLuhan's slogan – "response is the medium" – will become true. And then we could share McLuhan's enthusiasm about the effects of media, when he wrote: "Nothing ever printed is as important as the medium of print." We might say, regarding the possibilities of telematical media: Nothing ever said in response is as important as the invention of the medium of the response.'

Maybe that's a collapsed way of saying the same thing as, like, our capacity to understand what's going on in a black box, which is to say, our capacity to understand what happens when we stick our finger in the black box -- what it does in response. And maybe your statement is actually a little bit better than just saying the word 'response' because the idea of a black box is to acknowledge that there is an input and an output. I'm reminded of, do you know Jim Campbell's formula for computer art?

I'm friends with Jim and I asked him about this, and he basically made this as a provocative form of self-critique for a lecture that he gave some time ago. He made this to basically accuse himself but also everyone else at the same time in saying, "Is this all there is?" What I think is actually significantly missing from this is in fact the feedback operator that leads the output on the right-hand side back to the input. If there's a user operator in here, then the user's actions on the left and the response given to the user on the right are presented as completely decoupled here. What we don't see here is that when you do something, it gets processed. It produces a result in some output that then influences your path on the left-hand side again. That's not shown, and that's my critique with the picture.

JN: Right, we're very complex. And sometimes, even where we don't see complexity, we'll create it and vice versa. As long as we have a sense that our internal process is being responded to by the internal process of another party and that our two external processes are matching up, then we feel communication.

continue

GL: I've had some discussions about *The Snout* (pictured above) which is simply a robot that looks at you. Obviously it's a computer and the computer's not living, so I've done a whole bunch of work to create the illusion of life. People often make guesses about how sophisticated the model is that I'm using to create the illusion of life. Multi-level emotional state system, machine learning, and things like that. I tell them that with the very explicit admonition that it's not just that the piece is simple, it's that the observer is very complex and that the observer is going to impute all this intelligence to the thing that really isn't there. So, in the case of *The Snout*, for example, the one thing that it does that is actually sort of tricky is a the geometry that it does so that it always orients toward you. Then, it's just doing Perlin noise. That's it. But when you watch it, what happens is that you'll do do something abrupt, it reacts with a little more speed, it accelerates or decelerates the Perlin noise in response and people say, "Wow! It understands what I'm doing and it's reacting!" No, you just really feel like it's alive because you have big chunks of your brain that can't help but see it as alive.

You can't help but to put emotional weight on it pulling slightly back of coming slightly forward, we are really built to put that weight on everything because the things that matter the very most to us, parents, the tribe, reading intention in movement and faces, are so important that it's easier to just attach them everywhere rather than miss them in a vital instance. I think that's interesting because it brings us into the territory of the robotic body, the robot that we know is a robot, but that we ascribe humanity to simply because we can't help but do that.

I think we really have to talk as much about the human perceptual apparatus as we do about the aesthetics and machine form when we talk about the robotic body. The reason I say that is because if we're going to see a thing in the world move, big chunks of our reptilian brain are going to say, "That's alive." Or, the first thing they're going to say is: "That's alive," and then it's only when the higher order processes kick in and say, "Ew! That's in the uncanny valley, I don't like that," that then we say, "Ok, well, then what is it? Oh, it's a robot." So, getting out of the uncanny valley is a really important place to be. We understand what the uncanny valley is, it's been identified, we agree that it's there. So, then it's a matter of taste as to whether we want to be to the left or right side of it. I'm personally interested in being on the left side. I think that's where you have the realm of cute abstraction, it's where you have the realm of cartoons, it's where you have the realm of things that are alive but don't have to be understood as quadrupeds or bipeds or even as any kind of phylum we know of. It's where we can invent new species. Making *The Snout* allowed me to design a character animation system, a procedural one, that was freed from the limitations of having to imitate what a human being might do. On the right side of the uncanny valley so much other stuff comes into play about expectations about cultural modes of gestural communication, body language, appearance. You're not just dealing with

how things move but with the gendered body and the racialized body and the socialized body and the dressed body and with the culturized body that reacts to you with certain degrees of interpersonal space and other kinds of things.

JN: It's interesting though, that we still expect that a machine senses the same things that we sense though, that it conform to our sense of what it's supposed to 'see' in the world, no matter how unlike us it might be.

GL: I was just in London this weekend with the *Opto Isolator* (pictured above) which is a little eye robot that I made which has a very noisy face-detector that's kind of unreliable, and it suddenly looks off to the side when it imagines a face. When it does that, it's really disconcerting because people are like, "There's nobody there…?" They don't understand what it's looking at. So, I think that it's very important that to the extent that we perceive robots as sensate, we are also able to sense the things that they're sensing. In terms of our ability to understand what robots are sensing, it's very important that we have an agreed upon reality. That might just be from human conversation that we inherit that, right? You know, if I'm conversing with you, and you start looking around —

JN: you'll start looking around.

GL: … or I'll think you're crazy.

JN: Right, because I'm a system just like a machine and from a certain abstract, rather cold, point of view, steering a conversation and steering a ship are more or less the same thing.

To learn more about Golan Levin's work please visit flong.com.

09.29.10

Infographic of the Day: Admitulator Cracks the Code for College Admissions

From interaction designer (and geek demi-god) Golan Levin.

BY SUZANNE LABARRE

1 MINUTE READ

The old standby that killer test scores and a 4.7 GPA are a red carpet into any college in the world hardly abides nowadays. For better or for worse, colleges consider a swarm of additional factors: teacher recommendations, personal essays, extracurriculars, volunteer work, daddies in high places — you know the list.

To help faculty and administrators sift through the gobs of application information they face each year, legendary interaction designer Golan Levin developed an evaluation program called Admitulator for Carnegie Mellon University's art school. Admitulator lets users vet the applicant pool according to metrics they favor.

Say a professor wants well-rounded students; she might give more weight to recommendations and community service. That'll produce rankings of all the applications that can then be compared to those of an administrator who thinks grades and test scores are the best means of assessment. The incoming class can thus be balanced out, according to the overall student mix officials favor. Preferences are shown in the piechart below.

A companion program randomly assigns professors to applicants' portfolios, so that no two students are evaluated by the same group. That ensures fairness in the admissions process by eliminating "grouping effects" — what happens when a panel of preternaturally grumpy professors, say, hand out a cluster of low marks.

Obviously, Admitulator is deeply subjective — and the numeric rankings of such things like community service can't be perfect. So Levin warns that it shouldn't be used alone. "The highly-quantitative Admitulator is insufficient for use as the sole tool for making admissions decisions, but it is helpful," he writes on his website. "Ideally, it is used in tandem with database systems that can retrieve and display the applicants' qualitative data..."