"Media technology generally facilitates the suspension of disbelief; I'm trying to facilitate the resumption of disbelief."

Ken Goldberg[1]

Conceptual artist Ken Goldberg combines robotics with cultural criticism to create art for and about the Internet. Goldberg, Associate Professor of Industrial Engineering at UC Berkeley, works collaboratively with students and other colleagues to make net art that investigates age-old questions of epistemology: "How do we know what we know, and how do we know it is true?" His particular interest is in what he terms "telepistemology"--he investigates knowledge mediated through technology, a particular conundrum as more and more information is disseminated both "officially" and "unofficially" on the Internet. Over the last six years, Goldberg's work has explored the nature of authenticity. Through a series of Internet projects, he examines telepistemological questions regarding perception, knowledge, and agency: the ability to perform actions.[2]

Net art will be canonized in the year 2000. *Artforum*, a monthly art journal, has instituted a regular column entitled "Gadget Love" dedicated to covering the "hot.list" of technology. For the first time, the Whitney Biennial, a barometer of contemporary art trends, will feature "web-related and digital art," including Goldberg's MATRIX project.[3] John G. Hanhardt, former curator of film and video at the Whitney and currently senior curator for film and media arts at the Solomon R. Guggenheim Museum, is quoted in *The New York Times* as saying that Internet-based work has taken about half as long as video art to be included in a Whitney Biennial.[4] Hanhardt, one of a few people responsible for the canonization of video art, credits the Whitney's acceptance of the then new medium in the early to mid-1970s as laying the groundwork for rapid development and acceptance of Internet-based art. The lineage from video art to net art is widely embraced within the theoretical discourse. In our increasingly tech-savvy society, the acceptance of net art as art has been remarkably rapid. This development contrasts the early histories of video, film, and photography that were characterized by the conflict between their status as art and as technology.[5]

Synthesizing art and technology, Ken Goldberg's work encourages participation. Visitors to his projects can keep a garden alive, experiment with United States currency, or move a pointer. He also takes his work into actual space creating complex installations such as *Mori* (1999),

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[1] Ken Goldberg conversation with author, UC Berkeley Art Museum, Berkeley, California, December 3, 1999.

[2] See Goldberg, introduction to *The Robot in the Garden: Telerobotics and Telepistemology on the Internet* (Cambridge, MA: MIT Press, forthcoming). The book focuses on information that arises from live interaction with remote physical environments.

[3] "Looking Ahead: 2000 Biennial Exhibition," *Whitney Magazine*, Fall 1999-Winter 2000, p. 48.

[4] Matthew Mirapaul, "Whitney Plans to Include Internet Art in Biennial," *The New York Times on the Web*, November 25, 1999, Technology/Cybertimes.

[5] The debate regarding video was finally resolved by the mid-1980s. For a representative example of an early video text see David Antin, "Video: The Distinctive Features of the Medium," in *Video Art*, eds. Ira Schneider and Beryl Korot, (New York: Harcourt Brace Jovanovich, 1976).

much as Bill Viola and Gary Hill brought video out of the box and into the realm of installation.[6] Much of Goldberg's work reflects a skepticism about technology and contains a sharp sense of humor. He has said, "Engineers are implicitly critical of technology: we see its flaws and limits. In my artwork I try to expose these flaws with a whiff of irony."[7] Rather then asking his viewer/user to trust him and what he presents (to suspend disbelief), Goldberg encourages, perhaps even taunts them into a resumption of disbelief to counteract the overwhelmingly enthusiastic and uncritical embrace of technology. Comprehending the limits of technology and engineering, he propagates the underlying anxiety regarding science that has always plagued progress. Goldberg intends not to impede progress but rather to encourage skepticism because, as philosopher Michael Idinopulos writes in Goldberg's upcoming book, "Skepticism is often treated as a...'philosophical' issue with no real consequences for everyday life...this view is deeply and importantly mistaken."

All of Goldberg's projects involve "telerobotics"—mechanical operations that are activated by remote viewers through commands over the Internet. ***Ouija 2000*** (*www.bampfa.berkeley.edu/matrix/ouija*) is an on-line Ouija board with its planchette (the ace-shaped pointer that moves to indicate the answers) mounted on a robotic arm. A digital video camera broadcasts an image of the board over the Internet. Participants logging on to the Web site are given instructions for using the computer mouse as a planchette to interact with ***Ouija 2000***. The program randomly answers a selected slate of questions pertaining to each user's life in the next millennium, such as, "Will [user name] achieve great wealth in 2000?" ***Ouija 2000*** is available twenty-four hours a day, and viewers/users come together to "play" with up to twenty others at a time. The computer aggregates the motions players make with the mouse to move the planchette on the robotic arm. Thus, the answers to questions will appear as if by "magic" or "mystical intervention" as no single user can control what the answers will be. In contrast to most teleoperation systems where a single user controls a single robot, here, for the first time, multiple users come together to collaboratively control a single industrial robot arm. As such, ***Ouija 2000*** reflects the Central Limit Theorem, developed by DeMoivre and LaPlace in 1812 and appropriated by corporate America in the RAND Corporation's "Delphi Method." This statistical theorem describes how independent random variables can be combined to yield an estimate that becomes more accurate as the number of variables increases.

In this project, Goldberg couples epistemology with another esoteric pursuit: mysticism. ***Ouija 2000***, however, is intended as a critique of conventional notions of contemporary spirituality, technology, and the corporate application of science. Thus, in his introductory text for the project, Goldberg presents a pseudo history of the Ouija board, claiming that, "although their workings and origins remain shrouded in mystery, 'talking boards' are the world's oldest telecommunications devices."

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[6] Reena Jana, "Fault Vault," *Artforum*, October 1999, p. 35.

[7] Reena Jana, "Ken Goldberg: Keeping Technology Grounded," *Artbyte*, November-December 1999, pp. 34-37.

In the previously mentioned net art installation *Mori* (1999), the viewer/user enters a large, free-standing, constructed room past several active, "computing" computers.[8] A computer monitor flickering with the pulsating, rhythmic lines that are familiar from a hospital heart monitor is imbedded in the center of the floor. The lines correspond to seismometer readings from the Hayward fault in the Berkeley hills. In *Mori*, movements deep inside the core of the earth rise to the surface.[9] Goldberg collaborated with media artist Randall Packer to set these rumblings to sound. The sound of the moving earth increases the believability of the transmission.

Goldberg is perhaps most well known for his ongoing *Telegarden* project (1995). Currently located at the ARS Electronica Museum in Linz, Austria, the *Telegarden* is a community garden that includes a virtual village square. The digging, planting, and watering is controlled by user commands of an industrial robotic arm. A camera held in the hand of the robot proves that the viewer/user's commands are being executed. Or does it? The project poses questions regarding utopianism. Many enthusiasts have identified the telegarden as part of a "natural," logical continuum of technology. For example, telerobotic technology can be used for positive or good (pro-community, pro-nature) as opposed to negative or evil (military defense strategy, or mass production) purposes. Goldberg's perspective, if not opposing, is more critical. He designed the telegarden as a dystopia and asks why one would want or need to meditate interaction with the earth through a robotic arm. Ironically, as is potentially the case with any art work, there is often a wide divergence between that intention of the artist and the reaction of the viewer. Since 1995, 20,000 members, those willing to release their email addresses and as such their identities, have collaborated on the care and maintenance of this remote garden filled with living plants.[10] When I visited in December 1999, five visitors were discussing the fads that addict their kids, the same topic that could undoubtedly be overheard in any local garden. Who cares that this telegarden might not even exist? In fact, two members who met there married and conducted an on-line toast in the virtual village square.

Dislocation of Intimacy (1998) is a conceptual sculpture informed by Marcel Duchamp's *Ball of Twine (With Hidden Noise)* (1916) in which Duchamp wrapped an item in a ball of twine and gave the resulting object to a patron. Any attempt to know what the ball contained would require the destruction of the piece. Such is the case with Goldberg's large steel box. The box is filled with unidentified objects, six light sources, and a fan. In the gallery space, the viewer encounters a minimalist form from which an electrical cord snakes into a wall electrical socket and is given a white business card on which the URL is printed. In order to view the interior of the box, the viewer must log on from somewhere else because a computer station is not included in the installation. By activating six different switches in various combinations, thirty-two different perspectives can be achieved. Viewer choices are relayed to the gallery via the Internet and visitors there hear the effects of the choice made in some (or many) remote location(s). True or false? Is one seeing the effects of their efforts or has it all been pre-programmed and recorded? How many people actually have the chance to see the exterior of

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[8] Links to all of Goldberg's projects can be found on *www.kengoldberg.net*.

[9] This description is informed by one written by Steve Deitz, Director, New Media Initiatives, Walker Art Center, Minneapolis, Minnesota.

[10] Over 100,000 people have visited the site.

the piece to know that the physical presence does indeed exist? And if they do, that the noises they hear are live? The work is full of art historical references from Robert Morris' *Box with the Sound of Its Own Making* (1961), Tony Smith's *Die* (1962), and Charles Ray's *32x33x35=34x33x35* (1989) and *71/2-Ton Cube* (1990), to the photograms of Man Ray and Lazlo Moholy-Nagy, and the utilitarian-seeming but totally nonfunctional sculptural objects of Jessica Stockholder. Like much of Goldberg's work, *Dislocation of Intimacy* poses questions regarding notions of truth and relativity as well as the cause and effect of one's actions.

Such questions have potentially criminal ramifications in *Legal Tender* (1996) in which visitors are invited to deface (observe, puncture, heat, abrade, stain) two $100 bills, but only after registering their names, of course. *Legal Tender* was the first publicly accessible, on-line telerobotic laboratory. If participants choose incorrectly, disavowing the tangibility of the currency and the effects of their actions, the results could be severe. Perhaps. As critic Kenneth Baker wrote, "The main point [of *Legal Tender*] is to heighten the uncertainties built into interactivity on the Web...On what does anyone's credulity toward images and other information on the Internet rest?"[11] Such is a question that Goldberg continues to explore, along with all of us who gather information, purchase commodities, and view art on-line.

Goldberg continuously ponders the "aura" of the art object as defined by Walter Benjamin in his pivotal essay, "The Work of Art in the Age of Mechanical Reproduction." Decrying reproducibility as the death of authenticity, Benjamin argues for the maintenance of originality in works of art through their inherent uniqueness. Thus, one could argue that the question of aura is mute in net art where nothing is unique and everything is mediated. This seeming impossibility is what intrigues Goldberg. Through the attempt to capture the unknowable, the inherent core that disappears in translation, the original object becomes sacred. As technology continues to impact experience and communication, Goldberg's net art installations explore the remnants of authenticity, knowledge, and truth in our digital experience.

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[11] Kenneth Baker, "Lost in Cyber Space Translation There is Something Missing in On-line 'Art,'" *San Francisco Chronicle*, July 14, 1996, p. 28.