

## ART AT THE EVENT HORIZON

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(English translation – Sonia Dantziger).

### Abstract

This article compares real space, mental space, and virtual electronic space that connect them. The claim is that the three topological spaces are similar to a torus. Concentrations of mass in each of the three spaces create areas that bend distance and time, like the phenomenon of a black hole. Cyberspace is the electronic unifier of the three spaces, and enlarges the event horizon (the boundary of the black hole) of human consciousness. The topology falling within the boundaries of the event horizon is a non-Euclidean geometric distortion in the style of Riemann, and Einstein's general theory of relativity. A new examination of these phenomena using technical tools, leads to a different view of concepts, mainly post-modernistic, such as: simulacra, schizophrenia, hyper-reality, hyper-space, hyper-spectral sound and image, that today dominate the real world view, and the definition of cyberspace and human consciousness, and art. Cyberspace is the extension of the human brain that creates integrated consciousness.

Space is the distribution of mass in space. A large concentration of mass and energy in a certain location creates a distortion of space-time that bends the path of light rays surrounding the place. The power of gravity over a certain amount creates a black hole, an area in space-time from which nothing can escape, not even light. The event horizon is the edge of the black hole, the boundary of the area from which it is impossible to exit. In the centre of the hole is the singularity, the place in which the distortion is infinite. An object caught in the black hole in which time is slowed, loses its resting energy. In order to conserve its total energy, it converts its mass into kinetic energy and radiation. The object will lengthen greatly from the event horizon to the point of singularity. According to Roger Penrose, a black hole that rotates on its axis or has an electricity charge, allows entry and exit to and from its area without being trapped by its singularity (Calder 1979, 35). Roy Kerr found that a spacecraft launched along the length of the turning axis of a black hole could pass uneventfully to the Parallel space through the Einstein-Rosen bridge (Kaku 1994, 252)

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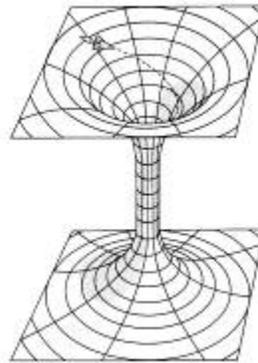


Figure 1. Einstein-Rosen bridge, from: Kaku 1994, 253.

The bridge compresses the time-space between the two space worlds, and prevents collapse into the singularity. In the inner boundary of the black hole, light is trapped in a closed circuit. The movement generates a reflection, like in a mirror room at an amusement park that distorts, and multiplies the observer's approach. Time on the edge of the event horizon is very slow, to the point where it stands still. Although we cannot distinguish a black hole in space, we can feel its power of attraction on objects in its vicinity, and changes in the paths and velocity (Kaku 1994, 255). The entropy (the number of internal states) of a black hole yields the information that what fell into the black hole is likely to be stored, like on a record, and will enable it to be replayed when the black hole disappears. From this, one may suppose that the information regarding all phenomena in the three-dimensional world can be stored at its two-dimensional boundary like a holographic picture, or like the images seen on the event horizon (Hawking 2001, 71).



Figure 2. Black Hole vision simulation. "Cloud Gate", Anish Kapoor, Millennium Park, Chicago.

A black hole with a mass similar to the Earth's mass will be 18 mms in size; on its event horizon two-dimensional objects inside it will be observed. Unlike in Euclidean geometry that

characterizes linear space, outside the black holes, where diffusion of mass is small, the geometry of the black holes is of bent spaces and planes joined by worm holes conforming to Georg Riemann's geometry, and Einstein's general theory of relativity (Seief, 2000, 160).

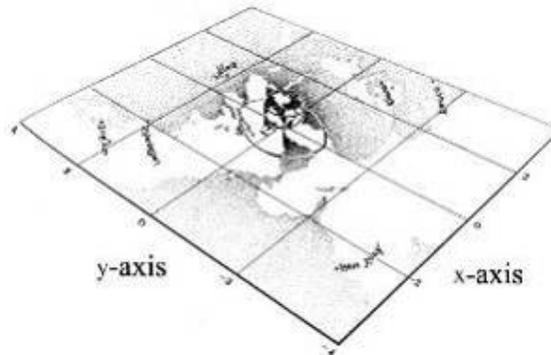


Figure 3. Stereo-graphic view of the Globe. From: Seife 2000, 158.

Cyberspace is electronic space, composed of computer networks like Internet; in them information moves at the speed of light. At that speed less than 0.1 seconds are needed for an electronic signal to join the two most distant points on Earth. The energy mass and energy of cyberspace compressed the Earth to a "black hole" having an event horizon of approximately 2 cm (Calder 1979, 60), located at a near-zero distance of 0.1 seconds from us the users connected to it.



Figure 4. Explosion of human body, implosion of the Globe.

The network is built of connections between terminal points that create junctions, which are joined to bigger junctions, which in turn join at the central hub, that behave according to the Bose-Einstein condensation law (Barabasi 2002, 140), that is to say, central junctions achieve the greatest number of connections to most of the pages in the network, like Google, Yahoo and Microsoft. The cyberspace formation resembles that of black holes into whose singularities all information is hurled to the event horizon, that are various assigned tools such as computer

terminals, cameras, television, microphones, telephones and other sensors, that convert the real world into digital information. The silicon chip generates teleporting of real linear slow time-space, into electronic information that travels at the speed of light in the bent space of cyberspace.

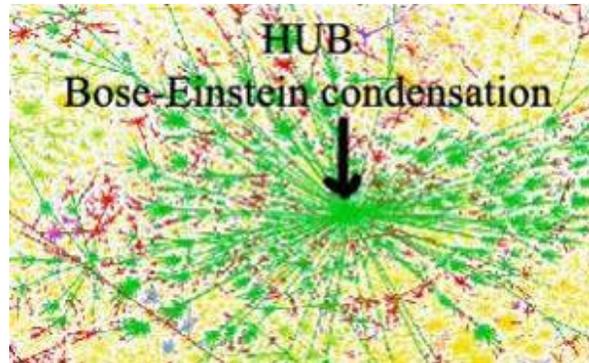


Figure 5. Internet Hub as a black hole. From: Internet Mapping Project, <http://research.lumeta.com/ches/map/gallery/index.html>

The connection creates Augmented reality that can also be defined as ingesting real time-space by the virtual, adding high dimensions to the real ones (Hellemans 2004, 9-10). The continuing growth of the virtual energy and mass in relation to the realities increasing the affect of the black hole, by the proportion:

Material-energy → time-space distortion

The energy of stored data in cyberspace influences processes in the real world, for example: industrial production, security, air dominance, banking, medicine, and digital information. The power of gravity in cyberspace accelerates the speed of objects in motion in the real world, and sweeps them spirally over its singularity, like in the Stock Exchange crash in 1987. The human brain is a mass containing millions of neuron synapses. The neurons cluster into groups that carry out specialized actions. Every area and route to the brain is responsible for a certain function, such as sight, speech, smell, and so on. (Shlain 1991, 392). Thought and motion stem from the data flowing to the brain and stored in cognitive modular mapping.

It is possible to compare areas of the brain to micro-black holes, or centres in cyberspace where Bose-Einstein processes take place. The wrapping of the body, that includes the senses, serves as an event horizon, and the singularity as the soul or consciousness. The topology of the consciousness resembles a torus, allowing movement from place to place in the consciousness by a circular motion, and also to make jumps in space-time like in cyberspace, and a black hole in space.

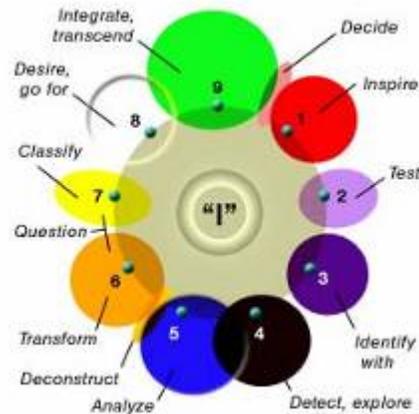


Figure 6, The Human cognition as a black hole, from: <http://intraspec.ca/cogmap.php>

The associative cortex role is to establish new nets, and omni connection of neurons in the brain. This act is similar to the Internet build-up. “The brain has no knowledge in it, until the neuron interconnection is built. Our identity is based on how our neurons are interconnected” (Restak, 2001h 26). New technologies like the [neural microcircuit](#) which links live brain neuron cells with electronic interface, enable direct connection of our body with computer networks. This act extends each human associative cortex to a new gigantic capacity, of the human brain and its Internet extension, or the super neo-cortex, which in turn is linked to all the other network participants creating a united super brain with integrated consciousness. This act is equal to a build-up of a black hole containing a Giga array of super-computers at its singularity, processing a task incoming from its event horizon. On the other end we have the increasing amount of hardware, linked to the Internet, and contribute to its black hole mass.

Within about 200 years the human body is accelerated from the speed of walking to the speed of light (Harvey, 1989, 241), at which it is carried on electro-magnetic waves and, enters cyberspace towards the singularity. Man is in an advanced stage of evolution, in the symbiotic process that unites his body with electronic and biological components. The data-suit, VR Headset, containing electronic implants that penetrate the body, enables direct “teleportive” contact between neuron networks within our bodies, and those in cyberspace (and the real world). The human brain, composed of three layers, (Reptilian Complex, Limbic System and Neocortex) has acquired another layer, the super-neocortex that augments the imagination and wisdom, and accelerates man’s judgement and sense of time and space. In other words, our central nervous system is connected, through computer networks to events occurring on Earth (McLuhan 1964, 9-10), and reacts to them as though they were occurring in the physical body. The world happening becomes integral to our own bodies.

Evolution connected the human event horizon to that of cyberspace, and to real space. We are in the accelerated process of virtualization of real objects that acquire virtual components in cyberspace. Cyberspace connected to the human body swallows real distance and shrinks to the minimum. The triangular joining of the three spaces, whose torus shape creates a large mass, bends space into a closed loop, orbitfold-shaped (Greene 1999, 219). The meeting point is the place of the new SELF, or the symmetry unity point of the three torus spaces (Kaku 2004, 58).

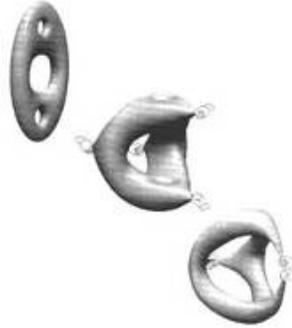


Figure 7. Orbifolding of 3 Torus shapes. From: Greene 1999, 219.

What are the differences between the topology of the bent space at high speeds, and the linear that dominated human consciousness until now? To find the differences we can examine the Albrecht Dürer (1525) print portraying the artist drawing a model in perspective, with the aid of various optical accessories, such as a frame, grid, and eyepiece. The resulting linear perspective, whose source is a single point, a singularity at an infinite distance behind the model, is contained in the frame between the artist and the model. The image in the frame continues and enters a second singularity point, through the eyes of the artist, to his brain and to his consciousness. After absorbing the image and its execution by the eye and hand of the artist, the data become a static linear perspective painting on a page, which is the event horizon of the body. The painting is a hologram that is the 2-dimensional view on the event horizon of the 3-dimensional object.

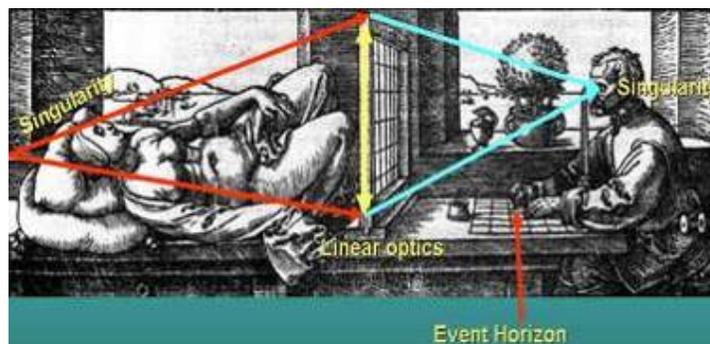


Figure 8. Perspective linear optics.

Albrecht Dürer (1471-1528) *Draftsman Making a Perspective Drawing of a Woman*, 1525. Etching. The Metropolitan Museum of Art, New York.

Now we will substitute a spherical (Einstein lens) for the optical linear installation in the manner of Riemann; it is the cyberspace, and the pencil is the Data glove. At low speed we will not feel the distortion, because the picture will be reflected through the equator of the lens. At higher speed and mass (Kaku 2004, 10) we will approach the pole of the three singularities of the orbifold. At that point, the data received through the artist's senses will be processed by his consciousness, and be translated into the data glove, that will be the observed object itself. An artist who paints with the data glove unites with the object. Artist's act of observation determines the subject's finale state (Kaku 2004, 135). The diffusion of mass and energy in the universe prevents collapse of matter, or a short circuit of thought, action and result. The transition to seeing and acting at the speed of light, demands delay interface, to slow the speed of happening to that which our regular senses can cope with. Art that exists in cyberspace is the interface by means of which we cope with visualization of the time-space distortion in cyberspace that converts distorted time-space near the singularity into the shapes of traditional, linear perception that we are used to outside of cyberspace.

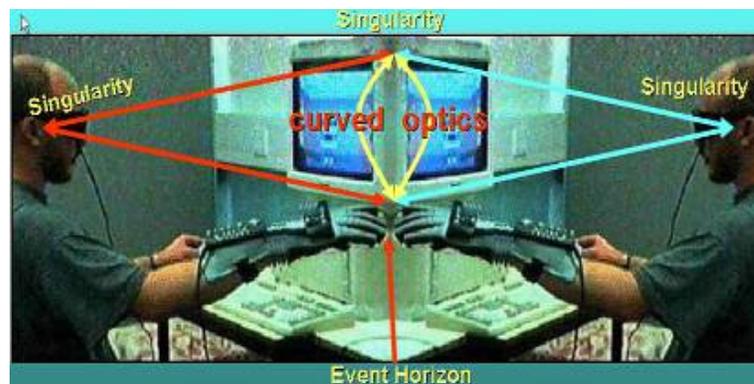


Figure 9. Curved optics (Einstein lens) at Cyberspace.

Understanding the special topology allows a different approach to phenomena, from the field of digital media, and cyberspace that is usually interpreted in post-modern concepts, with a pessimistic approach. We will examine a number of concepts, which Baudrillard, Virilio and Jameson use: "simulacra". For (Baudrillard 1983, 4.) it is a sign in which the relations of representation between the signifier and the signified, and between images and reality disappear; the signifier functions independently with it self in a closed circle. It is no longer a question of imitation, nor of reduplication, nor even of parody. It is rather a question of substituting signs of the real for the real itself.

(Jameson 2002, 51) uses the term simulacrum in the context of photorealism, a painting from a photograph, images on a television screen by Nam Jun Paik, and the polyester images of Hanson Duane and the radical decline of nature. (Virilio 2002, 81.) relates to all physical dimensions as to simulacra or as an echo of the Big Bang. What was defined up to now, as simulacrum is only an added higher dimension to a physical object. Electromagnetic waves

transmitted from the real object move at the speed of light and enter beyond the event horizon of cyberspace. The movement of the waves and their interference inside the closed torus generate the multiplication and distortion of the image.

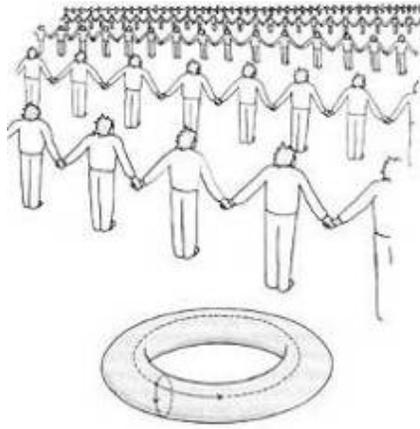


Figure 10. Images in Super Torus, from: Kaku, 1994, p. 120



Figure 11. Multi screen Image (Simulacrum) from Sky News.

The waves scatter and are ejected from the Cyberspace event horizon creating feedback to the object, and changing its characteristics, and so endlessly oscillate. Television screens in general and those of Paik in particular, are only 2-dimensional holograms of 3-dimensional bodies on the event horizon of Cyberspace. The replication cannot exist without the original object, and no feedback that returns to it. Thus, the simulacrum is an additional dimension, exactly like volume, shadow, and weight of a physical object. The entropy of cyberspace is the sum of the data that falls into it. Therefore, that is a reflection of the objects connected to it, and not those that are unconnected to it. "Hyper-reality or hyperspace described by (Baudrillard, 1992) as a reality that has lost its appearance, locality and significance; according to (Virilio 1997, 75) it is a

loss of reality and (Jameson 2002, 63): the space of motion that is not understood. These interpretations of reality are not valid. It is the same reality, but it is reflected inside the topographic torus and observed at high speed.

The new reality created the feeling of schizophrenia, personality dichotomy, and a state that describes a person functioning in cyberspace. Jameson: the person cannot locate himself clearly in space (Bonaventura Hotel), and experiences crises in his grasp of time sequence, and the stream of past, present, and future. Virilio describes NASA scientists who use Data suits, in order to activate a distant robot on Mars, an action that places him simultaneously in two far places and creates schizophrenia (Virilio 1997, 16). Thus, also (Baudrillard 1987, 126-134); the cyberspace network creates schizophrenia. For (Jameson 2002, 45) it is the illusion of meaning. (Virilio 2002, 86) relates to the phenomenon as "super-natural," and even religious, in which the data suit and information suit transforms the person into a spectre, found in a number of places at the same time. Virilio seeks a philosophical discussion on the comparison on the presence versus Tele- presence, and the presence versus Teleportation.

Splitting or distortion is the characteristics of a body falling beyond the event horizon of a black hole. The body lengthens greatly to form a one-dimensional string, and continues outside the event horizon over the infinity of the singularity, and seemingly time slows down and the distance shortens. That is exactly the feeling in the hand wearing a data glove activating a robot on Mars from afar. And also therefore the explanation of Virilio's words describing a person who when equipped with a data-suit, appears to be paralysed in a wheelchair. We are not talking here about schizophrenia, paralysis, or spectres and the supernatural. It is the same linear reality as before, experienced now in extreme conditions of high velocity and mass, travelling through a warm hole.

The end of music and the image - Hi-Fi music is not the end of music, as Baudrillard contends, just as a hyper-spectral image is not the end of the image! They are augmented reality with additional dimensions of sound and image beyond those were accustomed to experience at lower speeds (Baudrillard 1997, 25, Baudrillard 2000). In order to experience the whole spectrum and the new qualities, we need technology. Digital augmented sound and a picture do not conceal the object with hyper-real synthetic perfection, but open up a wider variety of possibilities and fidelity, over and above what we are used to hearing and seeing till now. The development of the Super-Neocortex enables absorbing, processing, aesthetic judgement in the widened field of our senses. Super-resolution, hyper-spectral images, digital watermarking, compression and decompression of information are technologies that make this complex mission possible.

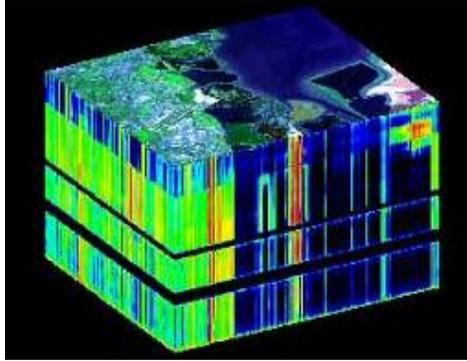


Figure 12. Hyper-spectral image. From: <http://www.csr.utexas.edu>

We are Cyborgs, implanted with electronic components, wearing Data Suit, generating teleportation of its body to parallel existences, through black holes, and returning safely. Technology is the problem and the remedy for the new reality. In this subjective situation, one does not observe reality more directly, but by means of the super-neocortex, which it developed. The actuality of observing space with electronic aid changes its characteristics by changing the location of the observed particles by the subject, by electronic means (Scanning Electron Microscope). Seeing is changes reality, and the characteristics of matter. One can say that the creative thought of the artist, at the meeting of the three singularities: of the human cognition, the real world, and cyberspace, that changes and reflects the reality, and creates an inter-subjective integrated consciousness (Lévy 1997, 214-220). Einstein asked himself how the world would look while riding on a beam of light; perhaps this is the answer.

What are the implications of those insights in Cyberspace art? New media art which utilizes digital equipment like computers is subject to physical laws. The electronic chip accelerates the artistic object, from its low speed and low mass realm outside the cyberspace event horizon, to an immediate bent, high speed and high mass cyberspace black hole medium. This transformation is typical of all technologies exploiting electromagnetic waves. The huge spread of digital cameras and cell phones with imbedded digital cameras on top of the PC computers produces an audio-visual data tsunami – hundreds of billions of digital images and cell-calls per year, spins at the global electronic nets. This is a socio-environmental omnipresent artistic act, which unites its global participants. In Israel on average, there is more than one cellular phone per capita, and the numbers are growing. There are many new media artists creating a wide range of art world wide on the internet. For this essay, I will analyze some of my new media works in the last 20 years. The beginning of such an art form in Israel was very modest. In 1984, some computer [images](#) that I created on IBM PC XT using Basic software was transmitted from Jerusalem to Haifa via a fax machine. The program was to send it across the world to Australia, New York and back to Jerusalem. Lack of financing left the plan with its initial Jerusalem – Haifa leg. Five years later, in my computer based installation [“Arcadia”](#) (1990) Haifa

Museum of modern art, a wide range of [images](#), videos and sounds, from several data bases were compressed into superimposed loops running on three 'Amiga' computers. The museum was the kernel of the black hole and its singularity would develop later on. The art consumer at the museum turned into a convergence point of the data base media art. From now on, "there was free art data flow, abolishment of the 'originality' concept in art, and transformation of the art consumer into an art creator; the next phase is direct connection to the art consumer brain". (Rosen, 1990). The development of the concept was achieved with Art-Net project (1992), an art data base, utilizing Novell net of hundreds of computers, at the Technion Electrical Engineering Faculty, Haifa, Israel. The art became available like other on-line features used on a daily basis at the faculty. The artistic project reduced to minimum the distance of centre to periphery and that of the artist to the art consumer, and made free and instant art consumption possible. In fact, some of the students downloaded images, and printed them on their shirts. Art-Net functioned as a black hole, attracting artistic objects outside its effect horizon consisting of computer terminals, to its singularity, the server. The trapped data circle within the net boundaries, and diffuse out by means of terminals, printers, fax machines, modems and telephone lines. The increase in the Art-Net perimeter was made the same year, when at the opening of "[Frames](#)", computer art exhibition, at Yavne Art Workshop, some 120 kilometres south of Haifa, a computer link was established to the Technion. This act reduced the centre periphery distance to zero time, or to a mouse click. The visitors at the gallery downloaded images from the Technion server and performed manipulations on it (Rosen, 1993). The rise in the number of connected computers to the net increases the mass, size and attraction force of the black hole and its impact on the real world.

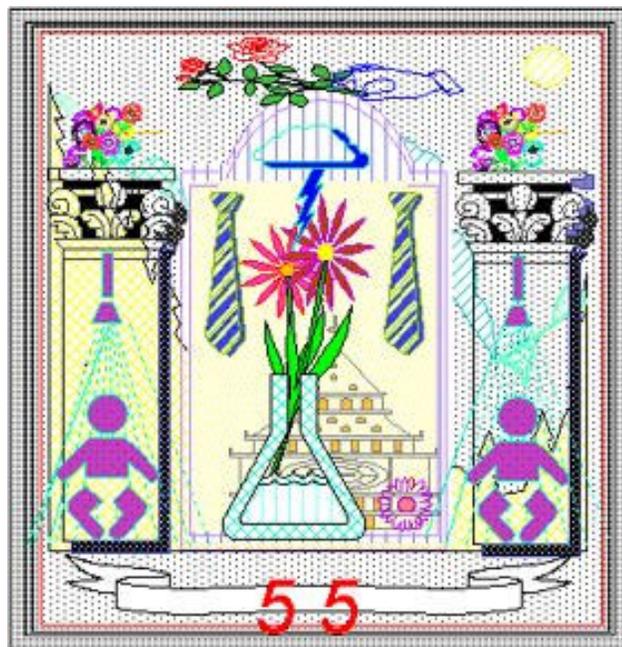


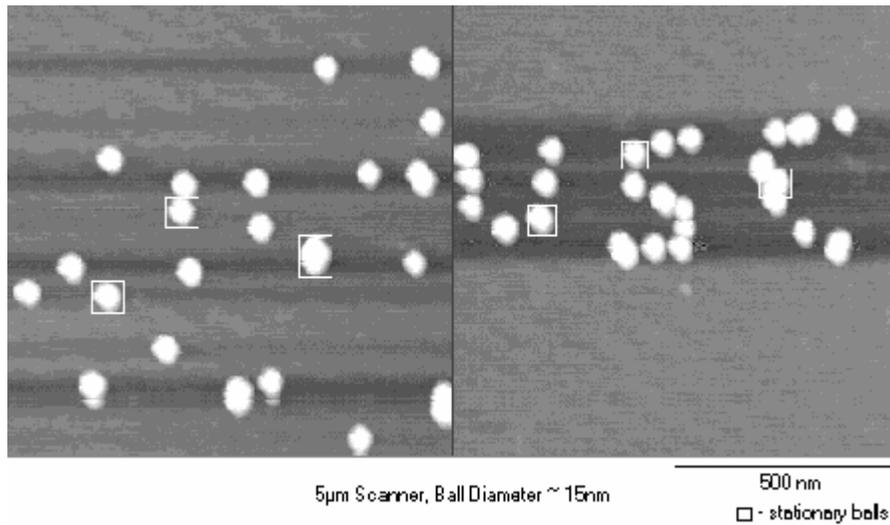
Figure 13. One of the Technion data base images downloaded at FRAMES (1992) exhibition.

In November 1993, the extent and range of ART NET activities was significantly increased, in the framework of the conference [FISEA 93](#) that took place in Minneapolis, U.S.A. A link was created with a server at the Technion, through the Internet and Gopher protocol; it downloaded art works from Israel and presented them in the U.S in real time. At the beginning of 1994, the first site of an Israeli artist on the Internet on the [net.art](#) site in the U.S widened the art net, using the graphic browser MOZAIC. Using the Internet compressed the size of the Earth to minimum, and lengthened the reach of the artist's hand and the art consumer that have now reached nearly every spot on Earth in zero time. Linking Minneapolis and Haifa, or any other place on the globe, uniting various users at the same spot, data base, viewing works of art simultaneously, as though they were in the same place at the same time, or in other words as though they simultaneously touched works of art that became the singularity point and joined a common orbifold. While surfing, did all the surfers look at the simulacra? Felt schizophrenic? Or experienced hyper-reality accompanied by physical paralysis? The answer is of course negative. The artistic object dispersed by the speed of light reaches places and distant viewers at the same time. Multiplication of artwork images on computer screens all over the world reflects electromagnetic waves that are trapped, and move in closed loops within the topology of the "torus" and are eventually emitted beyond the event horizon of cyberspace. The computer and the screen provide the escape velocity required to be released from this spin.

In order to understand this, the observer of the art must perform a mental "correction" or "jump" whose basis is the understanding that his body is not split and is not found in the U.S. and Israel, but underwent a transformation as a result of movement at the speed of light that "stretched" his body on the one hand, and reduced the physical distance on the other. Such a correction is a daily occurrence for us, when we talk on the cellular phone, look through the security camera outside the building or anywhere else in the world, or activate a machine by remote control. Those actions really connect two distant places through a worm hole. Use of electronic equipment that conveys us through a black hole slows time and stretches it. Sitting motionless, bending forward and concentrating on what is on the computer screen, our body seems paralyzed. The computer connected to the net functions as an Einstein lens, having immense mass that bends and focuses the electronic waves that is knowledge stored in cyberspace. We relate to the phenomenon as perfectly natural, but to people of other cultures, or to those who have not been exposed to new technology, it is not natural at all and sometimes seems miraculous.

The additional interactive ability with works of art on the net allows changing reality by a look, thought, or a click of the mouse. As an example my creation [FREE ART](#) (1999) enables the surfer to intervene and to change the component parts of a picture at will, an action like changing the location of atoms of a substance during observation by means of a Scanning Probe Microscope,

or Nano Manipulation of matter, in which electronic rays activated by the observer change the location of atoms in a substance.



. The random pattern of 15nm Au balls shown on the left was converted into the "USC" pattern on the right by a 4Figure 1  
<http://lipari.usc.edu/~lmr/publications/NanoIV> sequence of pushing commands. (Scanning Probe Microscope) from:



Figure 15. [FREE ART](http://www.technion.ac.il/~ravi) interactive, random net art, Avi Rosen, (1999)

<http://www.technion.ac.il/~ravi>

For this creation there is also a random component that arbitrarily changes visual components that are depicted, and the sound that is heard when a surfer enters. Like the experiment with Schrödinger's imaginary cat imprisoned in a sealed box for an allotted time, alone with volatile uranium that has a 50 – 50 chance of undergoing radioactive disintegration,

and a Geiger counter that identifies the disintegration and releases the fatal poison. In order to settle the question of whether the cat is alive or dead, we have to open the box and actually look at the cat. So too the observer of a work of art cannot know definitely the condition of the work he will look at before he sees it.

The installation "[Parallel Space](#)" (1999) by the artist creates a merging of three spaces: mental, the real, and the virtual, for singularities of time and place. Several computers connected to the net are operated by a surfer who works simultaneously at various sites. The artist who sits in a real room in front of the computers surfs and acts at the same time on various random sites – sites with video cameras installed on them, with virtual three-dimensional interactive surroundings, a spiritual healing site, and more sites according to his choice. His activities are fed by, and feed the unifying space.

A similar unification is found in the creation "[Teleporting an Unknown State](#)" by Eduardo Kac (1996), in which he grew a plant in a dark room by illuminating it by light from cameras on the internet directed at diverse sources of light all over the world.

In this case, the Internet became a life-giving organ of the plant and an extension of the plant, uniting it with human bodies taking part in the project all over the world. "[Body/Aura extension](#)" (Avi Rosen, 2000) project, utilized the Bluetooth wireless technology standard, for artistic purposes. Artist's presence causes automatic synchronization of his desktop, mobile computer, notebook (PC-PDA and PC-HPC) and his mobile phone with other users. For instance, as soon as he enters a new space the artistic content (text, audiovisual art data) in his notebook computer will automatically be updated to art consumer's desktop, or vice versa. The system extends artist's aura and amplifies his artistic capabilities. His presence induces content to the immediate space, and then to the wider space via the Internet or cellular systems. His passages through time and space leave trails of transmissions. Those trails can be considered as a continuous interactive multidisciplinary artistic act.

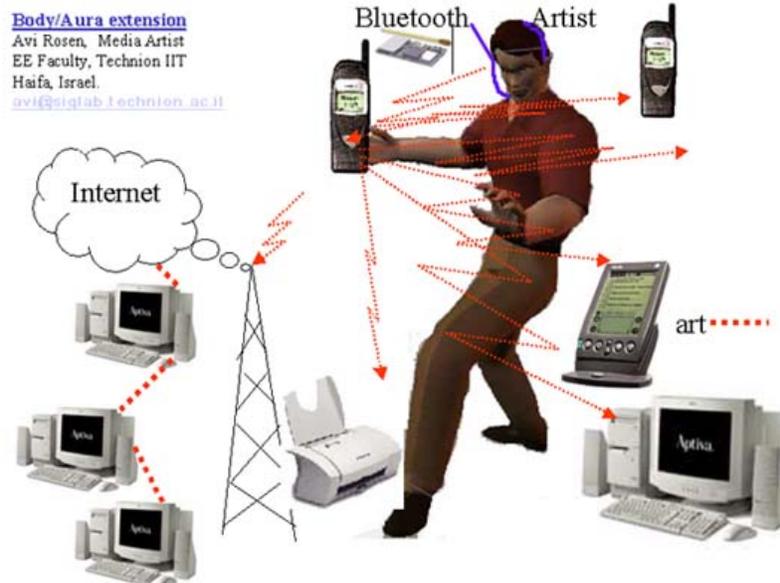


Figure 16. Scheme of "Body/Aura extension" project (Avi Rosen, 2000).

Quantum theory determines that it is always impossible to really know the state of a particle before observed measurement is made. This principle stands at the basis of the series of "BIG OPTICS" works (Avi Rosen 2003-2004) that simultaneously and randomly concentrate on the computer screen of video clips, sound and text, from number of data basis. The product is a changing audio-visual composition that describes compression of time and space (black hole). Surfers watch, and at the same time change the reality and the observed material by means of their computers, their observation, and their mouse. That action is an expression of an idea that the observer's awareness is exposed to stimuli of his various senses and the result causes his actions, is the joining point of three singularities in the orbifold. What is seen on the screen, are the images trapped inside the black hole of cyberspace and emitted randomly to the event horizon, following the observer's intervention. This constitutes joining or implanting electronic components in the human body, as in the works of Eduardo Kac (Time Capsule), Steve Mann, and Stelark, in which the technology has been inserted inside the body, thus creating expansion of the neo-cortex and direct connection of the physical body to cyberspace and to the real world.

[Power-Point presentation of the essay.](#)

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Restak, Richard. 2001. *Mozart's Brain and the Fighter Pilot*. Hebrew translation. Tamari Anita. Tel Aviv. Arie Nir Publishers.

Rosen, Avi. 1990. *Robotikim lo kotzeztim oznaim*. Interview with Alon Maoz (in Hebrew) Kol-Bo Newspaper, 2.12.90. p.64

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Seife, Charles. 2000. *Zero the Biography of a Dangerous Idea*. Hebrew translation: Lerner Arie. Ra'anana, Mi-An Press.

Shlain, Leonard. (1991). *Art & Physics Parallel Visions in Space, Time & Light*. New York Morrow.

Virilio, Paul. 1997. *Open sky*. Trans. Rose, J. London: Verso.

Virilio, Paul and Lortinger, Sylvere. 2002. *Crepuscular Dawn*. Trans. Taormina. New York: Semiotext(e).

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**AVI ROSEN: CURRICULUM VITAE**

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2001 - PhD candidate, Faculty of the Arts, the Art History Department, Tel Aviv University.

1999 - M.Sc. Industrial Design, Technion I.I.T. Thesis subject: ['Art Internet Interaction'](#).

1984 - B.F.A. "Bezalel" Art Academy, Jerusalem.

1976 - Practical Engineer in Electronics at the "Junior Technical Collage", Haifa.

1987- Working at the [Signal Processing Lab](#). Department of Electrical Engineering Haifa Technion I.I.T.

1997- Lecturer of "New Media Art" at Art Department of Haifa University, Art Institute of 'Oranim' the 'Kibutzim' seminary, Tivon.

**SELECTED EXHIBITIONS AND WORKS**

- 2005 - 'The Return of the Author'- [Rhizome.org](#)
- 2006 - DAF -Digital Art Forum, Tel-Aviv University, ['Art at the Event Horizon'](#) presentation (Jan. 30th).
- 2005 - 'Cimulacra', review in ['Ma Nishma be-Oranim'](#), 'Oranim', the Kibutzim Seminar bulletin, No.126, Dec. 2005. p.13.
- 2005 'The Return of the Author', [essay on the super-reader-author in cyberspace](#). (English). "Shuvo shel hamehaber" .(Hebrew html file.) links at "Ma'arav" [News](#). no-org.net [Calendar](#).
- 2005 - 'Mobail Gallery' Art on Bicycle. Tel-Aviv, Nov. 3ed. Curator, Karin Mendelevitz.
  
- 2005 - Cimulacra, will be presented at [Opening Gates in Teacher Education: 2006 Meeting the Challenges in Education and Teaching](#) . Second International Virtual Conference, Mofet Institute.
- 2005 - First one to acquire MTAA's 1YPV Art Data. [1 year performance video](#) . MTAA-RR site [blog](#).
- 2005 - BIG\_OPTICS in the frame of the project 'Netopticon' was part of the 'Observatori 05 Festival of Artistic Investigation at Valencia in 4,5,6 November. [Observatori 05 Festival](#).
- 2005 - [Capturing Utopia'](#)- The work 'ABC' was presented by projectors in the venue of Fornos, Athens, Greece from the 19th till the 25th September 2005.
- 2005 - prog:ME [Rio de Janeiro, Brasil](#). BIG\_OPTICS # 1,2 &3 presentation.

- 2005 - ART-NODE [Art at the Event Horizon](#).
- 2005 - Turbulence- networked\_performance\_blog [Real>>Mental>>Virtual](#).
- 2005 -T'es in T'es bat - France. [net.art](#) link to BOG\_OPTICS.
- 2005 - Isola della Poesia / Isola Virtuale - 51ma Biennale di Venezia 2005. [Poem -'I'](#). All the Poems of the Virtual Island, page no. 13.
- 2005 - NETOPTICON, NO-ORG.NET [Project](#).
- 2005 - Cimulacra [Interactive time & space compression](#).UK- Wales- Israel- Home.
- 2005 - webbiennial 2005, [Istanbul Contemporary Art Museum](#) Turkey.
- 2005 - Consciousness, Theatre, Literature and the Arts [International Conference](#) Aberystwyth, Wales, UK. Art at the Event Horizon [papaer](#). Hebrew [paper](#) Power Point [presentation](#).
- 2005 - Ben-Tovim Grant, Office of the Dean of Students, Tel Aviv University.
- 2005 - International Digital Art Awards exhibition [selected](#).
- 2004 - 6 Computer Art Biennale, Rzeszow (Poland) ['ABC'](#). laser print (74X90 cm.) [Wanda Siemaszkowa Theatre](#).
- 2004 -National Museum of Montenegro in Cetinje [international artists WebArt new media show](#)
- 2004 - WEBART- [Present Simple Tense](#) Yugoslavia.
- 2004 - KALAS (Keren Lekidum Segel) Grant.Oranim Academic College.
- 2004 - International Festival of Electronic Art 404 [Rosario, Argentina](#)
- 2004 - National Museum of Contemporary Art Bucatesti/Romania [BIG OPTICS](#) Part of [R][R][F] 2004---->XP.
- 2004 - New Media Art Festival Bangkok/Thailand [BIG OPTICS](#) Part of [R][R][F] 2004---->XP.
- 2004 - International Digital Art Awards exhibition [IDAA NEW MEDIA FINALIST](#)
- 2004 - REMAKES OF TRAVELLING [a-site.org](#).
- 2004 - MACHINISTA 2004 [Art from the Machine](#).
- 2004 - Videoformes 2004 [XIXeme MANIFESTATION INTERNATIONALE D'ART VIDEO ET MULTIMEDIA](#). Clermont-Ferrand,France.
- 2003 - Cinematheque at MediaCentre [Le Musee di-visioniste](#).
- 2003 - Group Exhibition. [CENTRO DE ARTE MODERNO](#) Madrid, Spain.
- 2003 - Group Exhibition. VCA gallery University of Melbourne, Australia.
- 2003 - [THIRD PLACE GALLERY](#) Sweden.
- 2003 - [MAD'03](#) 2nd international meeting of experimental arts in Madrid, Spain.
- 2003 - [maem 2003](#). Il muestra de arte electronico villa de mostoles, Mostoles, Madrid. Spain.
- 2003 - [Les 16es Instants Video de Manosque,France](#). [BIG\\_OPTICS](#), selection for the festival.
- 2003 - [Electronic Arts festival of Bogota](#) Colombia. [BIG\\_OPTICS](#), selection for the festival.
- 2003 - [The FIFI 2003 selections \(France\)](#) New Talents.
- 2003 - [\[diatopia\]](#) Stenmitsa, Arcadia, and art space GazonRouge, Athens and internet.
- 2003 - [Stockholm Challenge](#) [BIG\\_OPTICS](#) project participant.
- 2003 - [Art Sublime](#) Exhibition.
- 2003 - [FILE- electronic language international festival. Brasil](#). Selected artists.
- 2003 - [MAKOM - the omniplace](#). Interactive video online
- 2003 - [mt0003 - international forum medienturm](#) Graz, Austria.
- 2003 - ['3 Generations Lullaby'](#). machfeld.net, Viena Austria.
- 2003 - [AmsterdamEditions\\*- artists run website](#).
- 2003 - [BIG\\_OPTICS](#). Interactive videoart on line - (homage to Paul Virilio).
- 2003 - CODEART 2003 [The Interdisciplinary Center Herzliya, Israel](#).
- 2003 - Gallerythe <http://gallerythe.org/artist/rosen/rosen.html>
- 2003 - international digital art awards (IDAA) [Self Portrait 1,2&3](#) . Top 100 images.
- 2002 - Experimental Poetry Performance and International Techno- Poetry SectionRome University III -DAMS, ITALY. [New Media Poetry](#).
- 2002 - Curator of 'Siesta Games' - Ana Camusso & David Wapner [Janco-Dada Museum, Ein - Hod, Israel](#).
- 2002 - 'V Computer Art Biennale' Rzeszow Poland.
- 2002 - Body\_Slide [interactive work](#).
- 2002 - EXPLORA, Digital Art Project 2002. Rachel and Israel Polak Gallery, Tel-Aviv [Illustration of works](#) . Lecture "Timr and Space compression in Cyberspace art".
- 2002 - international digital art awards (IDAA) [PRESS#1, PRESS2](#) . Top 100 images.

- 2002 - "who needs property?" [Hebrew .doc text](#)
- 2002 - art-platform Gallery [art-platform.com](#)
- 2001 - Pixxelpoint, Nova Gorica, Slovenia. [Video: "Self portrait2"](#) .
- 2001 - microMuseum.Body / Aura extension, Parallel space [Video: Untitled #1](#)
- 2001 - 'Untitled#1' Video Art 4' 24". 14 es INSTANTS VIDEO MANOSQE. FRANCE. [Video: Untitled #1](#)
- 2001 - CYBER ARTS INTERNATIONAL COMPEDIUM PRIX ARS ELECTRONICA 01, Lintz Aostria. [Net & interactive section participation](#) .
- 2001 - '[Meimad Mishtane](#)'- [Art & Technology](#). Kastra Gallery Haifa.
- 2000 - [Net Art Guide book](#). Fraunhofer Electronic Business Innovationszentrum.
- 2000 - [art-omma](#) Dec. 00 -Jan. 01 issue
- 2000 - [Wigged.net](#) bi-monthly webzine that is focused on bringing innovative short videos, animations and interactive works over the internet.
- 2000 - [Pixxelpoint computer art festival](#)- Nova Gorica, Slovenia
- 2000 - [Body/Aura extension](#), Amplifies artistic capabilities and range. [more details](#).
- 2000 - [WWAR.COM](#) World Wide Arts Resources.
- 2000 - [Consciousness Reframed 2000 Conference](#) Centre for Advanecd Inquiry in the Interactive Arts (CAiiA), University of Wales College, Newport. '[Parallel Space](#)' paper, and presentation.
- 2000 - [FILE](#) - Electronic Language International Festival Museu da Imagem e do Som, Sao Paulo city, Brazil .
- 2000 - [Poevisioni 2000](#) - VIDEOpoesia e video digitali .
- 2000 - [ZINE new media](#) - a journal of new media experimental visual literary theory practice.
- 2000 - 'When we were kids' Exhibition of the Haifa University Art department teachers.
- 2000 - [INFOS 2000 \(off-line\) "net.art" contest](#) site open until the 15th of July. [INFOS 2000 INFOS 2000 text](#).
- 2000 - [The Ninth International World Wide Web Conference \(WWW9\)](#) Amsterdam. 'Parallel Space' paper, accepted within the "Advanced User Interface" session. [MEDICI Organization](#) Site.
- 2000 - [Netzkunstler](#) netzwissenschaft.de
- 2000 - 'IV Computer Art Biennale' Rzeszow Poland.
- 1999 - [VII International Biennale of Theatre Posters](#), Rzeszow Poland. [The poster](#).
- 1999 - "Just What is That Makes Today's Homes So Different, So Appealing?" [Hebrew .doc text](#)
- 1999 - 1st\_Medi@terra\_festival. 1999. [Fournos. Athens / net section / sites](#) . Free Art site.  
The CD-ROM VR\_BODY was pre-selected to enter the final face of the Mediterranean and Balkan Festival.
- 1999 - CYBER ARTS INTERNATIONAL COMPEDIUM PRIX ARS ELECTRONICA 99, [Net & interactive section participation](#) .
- 1999 - University of Haifa, DEPT. of FINE ARTS [Multimedia course site](#) . Special award of the committee for educational innovations. [Bulletin](#).
- 1999 - 'Haifa-Art' Internet center. [Winner of Haifa arts foundation competition](#).
- 1999 - The XI international computer art forum '[Computer Space](#)' 99, Sofia, Bulgaria.
- 1999 - "[Parallel space](#)" . Computer and Internet Interactive Installation [Video: "Parallel space"](#)
- 1999 - Artists and technology, art exhibition, 'Beck' Science Center, Jerusalem. ["Variable Dimension"](#)
- 1999 - WWW ART SITE. [DUCHINP](#)
- 1999 - 'Kaye' college of education Be'er Sheva. [Virtual art: Matter versus Mind, symposium](#)
- 1998 - [Healing and meditation site](#). Background [text](#).
- 1998 - The [findings chapter](#). From the Thesis- Avi Rosen, 'Art-Internet Interaction' (Hebrew .doc file 800k).
- 1998 - '[Art-Internet Interaction](#)'. Paper and demonstration of interactive multimedia VR art work. University of Wales College, Newport. [CAiiA 'CONSCIOUSNESS REFRAMED II'](#).
- 1998 - 'New Order Art' [paper](#) and Virtual interactive multimedia Computer Art installation - The Fourth International Congress and Exhibition, Technion, Haifa Israel. [ISIS SYMMETRY'](#)

- 1998 - X International computer art forum 'Computer Space 98' and international symposium Sofia, Bulgaria. Interactive multimedia VR Computer Art. ['The Violence of Information'](#) and paper [The Artist as a cultural identity provider](#)
- 1998 - III prize ['III Computer Art Biennale'](#) Rzeszow Poland [warsawvoice](#) text. [VR\\_BODY1 print.](#)
- 1998 - International Festival for Architecture in Video Florence (Italy). "UNTITLED" VR multimedia Interactive work. [image|architettura in movimento.](#)
- 1997 - CYBER ARTS INTERNATIONAL COMPEDIUM PRIX ARS ELECTRONICA 97, [Net section participation .](#)
- 1997 - "Shimshon and Delilah Now" Exhibition The Corine Maman Ashdod Museum. Computer multimedia Interactive VR space displayed in the museum and Internet. ["Shimshon and Delilah Now"](#)
- 1997 - 'The Virtual 3D Art Gallery on the Internet'. Paper and demonstration of multimedia Interactive VR art work. University of Wales College, Newport. [Paper.](#) CAiIA 'CONSCIOUSNESS REFRAMED'
- 1996 - DNP AWARD'96 network art [exhibition, Space5.](#)
- 1996 - Ciber@RT'96, Spain. [Participants](#)
- 1996 - PRIX ARS ELECTRONICA 96, [Net section participation .](#)
- 1996 - 'Artist/Industry' Binyaney-Ha'uma, Jerusalem Catalog 'Art-Industry '95 Exhibition' Israeli Ministry of Education and Culture.
- 1996 - Art in the Information Age The Gallery@PrePRESS . [Computer works.](#)
- 1996 - 'Gallery on the Internet A New Era in Art.' One Small Step for the Mouse a Geat Step for Art. Avi Rosen "The Israel Museum, The Ruth Youth Wing Quarterly. No. 28. Dec. 1996. pp. 36-39. Jerusalem. ["Mishkafayn"](#) (18MB)
- 1996 - 'HTTP://ART' ['Kol-Bo'](#) 02/08/96 p. 90-92. (Heb).
- 1996 - Exhibition of Artworks on the Internet. Students of 'Basic Design' course, The Faculty of Architecture and Town Planning in Technion. [Exhibition.](#)
- 1996 - 'The Virtual 3D Art Gallery on the Internet and computer art' lecture. Symposium of the Israeli Computer Music Forum (IL-CMF). The Center for Technological Education Holon Israel. [Gallery.](#)
- 1996 - Technion FOCUS ["Superbrush"](#). (Eng. pdf).
- 1995 BEYOND HUMACHINES "Bad Subjects" issue #18, Feb. 1995 UC Berkeley. Paper on Art in technological era. [BEYOND HUMACHINES](#)
- 1995 - 'Stormy Waters' Glasgow university Scotland. International Internet Art exhibition. ["Stormy Waters"](#)
- 1995 - SIGGRAPH Internet Art Guid [click.](#)
- 1995 - Portraits in Cyberspace MIT Media Laboratory. [Images.](#)
- 1995 - "PANIM": Faces of Art and Culture in Israel March/April 1995. (Information Division, Israel Foreign Ministry - Jerusalem) [text](#)(Eng).
- 1994 - Leonardo Electronic Almanac [Volume 2, No. 12 December 1994](#)
- 1994 - 'Mouse creativity' [text](#)(Heb).
- 1994 - Leonardo Electronic Almanac [Volume 2, No. 10 October 1994](#)
- 1994 - Art on the Internet instead "Artfocus", published in 'Studio', Israeli art magazine, no. 58, Nov.–Dec. 1994. p.10. [text.](#)
- 1994 - ["ISRAELI ART ON THE INTERNET"](#).
- 1994 - PRIX ARS ELECTRONICA 94, [Computergraphic section participation .](#)
- 1994 - "Computer Art Installation" "Bezalel 1" Art Gallery Jerusalem. Specially designed for the historic 'Bezalel' building computer based installation, including computers video camera and large computer prints.'Avi Rosen Exhibition' catalog, Bezalel Art Academy Jerusalem, 1994. [Images.](#)
- 1994 - ["Seriality/Randomness"](#) Computer based installation, [catalog](#) Kalisher Five Gallery Tel-Aviv, Israel.
- 1994 - ISEA94 Media Lounge, Helsinki Finland. "Tikshuv 2000" Net project presentation.
- 1994 - 'Personal Art Gallery on Internet' www site of my artworks, first of this sort in Israel, started may, 1994. Dudi Goldman 'Internet a narrow junction', Yediot-Aharonot, financial supplement, Aug. 17. 1994. p. 8. [text \(Heb\).](#)
- 1994 - THE INTER-SOCIETY FOR THE ELECTRONIC ARTS, THE ISEA NEWSLETTER SPECIAL EDITION [ISEA 1994](#) and Leonardo Electronic Almanac -Volume 2, No. 12 [mitpress Dec. 1994](#)
- 1994 - REIFF II Virtual Museum Aachen Germany. Exhibition of my works. [REIFF II](#)
- 1994 - 'Art on the Net' Palo Alto USA . [Curator](#) of the first Israeli artists exhibition on the Internet. [group exhibition](#) and a [solo exhibition.](#)

- 1993 - The Gabriel Sherover Information Center for Israeli Art at [the Israel Museum, Jerusalem](#).
- 1993 - FISE93 "[Man-Machine](#)" paper THE ISEA NEWSLETTER , [Minneapolis](#), MN. USA. The role of museums, the 'original', and the means of art consumption. Demonstration of on line connection to Art Net Israel . Minneapolis college of art an design FISEA 93 catalog.
- 1993 - "Tikshuv 2000", A experimental computer net supplying community services , in Carmiel Israel. A 'Art Net' service included with my computer works. Rivi Beler ['Mona Lisa in the PC'](#) 'Ha'aretz' newspaper, Jun. 26, 1993. p. 3b.
- 1993 - "Center - Periphery" Ma'ase Choshev -Vol. 4, Oct. 1993.p. 54. [text \(Heb\)](#).
- 1993 - "The Artist as a computer man" Mahshevim, No.140 August 1993 .p. 31-32. [text \(Heb\)](#).
- 1993 - 'Maase Hoshew' - Information Processing Association of Israel. Jan. 1993 ["The computerized Artist - The Artistic Computer" \(Heb\)](#).
- 1993 - "A matchbox enclosed..." Computer animation of myself performing respiration to matchbox. the Yavne Art Workshop sent to artists all over the world empty matchboxes to tern it to art. [animation](#)
- 1992 - "Frames" the Gallery of the Art Workshop in Yavne. Computer based installation. Artworks downloaded from the Technion to gallery, manipulated, and printed by the local visitors. Center periphery relations, and art consumer creation freedom were examined. [Kol-Bo &'STUDIO'](#) Art Magazine. Jan.1993. No. 40 p. 63. Images from [#Frames](#) . The [schem of project](#)
- 1992 - 'Computer Art Net' [Faculty of Electrical Engineering](#) Technion I.I.T. Haifa. A local 'Novell' net, to which I added art directory, with my artworks for students and faculty staff use. Limor Weisman, 'Electronic Van-Goch', 'Kol-Bo' newspaper, Haifa, Israel, Sep.9, 1992. p. 81. [text \(Heb\)](#).
- 1992 - 'The Computerized Artist, The Artistic Computer'. [Text \( Heb.pdf\)](#). 'Ma'ariv', 21.8.1992, Art and Literature supplement, p.2.
- 1992 - 'The Artist as Channel' Computerized installation, two 'Amiga' computers, running animations, and large computer prints. Art Gallery Haifa University. [Catalog](#) 'The Artist as Channel', Art Gallery Haifa University Israel. 'STUDIO' Art Magazine, May 1992, No.33, p. 48.
- 1991 - "The Computer Era painting". 'Symposium'nO. 1. September 1991. [text](#).
- 1991 - "Leaves" Artists' House Jerusalem. Computerized Video-Art work showing computer animation superimposed on TV broadcasting channel. 'Leaves' catalogue Artists'House Jerusalem 1991. [animation](#)
- 1991 - Computerized Laser animation for "Wings" Discotheque in Haifa bay.
- 1991 - "The Count" Jerusalem Film Festival. A 3 min. computer animation, including a computer synthetic speech.
- 1990 - "Arcadia" Haifa Museum of Modern Art. [Computer based installation](#) , relating human machine relations, includes animation, synthetic speech, video monitors, large computer prints 13 X 3 meter.Irit Miler 'Computerized Arcadia'. '[STUDIO'](#) Art Magazine. Jan.1991. No.18 p. 42. ["Arcadia"](#)
- 1990 - "Computer Art" Gallery of the Faculty of Architecture in Technion. 'Amiga' computer produced artworks, animation, prints and photos. 'Mabat-Technion'. Technion, Haifa. Dec. '89. Issue .38. P.25. [images](#)
- 1989 - Mabat Technion Dec. 1989, No.38, p. 25 "[New Art](#)".(Heb. text & images.)
- 1988 - "Meitzag"- Multimedia computer Installation proposal for the Jerusalem, Tel-Aviv and Haifa Museums. [Proposal](#) .(Heb. pdf text.) part of the project was realized, at the Signal and Image Processing laboratory, EE Faculty Technion.
- 1987 - Computer Art Vector drawing created with IBM PC AT Computer and 'Autocad' software and HP plotter. Signal and Image Processing Laboratory, Techniom IIT. [Image1](#). [Image2](#). [Image3](#).
- 1984-5 - 'FAX ART'. PC computer artworks transmitted by fax from Jerusalem to Haifa. This act shows an alternative way of creation and distribution art. Ora Brofman, 'HTTP://WWW.ART,' 'Kol-Bo' newspaper, Haifa, Israel, Aug. 2. 1996, pp. 90-93. Scheme of the global fax art [Scheme 1](#). Page of BAIC code of one of the computer images from global fax art [page 1](#).
- 1984 - "Young Artists' Exhibition" Artists' House Jerusalem. Wood structure, "pixel" based fluorescent paper images Installation, including LED display and computer icons. Catalog "Young Artists' Exhibition" Artists' House Jerusalem, 1984. [Installation](#)., High res. [Image](#) .

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- 1983 - [ASCII code Art](#) Bezalel Art Academy Jerusalem. Abandoned [building](#) at the Jerusalem central bus station .
  - 1982 - ["The Cave" Installation](#). Bezalel Art Academy Jerusalem.
  - 1982 - ["Flow chart" works](#). Bezalel Art Academy Jerusalem.
  - 1979 - 'Creative Photography and Surrealism'. Avi Rosen and Itzhak Nuriel, Beit Hahayal, Tel-Aviv. Mixed media: Polaroid shots of Oscilloscop screens and Panda on graph paper. [Image 1](#), [Image 2](#).
  - Some of the bibliographic and reference material, together with channel 1,2 and local video tapes on my artwork, can be also found at: *The Gavriel Sherover Information Center of Israeli Art. Israel Museum Jerusalem*. Tel: +972-2-6708018, or from the artist.