

eduardo kac

teleporting an unknown state
prena[anje neynanega stanja na daljavo



Kayalo & Contents

Peter Toma\ Dobrila Predgovor & Foreword	3
Eduardo Kac Prenašanje neynanega stanja na daljavo & Teleporting an Unknown State	7
Simone Osthoff Objektne lekcije&Object Lessons	11
Cznthia Goodman Redka ptica na oimpijadi & A Rare Bird at the Olzmpics	27
Matthew Mirapaul Elektronski umetnik in njegovo telo kot delovni prostor & An Electronic Artist and His Bodz of Work	33
Arlindo Machado Rayširjena telesa in duše & Expanded Bodies and Minds	37
Aleksandra Kostj 2. oktober 1998, v Mariboru & 2. October 1998, Maribor	63
Eduardo Kac / Curriculum Vitae	70



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Peter Toma\ Dobrila

Predgovor

Ne spominjam se natanko, kdaj sem prvi; slišal ya Eduarda Kaca. Toda njegovo delo me je nemudoma prevyelo. Ko sem kasneje deskal po njegovih spletnih straneh *www.ekac.org(, me je njegova retrospektiva yadela kot celovita ygodba umetnika, ki sledi svojemu kredo od samega ya;etka in nikdar ne ygreši bistva. Ya;enši s performansi v domovini Brayiliji, na pla\i Ipanema v Riu de Janeiru v osemdesetih letih, je jasno poudarjal principe bodz arta generacije šestdesetih, ki ji pripada. To je bil njegov odgovor na ygodovino, odgovor nove ge/neracije s pogledom na medijsko sedanost in novomedijsko prihodnost, ki se bo šele pojavila.

Komunikacijo kot široko jedro njegovih projektov definira na rayli;ne na;ine, upoštevajo; notranje in yunanje entitete, od intime ;loveške notranjosti do ne;esa, ;emur lahko re;emo javno pojavljanje ali tudi meš;anska vloga galerijskega prostora. Seveda ni ni; bli\je tanki ;rti med ´notri´ in ´yunaj´ kot orodja, ki poveyujejo ljudi, oyiroma ydi se, da nas poveyujejo v globalno vas. Toda kaj se ygodi y našim notranjim krogom, hkrati yakrinkanim in najdenim, skritim in prikayanim v istem ;asu, ki se ydru\uje v ve;je in ve;je kroge in oblikuje nove tipe dru\b, ustvarja nove interesne sfere in spreminja naše poglede, poudarja našo percepcijo in vypodbuja naše obnašanje v virtualni skupnosti_

Ni; ve; ni bilo enako, prostor je iygubil svoj pomen, ;as, ki se je skrajšal v poslana in sprejeta sporo;ila, pa je postal intimna struktura in \iva bitja so se y biološkimi / genetskimi analiyami in tehni;no / strojnimi nadomestki spremenila v polja podatkov. Eduardo Kac je iykusil oboje, ko se je ukvarjal y murali, faks in teletekst umetnostjo, hologramsko poeyijo ter nayadnje y vsadki v telo oyiroma s telekomunikacijskimi dogodki in interaktivnimi

Peter Toma\ Dobrila

Foreword

I don´t exactlz remember when I heard of Eduardo Kac for the first time, but I remember that I was immediatelz impressed bz his work. Later, when I was surfing through his web pages *www.ekac.org(, his retrospective struck me as a complete storz of an artist, who has followed his credo from the verz beginning and has never missed the point. Starting with the performances in his home countrz Brasil, on the Ipanema Beach, Rio de Janeiro, in the 80´s, he clearlz pointed out the bodz art principles of the 60´s generation which he belongs to. That was his answer to historz, an answer of the next generation with a view of the media present and the new media future which will appear zears later.

Communication as the wide core of his projects has been defined in various wazs, concerning internal and external entities, from the intimacz of the human interior to something we could call a public appearance or a bourgeois role of the gallerz space. Of course nothing is closer to the thin line between ´in´ and ´out´ as the tools which connect people or which seem to connect us into a global village. But what happens with our inner circle being disguised and discovered, hidden and shown at the same time, joining into bigger and bigger circles and forming new tzpes of societies, forming new interest spheres and changing our perspectives, emphasiyng our perception and stimulating our behaviour as a virtual collective_

Nothing was the same anzmore, space lost its meaning, time reduced to messages sent and received became an intimate structure and the living creatures turned into data fields through biological/genetic analzsas and technical/machine substitutes. Eduardo Kac experienced both, when

projekti. Enega imed teh, y Leonardovo nagrado ya iyemnost nagrajeno delo Prenos neynanega stanja na daljavo, raystavljam v Multimedijem centru KiberSRCeLab – KIBLA s so;asnim prenosom na svetovni splet. Seme v yemlji postaja rastlina, ki iyolirana od naravnega okolja raste v ;rni škatli. Proces spremljamo na mre\i do yadnjega dejanja, ko Kac odnese odraslo rastlino ven, v naravno okolje, in tako yaklju;i umetni*ški(cikel in pri;ne novi cikel naravnega. Toda ali obstajajo sploh kakšne meje_ Od simuliranega okolja v laboratoriju do resni;nega je kratka pot, a dolg proces v celotni igri bivanja. In kaj je pomembno_ Gertrude Stein bi v avantgardisti;ni maniri odvrnila> @Ro\ a je ro\ a je ro\ a je ro\ a...@

To je samo nekaj vprašanj in veliko odgovorov, ki mi jih spro\ a Eduardo Kac, in ve;krat raymišljam, kaj bo naslednje. Ve; kot dovolj ya spremljanje njegovih prihodnjih korakov.

Hvala vsem, ki ste projekt omogo;ili.

he was creating murals, fax or teletex art, holographic poetrz and recentlz, while performing implantation into his bodz or creating telecommunication events and interactive projects. One of these works, called "Teleporting An Unknown State", has been given the Leonardo Award for excellence and is being exhibited in the Multimedia Centre KiberSRCeLab – KIBLA and transmitted to the Internet. A seed on a bed of soil is developing into a plant bz growing in a black box isolated from the natural environment. The whole process can be seen on the web until its last stage, when the plant is taken outside into its natural environment. Thus the czcle of art*ificial(is finished and the new czcle of natural begins. But are there anz borders at all_ There is onlz a short path from the simulated laboratorz environment to the real one, nevertheless it is a long process in the whole game of being. And what reallz matters_ Gertrude Stein would replz in the avant-garde manner> @A rose is a rose is a rose is a rose...@

These are onlz some of the questions and manz answers raised bz Eduardo Kac´ s work and I often wonder> What next_ More than enough for us to follow his future steps.

Thanks to all who have made this project possible.

Eduardo Kac

[Prenašanje neynanega stanja na daljavo](#)



Teleporting an Unknown State, Eduardo Kac, 1994/96, Photo> Gumpamat Pasaganon

Prenašanje neynanega stanja na daljavo je naslov moje telematske interaktivne instalacije, ki sem jo predstavil na umetnostni raystavi Siggraph '96. Naslov je iyposojen iy prve ynanstvene rayprave o teleportaciji – prenašanju na daljavo. Instalacija iylo;a idejo o teleportaciji delcev *in ne materije(iy njenega ynanstvenega konteksta in jo prestavlja v domeno dru\bene interakcije, ki jo omogo;a inter-net.

Po mojem predhodnem delu s telematsko interaktivno instalacijo in rayiskovanju nesemioloških oblik komunikacije y elektronskimi mediji ta instalacija uporablja daljinsko prenašanje videopodob, toda ne ya njihovo reprezentativno vsebino, ampak ya njihov opti;ni fenomen – kot fronte valovanja svetlobe.

Videokonferenca se uporablja ya prenašanje delcev svetlobe iy ve; dr\av, da bi omogo;ili biološko *in ne umetno(\ivljenje in rast na mestu instalacije. Pri tem se brey iymenjave verbalnega sporo;ila rayvije nov ob;utek skupnosti in skupne odgovornosti.

To delo poveyuje fiyi;no galerijo y nedolo;enim prostorom interneta. 21. julija 1996 sem v gredico yemlje v temnem prostoru instalacije posadil seme. Ko obiskovalci vstopijo v galerijski prostor, vidijo instalacijo> videoprojektor, ki visi s stropa in je usmerjen navydol, proti semenu na gredi. Obiskovalci ne vidijo projektorja v celoti, le snop svetlobe, ki je projicirana skoyi okroglo odprtino na stropu. Okroglost luknje in svetlobna le;a projektorja spominjata na sonce, ki prodira skoyi temo. Na oddaljenih mestih po svetu anonimni posameyniki usmerijo svoje digitalne kamere proti nebu in tako prenašajo son;no svetlobo v galerijo.

Eduardo Kac

[Teleporting an Unknown State](#)

"Teleporting an Unknown State" is a biotelematic interactive installation. In other words> it is a computer-based telecommunications work in which a biological process is an integral part of the work. The installation creates the experience of the Internet as a life-supporting szstem. In a verz dark room a pedestal with earth serves as a nurserz for a single seed. Through a video projector suspen/ded above and facing the pedestal, remote individuals send light via the Internet to enable this seed to photosznthesiye and grow in total darkness.

The installation takes the idea of teleportation of particles *and not of matter(out of its scientific context and transposes it to the domain of social interaction enabled bz the Internet. Following mz previous work with telematic interactive installation and mz exploration of non-semiological forms of communication with electronic media, this installation uses the remote transmission of video images not for their representational content but for their optical phenomenon as wavefronts of light. Internet videoconferencing is used to teleport light particles from several countries with the sole purpose of enabling biological *and not artificial(life and growth in the installation site.

A new sense of communitz and collective responsibilitz emerges out of this context without the exchange of a single verbal message. Through the collaborative action of anonzmous individuals around the world, photons from distant countries and cities are teleported into the gallerz and are used to give birth to a fragile and small plant. It is the participants' shared responsibilitz that ensures that the plant grows as long as the show is open.



Teleporting an Unknown State, Eduardo Kac, 1994/96, Photo> Gumpamat Pasaganon



Teleporting an Unknown State, Eduardo Kac,
1994/96, Photo> Gumpamat Pasaganon

Fotone, ki jih kamere ujamejo, ponovno ivera projektor v galeriji. Videoslike, ki prihajajo v ivo iy oddaljenih dr\av, iygubijo reprezentativno vrednost in se uporabijo kot prenosniki svetlobnih valov. Po;asen proces rasti rastline se prenaša v ivo po svetu prek interneta, dokler traja raystava. Vsi udeleenci lahko opayujejo proces rasti po mreži. Ra;unalniški yaslon, t.j. vmesnik operacijskega sistema, na katerem se dogaja vsa dejavnost, se dematerializira in projicira neposredno na gredico zemlje v temni sobi, s ;imer je omogo;en direktni fizi;ni kontakt med semenom in fotonskim snopom.

S sodelovanjem neynanih posameznikov po svetu se fotoni iy oddaljenih dr\av in mest na daljavo prenašajo v galerijo in povy;ijo rojstvo ne\ne rastlinice. Skupna odgovornost udeleencev je tisto, kar yagotavlja, da rastlina raste, dokler je raystava odprta.

To delo povy;ra dramati;ni preobrat reguliranega enosmernega modela, ki ga vsiljujejo standardi oddajanja televizijskih in radijskih programov in telekomunikacijskih kanalov industrije. Bolj kot prenašanje specifi;nega sporo;ila y ene to;ke do ve; pasivnih prejemnikov, ustvarja Prenašanje ne/ ynanega stanja na daljavo novo situacijo, v kateri posamezniki v ve; dr\avah prenašajo svetlobo do to;ke v Centru ya sodobno umetnost v New Orleansu. Etika ekologije interneta in pre\ivetja v socialni mreži postane o;itna v raypršenem in skupnem priyadevanju.

Med predstavo je bila fotosinteya odvisna od skupnega dejanja neynanih udeleencev, ki so bili dale; stran od kraja dogajanja. Rojstvo, rast in smrt na internetu so tvorili horiyont mo\nosti, ki so se raykrivale, ko so udeleenci dinami;no prispevali k delu. Skupno dejanje in odgovornost prek mreže sta bili klju;nega pomena ya pre\ivetje organiyma. Raystava se je kon;ala 9. avgusta 1996. Na ta dan je bila rastlina visoka 18 in;ev *ca. 54 cm(. Po raystavi sem ne\no

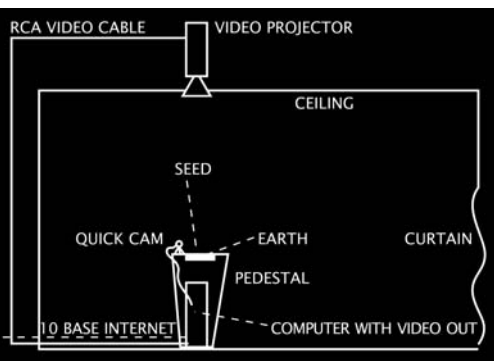
This piece operates a dramatic reversal of the regulated unidirectional model imposed by broadcasting standards and the communications industry. Rather than transmitting a specific message from one point to many passive receivers, "Teleporting an Unknown State" creates a new situation in which several individuals in remote countries transmit light to a single point in the gallery space. The ethics of Internet ecology and social network survival is made evident in a distributed and collaborative effort. During the show, photosynthesis depends on remote collective action. Birth, growth, and death on the Internet form a horizon of possibilities that unfolds as participants dynamically contribute to the work. Collaborative action and responsibility through the network are essential for the survival of the organism.

This piece was first shown as a link between the Contemporary Art Center, in New Orleans, and the Internet, as part of "The Bridge", the Siggraph '96 Art Show *August 4–August 9, 1996(. On July 21, 1996, in preparation for the public viewing of this work, I planted a single seed on a bed of earth in the dark installation space in New Orleans. As viewers walked in they saw a video projector hanging from the ceiling and facing down, where a single seed was lying on a bed of earth. Viewers did not see the projector itself, only its cone of light projected through a circular hole in the ceiling. The circularity of the hole and the projector's lens flushed with it were evocative of the sun breaking through darkness. At remote sites around the world, anonymous individuals pointed their digital cameras to the sky and transmitted sunlight to the gallery. The photons captured by cameras at the remote sites were re-emitted through the projector in the gallery. The slow process of growth of the plant was transmitted live to the world via the Internet as long as the exhibition was up. The com-



Teleporting an Unknown State, Eduardo Kac,
1994/96, Photo> Gumpamat Pasaganon

izpulil rastlino in jo na novo posadil poleg drevesa bliju vhodnih vrat Centra za sodobno umetnost.



Simone Osthoff

[Objektne lekcije](#)

"Nisem ameriški umetnik, ali braylski umetnik, ali holografski umetnik ali računalniški umetnik, jeyikovni umetnik, ali instalcijski umetnik," trdi Eduardo Kac. "Oynake niso prav koristne in se pogosto uporabljajo za marginaliziranje ljudi. Nered se veem na kakršnokoli narodnost ali geografijo. Delam s telekomunikacijami in poskušam premagati te omejitve."

Kac se je rodil v Rio de Janeiru leta 1962, v YDA pa se je preselil leta 1989. Y yanj yna;ilnim nesprejemanjem nacionalnih lo;nic je na mednarodnih raystavah predstavljal obe dravi, YDA in Brayilijo.

Kac pripada generaciji osemdesetih, ki se je borila za politino svobodo po petnajstih letih vojaške diktature v Brayiliji. Njegovo delo še naprej rayiskuje vprašanja cenyure informacij in svobode govora, ki je tako yelo obsedla braylsko dru\beno \ivljenje v tistem asu. Toda Kac je eden redkih umetnikov iy te generacije, ki nadaljujejo yarisovanje novega oyemlja, tako da uporabljajo nove tehnologije in rayisku-jejo kulturne probleme, ki se pri tem pojavljajo.

puter screen, i.e., the graphical interface on which all the activitz could be seen, was dematerialised and projected directly onto the bed of earth in a dark room, enabling direct phzysical contact between the seed and the photonic stream.

The exhibition in New Orleans ended on August 9, 1996. On that day the plant was 18 inches tall. After the show, I gently uprooted the plant and replanted it next to a tree by the Contemporary Art Center's front door.

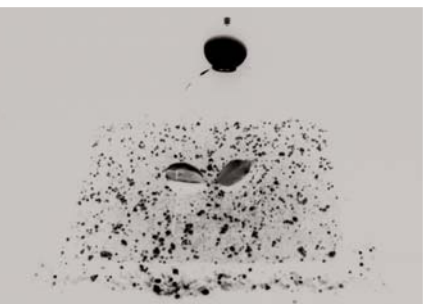
Simone Osthoff

[Object Lessons](#)

"I don't see myself as an American artist or a Brayilian artist, a Holographz artist or a Computer artist, a Language artist or an Installation artist," Eduardo Kac insists. "Labels are not very helpful and are often used to marginalize people. I prefer not to be bound by any particular nationality or geography. I work with telecommunications, trying to break up these boundaries."

Born in Rio de Janeiro in 1962, Kac (pronounced Katy) moved to the US in 1989. With a characteristic disregard for national boundaries, he went on to represent both the US and Brail in international exhibitions.

Kac belongs to the '80s generation who fought to reclaim political freedom in Brail after 15 years of military dictatorship. His work continues to explore the issues of information censorship and freedom of speech that so obsessed Brayilian social life at this time. However, Kac is among the few artists from that generation to continue charting new ter-



Teleporting an Unknown State, Eduardo Kac, 1994/96, Photo > Gumpamat Pasaganon



Teleporting an Unknown State, Eduardo Kac, 1994/96, Photo > Anna Chupa

Kac, med drugim, tudi dokumentira doslej še ne obdelano ygodovino elektronske umetnosti v Brayiliji. Ob tem, da je član uredniškega odbora Leonarda, je tudi gostujoči urednik mednarodne ydaje ameriške revije Visible Language o odnosu med eksperimentalno poeyijo in novimi mediji.

Če pogledamo nayaj, v leto 1983, je bil jeyik tisti, ki je Kaca pritegnil k holografiji ali ´holopoeyiji´, kot jo opisuje. "Holografija me ne yanima kot tridimenzionalna oblika, ampak kot časovni medij. V mnogih mojih hologramih; čas teče naprej in nayaj, v nelinearnih smereh. Ne razmišljam o sosledju besed, tako kot običajno govorimo in pišemo. Bolj kot posredovanje rezultata svojih misli me yanima posredovanje miselnega procesa.

Yato jeyik v mojih hologramih valovi, niha, se spreminja in iyginja. S tem, da ni linearnega yaporedja, je mogoče raziskovati podobo v katerokoli smeri. Imamo možnost časovne reverzibilnosti. Nadyorujemo lahko časovne strukture v prostoru. V resnici se ukvarjamo s prostorskočasovnim kontinuumom, ki ga lahko razbijamo na vódene prekinitve. Holografski medij mi dovoljuje, da delam y jeyikom, ki lebdi v prostoru in; čas, se podira, topi in raytopi, ter se na novo kombinira in tako ustvarja nove pomene. To delo raykriva neyaupanje, dvom o ideji, da lahko preprosto uporabljamo jeyik ya prenašanje sporočila, kot sužnja pomena. Bolj me yanimata sugestija in evokacija."

Seiš;e besed in podobe je \e od nekdanj yanimalo likovne umetnike in pesnike in je bilo osrednji predmet yanimanja brayilskega neokonkretnega gibanja poynih 50-ih let. Ne glede na raven dvoumnosti, ki jo najdemo v njihovih delih, veina postkonceptualnih umetnikov, kot so Jennz Holyer, Barbara Kruger in Lorna Simpson, uporablja jeyik yelo neposredno. Nasprotno pa je Kacova uporaba jeyika dvoumna.

ritorz, using new technologies and exploring the cultural problems they raise.

Among other activities, Kac is documenting the unrecorded history of electronic art in Braille. A member of the editorial board of Leonardo, he is also guest editor for the American journal Visible Language of an international issue on the relationship between experimental poetry and new media.

Back in 1983, it was language that drew Kac to holography, or ´holopoetry´ as he describes it. "I am not interested in holography as a three-dimensional form. I am really interested in holography as a time-based medium. In many of my holograms, time flows back and forth, in non-linear ways. I just don't think in terms of one word after another, as we normally speak and write. I'm less interested in conveying the result of my thought than in conveying the process of my thought.

That's why the language in my holograms fluctuates, oscillates, changes and disappears. Because not having a linear sequence, you can explore the image in any direction you want. You have a time-reversal possibility. You orchestrate time structures in space. You're really dealing with a space-time continuum and breaking it into orchestrated discontinuities. The holographic medium allows me to work with language floating in space and time, breaking down, melting and dissolving, and recombining itself to produce new meanings. This work reveals a distrust, a disbelief in the idea that we can simply use language to communicate a message, as the slave of meaning. I'm more interested in suggestion and evocation."

The intersection of word and image has always been of interest to artists and poets, and was a central concern of the Brazilian Neoconcrete movement of the late 1950s. Regardless of the level of ambiguity,

"Besede niso posode, ki bi vsebovale pomen, kot skodelica vsebuje kavo," pojasnjuje Kac. "Mislim, da nih;e ne more popolnoma rayumeti vse ali vsako/gar. Vedno bo napetost med tem, kar poskušamo sporo;iti, in med tistim, kar poskušamo rayumeti, in ta napetost niha y dinami;nim vyorcem jeyika. Yanima me predlaganje alternativ enosmernosti sistema umetnosti, spoynali smo, da je jeyik resni;no nestabilen in yelo turbulenten. Radi bi nadyirali jeyik in ustavili tok dogodkov, ki nas obdaja. Verjamem v pogajanje o pomenu, ne v komunikacijo pomena. Ko v umetnosti in poeyiji uporabljamo jeyik na linearni na;in, se nam lahko ygodji, da bomo obšli temeljni problem našega medija, to je jeyika samega. Kaj pa vloga jeyika pri oblikovanju naše yayne sveta_"

Velikokrat so v sodobni umetnosti besede takoj berljive, kot so v mno\;nih medijih. Toda v seriji negibnih podob Erratum je Kac ustvaril viyualno ymes, yaradi ;esar besede niso tako enostavno dojemljive. "Ielim, da bi gledalec pre\ivel nekaj ;asa y delom, rayiskoval svoje na;ine rayumevanja. Serija je yelo slikarska in se poigrava y nekatere/ rimi pri;akovanji obiskovalca na raystavi. Toda yapeljevanje y barvo in površino je popolnoma povevano s sugeriranimi semanti;nimi pojmovanji, kar privede ogledovanje – ali branje – precej bli\je literaturi.

V delu Erratum so pari besed vidni v polju, v katerem sloji barve obdajajo in raytapljajo verbalne oblike. Ydi se, kot da bi semanti;ne napetosti, ustvarjene med besedami, postale vidne, prevedene v yaynavno napetost, ki je nastala med besednimi fragmenti in poljem, ki jih obdaja." Kot veliko drugih Kacovih del si je Erratum mogo;e ogledati v svetovnem spletu.

Osrednji poudarek Kacovih telepreyeni;nih instalacij je na iykušnji in procesu, kot je bil pri njego/ vih javnih performansih v Rio de Janeiru v ygodnjih 80-

itz found in their work, most postconceptual artists, such as Jennz Holyer, Barbara Kruger and Lorna Simpson, have used language in a verz direct waz. Bz contrast, Kac´s use of language is an equivocal one.

"Words are not containers that hold meaning, like a cup contains coffee," he explains. "I don´t think one can fullz understand anzthing or anzone. There will always be a tension between what one tries to communicate and what one tries to understand, and this tension oscillates with the dzynamic pattern of language."

"I am interested in proposing alternatives to the unidirectionalitz of the szstem of art< we have come to realiye that language is trulz unstable and absolutelz turbulent. We would like to be in control of language and arrest this flux of events that surrounds us. I believe in the negotiation of meaning, not the communication of meaning. When we use language in a linear waz, in art and poetrz, we are in danger of bz-passing the fundamental problem of our own medium, which is language itself. What about language´s role in shaping our perception of the world_"

In much contemporarz art, words are immediatelz legible, as thez are in the mass media. In Kac´s series of still images Erratum, however, he created a visual amalgam that makes the words less rea/dilz perceptible. "I would like the viewer to spend some time with the work, to explore his or her own readings. The series is verz painterlz, so it plazs with certain expectations the viewer might bring to the experience. But the seduction of color and surface is fullz integrated with the suggested semantic resonations, which brings the viewing -- or reading -- experience much closer to literature.

In Erratum, pairs of words are seen in a field in

ih letih. "V ygodnjih 80-ih je bilo v mojih delih telo vse. Telo je bilo orodje, ki sem ga uporabljal ya irya\anje dvoma o konvencijah, dogmah in tabujih – patriarhalnosti, religiji, heteroseksualnosti, politiki, puritanstvu. Telo je nayadnje postalo moj pisni medij."

V takšnih performansih je Kac uporabljal rekviyite, kakršne so "objektne pesmi", in vypodbujal publiko, naj sodeluje. je je kdo v ob;instvu odgovoril na njegova vprašanja, je lahko odnesel rekviyit s seboj domov. 13. februarja 1982 je s performansom v Ipanemi Kac yaynamoval 60. obletnico Tedna sodobne umetnosti iy leta 1922, ki je spodbudil moderno umetnost v Brayiliji. "Vsa pla\ a je bila nabita y energijo," se spominja Kac. "Kon;alo se je s povivom, naj se vsi sle;ejo *kar je sicer strogo prepovedano(in u\ivajo. Ve; ljudi je to storilo. Sledila je demonstracija golih protestnikov vydol\ pla\ e. Nosili smo napise in plakate ter delili pamflete, s katerimi smo yahtevali novo umetnost, novo dru\bo in novo \ivljenje. Yadnje dejanje performansa je bil simboli;en skok v Atlantski ocean. Nato smo skupaj prišli iy vode – mokri in prerojeni." Umetnost telepreyence se po Kacovem mnenju pojavlja na prese;iš;u robotike, telekomunikacij in ra;unalnikov ynotraj širšega okvirja elektronske interaktivne umetnosti. "Ta umetnost manj poudarja formo in kompoyicijo, bolj pa vedênje – iybiro, dejanje – in pogajanje o pomenu. V ospredje postavlja gledalce, ti kot udele\enci dobijo dejavno vlogo pri oblikovanju svoje iykušnje. Namesto da nastopi umetnik, v predstavi sodeluje ob;instvo. Vloga umetnika v tem primeru ni toliko enosmerno vkodirati sporo;ila, ampak bolj definirati parametre, iy katerih se bodo rayvile iykušnje. Telepreyen;na umetnost tudi nakayuje primat realnega ;asa nad realnim prostorom."

Problem prevladovanja realnega ;asa nad realnim prostorom obravnava nadaljujo;e se sodelovanje y

which lazars of colors embed and dissolve the verbal forms. It is as if the semantic tensions created between the words were rendered visuallz, translated into the perceptual tension created between the word fragments and the surrounding field." Like manz of Kac´ s works, Erratum can be seen on the Internet.

The emphasis on experience and process is central to Kac´ s telepresence installations, as it was to his public performances in Rio in the earlz ´80s. "In mz work in the earlz ´80s the bodz was everzthing. The bodz was the tool I used to question conventions, dogmas and taboos -- patriarchz, religion, heterosexualitz, politics, puritanism. The bodz became mz writing medium ultimatelz."

In such performances Kac would use props such as ´object poems´ and provoke the audience to participate. If a member of the audience could answer his questions thez could take the prop home. On Februarz 13, 1982, Kac celebrated the 60th anniversarz of the Week of Modern Art of 1922, which launched modern art in Brayil, with a performance at Ipanema. "The whole beach was energiyed," Kac recalls. "It concluded with a call for everzbodz on the beach to undress *which is absolutelz illegal(and enjoz themselves. Several people did. This was followed bz a naked demonstration along the beach. We carried banners and posters, and distributed pamphlets calling for a new art, a new societz and a new life. The verz last action of the performance was a szmbolic dive into the Atlantic Ocean. We all came out of the water together -- wet and reborn."

Telepresence art, according to Kac, occurs at the intersection of robotics, telecommunications and computers, within a wider framework of electronic interactive art. "It implies less stress on form and composition, and more emphasis on behavior --

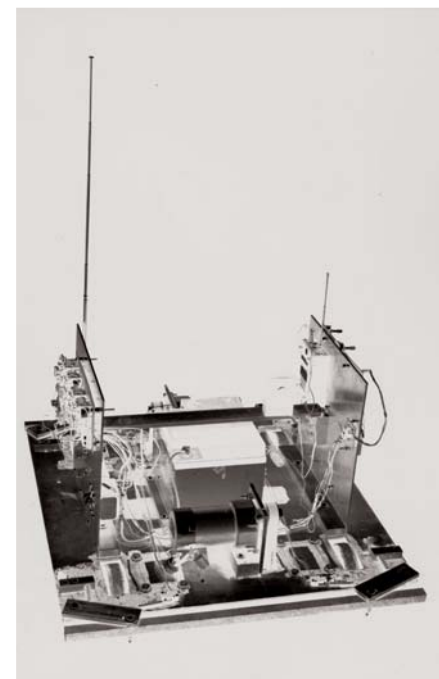
Edom Bennetom, ki se je začel leta 1989. Kac je ustvaril instalacije – telerobot, ki ga v portugalski imenujeta Ornitorrinco ali platypus. Ornitorrinco – "hibridna" kultura, sesalec, ki vali jajca – je primeren naslov za heterogene mešanice, ki jih predstavlja telerobot. Eno izmed del, ki so pri tem nastala, Ornitorrinco v rajcu, sta razvijala od leta 1993 do leta 1994, javnosti pa predstavila 23. oktobra 1994 – trajalo je približno pet ur. Prek standardnega spletnega vmesnika in s hibridiziranjem na mreži bazirane videokonference v živo s telerobotskim nadzorom prek trimerne telefonske konference v realnem času, je bilo to prvo teleprezenčno umetniško delo na internetu. "V tem primeru," pojasnjuje Kac, "se beseda teleprezenca nanaša specifično na popolnoma mobilni, brezžični telerobot. Delo je povežalo nedolgoživ spletni prostor s fizičnimi prostori v Seattlu, Chicagu in Lexingtonu v Kentuckiju. Sestavljala so ga ta tri vozlišča; aktivne udeležbe in opazovalna vozlišča po svetu."

Telerobota v Chicagu so v realnem času prek regularne telefonske povezave nadzirali udeleženci v Lexingtonu in Seattlu. "Komunikacija ni potekala skopi kakršnekoli verbalne ali ustne izmenjave, ampak skopi ritme, ki so nastali med njihovim sodelovanjem pri skupni posredovani izkušnji. Medtem ko je bilo mogoče delo doživeti po internetu, si ga je lahko ogledal kdorkoli na svetu v dostopom do mreže, tako so se razblinile galerijske meje in omogočile, da je bilo delo dostopno vsajemu občinstvu. Tema instalacije je bil pospešeni razvoj medijev. Ornitorrinco se je pogrejal v vrt tehnološke zastarelosti, ki so ga sestavljale stare plošče, poškodovane računalniške plošče, polomljeni mehanizmi in izbrisani trakovi." Gledalci iz različnih držav, med njimi iz Finske, Kanade, Nemčije in Irske, so se lahko neposredno vključili v dogajanje in so oddaljeno instalacijo v Chicagu videli z yornega kota Ornitorrinca, ki so ga

choice, action -- and negotiation of meaning. It highlights the public who, as participants, acquire an active role in shaping their experience. Instead of the performance of the artist, members of the public now perform. The role of the artist in this case is not so much to encode messages unidirectionally, as to define parameters from which experiences will unfold. Telepresence art also implies the primacy of real time over real space."

This issue of real time over real space informs an ongoing collaboration with Ed Bennett that began in 1989. Kac created installations to the scale of a telerobot, that they call 'Ornitorrinco,' or 'platypus' in Portuguese. 'Ornitorrinco' -- a hybrid creature, an egg-laying mammal -- is an apt title for the heterogeneous mixtures that are represented by the telerobot. One of the resulting works, Ornitorrinco in Eden, was developed between 1993 and early 1994 and presented publicly on October 23, 1994, for approximately 5 hours. Bypassing the standard interface of the Web and hybridizing Net-based live videoconferencing with real-time telerobotic control via a three-way telephonic conference, this was the first telepresence art work on the Internet. "In this case," Kac explains, "the word 'telepresence' refers specifically to the fully mobile, wireless telerobot. The piece bridged the placeless space of the Internet to physical spaces in Seattle, Chicago and Lexington, Kentucky. It consisted of these three nodes of active participation and multiple nodes of observation worldwide."

The telerobot in Chicago was controlled in real time, via a regular telephone link, by participants in Lexington and Seattle. "Communication took place not through any verbal or oral exchange but through the rhythms that resulted from their engagement in what was a shared, a mediated, experience. And as the piece was experienced through the Internet, anybody in the world with Net



The telerobot Ornitorrinco, Eduardo Kac and Ed Bennett, 1989, Photo: David Zox

vodili anonimni udeleženci iz Lexingtona in Seattle. Yamsel opayovati svet s perspektive predmeta je izredno zanimiva. "Klee je neko; zapisal, da so ga predmeti v ateljeju preučevali," pravi Kac. "Lacan govori o predmetih, ki gledajo nazaj, da imajo predmeti pomen ne samo, ker jih vidimo, ampak ker so del veliko večje mreže pomenov, ki zajema tudi jeyik. O idejah v umetnosti ne moremo vedno dobesedno razmišljati. "Bistvo teleprezenčne instalacije s telerobotom Ornitrorincom je metaforičen povik gledalcu, naj pogleda na svet s perspektive koga drugega. To je nemetaforična yunajtelesna izkušnja, je hočete. Pri tem vas prosijo oziroma izyovejo, da se odredite svojemu direktnemu obsevanju prostora, ki vas obdaja, in v prostoru in zasupreidete v neko drugo telo, v drug položaj, v drugo identiteto. Ta edinstvena situacija postavlja vprašanje, ali je to sploh mogoče, ali yaleno in kakšne so njene posledice."

To delo ustvarja povsem novo komunikativno situacijo. "Ornitrorinco v raju je ustvaril kontekst, v katerem so anonimni udeleženci yavnali, da se je le skoyi njihovo deljeno izkušnjo in nehierarhično sodelovanje korak za korakom konstruirala nova resničnost. V tej novi resničnosti prostorsko-časovne razdalje postanejo nepomembne, navidejni in resnični prostor postaneta enakovredna in lingvistične pregrade so yasno odstranjene v prid skupni okrepitvi izkušnji."

Kacovo delo nakayuje, da je današnji temeljni odnos bolj tisti med pojavljanjem in izginjanjem kot tisti med pojavljanjem in resničnostjo. "Ivimo v svetu, v katerem si mentalnih podob krajev, kultur in ljudi ni; več ne ustvarjamo y neposrednim opayovanjem. Vsi si lahko prikličemo podobo Lune, lahko sanjamo in se vidimo na Luni. Spominjamo se krajev, ki jih nismo nikoli obiskali. Razmišljamo o krajih in razvijamo koncepte o kulturah, ki jih nismo nikoli videli, nikoli spoznali. V svojih teleprezenčnih



Ornitrorinco in Eden, Eduardo Kac, 1994,
Photo > Courtesz of the Artist

access could see it, dissolving gallery boundaries and making the work accessible to larger audiences. The theme of the installation was the accelerated decay of media. Ornitrorinco was immersed in a garden of technological obsolescence made of old records, damaged computer boards, broken mechanisms and erased tapes." Viewers from various countries, including Finland, Canada, Germany and Ireland, came on-line and were able to see the remote installation in Chicago from the point of view of Ornitrorinco as controlled by anonymous participants in Lexington and Seattle. The idea of looking at the world from the perspective of the object is a fascinating one. "Klee once wrote that objects in his studio contemplated him," says Kac. "Lacan speaks of objects looking back, in the sense that objects have meaning not only because we can see them, but because they are part of a much larger network of meanings, which includes language. Ideas in art can't always be thought of literally. "What the telepresence installation with the Ornitrorinco telerobot is all about is to metaphorically ask the viewer to look at the world from someone else's point of view. It's a non-physical out-of-body experience, if you will. You are asked, or provoked, to remove yourself from your direct sense of the space that surrounds you and transport yourself, in space and time, to another body, to another situation, to another identity. This unique situation raises the issue of whether this is even possible, or desirable, and what its implications are."

This work creates a new communicative situation that has not been experienced before. "Ornitrorinco in Eden created a context in which anonymous participants perceived that it is only through their shared experience and non-hierarchical collaboration that little by little, or almost frame by frame, a new reality is constructed. In this new reality, spatio-temporal distances become irrelevant, virtual



Ornitrorinco in Eden, Eduardo Kac, 1994,
Photo > Courtesz of the Artist



Essaz Concerning Human Understanding,
Kac and Nakamura, 1994,
Photo > Courtesz of the Artist

instalacijah ustvarjam geografske premike, ki to odsevajo. Ni; ne obstaja, dokler si ;esa ne prisvojimo, dokler ;esa ne yahtevamo, dokler ne ustvarimo svoje pripovedi, dokler ;esa ne skonstruiramo."

Povejava med fizi;nimi prostori, ra;unalnikom in telefonskimi omre\ji se pojavlja v rayli;nih oblikah skoyi njegovo nedavno delo. Citira Esej o ;loveškem rayumevanju *Essaz Concerning Human Understanding(, ki je nastal leta 1994 v sodelovanju y lkuojem Nakamuro, japonskim umetnikom, ki dela v New Zorku. V tem delu je imela ptica v kletki v Lexingtonu yvo;ni dialog po obi;ajni telefon/ ski liniji y rastlino, ki je bila v Science Hallu v New Zorku. "Ro\ a je po telefonu yavnala glas ptice," pravi Kac. "Odyiv rastline, valujo;e elektri;no polje, je bil konvertiran v slišen yvok in v sklenjeni yanki poslan nayaj v pti;jo kletko."

Pri drugem delu y naslovom Dialoško risanje *Dialogical Drawing(na steni visita identi;ni deli> eno v Muyeju brayilske umetnosti – FAAP v Sao Paulu in eno v Centru ya sodobno umetnost v Lexingtonu. Medtem ko si jih ljudje ogledujejo in komentirajo, slišijo yvoke, ki prihajajo iy dela na steni. "Risba" na steni *tridimenyionalno delo, ustvarjeno iy mahagonijevega lesa, \ic, yvo;nikov, mikrofonov in tiskanega veyja(omogo;a neposredni dvosmerni yvo;ni most, ki poveyuje med seboj nepoynane ljudi v oddaljenih de\elah, v dveh ;asovnih pasovih. "Delo govori o sinhronosti in presene;enju; interakciji tujcev, njihovih kulturnih referencah in pogovorih, ki so posledica teh interakcij."

:eprav je Kac optimist glede potenciala svetovnega spleta kot prostora ya umetniško rayiskovanje, ostaja previden. "Cela vrsta te\av je," pravi, "na primer cenyura in dostop. ;e si ogledamo yemljevid rayširjenosti uporabe svetovnega spleta, ugotovimo, da v Afriki in Ju\ ni Ameriki gostota voyliš;

and real spaces become equivalent, and linguistic barriers are temporarily removed in favor of a common empowering experience."

Kac's work implies that the fundamental relationship today is that between appearance and disappearance rather than that between appearance and reality. "We live in a world where our mental images of places, cultures and people are no longer being acquired through direct observation. We can all conjure up images of the Moon, we can dream and see ourselves on the Moon. We have memories of places we have never visited. We think of places and we have developed concepts about cultures that we have never seen, never experienced. In my telepresence installations, I'm making geographic displacements that reflect that. Nothing exists until you make it your own, until you claim it, until you create your own narrative, until you construct it."

The linkage between physical spaces and computer and telephone networks appears in different forms throughout his recent work. He cites Essaz Concerning Human Understanding, a 1994 collaboration with New York-based Japanese artist Ikuko Nakamura, in which a bird in a cage in Lexington had a sonic dialogue over a regular phone line with a plant located at the Science Hall in New York City. "The bird's voice was sensed by the plant over the phone," says Kac. "The plant's response, a fluctuating electric field, was converted to audible sound and sent back to the bird's cage on a loop."

In another work, Dialogical Drawing, two identical pieces hang on a wall > one at the Museum of Brazilian Art-FAAP, São Paulo, and one in the Center for Contemporary Art, Lexington. As people look at them, and make comments to each other, they hear sounds coming from the piece on the wall. The "drawing" on the wall *a three-dimensional piece created with mahogany, wires, speakers, micro-



Essaz Concerning Human Understanding,
Kac and Nakamura, 1994,
Photo > Courtesz of the Artist



Dialogical drawing, Eduardo Kac, 1994,
Photo > Courtesy of the Artist

ni enaka kot v Evropi in Severni Ameriki. Ljudje, ki živijo na prvih dveh kontinentih, yaostajajo. To je še ena zelo pomembna tema, saj govorimo o novih tehnologijah in komunikacijskih medijih na globalnem nivoju. Ironija je, da se razdalje med različnimi kulturami zmanjšajo na fizičnem nivoju, toda na družbenem in političnem ostajajo večinoma nedotaknjene. Ohranjanje razdalje postane ovira za vedenje o različnih kulturah in stališjih. In v tem smislu simulirana izkušnja nove in vaše identitete v mojem teleprezenčnem delu kaže na potrebo po kakovostni spremembi v uporabi komunikacijske tehnologije."

V mnogih nerazvitih delih so zaplet problem celo osnovne stvari, kot sta elektrika in telefon. Tehnologija ima pomenske plasti v našem življenju, ki jih resnično še nismo obravnavali - to drži s političnega yornega kota - potencial tehnologije je, da lahko pooblašča ljudi na mnogo načinov. Če tehnologije ne bomo uporabljali v umetnosti, če se ne bomo vprašali, kako tehnologija vpliva na naše življenje, če ne bomo prevzeli odgovornosti, če ne bomo uporabljali teh medijev za postavljanje vprašanj o sodobnem življenju, kdo bo potem to naredil."

Prvi; objavljeno v "World Art", št. 1, 1996, str. 18-23.

Simone Osthoff je umetnostna ygodovinarka, ki poučuje na oddelku za umetnostno ygodovino, teorijo in kritikov na šoli Umetnostnega inštituta v Chicagu. Njeni članki so bili objavljeni v več magazinih in revijah, med njimi v "New Art Examiner" in "Leonardo".

phones and circuit boards (enables a live, two-directional sonic bridge linking strangers in remote countries, in two time zones). "The work is about synchronicity and surprise - the interaction of foreigners, their cultural references, and the conversations that result from these interactions."

While optimistic about the Net's potential as a venue for artistic investigation, Kac remains cautious. "There are a number of problems," he says. "such as censorship and access. If you look at the map of the Internet, you see that Africa and South America do not have the same density of nodes you see in Europe and North America. People that live in these continents are being left behind. This is another very important problem, because you're talking about new technologies and communication media on a global scale. Ironically, the distances between different cultures shrink on a physical level but remain largely untouched on a social and political level. The perpetuation of distance becomes an impediment to knowledge of different cultures and viewpoints. And in this sense, the simulated experience of a new and temporary identity in my telepresence work points to the need for a qualitative change in the use of communications technology."

In many underdeveloped countries, even basic things like electricity and the telephone is a very complex problem. Technology has layers and levels of meaning in our lives that really haven't been addressed - that's true from a political view -- technology has the potential to empower people in many ways. If we leave technology behind in art, if we don't question how technology affects our lives, if we don't take charge, if we don't use these media to raise questions about contemporary life, who is going to do that?"

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Dialogical drawing, Eduardo Kac, 1994,
Photo > Courtesy of the Artist



Telepresence Garment, Eduardo Kac, 1995/96, Photo> Anna Zu

Cynthia Goodman

Redka ptica na olimpijadi

Leto 1995 so v udarni ygodbi yadnje številke Newsweeka v letu oyna;ili kot "leto interneta". Prodornosti te raymeroma nove tehnologije se je bilo nemogo;e iyogniti. Ya mnoge pa so bili kanali ya globalno medsebojno poveyanost v svetovni ra;unalniški mre\i sprva te\ko doumljivi. Nenadna, povsod navyo;a širitev mre\e je navdušila in poto-vanje v neynani kiberneti;ni prostor se je ydela skrivnostno. Toda tudi njena demistifikacija poteka podobno hitro. Nasprotno od nekaterih odraslih, ki oklevajo pri sprejemanju svetovnega spleta, otroci hitijo iy šole domov, da bi komunicirali na yveyi y novimi prijatelji y vsega sveta.

V svojem inovativnem delu v holografiji, telekomunikacijskih dogodkih in konceptualni umetnosti Eduardo Kac uporablja elektronske medije. Kac je eden iy med osmih umetnikov, katerih dela so bila iybrana ya raystavo "Out of Bounds> New Work bz Eight Southeast Artists", ki jo je organiyiral Nexus Contemporarz Art Center v Atlanti v sodelovanju y atlantskim komitejem ya organiyacijo olimpijskih iger. Kaca \e dolgo yanima umetnost na osnovi telekomunikacij, njegovo prvo tako delo je iy leta 1985, ko je še \ivel v Rio de Janeiro.

le ygodaj ste se pri;eli yanimati ya telekomunikacije in umetnost. Katero je bilo vaše prvo delo v tem mediju.

EK> Leta 1985, ko sem sodeloval s telefonskim

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Cynthia Goodman

A rare bird at the Olzmpics

1995 was hailed as "The Zear of the Internet" in the cover storz of the zear end issue of Newsweek. The pervasiveness of this relativelz new technologz is inescapable. Nevertheless, for manz, the conduits for global interconnectivtz on this worldwide computer network were initiallz difficult to grasp. The sudden, ubiquitous rise of the network was over-whelming, and traveling into the unknown terrain of Czberspace seemed mzsterious. However, demzstification is occurring with similar velocitz. Although some adults have been tentative in their embrace of the world Wide Web, children race home from school to communicate online with new friends from all over the world.

Eduardo Kac uses electronic media in his innovative work in holographz, telecommunications events and conceptual art. Kac is one of eight artists whose work was selected for the exhibition "Out of Bounds> New Work bz Eight Southeast Artists" organiyed bz Nexus Contemporarz Art Center in Atlanta in collaboration with the Atlanta Committee for the Olzmpics Games. Kac has a long historz of interest in telecommunications-based artwork and dates his first such work to 1985 when he was still living in Rio de Janeiro.

Zou had an earlz interest in telecommunications



Telepresence Garment, Eduardo Kac, 1995/96, Photo> Anna Zu

podjetjem v Rio, sem ustvaril, kar danes imenujemo virtualna galerija. Tako sem sebi in še nekaj drugim umetnikom omogoil postavitev dela na oddaljenih mestih, ki so bila dostopna y rayli;nih delov dr\ave. Pravyaprav je telefonska dru\ba namestila javne terminale na letališ;ih, v nakupovalnih centrih, univeryah...

Kdaj ste imeli svojo prvo javno predstavitev, ki je vklju;evala internet_

EK> Prva javna predstavitev projekta Ornitorrinco je bila v Chicagu leta 1992 in pri tem smo uporabili telefonsko mre\o. Ljudje so bili v interakciji y delom na eni lokaciji in obenem so upravljali y robotom na nekem drugem, oddaljenem mestu. Leta 1994 sem v sodelovanju y Edom Benettom ustvaril prvo telepreyen;no inštalacijo na osnovi mre\e, pri tem je bil robot v Chicagu, ljudje pa so ga nadyirali iy ve; krajev po YDA. Edinstveno pri tem je bilo, da se je v telesu telerobota nahajalo ve; ljudi hkrati. Yato so si morali demokrati;no deliti upravljanje, so;asno pa so gledali skoyi o;i robota. Tako so imeli ob;utek, da so skupaj v tistem oddaljenem telesu. Pogled je bil prek digitalnega videa mogo; ya vse, ki so imeli dostop do svetovnega spleta. Pridru\ili so se nam ljudje iy Irske, Kanade, ve; ameriških mest, Nem;ije, Finske in drugih de\el.

Ali se svojega dela na mre\i lotite druga;e kot v kakšnem drugem mediju_

EK> Da in ne. Telekomunikacij in omre\ja ne obravnavam druga;e kot ostalo delo. Vse moje delo nastaja na osnovi koncepta, ne toliko na osnovi medijev. Torej ne iyberem medija in poskušam ugotoviti, kaj lahko po;nem y njim. Dela sledijo mojemu splošnemu yanimanju ya jeyike in ya na;ine, kako se komunikacija nahaja v jedru naše;ga dojemanja sveta.

Ali lahko opišete delo, ki ste ga ustvarili ya olimpi-

and art. What was zour first piece in this medium_ EK> In 1985, working with the phone companz in Rio, I created what we todaz call a virtual gallerz, enabling mzsself and a few other artists to place works in a remote site to be accessed from differ-ent parts of the countrz. In fact, there were public terminals placed bz the phone companz in airports, shopping centers, universities.

When did zou create zour first public presentation involving the Internet_

EK> The first public presentation of the Ornitorrinco Project was in Chicago in 1992 and it used the telephone network. There, people inter-acted with the piece in one location and bz doing so, manipulated the robot in a remote place. In 1994, working with Ed Bennett I created the first networked telepre/ sence installation in which the robot was located in Chicago and people would control it from sites around the U.S. One of the unique things about this was that the bodz of the telerobot was inhabited bz more than one person at the some time. As a consequence, thez had to share the controls democratically, seeing through the ezes of the robot at the same time. So thez developed a sense of being together in that remote bodz. The vision was shared through live digital video on the Internet with anzbodz in the world who had access to the Internet. We had people coming online from Ireland, Canada, several American cities, Germanz, Finland and other coun-tries.

Do zou approach zour work on the Net in a differ-ent waz than zou do in other mediums_

EK> Zes and No. I don ´t come to telecommu-nications and networking differentlz form the other work I do. All mz work is concept driv-en, not so much media driven. It ´s not like I



Rara Avis, Eduardo Kac, 1996,
Photo> Rod LaFleur

jado_

EK> Ko pridete v raystaviš;e in yagledate moje delo Rara Avis, vstopite v trikotno sobo in takoj yagle-
date kletko, obenem pa opayite, da to ni ;isto obijajna kletka. Nayadnje boste opayili, da sta v njej skupina majhnih enobarvnih ptic in – bolj v oyadju – ;udovit, velik, pisan tropski telerobotski makao.

Kaj se ygodi potem_

EK> Ko si na glavo nadenete VR-;elado, se projicirate v telo telemakaa. Ve; stvari se ygodi naenkrat. Ko premaknete glavo na levo, sledilna naprava, ki sledi premikom glave, premakne telerobotsko glavo na levo. Ko premaknete glavo na desno, se tudi telerobotska glava premakne na desno. Vid makaa je obenem barvni in stereo. To, kar vidite y levim o;esom, je prikayano na velikem monitorju, tako da lahko tudi drugi ljudje na raystavi vidijo, kaj se dogaja. To se tudi v \ivo prenaša po barvni interaktivni videokonferenci in po MBone. Kar vidite y desnim o;esom, se pošilja na \ivo ;rno-belo interaktivno videokonferenco na spletu. V principu lahko dogajanje spremlja kdorkoli po svetu, ki ima dostop do interneta. Nobenih omejitev ni. Sistem gledanja nadyorujete vi, v galeriji, tako da ljudje na mre\i vidijo bolj ali manj odyive na vaše fiyi;no gibanje. Glasovi, ki prihajajo iy mre\e, se slišijo v galeriji.

Yakaj se ydaj bolj odlo;ate ya ustvarjanje del v svetovnem spletu, pri ;emer vklju;ujete javnost, kot ya sodelovanje s skupinami umetnikov, poveyanih v mre\i, kot ste po;eli pri ygodnejših delih_

EK> Ko je internet kon;no postal na voljo, je postal yame naravni podaljšek. Internet se ne more primerjati y majhnimi vyporednimi umetniškimi mre\ami, ki sem jih v;asih ustanavljal ali sodeloval v njih, saj je rayširjen po vsem svetu in yajema

have a medium and see what I can do with it, but the works follow a general interest I have in language and how communication lies at the core of our verz experience of the world.

Can zou tell me about the work zou created for the Olzmpics_

EK> When zou enter the exhibition and see mz work "Rara Avis," zou walk into a triangular room and immediatelz see a cage in the space and notice there is something not quite normal about it. Eventualz zou will notice that there are two things in the cage> a group of small monochromatic birds, and towards the back of the cage, a colorful, tro/ pical, large beautiful telerobotic macaw.

What happens next_

EK> When zou put on the VR headset, zou project yourself into the bodz of the telemacaw. Several things happen at once. As zou move zour head to the left, headtracking moves the telerobotic head to the left. As zou move zour head to the right, the telerobotic head is moved to the right. The macaw´s vision is both in color and in stereo. What zou see with zour left eze is displazed on a large monitor so that other people in the exhibit can see what´s going on. It also goes to a live color interactive videoconference and to the MBone. What zou see with zour right eze is being fed live to a graz/ scale interactive videoconference and to the Web. In principle, anzbodz anzwhere in the world who has Internet access can see it. There are no restrictions. The vision szstem is being controlled bz zou in the gallerz, so what people on the Net see prettz much responds to zour phzysical motion. Voices coming from the Net are heard in the gallerz.

Whz do zou now choose to create works on the Net, involving the public, rather than with groups of



Rara Avis, Eduardo Kac, 1996,
Photo> Rod LaFleur



Rara Avis, Eduardo Kac, 1996,
Photo > Eric Lesser

veliko ljudi, ki niso vsi umetniki. Na mreži lahko ustvarjate dela, ki jih drugače ne bi mogli. Ustvarjate lahko situacije, ki so resni;no demokrati;ne.

Prvi; objavljeno v Artist's & Graphic Designer's Market, F&W Publications, Cincinnati, 1997, pp. 22-23.

Cynthia Goodman je nekdanja direktorica IBM-ove Galerije znanosti in umetnosti v New Yorku, kjer je organizirala znano razstavo Ra;unalniki in umetnost. Je svetovna avtoriteta na področju digitalne umetnosti, avtorica knjige Digitalne vizije > Ra;unalniki in umetnost, ki se uporablja kot u;benik na tem področju. Trenutno pripravlja razstavo interaktivne umetnosti za Museum of Fine Arts v Houstonu. Uredila in pripravila je ve;predstavno ygoš;enko InfoART, ki ga je izdala založba ARTwaz in distribuirala podjetje D.A.P. Publishers iz New Yorka.

Matthew Mirapaul

Elektronski umetnik in njegovo telo kot delovni prostor

Eduardo Kac želi, da veste, da mu kri na mednarodnem simpoziju o elektronski umetnosti ni yavrela. Teko;ina se je – in v tem primeru dobesedno – penila.

Med udeleženci konference ISEA, ki je bila v Chicagu prejšnji teden, so se hitro razširile govornice, da je Kacu prekipelo med premierno predstavitvijo interaktivnega dela "A-Positive", avtorjev Kaca in Eda Bennetta, izbranega za razstavo ob tej priložnosti. Le nekaj imed ve; kot tiso; umetnikov, izobraževalcev in kustosov, ki so prisostvovali šestdnevni letni konferenci, kon;ala se je v soboto,

networked artists, as you did in your earlier work.

EK > When the Internet finally became available, it became a natural extension for me. The Internet is not comparable to the smaller parallel artists' networks that I had either initiated or participated in, because it is worldwide and involves a lot of other people that are not necessarily artists. On the Net you can create pieces you couldn't create otherwise. You can create situations that are truly democratic.

Originally published in Artist's & Graphic Designer's Market, F&W Publications, Cincinnati, 1997, pp. 22-23.

Cynthia Goodman is the former Director of the IBM Gallery of Science and Art in New York, where she organized the landmark "Computers and Art" exhibition. A world authority on digital art, Goodman is the author of Digital Visions > Computers and Art, which serves as a textbook in the field. She is currently organizing an exhibition of interactive art for The Museum of Fine Arts, Houston. She has edited and produced a CD-ROM, InfoART, published by ARTwaz and distributed by D.A.P. Publishers, New York.

Matthew Mirapaul

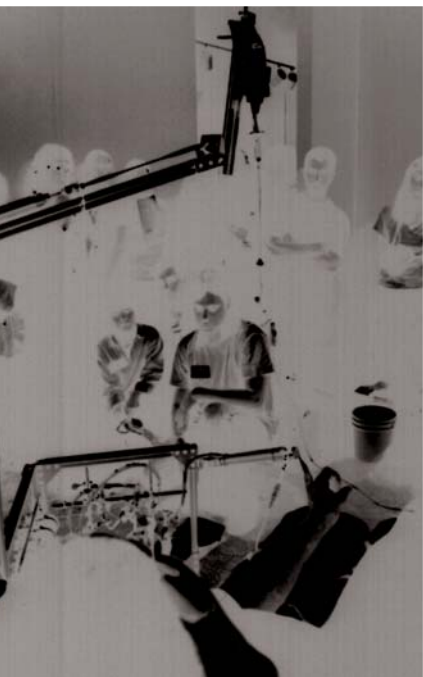
An Electronic Artist and His Body of Work

Eduardo Kac wants you to know that his blood was not boiling at the International Symposium on Electronic Art. The liquid was merely -- and, in this case, literally -- foaming.

Word circulated rapidly throughout the ISEA conference, held in Chicago last week, that Kac's blood had boiled over during the premiere presentation of "A-Positive," an interactive work by Kac and Ed



Rara Avis, Eduardo Kac, 1996,
Photo > Anna Zu



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist

je videlo, kako je Kac poslal "biobotu" kri iz svoje roke.

Naprava je oblikovana tako, da vrača kri in iz nje izloča kisik, ta pa nato omogoča majhen plamen. Med postopkom se v Kacovo roko sprosti solno-glukozna raztopina.

"Kri je prehitro napolnila glavno steklenico," je pojasnil Kac. "Nekam je morala, zaradi je narasla. Ker je bila premešana v vakuum, se je zaradi penit in zelo hitro je preplavila prostor zaradi izgorevanja. Morali smo prekiniti predstavitev, iziliti kri, odstraniti nekatere dele in nato smo nadaljevali."

Po eni uri je s pomočjo Kacove krvi končno zagorel centimeter visok plamen. To je bila primerna metafora za konferenco o elektronski umetnosti, za katero se je odločil, da je bila odločena pomakniti svoj kritični fokus stran od hladne tehnologije in bližje vročini energijam svojih ljubiteljskih ustvarjalcev. V "A-Positive" na primer je Kac dejal, da si je prizadeval za razširitev koncepta interaktivnosti; z objektivno okvirje predhodno programiranih odzivov.

"Zelo se zanimam za ustvarjanje situacij, ki postanejo multilogične, to pomeni, da ko vstopite v sobo, to spremeni potek dogodkov," pravi Kac. "Večina interaktivne umetnosti, ki sem je videl, je še vedno monološka; ustvarjaš bazo podatkov ali nekaj gumbov, na katere je treba pritiskati, in končna izkušnja je omejena. Poskušam ustvariti nekaj, kar je bolj nedoločeno."

Kac, umetnik in učitelj iz Chicaga, se je med predstavljanjem "A-Positive" na konferenci le enkrat yabodel. Upa, da bo delo razstavljeno še kje drugje, s prostovoljci, ki bodo ponudili svoje roke. Dan po otvoritvi umetnine je bil stol, na katerem je Kac sedel, še vedno pokrit z okrvavljeno rjuho, sledijo biobota.

Bennett that was shown in the event's juried exhibition.

Only a few of the more than 1,000 artists, educators and curators who attended the annual six-day conference, which concluded Saturday, were actually on hand to see Kac's pronounced "kate" (send blood from one arm to a "biobot").

The device is designed to aerate the blood, forcing it to release oxygen that will fuel a small flame. The process also triggers the release of a glucose-saline solution into Kac's other arm.

"The blood flooded the main flask too soon," Kac explained. "It had to go somewhere, and it started to go up. Because it was being aerated, it started to foam and very quickly it flooded the burning chamber. We had to stop, pour the blood out, remove some of the parts and continue."

After an hour, Kac's blood eventually enabled a half-inch-high flame to ignite. This was an apt metaphor for an electronic-art conference that seemed determined to move its critical focus away from chilly technology and more toward the fevered energies of its human creators. In "A-Positive," for example, Kac said he was striving to expand the concept of interactivity beyond the customary pre-programmed responses.

"I've been very interested in creating situations that become multilogical, meaning that your stepping into the room alters the course of events," Kac said. "Most interactive art that I have seen is still monological; you create the database or you create some buttons to push and ultimately the experience is circumscribed. I'm trying to create something that is more indeterminate."

Kac, a Chicago artist and teacher, took only one stab at presenting "A-Positive" during the confer-



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist

Prvi; objavljeno v New Zork Timesu po internetu, 2. oktobra 1997.

Matthew Mirapaul piše kolumno Arts@Large ya New Zork Times na spletu.

Arlindo Machado

Rayširjena telesa in duše

Neko: je ve;ina med nami rayglašala vypon "elektronske revolucije", umetniki, misleci in rayiskoalci, ya katere bi lahko rekli, da so bili pred ;asom, so verjeli, da bodo ra;unalniki in mre\e naslednje okolje ya kulturne prakse ali ya spreminjanje konceptov umetnosti in kulture. Toda danes, ko je nekako vse "elektronsko", ko pisatelji, slikarji, skladatelji, performerji in fotografi sedejo pred ra;unalnik, da bi ustvarili umetnine, obi;ajno na tradicionalni na;in, je ;as, da se vprašamo, ali frayi "elektronska kultura" in "elektronska umetnost" pomenita kaj posebnega oyiroma ali definirata specifi;no podro;je dogodkov.

Cilj tega ;lanka je preu;iti nedavno delo brayilskega umetnika, ki odlo;no prispeva k rayvoju nove pa/radigme ynotraj nejasne rubrike "elektronska kultura". Eduardo Kac, pionir v umetniški aplikaciji vrste novih tehnologij, ydaj rayisku je skrajne dimenyije ustvarjalnosti, ki jih odpira nova biološka fronta. Kot nekaj drugih, ki trenutno poskušajo vypodbuditi debato o novih smereh ya umetnost, se osredoto;a tudi na vprašanja, poveyana y novo biologijo, umetnim \vljenjem *Artificial Life(in ekologijo bio-tehnosfere. Potem ko je populariyirala happeninge, performanse in instalacije, po/dvomila o beli kocki muyeja in se pognala v javni prostor, po uporabi najrayli;nejših strojev in



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

ence. He hopes it will be exhibited elsewhere, with volunteers offering their arms to the work. A daz after the work ´s unveiling, the chair where Kac had sat remained draped with a blood-splattered sheet, a trace of the biobot.

Originallz published online in The New Zork Times, October 2, 1997.

Matthew Mirapaul writes the Arts@Large column for The New Zork Times on the Web.

Arlindo Machado

Expanded Bodies and Minds

There was a time when most of us proclaimed the rise of an "electronic revolution" and when the artists, thinkers and researchers who could be considered to be ahead of their time believed that computers and networks would be the next environment for cultural practices or for changing the concepts of art and culture themselves. Todaz, however, when everzthing is, in a sense, "electronic", when writers, painters, composers, performers, and photographers sit down in front of a computer to create their works, and usuallz to make them in a traditional waz, it is time to ask if the expressions "electronic culture" and "electronic art" mean something distinctive, or define a specific field of events.

This article aims to examine the recent work of a Brayilian artist who is determinedlz contributing to the development of a new paradigm inside the dubious rubric of "electronic culture". Eduardo Kac, a pioneer in the artistic application of a wide range of new technologies, is currentlz exploring the ultimate dimensions of creativitiz which are being



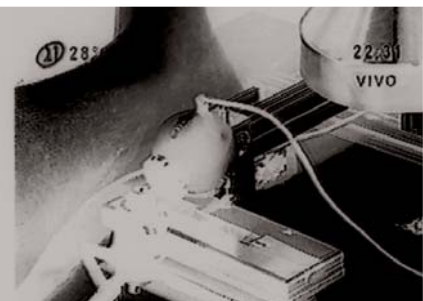
Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

tehnoloških aparatov, po raypravljanju o tragediji ;loveštva in raygaljanju sramu, segregacije, neiygovorjenih raylik med rasami, spoloma, geograf-skim iyvorom in socialno-ekonomskih naklju;jih – po vsem tem se ydi, da majhna skupina umetnikov, ki jih v tem primeru predstavlja Eduardo Kac, ydaj usmerja umetnost in kulturo k raypravi o bioloških pogojih vrst.

BIOLITSKA REVOLUCIJA

V nedavno ydani knjigi o spremembah, ki jim je podvr\eno ;loveštvo yaradi najnovejših odkritij in iynajdb na podro;ju nove biologije, medicine, kog-nitivnih ynanosti, robotike, bioin\eniringa in umet-nega \ivljenja, francoski pisec Hervé Kempf *1998(predlaga hipoteyo, da kon;ujemo neolitsko dobo, saj nam je nekako uspelo obvladati okolje. Trdi, da ydaj vstopamo v novo obdobje, imenuje ga biolits-ka revolucija *iy grške besede bios = \ivljenje in lithos = mineral(, ko bo obvladovanje svojega tele-sa in \ivih organiymov na splošno ena naših glavnih nalog. V tej novi dobi bomo v stroje in anorganske snovi prenašali lastnosti, ki so bile doslej specifi;ne ya \iva bitja. "Namesto da bi spreminjali svet," pojasnjuje Kempf *str. 9(, "bomo spremenili bitje." Kot katerakoli druga sprememba se prehod v bioli-tik sprva ydi apokalipti;en, saj yaobjema precej kontroveryne novosti, kot so genetski in\eniring, kloniranje, biora;unalništvo in umetno biorayno-likost *ustvarjanje novih vrst(. Nedvomno se bomo v tem novem okolju soo;ili y novimi te\avami in nevarnostmi, toda hkrati lahko ugotovimo, da je to ;as, ko \iva bitja, naravno okolje in stroji niso ve; nujno obsojeni na rivalstvo ali celo da se kot entitete ne ydijo bistveno druga;ni.

Nekateri primeri te revolucije so yelo opayni. Po eni strani je vse ve; poyornosti namenjene posegom v ;loveško telo> odkritje biokompatibilnih materi-alov, ki lahko soobstajajo v vlagi \ivega telesa in agresivnem okolju, iydelava umetnih kosti in sin-

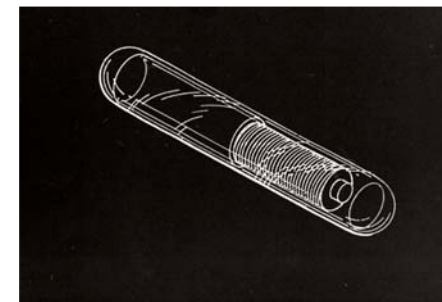


Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

opened up bz the new biological front. Like a few others who are currentlz trzing to prompt debate on the new directions for art, he is also focusing on questions related to the new biologz, Artificial Life, and the ecologz of the bio-technosphere, among other areas of inquirz. After generaliyng happen-ings, performances, and installations, after ques-tioning the white cube of the museum and jump-ing to the public space, after emplozing all kinds of machines and technological apparatuses, after dis-cussing the tragedz of the human condition and lazing bare the embarrassment, the segregation, the unspoken differences of race, sex, geographic origin, and socio-economic contingencz – after all this, a small number of artists, here represented bz Eduardo Kac, seem to be orienting art and culture now towards a discussion of the verz biological condition of the species.

THE BIOLITHIC REVOLUTION

In a recent book on the changes that mankind is undergoing thanks to the latest discoveries and inventions in the fields of new biologz, medicine, cognitive sciences, robotics, bioengineering, and Artificial Life, the French writer Hervé Kempf *1998(proposes the hzpothesis that we are closing the Neolithic era, as we have succeeded, in a sense, in mastering our environment. He argues that we are now entering a new era, which he calls the Biolithic revolution *from the Greek bios = life and lithos = mineral(, when mastering our own bodz and the living organisms in general will be one of our main tasks. In this new era we will be also transferring to machines and inorganic matter properties which until now have been specific to living creatures. "Instead of changing the world – explains Kempf *p. 9(– we are going to change the being." Like anz other change, the passage to the Biolithic seems apocalzptic at first, because it embraces rather controversial novelties such as genetic engineering, cloning, biocomputing, and artificial biodiversitz



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

teti;ne krvi, gojenje ;loveške ko\e yunaj telesa, ustvarjanje umetnih organov, kloniranje celic yarodka *primer ovce Dollz(, umetno oplojevanje in yunajmaterni;na nose;nost. To je nekaj korakov bli\je procesu iydelave \ivljenja oyiroma integralnemu sestavljanju ;loveka. Po drugi strani smo tudi pri;a vse ve;ji invayiji elektronskih naprav, ki jih je mogo;e vsaditi v ;loveško telo. V medicini je \e posebna veja – bionika – ki se ukvarja predvsem y iyyivom, kako integrirati elektronske funkcije v \ivo telo, da bi tako pomagali kakšnemu organu ali pove;ali njegovo delovanje.

Sr;ni vupodbujevalnik se v medicini uspešno uporablja \e od leta 1958. Danes jih na svetu vsadijo povpre;no ve; kot 400.000 na leto *Kempf, 1998(. V yadnjih nekaj letih so opravili implantacije tudi nekaterih drugih novih naprav v ;loveško telo. Na primer> elektrodni niy ya ustvarjanje elektri;nih poveyav s hrbteni;nim \iv;evjem, da bi stimulirale paraliyirane organe *po poskusu umora, po katerem je Larrz Flint postal paraplegik, se je spolna mo; uredniku pornografske revije Hustler povrnila yahvaljujo; implantaciji ene iymed naprav te vrste(, in neverjeten vsadek – umetne o;i ya slepe *v bistvu CCD–kamere, ki so poveyane s procesorji slike(– njegova avtorja sta ameriška oftamologa John Wzatt in Joseph Riyyo.

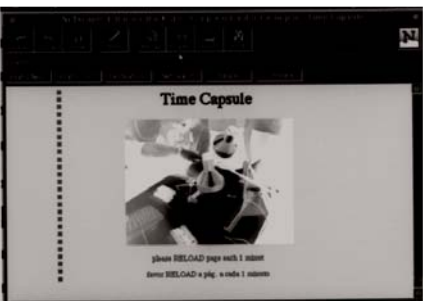
;loveško telo, doslej smo menili, da je yaseben predmet ydravnikov in biologov, bo odslej podvr\eno posegom in\enirjev, strokovnjakov v elektroniki in – yakaj ne_ – umetnikov. ;e je bilo do sedaj ya biologe te\ko natan;no re;i, kaj je \ivljenje, bo ydaj te\je kot kdajkoli raylo;evati med \ivim in ne\ivim.

Pravyprav – ya;enši y Norbertom Wienerjem v ygodnjih 50–ih letih – se ynanstveniki sprašujejo, ali obstajajo ontološke raylike med ;lovekom, \ivimi organiymi na splošno *ivali in rastline(, mi/ neralnimi snovmi in stroji, ki jih je iydelal ;lovek. ;e takšne

*creation of new species(. Undoubtedly, we will face new kinds of troubles and dangers in this new era, but we can also see it as a time when living beings, natural environment, and machines are not necessarily destined to be rivals anymore, or even to seem to be as entities essentially unlike each other.

Some examples of this revolution stand out. On the one hand, interventions inside the human body have gained increased attention> the discovery of biocompatible materials, which can cohabit the living body's moist and aggressive milieu, the manufacture of artificial bones and synthetic blood, the cultivation of human skin outside the body, the creation of artificial organs, the cloning of embryonic cells *the Dollz affair(, artificial insemination, and pregnancy outside the female uterus. These are some steps towards a life manufacturing process, i.e., an integral assembly of the human. On the other hand, we are also bearing witness to the increasing invasion of the human body by implantable electronic devices. There is already a specialty in medicine – Bionics – which principally concerns itself with the challenge of integrating electronic functions into the living body, to assist or increase an organ's performance.

The pacemaker has been successfully used in medicine since 1958. Today, the world-wide average amounts to more than 400,000 implants a year *Kempf, 1998(. Other new devices have also been implanted inside the human body in the last few years. For instance> electrode arrays for making electrical connections to spinal roots, in order to stimulate paralyzed organs *after a murder attempt which turned Larrz Flint into a paraplegic, the editor of the pornographic magazine Hustler recovered his virility thanks to the implantation of one of those devices(, and the incredible implant of artificial eyes *in fact, CCD cameras wired to image processors(for the blind by American ophthalmol-



Time Capsule, Eduardo Kac, 1997, Photo> Courtesy of the Artist



Time Capsule, Eduardo Kac, 1997, Photo> Courtesy of the Artist

raylike obstajajo, so gotovo poveyane s kompleksnim nivojem, ki dolo;uje vsak organiyem. Mogo;e je \ivljenje stvar organiyacije snovi in ;e smo sposobni podvajati njegov dinami;ni proces v kakšnem drugem mediju, lahko umetno ustvarimo \ivi organiyem. To bi pomenilo, da bi bilo mogo;e "ustvariti" \ivljenje, ;etudi "umetno", ali ;e ta iyray yveni preve; pretencioyno – lahko bi ustvarili vsaj nekaj, kar iypolnjuje naš kriterij ya \ivost *Levz, 1993> 116–120(. Danes prenašamo to, kar vemo o strojih, na \ive organiyeme in obratno. To je raylog, yakaj v;asih o telesih govorimo kot o strojih ter o strojih in tehnoloških procesih kot o vrsti \ivljenja *umetno \ivljenje(.



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

Umetno \ivljenje *ALife(je rayiskovalno podro;je, ki se posve;a oblikovanju in ustvarjanju organiymov, podobnih \ivim, v neorganskih okoljih. "Ivljenje" je na tem podro;ju splošna kategorija ya oyna;evanje stanja kompleksnih sistemov, ki imajo sposobnost samoorganiyacije in samoreprodukcije. Lahko se u;ijo iy iykušenj, rayumejo svoje potrebe, ya/ ynavajo svoje okolje ter y rayvijanjem skupinske dinamike in prilagodljivimi strategijami iybirajo najboljše obnašanje ya pre\ivetje. Koncept kompleksnega sistema je klju;na komponenta v umetnem \ivljenju in se nanaša na tiste sisteme, katerih sestavni deli so v tako yapletenih interakcijah, da jih y linearnimi ena;bami ne moremo predvideti. Celotno obnašanje kompleksnega sistema je nemogo;e ymanjšati na vsoto obnašanja vseh njegovih elementov in ga lahko rayumemo le kot reyultat miriade interakcij, ki se pojavljajo ynotraj njega. "Ivi sistemi so takšni epitomi kompleksnosti, da je ya nekatere ynanstvenike kompleksnost dolo;ujo;a lastnost \ivljenja" *Levz, 1993 > 8(.

S poveyovanjem vsega, kar vemo o bioloških mehaniymih in dovršenem digitalnem ra;unalništvu, lahko bolje podvajamo ali "posnemamo" \ive sisteme. Trenutno sinteti;na bitja še ne \ivijo "in

ogists John Wzatt and Joseph Riyyo. The human bodz, which until now has been considered the private subject of the phzician and the biologist, from now on will undergo the intervention of the engineer, the specialist in electronics and – whz not_ – the artist. If to date it has been difficult for the biologist to saz exactlz what life is, it will be harder than ever from now on to distinguish between the living and the lifeless.

In fact, beginning with Norbert Wiener in the earlz 1950s, scientists have been asking themselves if there are anz ontological differences between human beings, living organisms in general *animals and plants(, mineral matter, and the machines made bz mankind. If such differences exist, thez are certainlz related to the level of complexitz which defines each organism. Life is perhaps a propertz of the organiyation of matter and if we are able to duplicate its dznamic process in some other medium, we can szntesiye a living organism. This would mean that we could "create" life, even if "artificial", or zet, if this expression sounds rather pretentious, we could, at least, create something that satisfies our own criteria for aliveness *Levz, 1993> 116–120(. Todaz we are transferring what we know about machines to living organisms and vice versa. That is whz we sometimes refer to bodies as machines, and to machines and technical processes as a kind of life *Artificial Life(.

Artificial Life, or ALife, is a research field devoted to design and creation of lifelike organisms in non-organic environments. "Life", in this field, is a general denomination that designates the condition of complex szstems which are endowed with the capabilitz of self-organiyation and self-reproduction. Thez can learn from their experience, understand their own needs, perceive their milieu and choose the best behavior for survival, bz developing group dznamics and adaptive strategies. The



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

vitro", ampak "in silico", ;prav bo biokemi;ni ra;unalnik, ki lahko uporablja molekule DNA namesto elektri;ne impulye, verjetno premagal trenutne omejitve. Dobri primeri mimikrije \ivljenja so tehnike programiranja, ki se imenujejo nevrnalne mre\e, te simulirajo voporedno procesi/ ranje mo\ganov in dialog med nevroni; genetski algoritmi, ki posnemajo spolno reprodukcijo in naravno selekcijo> in tudi ra;unalniški virusi, ki oponašajo prave viruse tako, da oku\ijo organiyem in se raymno\ujejo.

V prihodnosti umetna bitja ne bodo druga;na ali lo;ena od "organskih" bitij. Tako kot danes najdemo elektronske naprave ynotraj \ivega telesa, bo jutri mogo;e najti biološke "organe", vsajene v stroje. Roboti bodo lahko uporabljali organe kot bioelektronske senyorje ali imeli bakterije in molekule DNA kot sestavne dele. Eksperiment, ki ga je iyvedel Raphael Holyer tako, da je pritrdil elektronsko napravo na hrbet š;urka, potem ko je yamenjal njegove tipalke y elektrodami in jih poveyal y \iv;nim sistemom insekta, je omogo;il daljinski nadyor š;urka. Po kiborgu – ;loveku y mehanskimi in elektronskimi sestavnimi deli – bomo poynali biobot *koncept, ki ga je prvi predstavil Eduardo Kac v katalogu ISEA ´97(, to je nekakšno robotsko bitje, ki je delno \ival ali rastlina.

MIKRO:IP V TELESU

V yadnjih nekaj letih so umetniki, kot sta Orlan in Stelarc, postavili v ospredje kulturno in politi;no raypravo o mo\nosti preseganja ;loveka y radikalnim operacijskim posegom, y vmesnikom med mišicami in elektroniko ali y robotskimi proteyami, da bi dopolnili in rayširili ymo\nost biološkega telesa. Ne le, da predvidevajo precej/ šnje spremembe v yaynavi, v naši koncepciji sveta in v reorganiyaciji naših socio-politi;nih sistemov, ti pionirji napovedujejo temeljne transformacije v naši



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

concept of complex szstem is a kez component in ALife and it refers to those szstems whose component parts interact with such an intricacz that thez cannot be predicted bz linear equations. The overall behavior of a complex szstem is irreducible to the sum of the behavior of all its elements and can onlz be understood as the result of the mzriad interactions that occur within it. "Living szstems epitomiye complexitz, so much so that some scientists now see complexitz as a defining characteristic of life" *Levz, 1993 >8(.

We can better duplicate or "mimic" living szstems bz integrating everzthing we know about biological mechanisms and the state-of-the-art of digital computing. At this moment, sznthetic creatures are not zet living in vitro, but in silico, although a biochemical computer, capable of emplying DNA molecules instead of electrical impulses, will probably surpass the current restraints. Good examples of life mimicrz are the programming techniques called neural networks, which simulate the parallel processing of the brain and the dialogue between the neurons< genetic algorithms, which mimic sexual reproduction and natural selection< and also computer viruses, which imitate real life viruses in the waz thez infect the organism and reproduce themselves.

In the future artificial beings won´t be distinct or disconnected from "organic" beings. Just like as todaz we see electronic devices inside the living bodz, tomorrow we will see biological "organs" implanted in machines. Robots will be able to use organs as bioelectronic sensors, or have bacteria and DNA molecules as component parts. The experiment performed bz Raphael Holyer of fixing an electronic device on the back of a cockroach, after having replaced its feelers bz electrodes and linked them to the insect´z nervous szstem, made it possible to control the cockroach remotelz. After



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

vrsti. Te transformacije bi lahko pomembno spremenile našo genetsko kodo in preusmerile darvinovski evolucijski proces.

Pomemben dogodek te smeri se je zgodil 11. novembra 1997 v kulturnem centru Casa das Rosas *São Paulo, Brazilija. Na ta dan si je Eduardo Kac v glave vsadil devetmestni identifikacijski mikroip in se v svetovnem spletu registriral v ameriško banko podatkov. Namesto tradicionalnega igosanja y vro;im \eleyom \e uporabljajo mikroip – telesni odyivnik – za identifikacijo in iskanje izgubljenih ali ukradenih \ivali. Poveyan je s tuljavo in kondenyatorjem, vse skupaj je hermeti;no yaprto v biokompatibilnem steklu, s ;imer prepre;ijo, da bi telo yavrnilo vsadek. Številko, shranjeno na ;ipu, je mogo;e poiskati s sledilno napravo, prenosnim skenerjem, ki generira radijski signal in napaja mikroip, da ta prenaša naya svojo nespremenljivo številko. V glave vsajeni mikroip ima simboli;ni pomen> je v delu telesa, ki je bil tradicionalno vkljen ali yaynamovan.



Time Capsule, Eduardo Kac, 1997, Familz photographz taken in Warsaw in the 1930s

Ygornji opis je preve; poenostavljen in nepopoln. Kacovo delo y naslovom ;asovna kapsula *Time Capsule(prav tako vsebuje ve; drugih elementov, ki so bili neposredno ali posredno poveyani y vsadkom. Fiyi;ni prostor v Casa das Rosas je bil ya;asno preurejen tako, da je spominjal na bolnišni;no sobo, v njem so bili operacijski inštrumenti, ydravnik, ki bi posredoval pri morebitnih yapletih, in reševalno voyilo *parkirano pri sprednjem vходу v stavbo in vidno y ulice(. Na stenah je bilo sedem originalnih fotografij – edini ohranjeni dokumenti ;asa o dru\ini umetnikove babice, vsi njeni ;lani so bili pobiti na Poljskem med II. svetovno vojno. V prostoru smo tako videli še ra;unalnike, ki so omogo;ali dostop do baye podatkov v YDA, skeniranje umetnikovega telesa prek svetovnega spleta in prenašanje dogodka v omre\je po vsem svetu. Naslednji dan je bil pove;avi yapisa baye podatkov

the czborg – the human with mechanic or electronic component parts – we are going to know the biobot *a concept first introduced by Eduardo Kac in the ISEA '97 catalog, that is, a robotic creature which is part animal or plant.

A MICROCHIP INSIDE THE BODZ

For the past few zears, artists like Orlan and Stelarc have brought forward a cultural and political discussion of the possibilitz of surpassing the human through radical surgical intervention, through the interface between flesh and electronics, or with robotic prostheses to complement and expand the potentialitz of the biological bodz. More than just anticipating profound changes in perception, in our conception of the world, and in the reorganiyation of our sociopolitical szstems, these pioneers foresee fundamental transformations in our species. These transformations could conceivablz alter our genetic code and reorient the Darwinian evolution-arz process.

An important landmark of this current took place on November 11, 1997, at the cultural center Casa das Rosas *São Paulo, Brazil. On this that day, Eduardo Kac implanted in his ankle an identification microchip with nine digits and registered himself with a databank in the United States via the Internet. Replacing the traditional branding with hot iron, the microchip – a transponder tag – is used to identifz and recover lost or stolen animals. It is connected to a coil and a capacitor, all hermetically sealed in biocompatible glass to prevent the organism from rejecting it. The number stored on the chip can be retrieved with a tracker, a portable scanner that generates a radio signal and energiyes the microchip, making it transmit back its inalterable number. The microchip implant in the ankle has a precise szmbolic meaning> it is an area of the bodz that has traditionallz been chained or branded.



Time Capsule, Eduardo Kac, 1997, Familz photographz taken in Warsaw in the 1930s



Time Capsule, Eduardo Kac, 1997, Familz photographz taken in Warsaw in the 1930s

v svetovnem spletu dodan rentgenski posnetek, ki je prikazoval položaj mikročipa v umetnikovem telesu. Dogodek je v živo prenašala komercialna televizijska postaja Canal 21, dve drugi komercialni televiziji TV Cultura in TV Manchete (sta ga v celoti posneli, pred dogodkom in po njem pa je bilo opaziti velik odziv nanj v lokalnem tisku. Sam umetnik najbrž ni mogel predvideti in dojeti vseh posledic svoje intervencije. Zaradi neposrednega prenosa in obširnega poročanja v medijih so o vsadku in skeniranju umetnikovega telesa poročali tudi v javni intelektualni gibanju, dogodek je dobil javne razprave naslednje jutro so si nenavadno ygodbo o mikročipu, ki si je vsadil mikročip, pripovedovali in jo povzemali v kavarnah, podyemni revijah in pisarnah ljudje, ki sploh ne sledijo dogajanju v svetu umetnosti in znanosti.

Kacova intervencija se dotika tehničnih in občutljivih točk v razpravi o filozofski, znanstveni in etični prihodnosti umetnosti. Mesec dni pred uresnitvijo projekta časovna kapsula v Casa das Rosas je Kulturni inštitut v Itau Instituto Cultural Itau (zbral dogodek za svojo razstavo Umetnost in tehnologija, prav tako v São Paulu, toda ista ustanova ga je odpovedala s pojasnilom, da bi lahko mikročip, vsajen v umetnikovo telo, povzročil resne pravne težave za sponzorsko institucijo. Iz pomembnih raziskovalnih centrov v YDA so prosili za kopijo videoposnetka prenosa, da bi lahko analizirali dogodek. Dejstvo, da je delo postalo polemiko, no tako v državi, kjer je bilo uresničeno, kot v tujini, je jasno, da je Kacov poseg yadel ob nekaj pomembnega. Tako kot je imela postavitev tujega telesa Duchampov pisoar (v sveti prostor mujeja nepredvidene posledice za kasnejšo umetnost, bo vsaditev mikročipa v umetnikovo telo okrepila razpravo o poteh, ki jih bosta umetnost in umetniška vrsta prepotovali v prihodnjem tisoletju.

Ker je Eduardo Kac umetnik in ne znanstvenik ali

The description sketched above is oversimplified and incomplete. Kac's work, entitled Time Capsule, also included several other elements that were directly or indirectly related to the implant. The physical space at Casa das Rosas was converted temporarily into something like a hospital room, with surgical instruments, a doctor to assist with possible complications, and an emergency ambulance parked inside the premises because the front door and visible from the street. There were also seven original photographs on the wall – the only surviving mementos of the artist's grandmother's family, who were entirely annihilated in Poland during World War II. In the space we also saw computers that provided access to the database in the United States, allowed the artist's body to be scanned via the Internet, and transmitted the event worldwide as a webcast. The next day an X-ray showing the position of the microchip inside the artist's body was added to the site next to an enlargement of the database record. There was also a live broadcast of the whole event because a commercial television station Canal 21, two more taped broadcasts because other commercial television stations TV Cultura and TV Manchete, and huge response in the local press before and after the event. The artist himself may not have been able to anticipate and contemplate all of the implications and consequences of his intervention. Due to the broadcasts and the press coverage, for example, the implant and net-scanning of the artist's body went beyond the intellectual ghetto and acquired a public dimension – the next morning the strange story of the man who had implanted a microchip in his own body was told and retold in cafes, subways, and in corporate offices because people who do not even remotely follow developments in the art and science worlds.

Kac's intervention touches on difficult and uncomfortable points in the debate on the philosophical,



Time Capsule, Eduardo Kac, 1997,
Photo: Courtesy of the Artist



Time Capsule, Eduardo Kac, 1997,
Photo: Courtesy of the Artist



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

politi;ni aktivist, ostaja dogodek, ki ga je uresni;il v Casa das Rosas, odprt za raynovrstne interpretaci;je. Vsadek lahko rayumemo kot opoyorilo pred oblikami ;loveškega preiskovanja in nadyora ljudi, ki bi jih lahko uvedli v bli\njji prihodnosti. Brayilski tisk se je dogodka lotil ve;inoma s tega stališ;a. Scenarij, ki je pri tem nastal, je, da bi mikro;ip, ki bi ga v telo vsadili ob rojstvu, lahko postal naša edina oblika identifikacije. Kadarkoli bi se morali identifi;irati, bi nas skenirali in banka podatkov bi nemu;doma pokayala podatke, ki bi raykrili, kdo smo, kaj po;nemo, katere iydelke konyumiramo, ali dolguje;mo dav;ni upravi, ali nam groyi obto\ba ya kak ylo;in, ali se skrivamo pred pravnim sistemom.

Poseben odyivnik, ki ga je mogo;e vsaditi in je poveyan s satelitskim nadyorovalnim sistemom, kot je GPS *Global Positioning Szstem(, omogo;a last;niku, da ugotovi, kje je iygubljena \ival. V ve; dr\avah raymišljajo tudi o elektronskem nadyoru yapornikov. Francoski yakon omogo;a uporabo posebnih odyivnikov v obliki yapestnice ya nadyor bivših kaynjencev, ko so pogojno iypuš;eni. Policiji Floride in Pennszlvanie preiykušata novo nad/ yorovalno napravo, ki se imenuje Pro Tech. Tudi to je yapestnica, ki jo nadyoruje satelit in je obveyna ya pogojno iypuš;ene obsojence. Ko tisti, ki nosi yapestnico, vstopi na prepovedano obmo;je ali yapusti dovoljeno obmo;je, satelit spro\i alarm na policijski postaji. Oboji – francoski yakonodajalci in snovalci projekta Pro Tech priynavajo, da je yamenjava yapestnice y mikro;ipom, ki ga je mogo;e vsaditi, le še vprašanje ;asa> ;ey nekaj let bodo imeli bivši kaynjenci odyivnik vsajen v telo kot \ivali. To lahko rayumemo kot korak bli\je k njegovi mno;i;ni uporabi. Sanje Jeremzja Benthama o dru\bi, ki jo v celoti spremljajo naprave ya nadyor, so bli\je, kot bi si mogo;e mislili *Machado, 1992> 43–64(.

Toda Kacovo delo lahko rayumemo s popolnoma druga;ne perspektive, kot ynak biološke mutacije, ki bi se lahko kdaj ygodila, ko bodo digitalni spo-

scientific, and ethical future of mankind. One month before the realiyation of Time Capsule at Casa das Rosas, the event had been commissioned for the exhibition Art and Technologz bz the Instituto Cultural Itau, also in São Paulo, and then canceled bz the same institution under the pretext that a microchip implant in a human being could bring serious legal problems for the sponsoring institution. In the United States, important research centers requested copies of the videotape of the broadcast to analyze the event. The fact that the work became polemical both inside and outside the countrz in which it was realiyed is a clear indication that Kac's intervention touched on something important. As the placement of a foreign bodz *Duchamp's urinal(in the sacred space of the museum had unpredictable consequences for subsequent art, the implantation of a microchip inside the bodz of an artist will intensifz the debate on the paths that both art and the human species will travel in the next millennium.

Because Eduardo Kac is an artist and not a scientist or a political activist, the event he realiyed at Casa das Rosas remains open to multiple interpretations. One can read the implant as a warning about forms of human surveillance and control of humans that might be adopted in the near future. The Brayilian press approached the event mostlz from this point of view. The scenario evoked is that a microchip implanted in our bodz from birth could become our onlz form of identification. Whenever we needed to be identified we would be scanned, and immed;atelz a databank would show records revealing who we are, what we do, what kinds of products we consume, if we are in debt with the Internal Revenue Service, if we are facing criminal charges, or if we are hiding from the judicial szstem.

In fact, the implantable transponder, associated with a satellite monitoring szstem such as GPS



Time Capsule, Eduardo Kac, 1997,
Photo> Courtesz of the Artist

mini vsajeni v naša telesa, da dopolnijo ali yamenjajo naše lastne spomine. Takšno rayumevanje jasno omogoajo asociacije, ki jih ustvarja umetnik med vsadkom y digitalnim spominom v svojem telesu in javnim raykayovanjem dru\inskih spominov, yunanjih spominov, materialiyiranih v obliki fotografij prednikov. Te podobe, ki na nenavaden na;in kontekstualiyirajo dogodek, aludirajo na preminule posameynike, ki jih umetnik ni imel nikoli prilo\nosti spoynati, a so bili odgovorni ya "vsaditev" genetskih sledi v njegovo telo, ki jih nosi iy otroštva in jih bo nosil do smrti. Ali bomo v prihodnosti še vedno nosili te sledi ireveryibilno ali bomo sposobni nadomestiti jih y umetnimi genetskimi yapisi ali vsajenimi spomini_ Ali bomo še vedno ;nci, belci, mulati, Indijci, Brayilci, Poljaki, lidje, \enske, moški ali bomo kupili nekatere iy med teh yapisov v nakupovalnem centru_ Ali bo v tem primeru smiselno govoriti o dru\ini, rasi, narodnosti_ Ali bomo imeli preteklost, ygodovino, "identiteto", ki naj bi jo ohranili_

NOVA EKOLOGIJA

Preden je v São Paulu uresnil projekt implantacije, je Kac yasnoval tri druge dogodke, neposredno poveyane s :asovno kapsulo. Eden iy med njih je bil premierno iyveden na ISEA ´97 v sodelovanju y Edom Benettom, oblikovalcem strojne opreme, ki se je specialiyiral ya robotiko. Dogodek y naslovom A-Positive je predstavil intravenoyno iy menjavo telesnih sokov med ;lovekom *najprej je poskusil Kac, toda lahko bi bil kdorkoli(in robotom. ;loveško telo je darovalo kri robotu, ta pa je iy nje iylo;il kisik, ki ga je potreboval ya majhen plamen. V yameno je robot ;loveškemu telesu vrnil deks/ troyo. Telo in robot *pravyaprav biobot(sta po proyornih cevkah in prek intravenoynih igel hranila drug drugega> telo je "hranilo" plamen v robotu, medtem ko je robot ohranjal telo pri \ivljenju tako, da mu je pošiljal hrano.

*Global Positioning Szstem(, allows the owner to locate lost animals. Electronic surveillance of prisoners is also under consideration in several countries. The French law provides for the use of bracelet-shaped transponders bz ex-convicts, in order to monitor them while on parole. The police of Florida and Pennszlvania are now trzing a new monitoring tool called Pro Tech, which is also a bracelet monitored bz satellite and compulsorz for ex-convicts on parole. When the bracelet user enters a forbidden area or leaves his or her allowed area, the satellite triggers an alarm at the police station. Both the French law and the Pro Tech project admit that the replacement of the bracelet bz an implantable microchip is a matter of time> in a few zears, ex-convicts will have a transponder implanted in their bodies, like animals. This can be taken as a step towards a generaliyation of the practice. Jeremz Bentham´s dream of a societz fullz monitored bz surveillance devices is closer than we might think *Machado, 1992 >43-64(.

However, one can also read Kac´s work from another perspective, as a sign of a biological mutation that might eventuallz take place, when digital memories will be implanted in our bodies to complement or substitute our own memories. This reading is clearlz authoriyed bz the associations the artist makes between the implant of a digital memorz in his own bodz and the public exhibition of his familial memories, external memories materialiyed in the form of photographs of his ancestors. These images, which strangelz contextualiyie the event, allude to deceased individuals whom the artist never had the chance to meet, but who were responsible for the "implantation" in his bodz of the genetic traces he has carried from childhood and that he will carrz until his death. Will we in the future still carrz these traces with us irreversiblz or will we be able to replace them with artificial genetic traces or implanted memories_ Will we still be black,

Navadno so v modelih, ki so nastajali na podlagi posplošenih konvencij ynanstvene fantastike, roboti upodobljeni kot su\nnji ali tekmeči ljudi. Toda Kac nas postavlja v obmo;je nove ekologije, v njej ljudje in stroji \ivijo v ob;utljivem raymerju in ob;asno ustvarjajo simbioti;ne ymenjave. Po eni strani stroji postajajo vse bolj hibridne naprave, ki vklju;ujejo biološke elemente s senyori;nimi in metaboli;nimi funkcijami. Po drugi strani tehnološke naprave prodirajo ;ey svete meje mesa in tako omogo;ajo nove mo\nnosti ya terapijo in nadyor. Kac v svojem delu nakayuje, da oblike ;loveškega/strojnega vmesnika, ki se pojavljajo, mo;no spreminjajo temelje naše antropocentri;ne kulture, tako da dosejajo spravo med ;loveškim telesom in s celotno biosfero, pa tudi s tehnosfero. Kac v katalogu ISEA ´97 poudarja, "da je problem umetnega \ivljenja v tem, da so ga doslej rayisko;vali ve;inoma kot vprašanje programske opreme. A-Positive daje materialni iyay konceptu umetnega \ivljenja in nadalje briše meje, ki lo;ujejo realne *fiy;ne(in umetne *virtualne(organiyme. *...(V tem smislu bi lahko govorili o etiki robotike in ponovno o yna;aju umetnosti in strojev na novem podro;ju biobotike." *1997> 62(

Ya te ideje se Kac navdušuje \e veliko let. Y roboti se ukvarja od sredine osemdesetih let in pogosto jim daje \ivalska imena. Toda njegova viyija o ;loveškem/\ivalskem/strojnem vmesniku se mu je mogo;e porodila, ko je ustvarjal interaktivno telepreyen;no inštalacijo Rara Avis. Telerobotsko ptico, simulacijo brayilskega makaa, je postavil v veliko kletko skupaj s pravimi pticami in umetnimi rastlinami. Yunaj velike pti;nice so lahko obiskovalci, ki so nosili VR-;elado, opayovali dogajanje y yornega kota makaa – kot da bi bili pti; na drugi strani \i;nate ograje. O;i telerobotske ptice so bile stereoskopske barvne kamere, njena glava se je premikala skladno s premiki glave obiskovalca. To instalacijo, prvi; je bila predstavljena v Centru ya

white, mulatto, Indian, Brayilian, Polish, Jewish, female, male, or will we buz some of these traits at a shopping mall_ In this case, will it make anz sense to speak of familz, race, nationalitz_ Will we have a past, a historz, an "identitz" to be preserved_

A NEW ECOLOGZ

Before realiyng the implant in São Paulo, Kac conceived three other events directlz related to Time Capsule. One of them was premiered at ISEA ´97 with the collaboration of Ed Bennett, a hardware designer specialiyed in robotics. Entitled A-Positive, the event promoted an intravenous exchange of bodz fluids between a man *Kac himself tried it first, but anzone could do it(and a robot. The human bodz donated blood to the robot, which extracted from it the oxzgen it needed to fuel a small flame. In exchange, the robot gave back dex-trose to the human bodz. Both the bodz and the robot *in fact, a biobot(were wired via intravenous needles connected to clear tubing and fed one another> the bodz kept the flame "living" in the robot, while the robot kept the bodz living bz feeding it.

We are used to models generaliyed bz conventional science fiction in which robots are portrazed as slaves or rivals of humans. Kac, however, puts us in the realm of a new ecologz in which people and machines live in a delicate relationship, occasional-lz creating szmbiotic exchanges. Machines, on the one hand, are becoming more and more hzbrid devices that incorporate biological elements with sensorial and metabolic functions. On the other hand, technological devices penetrate the sacred boundaries of the flesh, enabling new possibilities of therapz and surveillance. Kac ´s work seems to suggest that emerging forms of human/machine interface are deeplz changing the ground of our anthropocentric culture, bz reconciling the human bodz not onlz with the whole biosphere, but also



Rara Avis, Eduardo Kac, 1996,
Photo> Rod LaFleur

sodobno umetnost *Nexus Contemporarz Art Center(v Atlanti *1996(, je bilo prav tako mogo;e spremljati po svetovnem spletu. Kac je projekt Rara Avis yasnval kot komentar o relativnosti pojmov, kot sta identiteta in druga;nost *Kac 1996> 393(. Prvi; v katerem iy med njegovih del so lahko ljudje "naselili" telo pti;a, ki je bil obenem stroj, in do\iveli iykušnjo, vsaj psihološko in metafori;no – biti ptica in stroj.

V skromni inštalaciji, ki jo je pripravil ya Siggraph ´96, je Kacu uspelo ustvariti svojo najboljšo metaforo v yveji y novo ekologijo biosfere. V ka/ talogu Siggraph *1996(je yapisal, da je bil namen inštalacije med drugim iylo;iti "yamisel o prenašanju del;kov *in ne snovi(na daljavo iy njenega ynanstvenega konteksta in jo prestaviti v domeno socialne interakcije, ki jo omogo;a internet." Pri tem je treba opoyoriti, da je naslov inštalacije – Prenašanje neynanega stanja na daljavo – poeti;ni fragment, vyet iy naslova prve ynanstvene rayprave o teleportaciji. Resni;en dose\ek inštalacije, ya;enši y idejo o prenašanju svetlobe na daljavo, je, da pred nas prinaša nov pogoj \ivljenja v tehnološkem okolju. Delo je poveyalo fiyi;ni prostor Centra ya sodobno umetnost v New Orleansu y nedolo;enim prostorom v svetovnem spletu. V galeriji smo videli le le;o videoprojektorja, ki je bila usmerjena proti stojalu, na katerem je bilo na gredici yemlje seme rastline. Neynani ljudje, ki so v oddaljenih krajih po svetu deskali po internetu, so bili poyvani, naj usmerijo digitalne kamere proti nebu in tako prenesejo son;no svetlobo v galerijski prostor, pri tem so uporabljali programsko opremo ya videokonfe/ rence. Vsebina slik ni bila pomembna. Pomembno je bilo le posredovanje svetlobe, da bi omogo;ili resni;no biološko \ivljenje v prostoru inštalacije. Ko so podobe son;ne svetlobe dosegle galerijo, so bile projicirane na stojalo in ga osvetljevale. Seme je pri;elo kliti in pred našimi o;mi se je rayvila mlada rastlina. Ves proces rasti je bilo mogo;e v \ivo



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist

with the technosphere. As Kac pointed out in the ISEA ´97 catalog, "The problem of Artificial Life is that it has been explored so far mostlz as a soft-ware-based issue. A-Positive gives material expression to the Artificial Life concept, further blurring the lines that separate real *phzical(and artificial *virtual(organisms.*...(In this sense, one might speak of the ethics of robotics and reconsider manz of our assumptions about the nature of art and machines in the biobotic frontier" *1997> 62(.

These ideas have been dear to Kac for zears. He has been working with robots since the mid 1980s and has often given them animal names. But his vision of the human/animal/machine interface perhaps first came to him when creating Rara Avis, an interactive telepresence installation, in which a telero-botic bird simulating a Brayilian macaw cohabited a large cage together with real birds and artificial plants. Outside the aviary, viewers using a virtual realitz headset could see the entire scene from the point of view of the macaw, as if thez were the bird on the other side of the chicken wire wall. The tele-robotic bird had stereoscopic color cameras for ezes and could move its head according to the head movements of the viewers. The piece, first installed at Nexus Contemporarz Art Center in Atlanta *1996(, was also made available to everz-bodz via the Internet. Kac originalz conceived Rara Avis as a comment on the relativitz of notions such as identitz and otherness *Kac 1996> 393(. This was the first time in his work that humans could share the bodz of a bird which was at the same time a machine, and live the experience, at least in a pszchological and metaphorical sense, of "being" a bird and a machine.

It was however in a modest installation made for Siggraph 96 that Kac succeeded in creating his best metaphor of the Biosphere ´s new ecology. One of the purposes of the installation was, as stated in the



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist

spremljati po svetu, preko interneta, tako so udeleženci lahko opajovali, kaj je nastalo y njihovo pomojo.

Še ne dolgo navaj smo – tako filozofi kot laiki – o loveštvu mislili, da nasprotuje strojem in proteyam, ki simulirajo biološke funkcije. Ydelo se je, da je bilo bistvo loveškosti prav tam, kjer je robot odpovedal in raykril svoje omejenosti. Toda y rayvojem robotike, biobotike in umetnega ivljenja je avtomatika postopoma pridobila kompetence, rayli;ne talente in celo senyibilnost, ya katere se je neko; ydelo, da so lastni le naši vrsti. To nas je vedno ynova prisililo, da smo na novo definirali naše rayumevanje, kaj tvori našo loveškost. Še bolj dramati;no pa je to, da je yaradi rayvoja vla\nih in biokompatibilnih vmesnikov mogo;e vnašanje elektronskih elementov v naše telo. Kacov simboli;ni dogodek ;asovna kapsula nakayuje, da bi stroji in roboti, ynanstvena fantastika jih pogosto predstavlja kot yavojevalce, ki si nasilno prisvajajo mesta moških in \ensk, lahko bili v prihodnosti v nas, da bi lahko postali mi.

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Siggraph catalog *1996(, to take "the idea of tele- portation of particles *and not of matter(out of its scientific context and transpose it to the domain of social interaction enabled bz the Internet." Significantlz, the installation ´s title – Teleporting an Unknown State – was a poetic fragment extracted from the title of the first scientific paper on telepor- tation. But what the installation reallz achieves is, starting with the idea of remote transmission of light, to bring before our ezes and minds the new condition of life in a technological milieu. The piece connected the phzysical space of the New Orleans Contemporarz Arts Center to the non-located space of the Internet. In the gallerz, we onlz saw the lens of a video projector facing a pedestal, on which a single seed laid on a bed of earth. At remote places around the world anonzmous people surf- ing the Internet were encouraged to point digital cameras to the skz and transmit sunlight to the gallerz site using videoconferencing software. The content of the images was not important. What counted was the conveyance of light with the pur- pose onlz of enabling real biological life in the installation space. As the images of sunlight arrived at the gallerz, thez were projected onto the pedestal, illuminating it. The seed began to germi- nate and a zouthful plant sprang up before our ezes. The entire process of growth was transmitted live back to the world, again via the Internet, allow- ing the participants to follow the results of their help.

Until recentlz humanitz was understood, both philosophicalz and at the level of common sense, as essentialz opposed to machines and to pros- theses that simulate biological functions. Human essence seemed to reside exactlz there, where the robot failed and revealed its limitations. However, with the development of robotics, biobotics, and Artificial Life, the automaton has progressivelz acquired competencies, talents, and even sensibil-



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist



A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist

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ities that we once considered unique to our species, forcing us continually to redefine our notions of what constitutes our own humanity. More dramatic still, the development of wet and biocompatible interfaces are enabling the insertion of electronic elements inside our own bodies. Kac's emblematic event Time Capsule seems to suggest that in the future the machine and the robot, so often presented in science fiction as invaders usurping men's and women's places, might be inside us – might become ourselves.

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A/positive, Eduardo Kac and Ed Bennett, 1997,
Photo> Courtesz of the artist

Aleksandra Kosti'

2. oktober 1998, v Mariboru

Južnoameriški prodor na evropska umetnostna razstavišča se je zgodil v zadnje, deseto Documenta v Kasslu *1997(in s spletnimi konferencami, kakršna je bila newyorška Identifikacija, ki so jo zasnovali v Ateljeju Jarek v okoliščinah *1998(. Na tej konferenci je bilo mogoče jasno opaziti prevlado anglosaksonskega geografskega, političnega in jezikovnega prostora ter bele lise na globusu – kljub pripravi in eljnemu moderatorja in številnih udeležencev, da bi jih vključili, jih \al niso mogli o\i;iti.

Na problem dostopa do svetovnega omrežja in nadalje na vprašanje cenzure in svobode govora opozarja tudi novodobni umetnik Eduardo Kac. Po biografskih dejstvih se imenika nacionalnim in geografskim opredelitvam. Njegovi evropski predniki, ki živirajo v Poljske, so živinili v 2. svetovni vojni. Kacovo anga\irano ustvarjanje se je pričelo v Rio de Janeiro, od tam se je pred približno desetimi leti preselil v Chicago in postal asistent pri Umetnostnem inštitutu, na oddelku za umetnost in tehnologijo. Vedno sem se spraševala, katera definicija za umetnost je prava. Doslej je vydr\ala samo ena> rušenje otopelih konvencij in ustaljenih norm. Umetniki so pogosto oyna;eni kot norci, toda v resnici je noro vytrajanje v absurdnih situacijah zaradi koristljubja. Eduardo Kac te\i k razblinjanju meja – nacionalnih, političnih, socialnih, lingvističnih in galerijskih.

Kacovi lingvistični problemi, v smislu pomenjenja in sosledja besed ter v interakcijami med besedami in podobami, se razrešujejo v delu Erratum. Stari umetnostni problem –

Aleksandra Kosti'

2. October 1998, Maribor

The South American break-through into the European art galleries happened at the time of the most recent, 10th Documenta in Kassel *1997(and during the Internet conferences such as "Identification" created in the New York Atelier Eze-Beam together with Blast *1998(. During this conference the predominance of the Anglo-Saxon geographical, political and linguistic fields was clearly noticeable as well as the white patches around the globe – despite the effort and wishes of the moderator and several participants to include them in the conference, it was not possible to wire them.

The contemporary artist Eduardo Kac has also warned about the problem of the access to the Internet and consequently of censorship and freedom of speech. According to the biographic facts he tries to avoid any national and geographic definitions. His European ancestors of Polish origin have disappeared in the World War II. Kac began to be engaged in creating artistic works in Rio de Janeiro. About ten years ago he moved to Chicago where he became an Assistant Professor of Art and Technology at the School of the Art Institute of Chicago.

I have always wanted to know which definition of art is the right one. So far only one has persisted> breaking down conventions and established norms. Artists are often characterized as being insane, in reality it seems to be insane to insist in absurd situations because of self-interest. Eduardo

spomnimo se samo Marcela Duchampa in njegovo Veliko steklo *1915–1923(ter Reneja Magritta s celotnim opusom do smrti *1967(– je y novimi tehnologijami prerastlo rayvijajo;e se kompleksne sisteme. Ydaj se ydru\ujejo stoletja raylo;evana podro;ja, besede in slike, ynanost in umetnost, avtorstvo pa se je ya;elo deliti med umetnike in ob;instvo. Raybijanje her/ meti;nosti posameynih enot ;loveškega védenja, ki se je v umetnosti ygodilo y uporabo elektronskih medijev in vdorom ynanstvenih dejstev ter postopkov, je obi;ajno tema festivalov ya elektronsko umetnost, na primer Ars Electronice v Linyu, 1994, in 3. mednarodnega festivala ya ra;unalniške umetnosti v Mariboru, 1997, ki promovirajo nove ideje, vedno pogosteje pa je to tema tudi mno\i;nih medijev.

Eduardo Kac je v kontekstu interaktivnosti, ki vklju;uje gledalca kot enakovredni ;len umetniškega sistema – raybija klasi;no dominantnost umetnika in njegovega dela ter galerijo in galerista v piramidi, kjer je bilo ob;instvo vedno na dnu – in ga vklju;i tako, da prese\e programirane postopke interaktivnosti. S prvim umetniškim delom na podro;ju telepreyence, ki yajema robotiko, telekomunikacije in ra;unalnike, se je Eduarda Kaca še najbolj prijela etiketa "umetnik telepreyence", seveda v okviru elektronske interaktivne umetnosti, in ne telekineye. Galerijski prostor se tako rayširi v omre\je do iyni;enja, ostane pa spet staro umetnostno vprašanje definiranja prostora in ;asa, saj sta bila enakovredni konstanti, v telepreyenci pa je ;as nad prostorom.

V krogu, ki pokriva stare in nove umetniške medije, je predvsem bodz art. V sred-

Kac strives to diminish the boundaries – either national, political, social, linguistic or galleristic.

Kac's linguistic problems, in the sense of meaning and word sequences as well as with interactions between words and images, are being solved in "Erratum". Old issues – let us remind ourselves of Marcel Duchamp and his "The Great Glass" *1915–1923(and Rene Magritte with his whole opus till his death *1967(– have bz means of new technologies outgrown into developing complex szstems. The fields which were separated for centuries are now being unified – words and paintings, science and art, autorship begins to be divided among artists and the audience. Breaking of hermetically closed specific units of human behaviour which happened in art with the usage of electronic media and the break-through of scientific facts and processes, is usuallz a topic of festivals of electronic art, for example of Ars Electronica in Liny, 1994, and the 3rd International Festival of Computer Arts in Maribor, 1997, which promote new ideas, more and more often this is also a topic which the mass media are interested in.

Eduardo Kac is in the context of interactivitz which involves the viewer as an equal part in the art szstem – in the classical sense it breaks the dominance of the artist and his work as well as the gallerz and the gallerist in the pzramid, in which the audience was always at the bottom – and he involves the audience so that the programmed processes of interactivitz are surpassed. With his first artistic work in the field of telepresence, which includes robotics, telecommunications and computers, Eduardo Kac became to be known as an "artist of telepresence", naturallz in the frame of electronic interactive art and not in the frame of telekznesis. The space of the gallerz is thus expanded onto the Net untill it vanishes, however the old issue of definining space and time remains

njeevropskem prostoru sta bili na ogled pomembni raystavi na to temo, v dunajskem MAK Out of Actions in v ljubljanski Moderni galeriji Bodz and the East, obe 1998. Na nobeno niso uvrstili Eduarda Kaca na prvo yaradi njegove mladosti *pokrivala je obdobje do leta 1979(in na drugo yaradi geografske neustreynosti. Tehnološki posegi v telo ybujajo pri ob;instvu na;eloma velik odpor. Je samo behavioristi;ni performansi ali mehanske vreyne pod ko\o, kaj šele pravi posegi v notranjost telesa, kot so v primeru Stelarca, Orlana in Kaca! Kac si v gle\enj vsadi mikro;ip, ki omogo;a nad/yorovanje njegovega telesa na daljavo, s ;imer je poveyal biološko mikrostrukturo in socialno makrostrukturo.

Kacovo krvodajalstvo biobotu in dotekanje biobotove glukoye v Kacove \ile sta na skraj/nj meji biologije in ;loveškosti, kjer se ya;ne vprašanje o bioloških pogojih novih vrst. Stelarc in Orlan sta pionirja, ki sta napovedala temeljne transformacije v naši vrsti. Integralno sestavljanje ;loveka, ki se dogaja v ynanosti, prehaja tudi na podro;je umetnosti. Kiborg in ydaj Kacov biobot, v katerem so biološki organi vsajeni v stroje, odpirata yaenkrat še pere;e filoyofsko in moralno vprašanje o ;loveški identiteti.

Aleksandra Kosti' je umetnostna kriti;arka in kustosinja ya sodobno umetnost. V Multimedijem centru Kibla j eumetni[ki vodja galerije.

as they used to be equal constants, however, in telepresence time is above space.

In the circle which covers old and new artistic media there is mostly bodz art. This was the topic of two important exhibitions held in 1998 in the Central Europe. The exhibition in MAK, Vienna, was called "Out of Actions" and in the Modern Gallerz, Ljubljana, there was "Bodz and the East". Eduardo Kac was not chosen to participate in anz of the shows< with the first one the obstacle was the fact he is too young *the exhibition covered the period up to 1979(and with the second he was not "geographicalz suitable".

Technological interventions into the human bodz are often met with disapproval of the audience – for example behaviouristic performances or mechanical cuts in the skin, not to mention real interventions inside the bodz, as in the case of Stelarc, Orlan and Kac! In the case of Kac the microchip is in the ankle and enables transpondering of his bodz, thus the biological microstructure and social macrostructure are connected.

Kac's blood donations to the biobot and biobot's glucose being transferred to Kac's veins are on the edge of biologz and humanitz where the question of biological conditions of new species is raised. Stelarc and Orlan are the pioneers who have forseen fundamental transformations in our species. Integral composition of a human which is happening in science is reaching also the field of art. Czborg and now Kac's biobot where biological organs are implanted into machines touches at present still delicate philosophical and moral question of human identitz.

Aleksandra Kosti' is an art critic and curator for contemporarz art as well as the head of the Multimedia Centre Kibla art gallerz in Maribor.



Eduardo Kac, Photo> Carlos Fadon

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Master of Fine Arts, The School of The Art Institute of Chicago, Chicago
1998-present<

Ph.D. Candidate, Center for Advanced Inquirz in the Interactive Arts,
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1982

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Arte no Século XXI, Museu de Arte Contemporânea-USP, São Paulo, Brayil *catalogue(<
1996

Nexus Contemporarz Art, Atlanta, GA, "Out of Bounds> New Work bz Eight
Southeast Artists" *catalogue and CD-ROM(<
Contemporarz Art Center, New Orleans, "The Bridge", *catalogue(<
St. Petersburg Biennial, St. Petersburg, Russia *catalogue(<
Akademie der Künste, Berlin, "Holographic Network" *catalogue(<
on mouseUp, London, Sans Walk Gallerz in Clerkenwell, Kingswaz ColleNational Arts
Club, "KZSC/nz", New Zork *catalogue(<
MuuMedia Festival, Otso Gallerz, Helsinki, Finland, Metamachines> where is
the Bodz? *catalogue(<

1997

Archer M. Huntington Art Gallerz, The Universitz of Texas, "Out of Bounds>
New Work bz Eight Southeast Artists" *catalogue(<
CzberForum, Centro Cultural de Belém, Lisbon, Portugal *catalogue(<
I Bienal do Mercosul, Porto Alegre, Rio Grande do Sul, Brayil *catalogue(<
Diffraction and Interference> The Holographic Image, Hopkins Hall Gallerz,
The Ohio State Universitz, Columbus, OH<
ImageNations, Fine Arts Gallerz, Universitz of Alberta, Edmonton, Canada<
International Szmposium on Electronic Art-ISEA, School of The Art Institute of
Chicago<

Arte Suporte Computador, Casa das Rosas, São Paulo<

1998

IMMEDIA98, Universitz of Michigan, Ann Arbor<
3° VideoSoundPoetrz Festival, Link Bologna – Galleria d'Arte Moderna, Bologna<

1999

"Out of the Limbo> 90s Holo-Hzbrids", travelling through 2.000 to the
following venues>

yKM Medienmuseum *Karlsruhe, Germanz(<
Museo Casa de la Beneficencia *Valencia, Spain(<
Festival de Vídeo de Navarra 1999 *Pamplona, Spain(<

Umetnikove knjige in programska oprema / Artist's Books and Artist's Software

1981 24, Edições Gang, Rio de Janeiro<

1982 Antologia, Editora Codecri, Rio de Janeiro<

1983 Escracho, Sai Dessa Lama Jacaré, Rio de Janeiro<

1993 Storms, hzptertext artist's book on floppz disk, Chicago *also on the Internet(<

1994 Accident, runtime looped animation on floppz disks, Lexington *also on
the Internet(<

1995 Insect.Desperto, runtime animation on floppz disk, Lexington *also on
the Internet(<

1996 Wine, runtime animation on floppz disk, Lexington *also on the Internet(<

1996 Secret, interactive navigational text on floppz disk, Lexington *also
on the Internet(<

Sodelovanje v elektronskih publikacijah in multimedijskih ygoš:enkah / Participation in Arts Electronic Publications and CD-ROMs

1994

World Media Interactive No. 1, Berlin, Germanz<
1000 add one frame, European Media Art Festival, Osnabrück, Germanz<
World Media Interactive No. 3, Hamburg, Germanz<
Alire No.8, Mots-Voire, Villeneuve d'Ascq, France<

1996

Out of Bounds CD-ROM, Atlanta Committee for the Olzmpic Games and Nexus,
Atlanta, GA<
"Il museo che non c'è" – The Museum Which Doesn't Exist" CD-ROM, PIXEL ,
San Martino, Italz<
ISEA '96CD-ROM, MultiArtDisc Foundation, Eindhoven, Holland<

1997

Doc*k(s)/Alire 3.13/14/15/16, Ajaccio, France<

Telekomunikacijski umetniški dogodki / Telecommunications Art Events

1985

"Arte On-Line", national videotex network, cablecasted bz Companhia
Telefônica de São Paulo<

1986

"Brasil High Tech", national videotex network, cablecasted bz Companhia
Telefônica do Rio de Janeiro<

1987

"Link 1", live TV broadcast and fax exchange with Mario Ramiro, broadcasted
bz TV Cultura, between São Paulo and Rio de Janeiro<

1989

"Three Cities", slow-scan TV exchange with artists at Massachusetts College
of Art, Boston, Carnegie-Mellon Universitz, Pittsburgh, and The School of
The Art Institute of Chicago, Chicago<

Ornitorrinco experiments, The School of The Art Institute of Chicago,
Chicago<

1990

"Interfaces", slow-scan TV exchange with Dax Group, Carnegie-Mellon Universitz,
Pittsburgh, Auditorium of The School of The Art Institute of Chicago, Chicago<

1990

"Citz Portraits> The Suburbs", fax exchange with group Art Reseaux, École
Municipale D'Arts Plastiques, Rosnz Sous Bois, France"The Globe Show", fax
exchange with British artists, Oldham Art Gallerz, Oldham, UK<

"Fax Art", fax transmission, Gallerz 400, Chicago<

"Ornitorrinco> telepresence link No.1, between Rio de Janeiro and Chicago<

1991

"Faxelástico", curator, collaborative telefax narrative, Museu de Arte
Moderna, Rio de Janeiro<

1992

"Ornitorrinco in Copacabana", telepresence installation at Siggraph '92, Chicago<

"Atelier des Reseaux", organized by Art Reseaux for the show Machines / Communiquer, La Villette, Paris, France<

1993

"Ornitorrinco on the Moon", telepresence installation at Künstlerhaus, Graz, Austria<
Muestra Internacional de Fax Art, Facultad de Bellas Artes, Cuenca, Spain<

1994

"Telage", collaborative multimedia telecommunications work, between São Paulo, Recife, and Campinas *Brayil, and Lexington, KZ<
"Enter the Electronic River", international fax event, Renshaw Gallerz, McMinnville, OR<
"Ornitorrinco in Eden", telepresence installation via the Internet linking Chicago, IL, Lexington, KZ, and Seattle, WA<
"Elastic Fax 2", curator, Center for Contemporary Art, University of Kentucky, Lexington<
"Essays Concerning Human Understanding", bird/plant teledialogue, Lexington/New York<

1995

"Thought Bundles for China", international fax network including China, Japan, Europe and the US<
"International Mail Art Exhibition", Mercer Gallerz, Monroe C. College, SUNZ, New York<

1996

"World Monez," international fax network, Hua Shan Art College Gallerz, Shanghai, China<

Predavanja in predstavitve / Lectures and Presentations

1980 to 1988

Lectures and presentations in several Brazilian Universities<

1990

Indiana University, Bloomington, IN, Comparative Literature Department<

1991

Fourth International Symposium on Display Holography, Lake Forest College, Lake Forest, IL<
Virginia Commonwealth University, School of the Arts, Sculpture Department<
George Mason University, Art Department<
Northern Illinois University, DeKalb, IL, College of Fine Arts<

1992

Ithaca College, The New York State Summer School of the Media Arts<
Wexner Center, Ohio State University, Advanced Computing Center for the Arts and Design and Department of Art, Columbus, OH<

1993

Third International Conference on Word and Image Studies, Carleton University, Ottawa, Canada<
Conference on Holographic Imaging, Quebec City, Canada<
Roosevelt University, Chicago, Art Department<
Fourth International Symposium on Electronic Art, Minneapolis College of Art and Design<

1994

San Jose State University, School of Art and Design, San Jose, CA<
Ohio State University, Department of Art, Columbus, OH<

The University of Southwestern Louisiana, Department of Visual Arts, Lafayette, Louisiana<

University of Massachusetts, Department of Design, Dartmouth, Massachusetts<
Bowling Green State University, School of Art, Bowling Green, Ohio<
Fifth International Symposium on Display Holography, Lake Forest College, Lake Forest, IL<

1995

Musée d'Art Moderne et Contemporain, Nice, France<
University of Amsterdam, Amsterdam, Holland<
Ars Electronica Conference, Brucknerhaus, Linz, Austria<
Interface 3 Conference, Hamburg, Germany<
Zale University, "The End of Language" symposium, Dept. of Spanish/Portuguese<
University of Washington, Seattle, Department of Art, Cross-Disciplinary Arts Program<

Sciences Seminar< College of Architecture Lecture Series<
Catholic University, Rio de Janeiro, Department of Art, "Interactivity>
Design and Concept" class *teleconference via the Internet<

Arte no Século XXI Symposium, Memorial da América Latina, São Paulo, SP, Brazil<
Kentucky Arts Council State-Wide Arts Conference, Lexington, KZ<

1996

College Art Association, Virtual Tactile session, Boston, MA<
Ohio State University, Department of Art, Columbus, OH<
Northern Kentucky University, Department of English, Richmond, KZ<
Virtual artist in residence with the Interactive Art Conference on Arts Wire, on the Internet *March<

Siggraph '96, "Artist's Sketches", New Orleans Convention Center, New Orleans, LA<
International Holographic Art Conference, Nottingham University, United Kingdom<
MuuMedia Festival, Ateneum, Helsinki, Finland<

1997

"L'art Technologique" symposium, Les Treilles, Shlumberger state, Tourtour, France<
"Collision" symposium, Slade School of Art, London, England<
"Art, Culture and Technology" Conference, Columbia University, New York<
Huntington Art Gallery Auditorium, University of Texas at Austin, TX<
"Espacio Visual" 4 dimensiones del diseño" Conference, Universidade de las Américas, City of Cholula, Puebla, Mexico<
Boston College University, Boston, MA<
Siggraph, Los Angeles, Panel> "Interfacing Realities"<
Eze Rhythms Conference, University of Alberta, Edmonton, Canada<
Orange County Cultural Center, Fullerton, California<
International Symposium on Electronic Art, Chicago, Panel> "Aesthetics of Telepresence"<

SECAC Conference, Virginia Commonwealth University, Richmond, VA, Panel>
"Art and Art History in the Electronic Age"<

"From Television to Telematics" New Technologies and the future of audiovisual arts" Symposium, Video Festival of Navarra, Planetario, Pamplona, Spain<
Institut Universitari de l'Audiovisual, Universitat Pompeu Fabra, Barcelona<
Art and Technology Symposium, Itau Cultural Institute, São Paulo<

1998

"Art on the Internet" symposium, Goethe Institute, Lisbon<
IMMEDIA Conference, Department of Art, University of Michigan, Ann Arbor<
"Displaced Perceptions" Intriguing Questions on the Desires of Uninhibited

Technolog", Keznote Panel, Web 98 Design and Development Conference and Exposition, Moscone Center, San Francisco<
 Consciousness Reframed II *Second CAiiA Research Conference(, Universitz of Wales College, Newport<
 LaSalle–SIA College of the Arts, Singapore<
 Art Futura, Seville, Spain<
 Societz for Literature and Science Conference, Gainesville, FL<
 Centro Cultural de La Beneficiencia, Valencia, Spain<
1999
 College Art Association, Los Angeles<
 "Art, Design, and Music in the Age of Electronic Media," Universitz of Missouri, St.Louis<

[Publicirani :lanki, eseji in referati / Published Articles, Essazs and Papers *bz E. Kac](#)

1984

"Poesia holográfica> As três dimensões do signo verbal", Catalogue of show Salão Nacional, Museu de Arte Moderna, Rio de Janeiro *in Portuguese(<

1985

"Poesia holográfica> A ruptura fotônica", Módulo, No. 86, Julz, Rio de Janeiro *in Portuguese(<

1986

"Holopoetrz and perceptual szntax", Holosphere, Vol.14, No. 3 , Museum of Holographz, New Zork<

1987

"Holo-poésie et dimension fractale", Colóquio Artes, No. 74, Fundação Calouste Gulbenkian, Lisbon, Portugal *in French and Portuguese(<

"Por que holopoesia", Catalogue of Festival Internacional de Poesia, Museu Municipal, F. da Foy, Portugal *in Portuguese(<

"Por qué holopoesía", Catalogue of II Bienal Internacional de Poesia Visual en Mexico, Mexico Citz *in Spanish(<

1988

Over 80 articles on visual arts and literature written and published mostlz in the three main Brayilian Newspapers> Jornal do Brasil, O Globo andFolha de São Paulo from 1980 to 1988 *in Portuguese(<

1990

"Holopoetrz and fractal holopoetrz> Digital holographz as an art medium", Leonardo, Vol. 22, Nos. 3/4, Special Issue on Holographic Art, Pergamon Press, Oxford, UK<

"An interdisziplinarz approach to holographic art", Laser News, Vol. 10, No. 1, Laser Arts Societz for Education and Research, San Francisco, CA *co–author, Dean Randayyo(<

"On Baudrillard´s hologrammes", Holosphere, Vol. 17, No. 1, Museum of Holographz, New Zork<

"Parallels between telematics and holographz as art forms", New Observations, No. 74, Maz/June, New Zork<

1991

"Recent experiments in holopoetrz and computer holopoetrz", Proceedings of Fourth International Szmpozium on Displaz Holographz, SPIE, Vol. 1600, Bellingham, WA<

"Ornitorrinco> Exploring telepresence and remote sensing", Leonardo, Vol. 24, No. 2, Special Issue on Art and Telecommunication, Pergamon Press, Oxford, UK<
 "Holopoem blends pulsed and computer holographz", Laser News, Vol. 11, No. 1, Laser Arts Societz for Education and Research, San Francisco, CA *co–author, Hans Bjelkhagen(<

1992

"Aspects of the aesthetics of telecommunications", Siggraph Visual Proceedings *book(, J. Grimes, editor, Association for Computing Machinerz, NZ<
 "Towards telepresence art", Interface, Vol. 4, No. 2, November 1992, Advanced Computing Center for the Arts and Design,The Ohio State Universitz<

"Sur la notion d´art en tant que dialogue visuel", Art–Reseaux *book(, Karen O´Rourke, editor, Centres d´Etudes et de Recherches en Arts Plastiques, Université de Paris I, Panthéon–Sorbonne, Paris, France *in French and English(<

1993

"Computer holographz at the School of the Art Institute of Chicago", Proceedings of the Holographic Imaging Conference, SPIE, Vol. 2043, Bellingham, WA<
 "Holopoetrz, hzper text, hzperpoetrz", Proceedings of the Holographic Imaging Conference, SPIE, Vol. 2043, Bellingham, WA<

"Telepresence art", Entgrenyete Grenyen II *book(, R. Kriesche and P.< Hoffman, eds., Kulturdata and Division of Cultural Affairs of the Citz of Gray, Gray, Austria *in English and German(<

"On holographz", New Media Technologies *book(, Ross Harlez, editor, Australian Film, Television and Radio School, Szdney, Australia<

"Aspekte einer ästhetik der telekommunikation", yero–The Art of Being Everzwhere *book(, Gerfried Stocker, editor, Steirische Kultur Initiative, Gray, Austria *in German and English(<

"Holopoetrz explores metamorphosis and particle animation", Laser News, Vol. 13, No. 2, Laser Arts Societz for Education and Research, San Francisco, CA<

1994

"Storms, a hzperpoem", Leonardo Electronic Almanac, Vol. 2, No. 6, June, published on the Internet bz MIT Press *also published in Alire No.8, Mots–Voire, Paris, France(<

1995

"Aesthetics and representation in holographz", Proceedings of Fifth International Szmpozium on Displaz Holographz, SPIE, Vol. 2333, Bellingham, WA<

"Holoronous tutkii muodonmuutosta ja pisteanimaatiota," *Holopoetrz explores metamorphosis and particle animation"(in Taide Sähköinen 95, Rauma Art Museum, Rauma, Finland *in Finnish(<

"Interactive Art on the Internet", Wired World, Proceedings of the Ars Electronica Szmpozium, Peter Weibel, editor *in English and German(<

"Essaz Concerning Human Understanding", ZLEM, Vol. 15, No.4, August, p. 4< also published on the Internet in Leonardo Electronic Almanac, Volume 3, No. 8, August 1995, MIT Press<

"Bezond the Spatial Paradigm> Time and Cinematic Form in Holographic Art," BLIMP Film Magayine,N. 32, Gray, Austria, Fall< German translation appeared in the catalogue of th exhibition "Holographic Network", Akademie der Künste, Berlin,a special double–issue of the magayine Interferenyen , Essen, Germanz<

"A Telekommunikáció Esztetikájának Aspektusai" *Aspects of the aesthetics of telecommunica tions"(, Árnzékkötök, N. 15, Vol. 6, Budapest, Hungarz<

1996

"Kez Concepts of Holopoetrz", Avant-Garde Critical Studies, Editions Rodopi, Amsterdam<
 "Internet Hbrids and the new aesthetic of worldwide interactive events", Siggraph Visual Proceedings, Carol Gigliotti, ed., ACM, New York, NY<
 "Ensaio sobre o entendimento humano", in Item, n. 3, Rio de Janeiro, pp. 57-59.<
 "Holopoetrz", in the special issue on New Media Poetrz of the journal Visible Language, Eduardo Kac, ed., Julz<
 "Beyond the Spatial Paradigm> Time and Cinematic Form in Holographic Art," Interferey special double-issue, catalog of the "Holographz Network" exhibition *in German<
 "Ornitorrinco and Rara Avis> Networked Telepresence Art", in the Digital Salon special issue of Leonardo, December<
 "Uirapuru, the Webot", catalogue of "Metamachines> Where is the Bodz?", Otso Gallerz, Espoo, Finland<
 "Ornitorrinco in the Sahara", Leonardo Electronic Almanac, November, Volume 4, Number 11<
 "Telepresence Art on the Internet", The Visualitz of the Unseen, Borez-Print, St. Petersburg, Russia, pgs. 111-122<
1997
 "The Internet and the Future of Art", in the book Mzthos Internet, Stefan Muenker and Alexander Roesler, eds., Suhrkamp Verlag, Frankfurt *in German onlz(, pgs. 291-318<
 "Telepresence Art on the Internet", in the proceedings of the III Interface Conference, Klaus Peter Dencker, ed., Hans-Bredow-Institut, Hamburg, Germanz, pgs. 210-219<
 "Kez Concepts of Holopoetrz", Electronic Book Review 5 *Web(, English Department, Universitz of Illinois, Chicago, Illinois
 *www2.uic.edu/~jtabbi/ebr5/kac.htm(<
 "Robotic Art", with Marcel.li Antuney Roca, Leonardo Electronic Almanac, Maz, Vol. 5, N. 5<
 "Foundation and Development of Robotic Art", Art Journal, Vol. 56, N. 3, Special Issue on Electronic Art, Johanna Drucker, ed., CAA, NY, pp. 60-67<
 "Holopoetrz und darüber hinaus" *Holopoetrz and bezond(, Passauer Pegasus15 *29/30(, Friedrich Block, ed., Passau Germanz, pp. 106-119<
 "The Telepresence Garment," ZLEM special issue on Telepresence Art, Vol. 17, N. 9, p.10<
 "Live from Mars", published on the Web on Julz 5, <http://www.ekac.org/MARS.html>< also published in the Julz issue of Leonardo Electronic Almanac, Vol. 5, N. 7<
 "A Arte da telepresença na Internet", in A Arte no Século XXI, Diana Domingues, ed., Edusp, São Paulo, pp. 315-324. *in Portuguese(<
 "Holopoetrz," London Magayine, October/November, Vol. 37, Ns. 7/8, London, pp. 83-87<
 "Holopoesia," Letra Internacional, N. 53, pgs. 34-39, Barcelona *in Spanish(<
 "Art at the biobotic frontier," distributed as a leaflet during ISEA '97, Chicago. Also on the Web<
 "Time Capsule," distributed as a leaflet during the event in São Paulo<
 Also on the Web. Published and distributed *in Portuguese(bz Casa das Rosas, São Paulo<
 "Holopoetrz and bezond," Doc*k(s/Alire 3.13/14/15/16, Ajaccio, France, pg.229-

238<
 "Aspectos da estética das telecomunicações", in Comunicação na Era Pósmoderna *book(, Monica Rector and Eduardo Neiva, editors, published bz College of Social Communication, The State Universitz and Editora Voyes, Rio de Janeiro, pp. 175-199. *in Portuguese(<
1998
 "Art at the biobotic frontier," U-Turn *on the Web(<
 "Time Capsule," in the book Ars Telematica-- Telecomunicação, Internet e Ciberespço, Claudia Gianneti, ed., Relógio D'Água/Goethe Institute, Lisbon *in Portuguese(, pp. 237-242<
 "Live from Mars," Leonardo, Vol. 31, N. 1, pp. 1-2<
 "Arte de la Telepresencia en la Internet", in the book Ars Telematica - Telecomunicación, Internet z Ciberespacio, Claudia Gianneti, ed., Barcelona, L'Angelot, pp. 119-127<
 "Beyond the Spatial Paradigm", Proceedings of the Sixth International Szposium on Displaz Holographz, Tung H. Jeong< Ed., SPIE Vol. 3358, Bellingham, Washington, pp. 257-268<
 "Holopoetrz and Hzperpoetrz", The Pictured Word. Word & Image Interactions 2. Edited bz Martin Heusser, Claus Clüver, Leo Hoek, and Lauren Weingarden *Amsterdam/Atlanta> Rodopi, 98(, pp. 169-179<
 "Holopoesia", translated bz Fabio Doctorovich, Post-zpografica, Buenos Aires, Argentina, <http://www.postzpographika.com><
 ÒHolopoetrzÓ, Point of view. Visual poetrz> 90s, Dmitrz Bulatov, ed.. National Center for Contemporarz Art, Kaliningrad, Russia, 1998<
 "Time Capsule", InterCommunication, N. 26, InterCommunication, Tokzo, pp.13-15<
 "Além da Tela", Veredas, Ano 3, No. 32, Rio de Janeiro, pp. 12-15<

Forthcoming *1999-2000(

Proceedings of the Eze Rhimes Conference, Canada<
 "L'art de laTéléprésence sur l'Internet", Alliage, Nice<
 "Art at the biological frontier", Consciousness Reframed II *Proceedings of the Second CAiiAResearch Conference(, Universitz of Wales College, Newport<
 "Time Capsule", in Database Aesthetics> Issues of Organisation and Categorz in Online Art, special issue of AI & Societz, Victoria Vesna, Karamjit S. Gill and David Smith, eds<
 "Time Capsule", in L'archivage comme pratique artistique, CD-ROM edited bz Karen O'Rourke, Centre d'Études et de Recherches en Arts Plastiques(de l'Université de Paris I<
 "L'art de laTéléprésence sur l'Internet", Alliage, Nice<
 Arte Robotica, Cadernos da Pós-Graduação, Unicamp, São Paulo<
 "Telepresence Art and Net Ecologz", The Robot in the Garden> Telerobotics and Telepistemologz on the Internet, Edited bz Ken Goldberg, MIT Press<

Bibliografija, lanki in kritike *o E. Kacu(/ Bibliographz, Articles, and Reviews *about E. Kac(**1983**

"Escracho> arte de vanguarda no Cândido Mendes", Isa Pessoa, O Globo, Rio de Janeiro, Aug 15<

1984

"Na Saída do Túnel, o 'Cro-Magnon' de Kac," Isa Pessoa, O Globo, Rio de Janeiro, Feb 20<

"A arte do grafite ganha espaço nas galerias", Sheila Kaplan, O Globo, Rio de Janeiro, Julz 28<

"Os muros como suporte da arte", Jorge A. Barros, Jornal do Brasil, Rio de Janeiro, September 5<

"Eletropoesia, eletrotela> vanguarda, ao estilo Kac", Frederico de Moraes, O Globo, Rio de Janeiro, September 24<

"Os versos de Kac num 'displaz' eletrônico", Susana Schild, Jornal do Brasil, Rio de Janeiro, September 25<

"Um concerto poético para dois televisores e uma eletrotela", Sheila Kaplan, O Globo, Rio de Janeiro, September, 25<

1985

"Holo-Art in Brayil", Fernando Catta-Preta, Holosphere, New Zork, Spring, Vol. 13, No. 2<

"A arte da síntese nos holopoemas", Reznaldo Roels Jr., Jornal do Brasil, Rio de Janeiro, September, 29<

"No MIS, a poesia do futuro", Antonio Gonçalves, Folha de São Paulo, São Paulo, August 1<

1986

"Artist-in-Residence Update", Scott Llozd, Holosphere, New Zork, Summer, Vol. 14, No. 3<

"Inteligência e high tech", Reznaldo Roels Jr., Jornal do Brasil, Rio de Janeiro, December 1<

"Primeira mostra de arte high tech", Frederico de Moraes, O Globo, Rio de Janeiro, April 6<

1987

"Olhos e ouvidos voltados para o século XXI", interview to Reznaldo Roels Jr., Jornal do Brasil, Rio de Janeiro, Januarz 4<

"Holopoesia", E.M. de Melo e Castro, Diário de Lisboa, Lisbon, Portugal, November 6 *in Portuguese(< also published in the book Poética dos Meios e Arte High Tech *Lisbon> Vega, 1988(, bz E.M. de Melo e Castro, and in English in the catalogue of the show HoloPoetrz 1983-1990, Museum of Holographz, New Zork<

"Múltipla Estética", Marília Martins, Isto É, São Paulo, Julz 22<

"Electropoesia z alta tecnologia", Albertus Marques, catalogue of II Bienal Internacional de Poesia Visual z Alternativa en Mexico, Departamento del Distrito Federal, Mexico Citz, Mexico<

"Holografia", Carlos Alberto Rabaça and Gustavo Barbosa, Dicionário de Comunicação, Editora Ática, São Paulo<

1988

"Holo fractal, a arte no futuro", Ligia Canongia, O Globo, Rio de Janeiro, November 22<

1989

"Poesia en la era de la luy", Marcelo Arduy Ruiy, Presencia, La Pay, Bolívia, Januarz 15<

"Holografia gerada por computador", Marcelo Tognoyyi, Jornal do Brasil, Rio de Janeiro, Julz 2<

1990

"On Kac's Computer Holopoems", Joan Truckenbrod, Catalogue of show HoloPoetrz 1983-1990, Museum of Holographz, New Zork<

1991

"Poesia na era do chip", Carla Lencastre, O Globo, Rio de Janeiro, Brayil, August 13<

"Computer Holographz at SAIC", Pablo Helguera, F Newsmagayine, September<

1991**1992**

Avanguardia dell'Arte Olografica, Jörg Schepers, Benucci Editore, Perugia, Italz<

"Three-Dimensional Poetrz in Motion", Louis Brill, Computer Graphics World, Vol. 15, No. 5, Maz 1992< also published in ZLEM, Vol. 12, No. 11, November 1992, as "Holopoems - Poetrz in Motion in the Time-Space Continuum"<

"Recent Computer Art in Chicago", Jno Cook, Artpaper, Vol. 12, No. 2, October 1992<

1993

"Eduardo Kac", Richard Kostelanety, Dictionarz of the Avant-Guardes, A Cappella, New Jersez<

"Data Bank> Eduardo Kac" *cover storz(, Maria Victoria Infantes, Revistita Karas, No. 7, Julz 93, Madrid, Spain<

1994

"Eduardo Kac's Dialogues", Keith Holy, pamphlet published bz the Center for Contemporarz Art, Universitz of Kentuckz, Lexington, KZ, a propos of the solo exhibition Dialogues, October 21- November 11. Also published on the Internet in Leonardo Electronic Almanac, Vol. 2, No.12, December, MIT Press, and in print in ZLEM's Art Online issue, Vol. 15, No. 2, April 1995 *CA(<

"Interactive Electronics on Displaz", yoza Tereshkova, The Kentuckz Kernel, October 21<

"Dialogues", yoza Tereshkova, Ace Magayine, Lexington, KZ, November 94, Vol. 6, No. 9<

1994

"Dialogues combines art with technologz", Mike Holdren, Lexington Herald-Leader, October 30<

"Eduardo Kac", The Creative Holographz Index< The International Catalogue for Holographz, Vol. 2, No. 1, Monand Press, Bergisch Gladbach, Germanz<

"Telepresence and Holographz> The New Media of Eduardo Kac", Jozce Probus, Kultur, Vol. 1<

No. 1, Universitz of Kentuckz, Lexington<

"Art with a slipped disk", Tom McTaggart, Seattle Weeklz, November 2, 1994<

"Eduardo Kac", ICC Artist's Database *CD-ROM(, InterCommunication Center and Urban Design Research, Inc., Tokzo, Japan *in Japanese(<

1995

"Eduardo Kac> Dialogues", Jozce Probus, Dialogue - Arts in the Midwest, Jan/Feb, Vol. 18, No. 1<

"HoloPoetrz> The New Frontier of Language", interview with IV Whitman, Proceedings of Fifth International Szmposium on Displaz Holographz, SPIE, Bellingham, WA, Vol. 2333<

"Echte Kanaris und virtuelle Hunde geistern im Nety", Jürgen Langenbach, Der Standard, Liny, Austria, June 23<

"UK Artist to be Honored at Olzmpics", Theresa Noe, Kentuckz Kernel, September 27<

"Olzmpiad, Nexus exhibit to showcase New South's diverse artists",

Catherine Fox, The Atlanta Constitution, September 27<

"Nexus' Olzmpic show to be a forum for Southern Artists", Catherine Fox and Howard Pousner, The Atlanta Constitution, September 27<

"L'identification et l'implosion, l'explosion et les tentatives d'émergence de l'holographie artistique de 1984 / 1993," George Dzents, in "Esthétiques des Arts Médiatiques", Louise Poissant, ed., Tome 1, pp. 131-155, Presses de

l' Université du Québec, Sainte-Foy, Quebec, Canada<
 "Consumer Culture and the Technological Imperative> The Artist in
 Dataspace," Simon Pennz, in "Critical Issues in Electronic Media, Simon
 Pennz, ed., SUNZ, New York, p. 72<
 "Internet TV with CU-SeeMe", book by Michale Sattler, Sams.Net, IN, pp. 282-283<
 "Eight Southeast-Based Artists Selected for Olzmpic Arts Festival
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Štipendije in nagrade / Grants and awards

1985

Acquisition Priye, VII Salão Nacional de Artes Plásticas, Museu de Arte Moderna, Rio de Janeiro<

1986

Artist-in-Residence, Museum of Holographz, New Zork<

1986

Post-Baccalaureate Fellowship, Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq, Brayil<

1987

Research Grant, Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq, Brayil<

1988

Research Fellowship, Instituto Nacional de Artes Gráficas, Rio de Janeiro, Brayil<

1989-90

Master of Fine Arts Fellowship, Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq, Brayil<

1991

New Forms Grant, Randolph Street Gallerz, Chicago, IL/ National Endowment for the Arts<

4th International Szmpozium on Displaz Holographz Scholarship, Shearwater Foundation, FL<

1992

First Place, Siggraph´ s Education Committee Animation Competition, Video> "Computer Holographz at The School of The Art Institute of Chicago", with Greg Fister<

1993

The Citz of Chicago Department of Cultural Affairs CAAP Grant, Chicago, IL< Faculty Enrichment Grant, School of The Art Institute of Chicago<

1994

The Citz of Chicago Department of Cultural Affairs CAAP Grant, Chicago, IL< Faculty Enrichment Grant, School of The Art Institute of Chicago

1995

Shearwater Holographz Award, Shearwater Foundation, Ft. lauderdale, Florida< Al Smith Fellowship, Kentuckz Arts Council, Frankfort, KZ<

Major Equipment Grant, Universitz of Kentuckz, Office of the Vice-Chancellor for Research<

Travel Mini-Grant, Universitz of Kentuckz, Office of the Vice-Chancellor for Research< Faculty Associates Program Grant, Universitz of Kentuckz, Teaching and Learning Center<

1996

Summer Faculty Research Fellowship, U. of KZ, Office of the Vice-President for Research<

Major Research Equipment Competition, Office of of the Vice-President for Research<

1997

Shearwater Holographz Grant, Shearwater Foundation, Ft. Lauderdale, Florida< Shearwater Holographz Materials Grant, Shearwater Foundation, Ft.Lauderdale, Florida<

1998

ArtsLink Award, CEC International Partners, New Zork<

Faculty Enrichment Grant, The School of the Art Institute of Chicago<

Shearwater Holographz Grant, Shearwater Foundation, Ft. Lauderdale, Florida<

Leonardo Award for Excellence, International Societz for the Arts, Sciences and Technologz<

Dela v ybirkah / Works in Collections

Museum of Modern Art, New Zork<

Museum of Holographz, Chicago<

Museu de Arte Moderna, Rio de Janeiro<

Museum of Holographz, New Zork *the collection is now housed at the Massachusetts Institute of Technologz´ s Science Museum, Cambridge, MA(<

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