

Lea

LEONARDO ELECTRONIC ALMANAC

VOL 17 NO 1 A collection of articles, reviews and opinion pieces that discuss and analyze the complexity of mixing things together as a process that is not necessarily undertaken in an orderly and organized manner. Wide open opportunity to discuss issues in interdisciplinary education; art, science and technology interactions; personal artistic practices; history of re-combinatory practices; hybridizations between old and new media; cultural creolization; curatorial studies and more.

Contributions from

Frieder Nake, Stelarc, Paul Catanese

and other important cultural operators.

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INVERSE EMBODIMENT

by

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EAR ON ARM, London, Los Angeles, Melbourne 2006

Photographer: Nina Sellars

STELARC

Lanfranco Aceti: Let's start with a controversial question: what is left of cyborgology today when we are actually looking at an artworld that is in total flux with bio-art, nano-art, data art and an infinite recombinatory matrix of disciplines in which art is the definition of human creativity?

Stelarc: Well, there are a few contentious issues mentioned ha, ha. The Cyborg, the art world, the human and what constitutes creativity are all problematic in defining – and in doing. What's meaningful is to understand that the discourse of the cyborg has diversified from the manga, military and medical constructs into a multiplicity of possibilities, meanings and operations that have become simultaneously more extended and also more internalized. Cyborg constructs become modes of interrogation about what a body is and how a body operates and becomes aware in the world. Arts practice is understandably fascinated by the aesthetic and conceptual possibilities of contemporary media and this is expressed with installations using Robotics, AI, AL, Medical Imaging, the Internet, Tissue Engineering and Nanotech. New technologies generate unexpected information and images of the body and its world. It's not so much that technology enables but rather that it destabilizes and generates more uncertainty, anxiety and consequently more creative solutions to unpredictable perplexing problems.

Do you think that it makes sense to continue thinking of the cyborg as a liberating entity – loosely quoting Donna Haraway – that will defeat the oppression of corporate and military social structures? Or would it be better to acknowledge the cyborg's inability to autonomously self-repair and self-improve, therefore being a creature that is increasingly dependent on these corporate and military frameworks for engineering, genetic and biochemical upgrades?

Certainly the construct of the cyborg needs to be positioned in social and political spaces of discourse. And Donna Haraway articulates particular insights that are

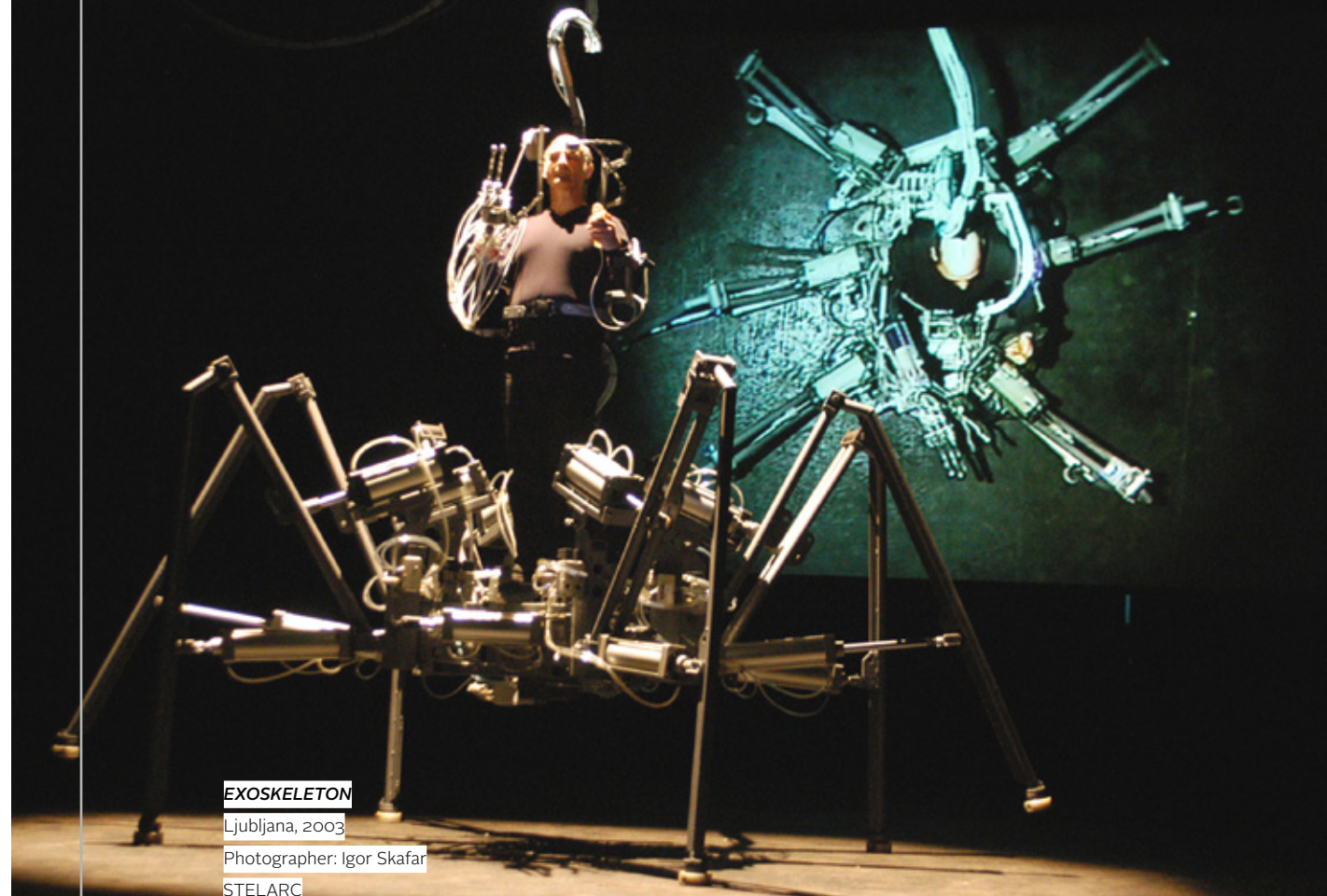
important. In this age of gene mapping, body hacking, neural jacking, organ switching, organ printing, gender reassignment, prosthetic augmentation, avatar surrogates and telematic embraces we are all resigned to be repaired and re-engineered by medical and corporate institutions that are regulated by political bodies with particular social and sometimes cultural agendas. To autonomously self-repair and self-improve is not something we do adequately as biological bodies. And what determines our identity is no longer our presence or location but rather our connectivity. The body is not identified or experienced any longer by its presence but rather by its ABSENCE. If the body recedes it does so not because of the irrelevance of the physical but because of becoming massively embodied in a techno-apparatus and because of its complicity with code. The body is now a fluid and floating signifier whose meaning is unstable and constantly being re-coded and reconfigured. The body becomes simultaneously a zombie and a cyborg. The cyborg is not the alien other, but rather this particular body. The cyborg is no longer a body without organs. The cyborg is no longer an idea but an actualization. We are all becoming extended operational systems that mesh meat with metal and that interface brain signals with silicon chip circuitry. We can now remotely project and remotely control. We all experience telematic embrace. We all experience telepresence and telexistence. Our bodies are accelerated, our senses are accentuated and our cognitive capabilities are amplified. What's also interesting at this time is that flesh is circulating. The body becomes composed of the organs of the

other, the face of the other, the hands of the other. Dead bodies need not decompose, near dead bodies need not die. We are living in an age of excess and indifference. Of printed flesh. Organs will be printed. Organs will be in excess. Organs Without Bodies. Of organs awaiting bodies. There is now a proliferation of biocompatible components in both substance and scale that allows technology to be attached and implanted into the body. Hydraulic hearts circulate blood without beating. Ova are fertilized by sperm that was once frozen. There is now the possibility that the skin cells from a female body will be re-engineered into sperm cells. The face of a donor body becomes a third face on the recipient. Limbs from a dead body can be attached and reanimated on a living body. Cadavers can be preserved forever with plastination whilst comatose bodies can be sustained indefinitely on life-support systems. Cryogenically suspended bodies await reanimation at some imagined future. The dead, the near-dead, and the yet to be born now exist simultaneously. What becomes meaningful now is not only to ask what is alive, but what is dead. The boundaries are blurring between the living, the partially living, the dead, the near dead and the cryogenically preserved. This is the age of the cadaver, the comatose and the chimera. The cyborg is the chimera, the recombinant body that performs with mixed realities. Meat, meshed with metal, managing data streams in virtual systems.

The politics and boundaries of the body have been stretched today to such an extent that it has become a battleground for exo and endo technologies. Jean Baudrillard decried the transformation of the body and its invasion – I personally see it as a normal process of evolution with social and political connotations. From an art practice and aesthetic perspective what are your conceptual underpinnings?

Like you, I share the acceptance, rather than Baudrillard's unease, at the body's invaded and augmented

boundaries. What is human about the biological body is not only its genetic and physiological repertoire of behavior but that it is an inscribed social and cultural creature that can communicate and collaborate in a multiplicity of media. The body is part of a dynamic and often unstable system of interactivity between other bodies, social institutions, cultural conditioning and its instruments and machines. As such the body is not isolated or insulated from modulation and even modification. At a time when we question public surveillance of the body, we realize the necessity for a more adequate internal surveillance system. The body is an excellent host for technology if that technology is biocompatible in both scale and substance. Its cellular structure, its empty spaces and its circulatory system enable the implanting and embedding of micro and nano scaled sensors and machines. So this unease that if we penetrate the boundary of the skin that we somehow expose and endanger the self or what it means to be human is somewhat simplistic. What wireless media allow us to do now is to perform beyond the boundaries of our skin, to project our human presence to people in other places, to perform with Augmented and Mixed Realities. In fact the body now has an extruded self, it performs remotely and virtually and it increasingly experiences itself as fragmented and distributed. . Subjectively, the body experiences itself as a more extended system, rather than an enclosed structure. The self becomes situated beyond the skin. The body is emptied out. But this radical emptiness is not through a lack but from the extrusion and extension of its capabilities, its new sensory antennae that generate abstract information and its increasingly remote functioning. The body experiences its actuality neither all-present-in-this-body, nor all-present-in-that-body, but partly-here and projected-partly-there. An operational system of spatially distributed but electronically interfaced of bodies and bits of bodies ebbing and flowing in awareness, augmented by alien agency. What I refer to as Fractal



EXOSKELETON

Ljubljana, 2003

Photographer: Igor Skafar

STELARC

Flesh. This process of extrusion, of becoming an extended and remote operational system sees a radical emptying of the body which accompanies an amplified absence. One caused not through a lack but rather from an excess. We have become Split Bodies, simultaneously possessed and performing bodies – partly zombie and partly cyborg bodies. And the body itself now becomes a prosthesis to enable its avatars – an Inverse Motion Capture System. What is needed then is not a Second Life but rather a Third Life where avatars are able to actuate surrogate bodies and perform in the real world. Embodied artificial agents proliferate and become more animated, operational and interactive. What I've referred to as Phantom Flesh.

If we analyze the recent evolution of contemporary art how do you envisage the future artistic practices that may develop from the blurred boundaries that define artistic practices and creativity today?

There has always been a curiosity about alternate areas of creativity. In the early seventies I noted that the future role of the artist would be as a “genetic sculp-

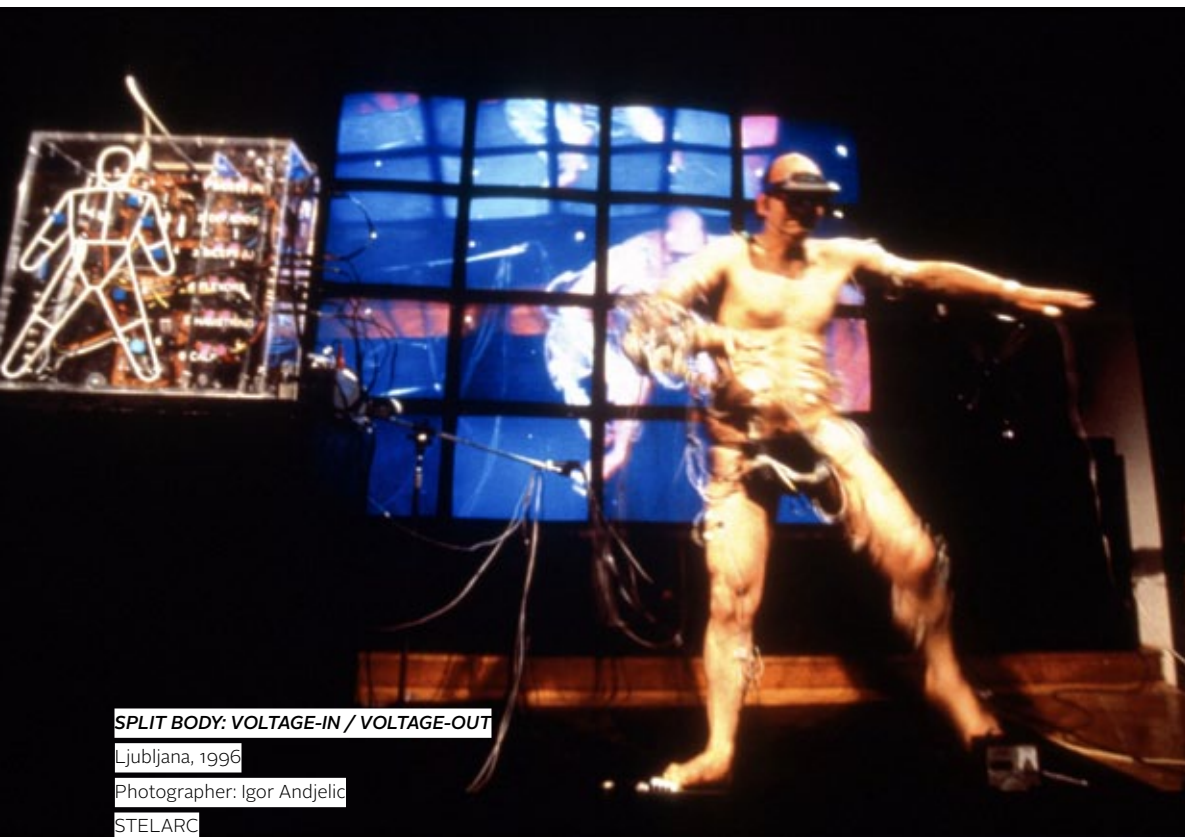
tor”, considering the redesigning of an obsolete body. There is a theoretical interest about how technology that was once external, is now becoming biocompatible both in scale and substance. There has been an interest in the idea that we may be able to re-colonize the human body with nano-sensors and nano-bots to augment the bacterial and viral populations already in our bodies. We need to detect pathological changes in chemistry, temperature and abnormal cell-growth. As an artist, I'm interested in constructing actual interfaces, experiencing them and thereby being enabled to meaningfully articulate. My ideas need to be authenticated by my actions. So I'm uncomfortable about merely speculating. It seems so inadequate. Having said that I've been considering the idea of Inverse Embodiment. The idea that since all technology will be inside the body, we could reconstruct the body from the inside out, atoms up. There is the possibility of engineering endo-sensors, endo-machines and endo-architectures in cellular spaces. Why engineer and construct external to the body? The body can become a host for all its technologies.

The concept of **INVERSE EMBODIMENT** is a very exciting thought, particularly if framed within the context of consciousness and identity. If we would be able to build the body atom up how do you think consciousness would be determined? Or even better, do you think that it would reside – as believed in medieval times in a particular organ, or it would arise from a combination of cellular patterns? And are these patterns – speaking speculatively – random or actually determinable?

Re-engineering a body inside out, atoms up might be a more effective, incremental strategy. And a modification of its physiology and sensory apparatus would result in an adjusted and extended operation and awareness in the world. It would not be meaningful and it would probably be misleading to suggest that consciousness resides anywhere, even in the brain. Consciousness is a characteristic of an operating and interactive body, one that is positioned in a social and cultural history. (To be an intelligent agent, you need to be both embodied and embedded in the world). Insects and animals with a different optical and sensory

apparatus would experience the world in diverse ways. Redesigned and re-engineered humans might not only see and move differently but have an alternate experience of time and space, affecting their interaction with others and the technological terrain they inhabit. We have evolved soft organs to better operate in a biological world. Perhaps now we have to engineer additional organs to better interface and operate with our media and machines.

As you can see I am talking of an INVERSE EMBODIMENT not only of the flesh but of the soul as well... In a way it would be a response to Paul Virilio and



SPLIT BODY: VOLTAGE-IN / VOLTAGE-OUT

Ljubljana, 1996

Photographer: Igor Andjelic

STELARC



The more and more performances I do the less and less I think I have a mind of my own nor any mind at all in the traditional metaphysical sense. This body is profoundly obsolete, empty, often absent to its own agency and performs largely involuntarily.



the idea of humanity as a perfect creation of God in no need of further developments...

I admire many of Virilio's observations about technology, but as an evolutionary architecture, the biological body is quite inadequate, not very robust, soft and easily damaged, susceptible to infection by microorganisms and the body malfunctions often, with a limited longevity.

What it means to be a body has always been a biological, social, cultural, and technological construct. But we do need to go beyond Platonic, Cartesian and Freudian constructs of internal minds and selves. Of the skin as a bounding of the self and as a beginning to the world. Nietzsche asserts that there is no being behind the doing, and Wittgenstein says that there is no need to locate thinking inside the head. The more and more performances I do the less and less I think I have a mind of my own nor any mind at all in the traditional metaphysical sense. This body is profoundly obsolete, empty, often absent to its own agency and performs largely involuntarily.

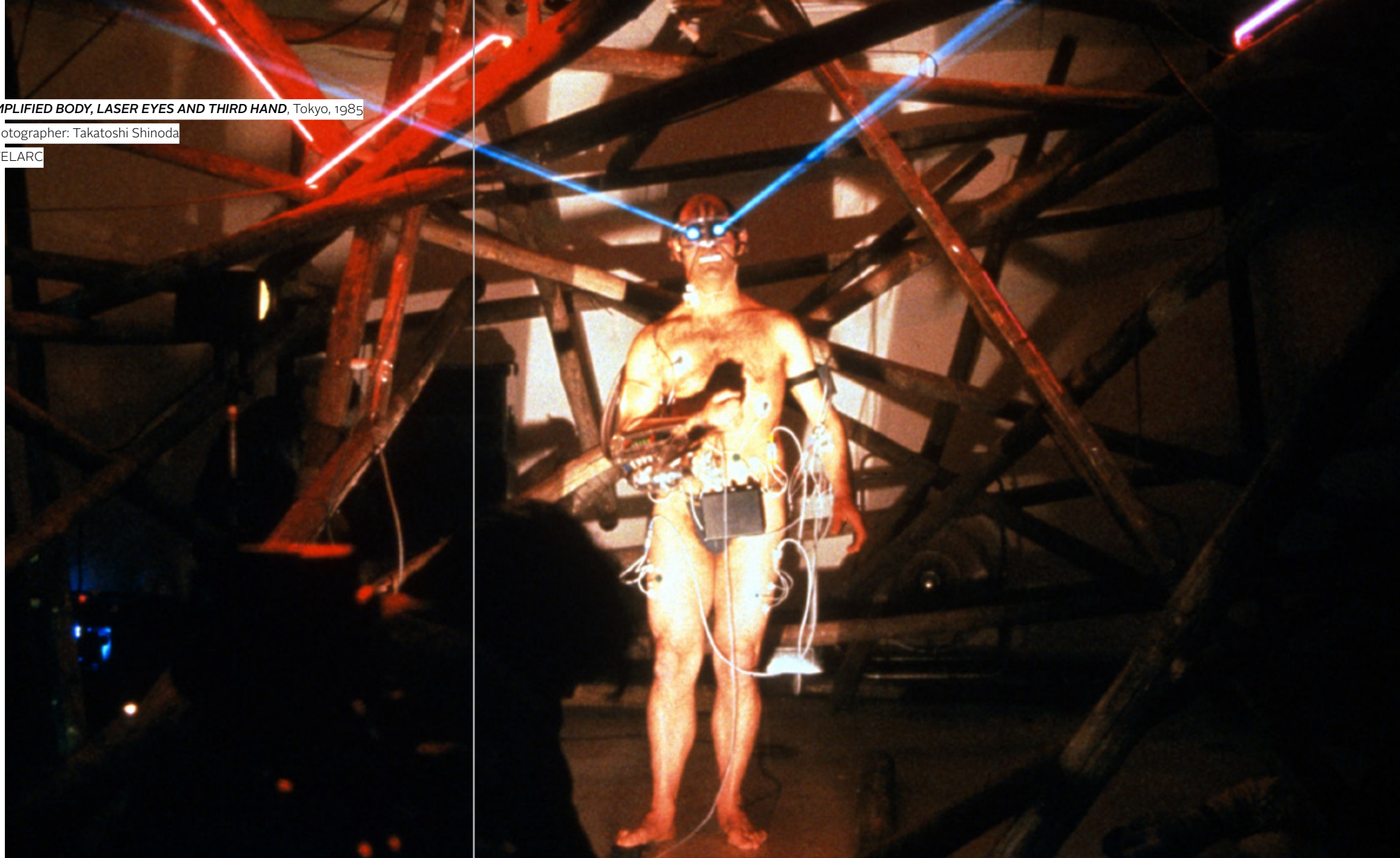
In this context do you think that we are talking of a replica body of what is already there – only this time created by man? Or there are different expectations. Is the INVERSE EMBODIMENT a tool for construction of a totally different human?

Initially the idea of Inverse Embodiment would be to engineer a more adequate internal surveillance system to detect pathological changes in chemistry, temperature and abnormal cell growth. To repair and make more robust the body as it is. A higher metabolic rate is thought to be one primary factor in ageing. To extend a body's longevity it might be possible to better monitor, regulate and stabilize the body's metabolic rate for the body to live faster and to live longer. Controlling the rate of free radical production, reducing and repairing the damage they cause might be a capability best engineered inside out, atoms up. But why perpetuate the present body by repairing and making it more robust? Why not question the very design of the body itself? Why a body with this particular form and these particular functions? Must bodies be born? Must they die? Humans are curious and creative. What it means to be human is perhaps not remaining human at all...

AMPLIFIED BODY, LASER EYES AND THIRD HAND, Tokyo, 1985

Photographer: Takatoshi Shinoda

STELARC



If we are to speculate further – and I know you don't really like to prognosticate – what do you believe are the new frontiers of contemporary art? What else do you believe may there be awaiting us to surprise and challenge preconceived and worn out systems of production?

Oh, just to say that arts practice, given its parasitic nature, will appropriate and be sustained by any new media, technology or system that generates surprising information and images. What's interesting about art is that there is a willingness to mess with new media. To entertain the accident. To be enamored by the ambivalent and the uncertain. To allow for the slippage that occurs between intention and actuality. To undermine and expose new technologies. And to appropriate and morph systems into new operational and aesthetic possibilities. Given the strategies of art, to be asked to predict particular areas of aesthetic experimentation is not so meaningful or so necessary.

Art and science collaborations have been going on for a while now and not always with positive results. These are complex human interactions that usually succeed based on the will of personal more than institutional cooperation. What would be your successful recipe – as an artist – in order to foster these forms of creativity?

Well, sci-art projects can be problematic, especially at institutions that want to authenticate arts practice within the realm of research. What often happens is that artists do poor science and scientists do inadequate art. An artist in a white coat working in a lab

neither guarantees meaningful research, nor provocative art. Certainly there have to be constraints in using bio-hazardous material in doing bio-art that need regulation and control. Getting ethical clearance for a particular bio-art project though becomes a contentious issue as there is often a collision between artistic intent and institutional concern and alarm that is not so easy to resolve. If the *EAR ON ARM* project, 2006 had been done within a university research context, it would have been unlikely that ethical clearance would have been given. Doing surgery on the artist? Possible problems with infection? An extra ear on your arm? Not possible! Likewise *BLENDER*, 2005 (a collaboration with another artist Nina Sellars) would have been

banned from going ahead. Doing surgery on 2 artists' bodies? Surgical risks? Using the extracted biomaterial as part of an installation? I don't think so! Anyway, that's not to say some interesting and possibly provocative projects cannot be realized within institutions. And in the real world the artist is always constrained in some way or another. Fortunately, there will always be some programmers, engineers or surgeons who will assist artists, even though they may not understand their *raison d'être* or how it can possibly be art. They'll do so because they're intrigued with the idea and are interested in the artist as a person and a creative other. Should artists do the inadvertent, unexpected, the accidentally and even the inappropriate? Perhaps.

BioArt will become simultaneously more seductive and unsettling when artists can engineer, and you can caress, partially living teratomas with throbbing flesh, slimy skin, limbs that twitch, eyeballs that blink and orifices that sigh. These lumps of tissue, hair and teeth will be more potent objects to interrogate issues of aliveness, the transgenic, the pathological, the monstrous and what it means to be human.

Looking back to your career you have been closely associated with cyborgology but there has also been an element of performance to your work parallel to the dramatic and ground breaking re-interpretation of sculpture and installation in biological terms. Would you consider your artistic practice as being influenced by new materials but at its core still a 'classical' art practice?

Although most of my art activities have been performative, these actions were framed by sculptural and installation concerns. With the earlier *Suspensions*, the body was seen as a sculptural medium, the stretched skin a kind of gravitational landscape. The performances had no shamanistic, yogic or transcendental intent. The suspended body counterbalanced by a ring of rocks, suspended on an outcrop of rocks at the seaside, or hung between two buildings on East 11th Street in NY were all imagined as sculptural works within certain spaces and situations. The *AMPLIFIED BODY*, *LASER EYES* and *THIRD HAND* performances occurred within interactive installations that were modulated by EEG, EMG, ECG and other body signals whilst the *Third Hand* was actuated by abdominal and leg muscle signals. Intimate and interactive interfaces have been a performance concern. Given that the body has become this hybrid chimera of biological, machinic and virtual systems that increasingly performs in Mixed Realities, more intimate interfaces are needed so that the body can seamlessly slide between these different modes of operation. All of these projects have not been constrained and contained by any one media. Rather there is a conceptual continuity of concerns that sometimes are better expressed with diverse media and alternate artistic strategies. The *PROSTHETIC HEAD*, 2003 (a kind of digital portrait of the artist) has also generated the *WALKING HEAD*, 2006 (a kind of robot portrait of the artist) and the *PARTIAL HEAD*, 2006 (a tissue-engineered portrait of the artist). Recently, there have been other embodiments such as the *ARTICULATED HEAD*, 2010 (as part of the Thinking Head project at uws) and the *FLOATING HEAD*, 2010 (a collaboration with NXI Gestatio in Montreal). The *Prosthetic Head* was also an installation at the Kinetica Art Fair, 2011 as an interactive hologram, using the Musion system. The recent *INTERNET EAR* project, realized for Biotopia, 2011 (curated by Morten Sondergaard with technical realization by Mogens Jakobsen) involved soft casts of the *Ear on Arm* with

implanted microphone, located in gallery spaces in Aalborg, Paris and Moscow. When visitors speak into the ear, the speech recognition system interprets what is said and speaks the words aloud in all of the gallery spaces simultaneously. There was also a website where people elsewhere could click on the ear and input text for the text-to-speech engine to speak. The installations resulted in a cacophony of circulating voices, visually displayed and acoustically modulated with feedback. For this internet installation sculptural, computational and audio-visual techniques were required. And a present project involves engineering an insect-like *MICROBOT*, with webcam attached, that is robust and small enough to climb up my tongue and into my mouth. I just have to remember not to swallow ha, ha... ■

NOTES

The Thinking Head project is one of three Thinking Systems Special Initiatives jointly funded by the Australian Research Council (ARC), and the Australian National Health and Medical Research Council (NH&MRC) for the years 2007–2011. It is administered by the MARCS Auditory Labs at the University of Western Sydney, with participating universities in Australia, Denmark and the USA.

Stelarc is Chair in Performance Art, the School of Arts, Brunel University West London and Senior Research Fellow, MARCS Auditory Labs, University of Western Sydney. He was awarded the Hybrid Arts Prize at Ars Electronica in 2010. His artwork is represented by the Scott Livesey Galleries in Melbourne.



BLENDER

Melbourne, 2005

Photographer: Stelarc

STELARC & NINA SELLARS

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photograph Murat Germen,
Muta-morphosis #79, Istanbul,
150 x 85 cm, 2011, 7 editions + 2 AP,
courtesy of C.A.M. gallery.

