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Body Augmented: Interview with Stelarc

KHŌREIN: You tend to use architectural terms when speaking about your work. For example, you have frequently emphasised your exploration of "alternate anatomical architectures." What does the project of designing a "new body" mean to you?

STELARC: I have always thought architectonically, structurally, of spaces both internal and external, of circulatory systems—going beyond the mere surface of things. My parents would have hoped I had undertaken a career in medicine. Hence the general interest in both anatomy and architecture. In fact, I was accepted into the architecture course at Melbourne University, but after a hesitant start, I decided to do a visual arts course instead. The internal body probes and the sculpture inserted inside my stomach amplified the use of that kind of terminology. The body is an intricate, evolved analogue body. But objectively, it is not well designed neither for full adaptation with its natural environment nor able to effectively cope with its own engineered technological habitat. Before the possibilities of nanotechnology became apparent to me, I thought that we might only be able to redesign the body not from inside out but rather at the skin level. If we could engineer an alternative skin which had the additional properties of photosynthesis and be permeable to oxygen, then we could radically redesign the body. We would not need lungs to breathe, a mouth to chew, a gastrointestinal tract to digest food or a circulatory system to convey nutrients and oxygen throughout the body. The body would no longer be an organisation. We could hollow out the human body, making it more amenable to technological components it could become a host for. Admittedly a naïve idea but seductive at the time because it bypassed the internal complexity and analogue complexity of the body. So yes, we can accept poetically the biological status quo of the body as a malfunctioning and even fatally flawed organism whose very operation guarantees its demise. Aside from speculation, the emphasis

Figure 1. Stelarc, *City Suspension*. Copenhagen, 1985.
Photograph by Morten Schandorff. Courtesy of Stelarc.

is not so much on designing a new body as such but rather considering alternative anatomical possibilities that allow the body to perform more effectively, not only pragmatically, in Earth environments but also beyond this biosphere in zero G and in extreme electromagnetic and gravitational fields. Perhaps our only contribution as a species is to provide the brains for humanoid robots that can be engineered to become more mobile and more robust systems that can disseminate intelligent life beyond this planet. As individuals and as a species our longevity is so limited that we only experience phenomena and the universe in an incredibly brief instant of cosmological time. So, the perpetuation of intelligent life in any form or substrate becomes a priority if indeed it is such a rare occurrence. What is needed is a splitting of our species. We need to reconsider embodiment beyond this particular form with these particular functions.

KH: Could you tell us more about your experience of "surgical sculpting" of your body; you started with an implant of a third ear on your arm, is that right?

STELARC: During a residency at Carnegie Mellon University in 1996 and after growing rat myoblasts in a petri dish, I had an idea of engineering a soft prosthesis—one that would become a permanent modification of my body rather than simply a mechanical attachment as with the *Third Hand*. And being always with the ear structure—which is not only an organ of hearing but also an organ of balance—the idea of an extra ear became an obsession. Albeit its external structure. At first, it was imagined as an extra ear on the side of my head. But no one would assist in realising that. It took ten years to get funding and to find three plastic surgeons to actualise the project, but as an ear on my arm. There have been four surgical procedures since 2006. Although "surgical sculpting" is seductive terminology, the process is more prolonged and constrained and not without complications. There were several serious problems that occurred: necrosis during the skin expansion process necessitated excising it and rotating the position of the ear around the arm. Ironically, this proved to be the original site that the 3D model and animation was visualised. Anyway, the inner forearm was anatomically a good site for the ear construction. The skin is thin and smooth there and ergonomically locating it on the inner forearm minimises the inadvertent knocking or scraping of the ear. There was also a serious infection having left the microphone inside the ear construct for a week. Melodramatically, I could

have lost an arm for an ear. The process involved firstly inserting an expander in the arm, self-injecting sterile saline solution for several months to stretch the skin. The expander was then removed and a Medpor scaffold was inserted. The Medpor implant is a porous, biocompatible polyethylene material, with pore sizes ranging from 100–250 micrometres, encouraging your cells to populate it. In about six months there was tissue ingrowth and vascularisation. The construct becomes a living part of your body. The project was not about merely replicating an ear and relocating it to my arm. The ear is not for me. It is a remote listening device for people in other places. The *Ear on Arm* is an alternative aesthetic gesture for a new organ for the body: an available, accessible and mobile organ for other bodies in other places, enabling people to locate and listen in to another body elsewhere. The intent is still to realise a functional capability, but up till now I have not found any elegant and inexpensive way to do that (figure 2). There are biomedical, technical and issues of scale that still exist. The test done immediately after the second surgery with the microphone implant demonstrated that it is a plausible project. Even with a partial plaster cast and the arm and ear wrapped in bandage, and even with the surgeon wearing his face mask, his voice was picked up and wirelessly transmitted. But rather than an ear that hears and transmits, I first imagined an ear that would speak to the person who came close to me.

KH: If the ear implant became part of your body and was meant for remote listening as you say, or as a communication device oriented to the "external world," what was the idea behind the project *Stomach Sculpture* where your body was a host for a surgically inserted sculpture?

STELARC: There was a simultaneous interest to both probe and extend the body, and to externalise internal body functions. For example, with the *Amplified Body*, *Third Hand* and *Laser Eyes* performances, brainwaves, heartbeat and muscle signals were acoustically amplified, morphing body shape into the cuboid gallery space and immersing the audience. As well as actuating the *Third Hand* and amplifying the motor sounds, I was able to scribble with laser beams directed to the eyes via optic fibre cable, piercing and probing the space. The eyes metaphorically become transmitters of light, rather than passive receptors of images. The nervous system of the artist inhabits the gallery and contains the audience. And the realisation that just as technology can be now attached, it could also

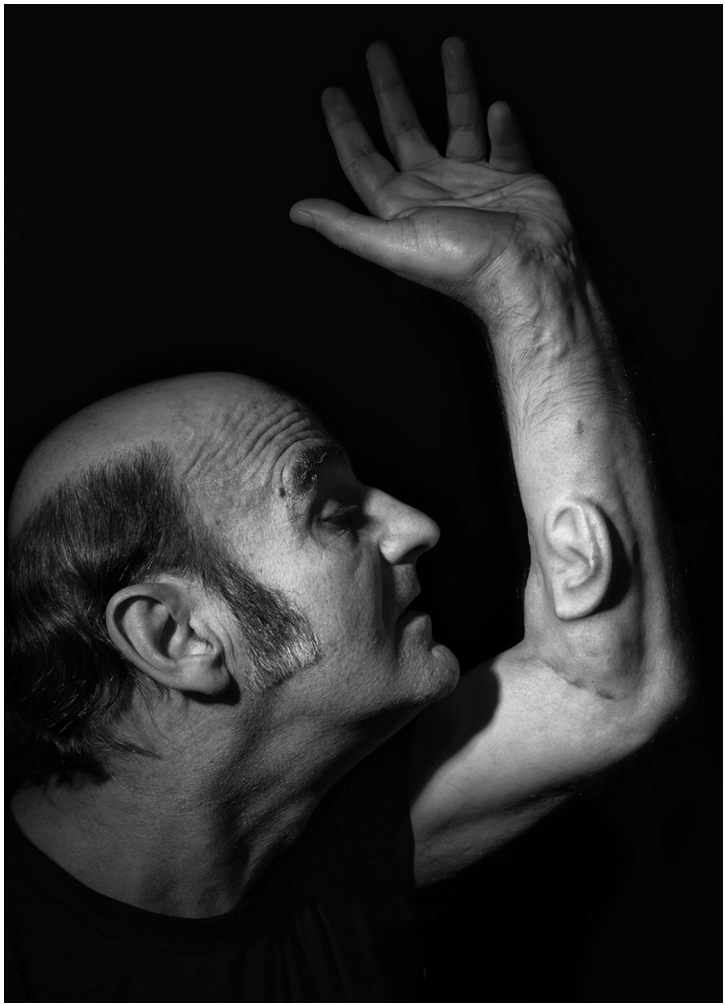

Figure 2. Stelarc, *Ear On Arm*. London / Los Angeles / Melbourne, 2006. Photograph by Nina Sellars. Courtesy of Stelarc.

be inserted. Between 1973–1976 I filmed three metres of internal body space into the left and right bronchi of the lungs, the stomach and the colon using endoscope technology. For the first time for me, there was an experience of the body not as a surface of skin but rather an internal architecture of spaces, structures and circulatory systems. Twenty years later I was invited to participate in the Fifth Australian Sculpture Triennial, whose theme was site-specific works. But instead of a sculpture for a public space, I decided to engineer a sculpture for a private physiological space. The empty stomach had to be inflated to make the insertion safer. This was realized with the assistance of a friendly endoscopist five minutes away from the local hospital. When fully closed as a capsule structure, it could be inserted down the oesophagus into the stomach cavity. Inside the stomach the sculpture could open and close, extend and retract, it had a flashing light and a beeping sound. A simple machine choreography inside a soft organ of the body. The concern was that if the mechanism failed to close it could not be pulled out, necessitating a serious operation to extract it. The body here not as a site for the psyche nor for social inscription, but rather the body simply as a site for a sculpture. The body as a host for a work of art. The process involved six insertions over a period of two days. It was certainly the most uncomfortable and traumatic of the projects and performances and the one requiring observation overnight in a clinic. It proved to be the most difficult of all of the performances, including the suspensions (figure 3).

KH: You have often stated that you treat your body as a host. Could the trauma that has been inflicted on your own body, within the internal cavities of your stomach, be regarded as an act of "unconditional hospitality?"

STELARC: Any references to my body should be understood as this body. Language fatally encourages us to always speak as a subject. Trauma of course was not intended but certainly was an outcome of some of these projects and performances. And that exposed both the body's spaces and structures as well as its vulnerabilities. Although pain is an early alert that you might be doing damage to your body or that you are suffering a pathological condition, a body in pain is a throbbing body, a painful condition that collapses distinctions of mind and body. You are only one throbbing body. The intent again is not to deliberately inflict pain, nor should the performances be seen as some sado-masochistic act. To actualise some ideas has been physically difficult and at other times technically

Figure 3. Stelarc, *Stomach Sculpture*. Melbourne, 1993. Photograph by Anthony Figallo. Courtesy of Stelarc.

challenging. The experience since the early endoscopic probing of the body was to open up the body, to be open to possibilities. Through both exposing the spaces and circulatory systems and through the experience of extrusion of the self only, the bounded and contained body becomes a Hollow Body. A hollow body is a more hospitable body, more capable of welcoming, both spatially and psychologically. Yes, it can be seen as an act of a Derridean hospitality but not so much in terms of the welcoming of the other, but of the artifact. An openness mixed with an indifference. Indifference here meaning a state of not having any expectation. To allow an unfolding with its own time, in its own rhythm. Technology is no stranger to the body. What it means to be human is to construct artifacts, instruments and machines. The trajectory of technology is the trajectory of the human. There is agreement with Bernard Stiegler's assertion of the prostheticity of the body. So, it is not about inducing trauma but rather about indicating what is happening in the transition from attachment to insertion. Technology begins as artifacts and machines that are external to the body. In a sense, technology explodes away from the body, finally immersing and containing it. With micro-miniaturisation, technology implodes back to the body. It not only attaches but sticks to the skin and also becomes implanted into the body. The most significant event in the twentieth century was not technology landing on other planetary bodies but landing on the human body itself. The body welcomes technology given its scale and substance.

KH: You speak of an analogy between space and architecture, and about an architecture of spaces (albeit, spaces within the body). Is digital, virtual architecture the prosthetic element that enables the future?

STELARC: We now construct virtual structures and spaces that are more responsive and intelligent in algorithmic and organic ways. Virtuality is a mode of operation, a mode of interaction. Virtuality generates an inverse embodiment. Presence not so much about a feeling of being here but rather a feeling of being over there. Virtuality is a digital prosthesis for being elsewhere, of being somewhere rather than being in some time. Generating pure spatiality devoid of time. A mode of interaction of being lost in virtual space. Rather than a prosthesis enabling the future, it is a means to be present without presence. The virtual pacifies the body and simultaneously liquefies its materiality. And Virtuality is not so much an extending prosthesis but rather a flattening mode of interaction,

not between bodies but bodies interacting with screens. A doubling of the between. The between of bodies has now collapsed onto the surfaces of the screens. Our screens have become our skins. I caress my screen to caress your skin. An intimacy without proximity, an intimacy with skin contact. What the virtual perhaps does in enabling simulation, it facilitates prediction. Prediction exposes possible outcomes rather than enabling us to see the future. And that is if you assert that the future is a time yet to come. William Gibson made the observation that the future is already here, it is just not equally distributed. The future should not necessarily be framed as happening next—that is, after a present made possible by a past. Memory (associated with the past), attention (what constructs the present), and expectation (or imagining a future) blur into all-at-onceness in oscillation. We conveniently assume that we have been formed by the past and we, in the present, construct the future. But it is not so much an additive process, a progressing towards, but rather an oscillation between memory, awareness and imagining in generating the other, the alternative. Deleuze thought of the virtual as potentiality. The not-yet-actual. But the virtual in techno-speak is what can now be engineered. And because we are increasingly seamlessly sliding between the actual and the virtual with our simulations and interactions online, there is no need to speak of the virtual as the not-actual. No longer meaningful to separate the real from the actual. Increasingly we experience a blurring of these modes of operation and existence.

KH: How do you think the prosthetic character of the human body and the idea that it has to be "augmented, extended and enhanced by technology" contests traditional concepts of beauty?

STELARC: At a body hacking conference several years ago, two of the attendees were a female with a prosthetic leg and a guy with an artificial arm that had a detachable hand. Although human like, neither prosthesis tried to be cosmetic in appearance. The leg was ornamental with its 3D printed design and the arm exposed its carbon fibre and metal materials and was proudly displayed. Individually we are becoming accepting of prosthetically augmented bodies with industrial materials. We are accepting of the other as hybrid human-machine. The new ambidextrous arm and hand, now being engineered with the assistance of the ISIR Lab at the Sorbonne, has double-jointed fingers and continuous wrist rotation becoming both a left and right hand in the one design. It will have four

modes of control—an autonomous AI function, a bio-signal animation, an exoskeleton actuation, and a remote interactivity. As an extra arm, it will be uncanny in switching from left to right arm and hand, with a continuous wrist rotation. Alternate operation, alternate aesthetics. And well, I am seduced by the aesthetics of the smooth, the shiny, the metallic, the plastic, and the transparent. Acrylic, stainless steel, aluminium, carbon fibre are materials used in my Third Hand, Extended Arm and Exoskeleton Arm. What also generates alternative aesthetics are the developments in material sciences that lead new materials with new capabilities, to flexible circuitry and biodegradable chips—the research outcomes of John Rogers at the University of Illinois—and soft robotics (figure 4).

KH: Can we speak about the biological body augmented with technology as a kind of aesthetics of a future human body? Is it even still a human body, or perhaps a cyborg of sorts? In your view, does the use of new, sophisticated technological material, that you say you are seduced by, also imply a new aesthetics or even a new kind of beauty?

STELARC: Having given an interview for *The Journal of Somaesthetics* and having had a discussion with Richard Shusterman as part of a public event organised by the Academy of Fine Arts in Krakow, there was a focus on the centrality of the aesthetic experience, beyond the pleasurable and the beautiful, beyond art and nature. Cultural norms are questioned and there is an imperative to go beyond social assumptions of beauty, encouraging self-improvement and enhancement of the individual body. And an aesthetic approach that collapses distinctions between mind and body. The body as a site and a means by which aesthetic experience is generated. The historical notions of beauty have often been associated with the experience of transcendence—the wonder of the divine celestial heavens, transitioning to the awe of nature and to the ideal form of the body. Beauty is not only pleasurable experiences. Experiences of the incomprehensible, of the immensity, of the complexity of nature, have historically contributed to the aesthetics of the human, shaping our engagement with the world and generating meaning with existential reality. As an art student there was a distinction made between the naked and the nude. The body transformed from its gross materiality of a naked body to an ideal, perfect form in the nude. In contemporary society, the beauty of the world of appearances has given way to seeing beauty in the malformed, in the monstrous, in the differently enabled, in the deviant,

Figure 4. Stelarc, *Third Hand*. Tokyo / Yokohama / Nagoya, 1980. Photograph by Pamela Fernuik. Courtesy of Stelarc.

in the chimera. The human is a historical construct. And now specifically a bio-techno body. I characterise the body as a contemporary chimera of meat, metal and code. Its beauty is generated in the aesthetics of its hybridity. A kind of hypertrophy of the human. Not a human-animal chimera but as a human-machine system. Any beauty resides in this monstrous hybridity. Not only the look and feel of its mixed materiality but also in its operational and computational capabilities that these augmentations generate.

KH: In terms of aesthetics of hybridity, you have often expressed the need to "deconstruct our evolutionary architecture" and to "redesign humans." With the potential that the current advances in computing, robotics, AI, etc., what in your view is a new "hybrid human?" Is it a product of evolution that "revives" the body/chimera with technological "injections" to make this hybrid entity more compatible with machines and more disposed to being automated?

STELARC: It depends on how we frame evolution. If we are speaking about Darwinian evolution, it is a process taking about four billion years to unfold gradually through natural selection and random mutation generating the diversity of life forms we know now. There is nothing to suggest that evolution is not an ongoing process. But the difference now is that there are feedback loops and interactions with human research and biomedical instruments, machines and computational systems that not only allow for physiological modification but also with CRISPR, intervening on a DNA level, accelerating change in the body in form and function. Whether we see this still as part of natural evolution or whether accelerated and technological intervention is considered "unnatural" depends on how we frame the human and the natural. But having constructed the technological terrain that it now inhabits—one of fast, powerful and precise machines and computational systems that extend cognition—the body is exposed for its inadequacies. The body's metabolism and 1400cc brain will increasingly be unable to compete. The body is soft and vulnerable, can be fatally infected by microbial life and viruses it cannot detect until symptoms surface, if one organ fails this is usually fatal and its analogue design means it is difficult to replace malfunctioning components. It has to gulp air continuously to stay alive an average of 80 years, and its heart must beat faultlessly almost 3 billion times. The body fatigues easily and spends an average of one third of its life inactive

in sleep. Of course, we can poetically accept the biological status quo of the body and the Heideggerian assertion that life is authenticated with death. Or we can examine the body's design and consider whether biological evolution has resulted in an adequate body. The answer is both yes and no. The body is not self-sufficient in the natural realm it has evolved in. It requires protective covering and necessitates augmentation with artefacts, instruments and machines. Through technology the body extends its spatial and temporal parameters beyond its biological longevity and its biological sensory and cognitive realm. In retrospect, the chimera has been both a contingency and a necessity.

KH: What is the paradigm, the idea or model, for the design of this hybrid body?

STELARC: There is no simplistic paradigm, model or prototype for this hybrid human body. And whatever is proposed should always be contestable and it will be contingent on a multiplicity of conceptual, medical and technical possibilities. The urge is to aesthetically experiment with additional capabilities. What does it mean to perform with a Third Hand, an Extended Arm, have your bipedal gait translated into a six-legged locomotion and to be actuated by a six degree of freedom exoskeleton? These actions are not about enhancing the body but rather augmenting it in unexpected ways. Do we accept the biological status quo of this biological body, or can we reimagine and reconfigure it? And it will be contingent on the social adjustments, ethical acceptance, new instruments and technologies and the possibilities they generate. Also, increasingly skilled surgical procedures, genetic interventions and synthetic biocompatible materials. So, the process for a hybrid body might accelerate but it will happen incrementally for both medical necessity and aesthetic and cosmetic reasons and extending functionality. It will depend also on why this hybridity might result. Will a splitting of the species occur as the form and function of bodies elsewhere need to change significantly in varying electromagnetic and gravitational fields? Certainly, there are general parameters that can be considered in the design of the body. Its limited longevity, its vulnerability, its robustness, its analogue design, its limited sensory perception, just for starters.

KH: Human-machine interaction, which is a recurrent theme in your work, has raised many philosophical and ethical questions. You yourself

wondered, "Would a machine physiology generate a machine phenomenology, a reflective loop developing an awareness and consciousness?" To which you answer that "until complex cognitive systems learn to incorporate new experiences and make appropriate associations machines will not achieve the intelligence for subtle interactions with humans." Have we reached that point? What is your view on a potential future human-machine cohabitation?

STELARC: We assume an agent is intelligent if it responds appropriately. We largely interact and respond interpreting the actions of the other. We react to certain behavioural cues—facial expressions, speech and gestures. How we imagine the inner state or emotional condition of the other depends on how subtle or overt these behaviours are. With 32 micromotors embedded into flexible silicon skin, humanoid robots have real-time lip syncing, express human emotions through facial expressions and now robot limbs and hands have become more dexterous and subtle in their articulations. And embedded with AI algorithms trained on large language models, humanoid robots will adequately predict and compose appropriate speech responses. Simulation becomes real enough to the point where it becomes meaningless to discern any difference between a human and a machine. Daniel Dennett asserted that you could have competence without comprehension. You can exhibit appropriate and what would be considered intelligent behaviour without necessarily having the attributes which we call consciousness. So, a machine physiology certainly will be able to exhibit that kind of intelligence behaviour but at present we can only speculate that it will develop a machine phenomenology and what it means to experience consciousness. I would suggest though that what we assume to be an individual internal state is perhaps an essentially learned and consensual one.

KH: You say that the human is a historic construct. How then should we frame the human today, in what philosophical terms? And in the skein of recent terms and vocabulary regarding the human, such as non-human, more-than-human, other-than-human, post-human, trans-human—what path are you inclined to take?

STELARC: Human+? More-than-human? Other than human? Well, Transhumanism is about enhancement of the body, about achieving motor, sensory and cognitive capabilities beyond our biology. These projects

and performances are not so much about enhancement but rather more about augmentation experiments with alternative anatomical architectures. But I have said that altering the architecture of the body means adjusting its awareness of itself and the world. Transhumanism might be seen as an offshoot or a phase of Posthumanism. And Posthumanism might be defined as the more radical outcome of enhancing the body to become something other. I would assert that what it means to be human is rather not to remain human at all. That impulse, that striving to experience and even become the other, something other. The fascination of the alien contaminates our thoughts, imaginings and actions. We use language to categorise and hopefully clarify the world but often categories can confuse us philosophically by what they exclude. There is a certain contingency when we categorise. There is a certain indifference, as opposed to having expectations, that allows for being open to possibilities. To allow a performance to unfold in its own time, with its own rhythm. It is that indifference that allows for the body to be suspended, that allows the body to insert a sculpture into an organ of the body, that allows a body to have an ear surgically constructed on this arm. To actualise requires indifference. I am not inclined to plot a particular path as such. There is no pre-determined trajectory, a linear plotting of a particular direction that is taken, but rather a more circumstantial, opportunistic, intuitive, fluid twisting and turning. Not really knowing where you are going and how you are getting there, but still desiring, still persisting. Can one desire without desiring something? Can one persist without a purpose? And is intentionality simplistically an attribute of an individuated agent, or the outcome of a more complex interactivity with other bodies, objects, social and cultural systems? Again, it depends on how we construct the world, how we designate and classify things, and this also depends on their spatial presence and their temporal existence in relationship to the human.

KH: You mention that a certain indifference is necessary for a performance to unfold. For your performance *Fractal Flesh*, you decided to give other people's minds the freedom to remotely control your enhanced and augmented body. How does this process affect your sense of self and free will? Are you repudiating Cartesian mind-body dualism?

STELARC: Firstly, the issue is not one of control but rather constructing more complex and extended operational systems where bodies, spatially

separated but electronically connected can interact with distributed agency. Problematising the body's intentionality as simplistically all its own. *Fractal Flesh*, for two days, six hours each day, was about accessing and choreographing the body's movements remotely (figure 5). The body performs involuntarily via the muscle stimulation system, but one leg is free to pivot and it can still also respond by actuating its Third Hand. The body experiences itself as a split body, not a Cartesian split mind and body but a physically split body. Voltage in on the LHS generating involuntary motion, voltage out on the RHS intentionally actuating its Third Hand. The body is simultaneously a possessed and performing body. There are more recent but different iterations of this concept. With the *StickMan,* a minimal but full body exoskeleton, the body is algorithmically actuated for a five-hour continuous performance. Sixty-four possible combinations of gestures are generated. The artist performs unaware of how it will be actuated at any time. Sensors on *StickMan* generate sounds that augment the pneumatic noise and register the limb movements. But he can pivot on one leg, modulating the projected video feedback on one wall and adjusting his shadow on the adjacent wall. A ring of speakers circulates the sounds, immersing the audience. There was a miniStickMan (figure 6) interface that allowed the audience to insert their own choreography by bending the limbs of the interface and pressing the play button. And with the *Re-Wired/Re-Mixed* performance for five days, six hours each day continuously I could only see with the eyes of someone in London, I could only hear with the ears of someone in New York, whilst anyone, anywhere, at any time could access my right arm via the exoskeleton and choreograph its movements. I couldn't anticipate what I was going to see, what I was going to hear or how I was going to move. An experience of distributed agency and shared visual and acoustical senses. The body was effectively in three places at once, two virtually in London and New York and one physically at the Perth Institute of Contemporary Art. *Re-Wired / Re-Mixed: Event for Dismembered Body* was an internet enabled performance that explored the physiological and aesthetic experience of a fragmented, de-synchronised, distracted and involuntary body—wired and under surveillance online (figure 7). It is as if the body has been electronically dismembered, spatially distributed and possessed with multiple agencies. The body was indifferent but not insensitive. Disturbed but not dismayed. When I speak about the body it is not in counter-distinction to a mind. And the more and more actions that have been performed the less there is a mind of my

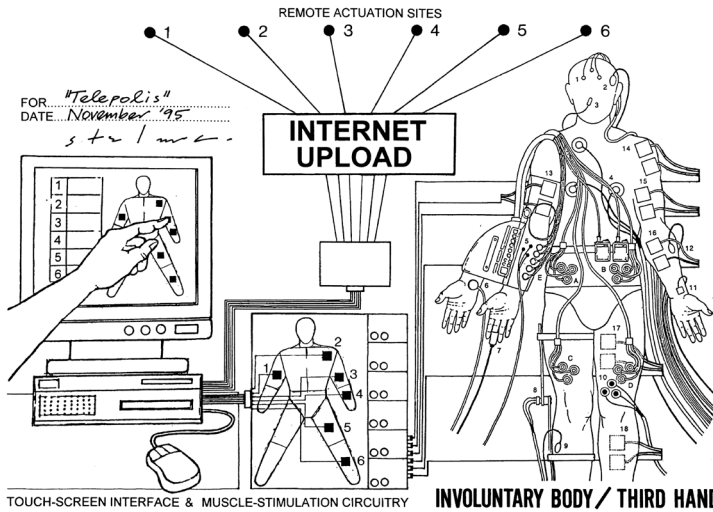

Figure 5. Stelarc, *Fractal Flesh*, Luxembourg, 1995. Diagram by Stelarc. Courtesy of Stelarc.

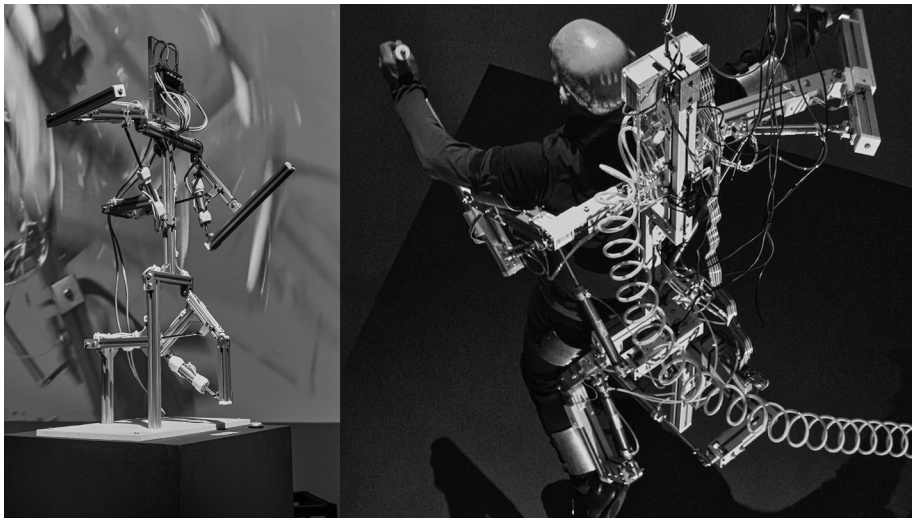

Figure 6. *Stelarc, StickMan / miniStickMan*, Melbourne, 2022. Video still Stelarc. Courtesy of Stelarc.

own, nor any mind at all in the traditional metaphysical sense. This is a complex physical and phenomenological body, aware and interacting in its world of other bodies, artefacts and ecosystems.

KH: If giving control to an external agency is not a key issue for your performances, is then connectivity what is at stake here?

STELARC: What is important is not the body's identity or agency but rather its connectivity. Not its location nor its mobility but its interface. With its increasing functioning online, it performs remotely with a distributed sense of agency, in Mixed and Augmented Realities. The body's sense of self is extruded beyond its skin. This extrusion empties the body. This hollow body is an empty body. Not through any lack but rather through the excess of its technologies. Through its extension and extrusion by artificial and external nervous systems of sensors, circuitries and information and image generating machines. Fractal flesh is that condition of bodies and bits of bodies, spatially separated but electronically connected, generating recurring patterns of interactivity at varying scales. This more intricate, interacting extended operational system reconfigures what an entangled body is and how a body performs.

KH: In your writing, you make frequent use of philosophical ideas; one could say that your work is theoretically informed. On the other hand, you also claim that your ideas are authenticated only through physical actions, in the choreography of performance. How important then are the ideas you find in the theorists you have mentioned, for your performances?

STELARC: Well, it can be both. Media Theory and Philosophy interests me and undeniably there is a feedback loop that occurs over time. But most of my ideas are premised on the performances. In turn they prompt me to read some past philosophers and particular contemporary theorists. You might have an idea, but to actualise it and experience it personally is what is necessary in this process. Those experiences generate unexpected other ideas. And sometimes they synchronise with other critical theory and philosophical writings which will then prompt me to read further. For example, I have always referred to the body as an object so I was intrigued with Graham Harman's definition of an object as not being able to be reduced to its component parts nor its relations or effects. Of being something other. Riffing from Arthur Eddington's

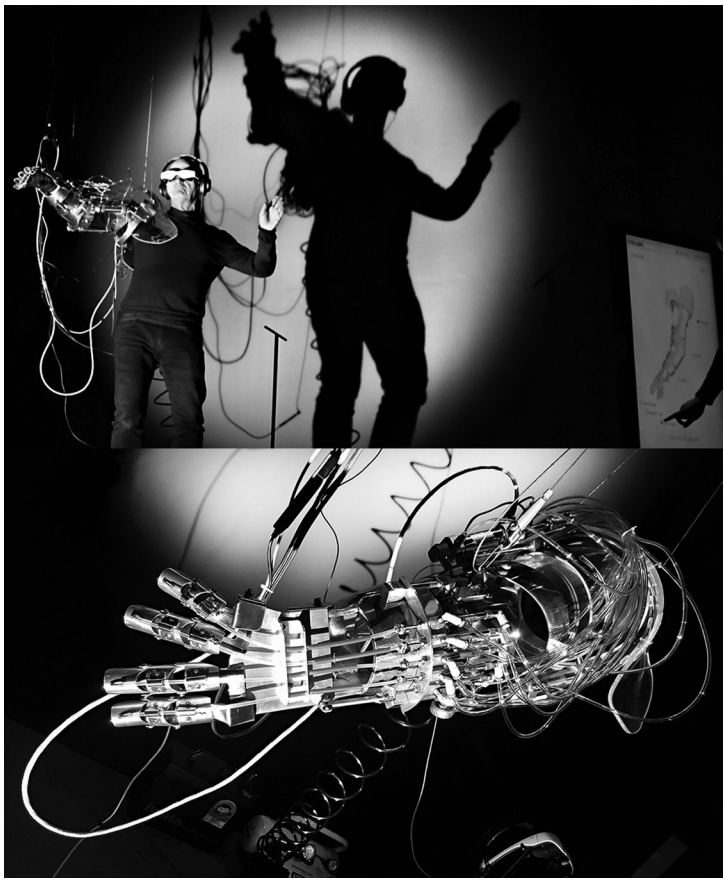

Figure 7. Stelarc, *Wired / Re-Mixed*. Perth / London / NY, 2015. Photograph by Steven Alyian. Courtesy of Stelarc.

distinctions of the scientific table and the phenomenological table. And experiencing the body as a component in an operational system made me read both Actor–Network Theory and more on Object–Oriented Ontology as these are both flattened ontologies where the human is not privileged. Yes, sometimes my ideas are elaborated and informed by these readings. Typically, I will read writers who contribute to my own ideas in some way. As a younger artist reading McLuhan's ideas of technology as an extension of the body, Heidegger discerning notions of "ready-to-hand" and "present-at-hand" in using technology and when it malfunctions. Semiotext(e) publications such as Baudrillard's *Simulations* and Virilio's *Speed and Politics* were interesting and informative to read also as a younger artist. Having said all that, I do enjoy reading other theorists and philosophers that challenge my comfortable assumptions about what constitutes a body and how we experience the world. For example, Hilary Lawson and Donald Hoffman whose ideas veer towards an Idealism, privileging mind-constructed worlds, consciousness over materialism. It is important to remember that art practice is not about accumulating information nor illustrating ideas but rather creating aesthetic experiences. Artistic practice certainly includes the realm of design and craft but contemporary art is more conceptually inclined. Just to remind, speaking about these performances is not the same as performing them, of the artwork itself. And to emphasise that an artist doesn't simplistically illustrate ideas.

KH: We could not agree more about the reflection on the role of art practice. However, when you say that you "always referred to a body as an object," it opens up many avenues for philosophical analysis of the body. Thus, German recognises the difference—particularly prominent in Nietzsche's writing—between *Körper* (physical body) and *Leib* (living body), both of which are translated into English and French with a single word, *body*, that is, *le corps*. More recently, Richard Shusterman has insisted on the use of the Greek word "soma" in his theory of somaesthetics, and to which you referred earlier. With this in mind, how do you perceive the "body," theoretically speaking?

STELARC: I speak about the body in a simple, generalized, abstract way, albeit very much embodied, as a physical form, with particular functions and with a certain analogue, anatomical structure, that is increasingly problematized. So very much the material body embodied and embedded

in the world. And, if I am permitted, without speaking gender, without speaking Soma, without speaking Leib and without speaking Mind. But I appreciate language and cultural distinctions made in discerning and enriching our ideas of what a body is and how a body performs. And yes, different languages and cultures provide additional insights. But these are categories constructed in language. Just as the word "I" is a convenient way of designating this body. It means little else. An "I" is not what is possessed but what is pointed at. But what I find meaningful is the blurring of distinctions between the potentially alive, the actually living, the non-dead and the dead. Frozen embryos (yet to be born bodies), comatose bodies (on technological life-support systems), prosthetically augmented bodies, cryogenically preserved bodies (awaiting reanimation), and plastinated bodies (previously alive). And these are now all in proximity with each other and with other biologically alive bodies. We inhabit liminal realms of transition rather than being in bounded discrete states. Everything is blurring. In the process of breaking down boundaries rather than being blocked by them. Being in states of transition means being ambivalent, anxious and uncertain. Perhaps being on edge rather than being at the edge. In a stage of oscillation rather than being on a trajectory. I would characterize liminality as a condition, if not negating boundaries, of blurring boundaries. Not so much necessitating obstacle avoidance but rather postponing obstacle collision.

KH: *Prosthetic Head* was "theoretically supported" with the philosophical idea of Friedrich Nietzsche "that there is no 'being' behind the 'doing'," as well as that of Ludwig Wittgenstein that "thinking is not located inside the head." Nevertheless, you imply that this engineered *Head* has the capacity for creativity. What kind of creativity are we talking about, how would you explain it?

STELARC: Yes, I thought those statements from Nietzsche and Wittgenstein were applicable in better understanding our interactions with robots and virtual agents. They exposed and problematised issues of internal agency and what constitutes intelligence and mind, which is not simplistically an internal essence but rather what is actualised by our verbal responses, behaviour, and our actions. That is, what is important is what the robot or avatar does and says that determines attribution of agency and intelligence. We need not be concerned about an internal mind if it responds appropriately in the world in unexpected situations

and with its social interactions with humans. The *Prosthetic Head* was completed in 2001. A 12,000-polygon mesh with a flattened image of the artist face providing the skin. So, the head was hand-made ha, ha. It has an Alice chatbot engine that was modified—subtracted and added to. With real-time lip syncing, speech synthesis and facial expressions it is still reasonably seductive. In fact, the *Prosthetic Head* came about when I was getting many requests from PhD students for interviews. Sometimes I could not accommodate them, but sometimes on the move or really busy it was hard to give them time. I thought that if it was not possible to interview me personally, they might be able to interview my head instead. So, the *Prosthetic Head*, an embodied conversational agent and somewhat resembling the artist was programmed with the artist's personal information and his artistic history, his projects and performances and his ideas. It also had general information on current affairs, and being synced to the computer could tell you the time. It was an automated, animated and reasonably informed head. And if you introduced yourself, it would remember your name. As a chatbot engine it would speak to questions it was asked. Depending on key words, key phrases and depending on how it was asked, resulted in the way it answered. Sometimes its responses were plausible, sometimes it didn't know the answers but gave a trivial response. Sometimes it simply deflected by asking if you would like it to sing a song. Sometimes it seemed intelligent, sometimes it sounded stupid. Somewhat like the artist ha, ha. In defence of its responses, I would point out that the *Prosthetic Head* is only as intelligent as the person interrogating it! For a conference in Melbourne that I couldn't give the presentation in person as I was overseas, the *Prosthetic Head* was programmed to give my lecture instead and then at the end was able to respond to audience questions. What is meant by it being creative was due to its unexpected generation of song-like sounds when it strings together vowels, due to the quirks of its text to speech engine. If you asked it to sing a song it would be different each time. Also, it had simple rules in its programming so that if you asked it to recite a poem, it would generate simple poems that were different each time, from its rules and database of words. So, creative in the sense of generating unexpected outcomes. The *Articulated Head* is a more recent iteration. Instead of the *Prosthetic Head* being displayed as a five-metre-high projection as a purely virtual head, the *Articulated Head* had a monitor displaying the head on a robot arm, giving it a physical and sculptural presence. Which combined its virtual facial behaviour with the physical motions of the robot arm.

With added body tracking and sound location it became a more physically interactive presence in responding to its interlocutor. All my projects and performances are aesthetic gestures realised with limited funding and depending on the expertise available at the time. Art needs to be surprising to be interesting. If these installations generate some uncertainty and ambivalence and necessitate rethinking and reimagining then, way to go. All these projects, from the *Third Hand* to the *Ear on Arm*, to the *Articulated Head*, to the recent exoskeletons and robots have never been fully realised in ways that were intended. Admittedly, I have made a career out of being a failure. That is, nothing ever turns out the way that it is imagined. Having said that, my definition of art is that which happens in the realm of slippage between intention and outcome, incorporating the accidental and the unexpected.

Interview conducted by Zoran Erić, Snežana Vesnić, and Željko Radinković