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MIRROR STATES:

ALEX DAVIES

ANNA DAVIS AND

JASON GEE

SEAN KERR

GEORGE KHUT

JANINE RANDERSON

HYE RIM LEE

DAVID ROKEBY

JOHN TONKIN

MARI VELONAKI

CURATORS:

KATHY CLELAND AND

LIZZIE MULLER

FOREWORD

Campbelltown Arts Centre is a multidisciplinary contemporary arts centre located in Sydney's West that is focused on engaging communities with contemporary arts programming. The Centre's artistic program presents and supports new models of practice within intercultural contexts.

Mirror States is a key project that brings together the work of media artists primarily from Australia and New Zealand to examine new technologies with elements of interactivity. Curators Kathy Cleland and Lizzie Muller have focused on the dualities of 'self' and 'other' through the projections and reflections of the digital format. In this sense, many of the artworks presented can be viewed as mirrors by those who interact with them, allowing the 'self' to reflect within and upon the digital 'other'.

I would like to thank our partner organisation MIC Toi Rerehiko, Auckland who have

worked with us to produce this project. I would also like to thank Megan Davis for her contribution to the production of the exhibition and the catalogue.

The support of the Australia Council for the Arts was critically important in the presentation of *Mirror States*. I would also like to thank Arts NSW for their continuing support of the Campbelltown Arts Centre. Finally, I extend my appreciation to the Curators Kathy Cleland and Lizzie Muller for their insights and championing of this significant field along with the participating artists who have been generous in their contributions to *Mirror States*.

LISA HAVILAH
Director
Campbelltown Arts Centre

MIC Toi Rerehiko is pleased to present *Mirror States* in partnership with the Campbelltown Arts Centre, Sydney. This insightful and playful exhibition showcases examples of technology based art projects that exhibit new ways of combining technologies and in some cases collaborative and interdisciplinary modes of artistic production. These interactive artistic installations entice their audience and co-creators to play; variously interrogating, transforming and distorting their experience of self.

I am grateful to Kathy Cleland and Lizzie Muller for their outstanding work on curating and organising this ambitious exhibition and their ability to uniquely curate selections for each gallery, responding to the site specific features of each of the venues. I would also like to thank Creative New Zealand for their ongoing major funding support of MIC Toi Rerehiko which enables us to produce such projects as *Mirror States*.

Thanks also to the staff and board of MIC Toi Rerehiko for their passion, patience and stamina in what has been a rapid development phase for the organisation. Particular acknowledgment goes to Barbara Procter, General Manager, and to Nicole Edwards, our Curatorial Intern, for the specific work they have both done in supporting the development of this particular exhibition.

Above all, this exhibition would not be possible without the generosity and creative integrity of all of the artists who are contributing their work to this project.

Alongside the exhibition, will be a symposium staged jointly with Co-Lab, a research and development initiative between MIC Toi Rerehiko and AUT University. This symposium marks the launch of this new research centre which has recently gained significant core government funding from the Tertiary Education Commission. Co-Lab is based on collaboration, communication, convergence, creativity and communities, enabled through new technologies. It will, we hope, become a leading transdisciplinary research centre engaged in the exploration and development of digital technologies for expression and communication.

My heartfelt thanks to Co-Director, Frances Joseph for her persistence and clarity of vision in the establishment of our new leading research centre for New Zealand.

DEBORAH LAWLER-DORMER
Executive Director: MIC Toi Rerehiko,
Media and Interdisciplinary Arts Centre,
Auckland, New Zealand
Co-Director: Co-Lab

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INTRODUCTION

Both art and technology act as mirrors that reflect our selves and our relationship to the world. Both also create “quasi-others”—entities which we endow with subjectivity through the projection of ourselves. *Mirror States* draws together art and technology, combining these two powerful systems of reflection and projection. The exhibition presents digital and interactive artworks that offer arresting glimpses of the self and intriguing interactions with digital others.

In *Mirror States*, some art works act as digital mirrors, enabling the audience to interact with magical reflections of themselves. These works make use of the seductive allure of the reflection, but go beyond narcissism into a realm where the self is creatively transformed. They explore aspects of contemporary identity, but also point to historical metaphors, myths and mechanisms for understanding our subjectivity.

Other art works act like Alice in Wonderland’s magical looking glass, taking audiences into a digital realm where they come face to face not only with transformed selves but also with digital entities and simulated personas. Computer technologies allow artworks to ‘come to life’, demonstrating life-like behaviours and sophisticated modes of audience interaction.

In these encounters with digital others the audience enters into a new participatory relationship with the artwork. These can be magical moments or uncanny and disturbing confrontations depending on the style and mode of the interaction.

Together, the artworks in *Mirror States* point to new ways of exploring and understanding our own subjectivity and relationship with ourselves as well as our increasingly important relationships with technology.

The exhibition brings together some of the leading artists working in digital media in Australia and New Zealand and demonstrates the strength and diversity of contemporary digital art practice in Australasia. Into this Australasian line-up we have invited Canadian artist David Rokeby, whose artworks and writing have been an inspiration for this exhibition, and an influence on many of the artists in the show. This is the first time that Rokeby’s seminal works, *Very Nervous System* and *Giver of Names*, have been seen in Australia and New Zealand.

LIZZIE MULLER AND KATHY CLELAND

ALEX DAVIES



For anyone interested in new media magic, but irritated by the gimmicks of the virtual reality labs, Alex Davies' work is easy to like. The term 'mixed reality' will not suffice to describe it, implying as it does some integration of reality with its other, be that un-real, sur-real, hyper-real, whatever. What is at stake in Davies' work is not an integration, but an invocation, a seduction—the opposite of simulation. It is not the real being seduced by some not-real, for the decisive exchange is precisely that seduction which puts every opposition between reality and its others in doubt and reveals them in their sheer reversibility.

On entering Davies' *Dislocation*, you are drawn to one of four small peepholes, built into the wall of this otherwise featureless room. You peer into the peephole and see the room, and yourself from behind. Before long the false privacy of the voyeur is disrupted by ghostly visitors, who appear behind you. But, glancing over your shoulder, you find the space empty.

For work that would undermine the architecture of experience, the experience of architecture is an essential parameter. Yet for all its magic, *Dislocation* turns on neither illusion nor immersion, but on the moment of their undoing. (The alternative—to remain within the illusion indefinitely—is the unthinkable catastrophe that must be averted at all costs.)

The uncanniness of Davies' installations resides in their uncertain, compound, parallel temporalities, on the accumulation and glimpses of pasts and, for all we know, futures. These are not the pasts or futures of the image, nor of the viewers. They belong to the *space*. A peculiar digital trespass:

trapping and expropriating that which people call their own, but which is yet not theirs.

All this has nothing to do with 'real-time'. It is *another* time, given as the incursion of another *mood*, as in *déjà vu*—its truth is not known, but felt. "[A] moment that no longer belongs to time,"¹ in Derrida's memorable phrase, interrupting the present, the coherence or cohesion of this moment which in any case rests not on the proven continuity of things, so much as on our aptitude for overlooking and ignoring them. And this other time is always populated. To spatialise memory is to socialise it.

The spectral logic of new media: to populate by reflection. Hence, the special relationship between the ghost and the copy. Having both an ethereality and a real, imaginary potency, ghosts can multiply, proliferate and infest with ease. It would not be doing the ghost justice to say that it can reproduce, nor that it is a reproduction. Rather, the ghost *is reproducibility*, it is itself the very danger of reproduction that cannot be reduced to, nor contained by, either the thing reproduced or the reproduction.

It is, paradoxically, by keeping things resolutely audio-visual that Davies precipitates a supernatural or 'extra-sensory' experience. Ghosts are all image, as it were; hence, their intimate partnership with media, especially photo-media. For the copy, too—the work of art in its mechanical reproducibility—treads this line between substantial and ethereal, all the more delicately in its digital reproducibility.

Simulation, as it moves toward saturation, flooding the senses, mainlining every channel with maximum data, leaves no room for imagination. Bandwidth will never exceed experience the way a good ghost story does. The 4-dimensional deluge puts us to sleep. But still we jump at shadows.

DAVID TEH



ANNA DAVIS AND JASON GEE



Data is meaningless. Ones and zeros judge nothing. Puppets need masters. But still, when we encounter Anna Davis and Jason Gee's Bioheads, digitally-animated ventriloquist dolls that sing pop songs and spit out psychobabble, we're not exactly sure whose lips are moving.

Davis and Gee download the digital detritus of contemporary culture—snapshots of dusty ventriloquist dolls sold on eBay, self-help tomes hawked at Amazon.com, celebrity photographs with viral tendencies, and some of the catchy little numbers that populate peer-to-peer networks—and remix and reanimate the random data (with the help of easy-to-use animation software) in an absurdist attempt to make sense of it all.

Naturally the puppets get all of the attention. When George Bush and Osama Bin Laden sing a duet of Snap's "I've got the Power" or Stalin, Hitler and Mao get together for a rousing rendition of "I Get Around" by The Beach Boys in *Bioheads Karaoke*, it's a performance not to be missed. More than just a good gag or a clever juxtaposition, however, Bioheads pack a satirical punch because they are composite reflections of what really exists. The seeming humanity of Bioheads is all borrowed: we're the ghost in the machine.

In *Biohead Actualized*, Davis and Gee show us what "greedy little dolls"¹ we've become. This new video installation holds a mirror up to the contemporary quest for self-improvement and perfection, and gives life to a post-modern Prometheus, a creature who speaks only the language of self-help, spewing distrustful, selfish and even silly advice at unsuspecting passersby. But the Biohead isn't making any of it up—Everything he utters is lifted directly from a self-help audio book. The Biohead is the kind of personality that develops when fed a steady diet of actualization mantras—no wonder his psyche seems so sinister. He has been reprogrammed.

But as creepy as Bioheads may be, there is also a playfulness that stems from both the work's humour as well as the empowerment afforded by sample-based digital culture. One can make George Bush bark like a dog if one wants to. The digital environment makes use a more powerful critical tool than production and turns consumption on its head. By agitating the media environment Gee and Davis exercise powerful artistic agency in the face of media hyper-saturation and proliferation. They're pulling all the strings now.

While Davis and Gee may coax the Bioheads to come out and play, they also speak about the strange sense of autonomy the Bioheads exert, explaining that the digital dolls seem to develop personality partly on their own. The artists tease out subtle facial expressions and meaningful gestures from what's already there, creating a life-like being from a single moment once captured in a photograph. That moment now has a life of its own and there is a palpable glee in watching as the image runs away from its past and into any number of digital futures.

MARGIE BORSCHKE

¹ From a conversation with Anna Davis & Jason Gee on March 8, 2008



SEAN KERR



If you're looking for Artificial Intelligence, Sean Kerr's interactive works aren't about to sit still for a Turing Test. In fact, they can be quite badly behaved. Fingers pick noses, or inflating and deflating, appear to 'flip the bird'. We hear things smashing. An expletive slips out. These ill-mannered computer-controlled scenarios embody something closer to Artificial Dumbness. Sensor-triggered goggle eyes might follow us round the room, but not much else will come under our control. Like the vending machine that eats your change but won't give up the goods, the artist's networks of computers seem to be watching but impervious. They talk mostly amongst themselves, carrying on despite, as much as because of, our presence.

Kerr has often used the classic PlainTalk Text To Speech synthesised voice Bruce to sing, even to yodel, his soundtracks. Somewhere close at hand is another Bruce, the West Coast American process art/conceptualist Nauman. His evocation of the body through cast parts, and his pushes towards absurdity, where communicative

ambitions dissolve into frameless ambiguity, are cousins of the pointed, dumb fun in Kerr's work.

The artist has used digital photography to float himself on the end of a fountain jet in the park, to levitate a Mercedes in the driveway, and to simulate the lighting of farts. His wired *tableaux vivants* share in this comedy of obvious tricks and base humour. Ignoring the latest touchscreen-bodysuit-3D fantasy of seamless digital simulation, their code mimics the mechanics of a slot machine automaton, a ghost train or haunted house ride. The oldest tricks of this trade—sound effects and sight gags—may not be too mysterious, but they still work. Technology here is not about habituating us to new levels of ease or opening up new possibilities, but appears liable as ever to crash, hang, and go haywire.

Compellingly, these recalcitrant mechanisms implicate us, even as they leave us looking on. For one thing, they show they know us by playing off our instincts. The crudest prompts rehearse the way we make sense of things in terms of our own bodies; two dots within circles are inescapably eyes, a pink stalk is a finger. And beyond seeing faces and limbs in things, we might also notice our tendency to project a general independence, when these roomfuls of technology seem to take on a life of their own. The crux is that their stupidity may be very close to home. In their senseless displays, they model for us our own knee-jerk reactions, slips and insensitivities. Their perversity reflects not just the tools at hand, but the tradespeople who, we know, shouldn't hold them to blame for sneezes, sore fingers, and things that just don't work out.

JON BYWATER

Sean Kerr,
Klunk, Clomp, Aaugh!
—*Friends Reunited* 2008



GEORGE KHUT



WITH CAITLIN NEWTON-BROAD,
GREG TURNER AND DAVID MORRIS-
OLIVEROS

The Heart Library (2008) is a collaborative installation with two inter-related components. The first, *Biofeedback Mirror*, uses technology appropriated from the realm of psychotherapy to translate heart rhythms into an immersive audio-visual environment. Individual participants are invited into a semi-transparent enclosure where they recline on a bed-like platform looking up at a ceiling projection. Two hand-held sensors are used to measure heart rate variation. The video responds in real-time to the changes in the participant's psycho-emotional state using colour, light and pattern concentration, transparency and sound. Khut encourages the audience to explore the impact of different thoughts, memories, and moods on the body's physiological responses. In this way, they are able to self-consciously mediate their own embodiment as displayed audio-visually in the gallery space. Participants are then invited to reflect on and share their experience of *Biofeedback Mirror* through a process of storytelling and illustration. The resulting 'body maps' and conversations recorded on video are re-inserted into the installation space to form a growing library of descriptions of experience. Earlier works by Khut have similarly mobilised biofeedback technologies to generate interactive audio-visual environments. *Drawing Breath* (2004–2006) and *Cardiomorphologies* (2004–2007) use breath, and breath/heart-related data respectively to manipulate real-time visualisations and soundscapes based on participants' psychophysiology. These works also invite audiences to explore the connection between their emotional and physiological states, and their agency in controlling this correlation. However, *The Heart Library*

indicates a significant shift toward a dual mode of reflexive engagement. Here, the addition of a social dimension reconfigures interactivity within an inter-subjective, rather than strictly technological framework.

The free-form structure of *The Heart Library's* storytelling component is facilitated, but not directed by the artist and his collaborators. It focuses entirely on the 'meaning making' preferences of the participant. It is a speculative exercise, allowing an endless range of responses, and draws out a distinct contrast in the different modes of participation that the project enables. The dialogic potential of *Biofeedback Mirror* is generated from an experiential mode that is intensely intimate and subtly premised upon proprioceptive sensation, rendered from within. In the mapping and storytelling activity, on the other hand, the subjective agency of the participant is outwardly expressed via discursive and performative responses.

The cycling of these reflexive traces of participants' experiences back into the installation as content reinforces the contingent, spontaneous, and dynamic framework of *The Heart Library's* interactive premise. The dual layering of the work's 'relational' structure discloses Khut's fundamental interest in using the subjective space of art to provide a catalyst for rethinking the relationship between cognition and sensation in the broader context of everyday experience. By generating a situation in which the usually subconscious and automatic activity of the body is consciously registered—both through visual and auditory feedback, as well as socially-mediated reflection—Khut creates the potential for a shift in how we understand and relate to our embodiment. *The Heart Library* allows participants to go beyond a perfunctory attentiveness to those facets of sensation we consider abnormal or problematic. It provokes other kinds of reactions—such as intrigue, delight, and sensitivity—which help to build a register of comprehension that contains a broad spectrum of possibilities.

ANNEKE JASPERS

George Khut,
The Heart Library 2008



JANINE RANDERSON



The *albedo of clouds* by Janine Randerson concerns sunlight in a darkened room. It joins a magnificent history of art that takes sunlight, in real time or delayed, and brings it indoors. Such were the great stained glass windows of the Gothic cathedrals; such is Thompson and Craighead's *Light from Tomorrow*.

Albedo is the proportion of visible light which things reflect. Even on a dark day, sunlight makes it through the clouds down to us on the surface, but on a plane, you can see how much of the sunshine is converted into earthshine and bounced up and away into the teeming emptiness of space.

This is a work concerned with the light that the earth gives back. Huge aggregations of water droplets, clouds scatter light—again, on a plane, or sometimes on high mountains above the cloudline, a rainbow-hued halo around a cast shadow, your own or your aircraft's, shows how richly a cloud plays with the light the sun gives it. Just so the perspex domes play with light.

In the two screens suspended in the half-lit gallery are images of clouds, one seen from below as we would normally see them. We look up to see the real and the recorded clouds. But now we also look up to see what clouds look like if we

could look down on them, from a great height, from geostationary orbit. There are two optics, and the distance between them is not very great.

One is the image of transmitted light, light that makes it through. The other is of reflected light, light we will never see on the surface of our suffering planet. Light sent to communicate to the outer galaxy, and to the galaxies beyond, that we too once shone. It is our response to the vast generosity of the sun. Looking up from below into clouds we see that generosity: we are rarely aware of what we give back in return. Such is the nature of generosity.

The perspex clouds hanging in the gallery's air are manufactured from oil. The whole system of drives and casings [in computer-driven art] are organised from industrial chemistry and rare earths, from oil drilling and mines. They are physically implicated in climate change, which is the unhidden meaning of any meteorological theme in the early twenty-first century. These materials are integral with ancient sunlight and the changing albedo. As the last oil flows, we still do not know all of its potential. Better make an artwork out of oil and earths than to burn them or scatter them in the oceans. This is the nature of honesty.

Reflection is how we must respond to the untold generosity of the sun which produced the forests whose dying made us our irreplaceable chemical heritage. Saddam Hussein burnt the oilfields in order to cut out the middleman. The *albedo of clouds* reinscribes the middle, mediation. Be reflected in these transmissions. Assume your role in the solar cycle.

SEAN CUBITT



HYE RIM LEE



In the ongoing series *TOKI/Cyborg Project: game, pop and cyber world* Hye Rim Lee's project is the development and increasing sophistication of the avatar TOKI, the world she inhabits and her experiences in it. As a representative fantasy TOKI resides in an unbounded parallel world, one tempered only by the parameters of the technology used to fabricate it.

In Lee's 2005 project *Powder Room* TOKI's facial features and hair are undergoing a makeover. For TOKI this makeover is literally a making at a structural level. The four screens, seen through circular apertures, show aspects of TOKI's face as it is refined by delicate remodelling, presenting the endless nip and tuck of TOKI simultaneously as a mirror and an observation portal. By showing the construction of TOKI Lee exposes the workmanship, revealing the maturing TOKI as she develops physically to command a wider range of expression and personality. This deliberate exposure of the mechanics of TOKI's making demonstrates the hyperrealist graphics behind the creation of digital persona allowing Lee to initiate a dialogue about gaming culture, role play, aesthetics, avatars and the technologised body, particularly in relation to the representation of women and the use of cosmetic surgery.

In his essay for the *Power Room* catalogue sociologist Barry King discussed the creation of the dream self in relation to surgical enhancement. For Lee TOKI operates as a

dream self, one that through its malleable hybridity has the ability to shift in its capacity to be representative, enabling Lee to play with tropes of the ideal. TOKI embodies a desirable hybrid of Western and Asian female and animal, personifying a fantasy often demonstrated in anime and manga. In Korean TOKI is the word for rabbit and in Korea the rabbit is associated with the domestic female. TOKI's rabbit ears also relate to the archetypal Western sex object the Playboy bunny, the reputation of the rabbit for promiscuity and the association of the feminine with the instinctive and irrational animal self. TOKI is a reflection of all these typologies within which we can find ourselves and our attitudes mirrored.

After the refinements of the powder room TOKI has emerged to feature in *Lash*. The projection echoes the circular 'mirrors' in *Powder Room*, here though TOKI is larger than life. TOKI is disarmingly cute. She is also a vampish seductress. Accompanied by a whiplash sound the gamine TOKI bats her Venus flytrap eyelashes and coos. In *Lash* the newly finished TOKI has emerged from the digital incubator and has reached a stage of self-recognition. At times she plays to the viewer, at times to the mirror, moving the viewer from participant to voyeur in a typical sexual power play. Her change from cute to sensual, marked by a change in lip colour, hovers seductively between submission and dominance as she explores her newfound self and sexuality. If awareness is power TOKI also represents the argument that recognising your self is an empowering act.

CHARLOTTE HUDDLESTON

1 See Barry King 'Cybernetics and Sex' in *Hye Rim Lee Powder Room* (ex cat.) Saatchi & Saatchi, The Gus Fisher Gallery, The University of Auckland, TOKI publications, 2006

Hye Rim Lee,
Powder Room (above)
and *Lash* (right) 2005



DAVID ROKEBY



“Indeed people sometimes feel irritation when faced with an interactive artwork, because they feel their behavior is being judged.” (David Rokeby, *Transforming Mirrors: Control and Subjectivity in Interactive Media*, 1996)

It may seem strange for an artist to criticize his chosen medium so candidly, but for David Rokeby this line of inquiry is essential. His explicit acknowledgment of the ‘irritation’ that is so often a limiting element of interactive art, allows the artist to address a larger anxiety people feel not only about interactivity, but technology in general. Through his large and varied body of work, Rokeby confronts this anxiety by exploring an equally large variety of interactive approaches. Approaches that expose the ways computer technology, and our associated assumptions and concerns, create meaning both as processing devices and physical objects.

Very Nervous System (1986–present), one of Rokeby’s earliest and most often referenced interactive installations, elegantly translates movement into sound. Technically speaking, a camera tracks a user through a defined space and this information is sent to a computer that outputs the body’s movement as musical or dissonant sound. The technology that enables this interaction is not obvious to the viewer. Apart from a camera, there is no visible technology to navigate, and the interface is as elemental as the air the user moves through. The response time of the system, what Rokeby refers to as the ‘feedback loop,’ is intentionally short and as a result, the computer’s seemingly instantaneous response to movement leaves little time for the user to ruminate on how or why their actions create sound. It encourages an intuitive and physical, rather than purely cerebral, relationship to and understanding of the work. This compressed feedback loop, and the absence of a complicated and potentially intimidating

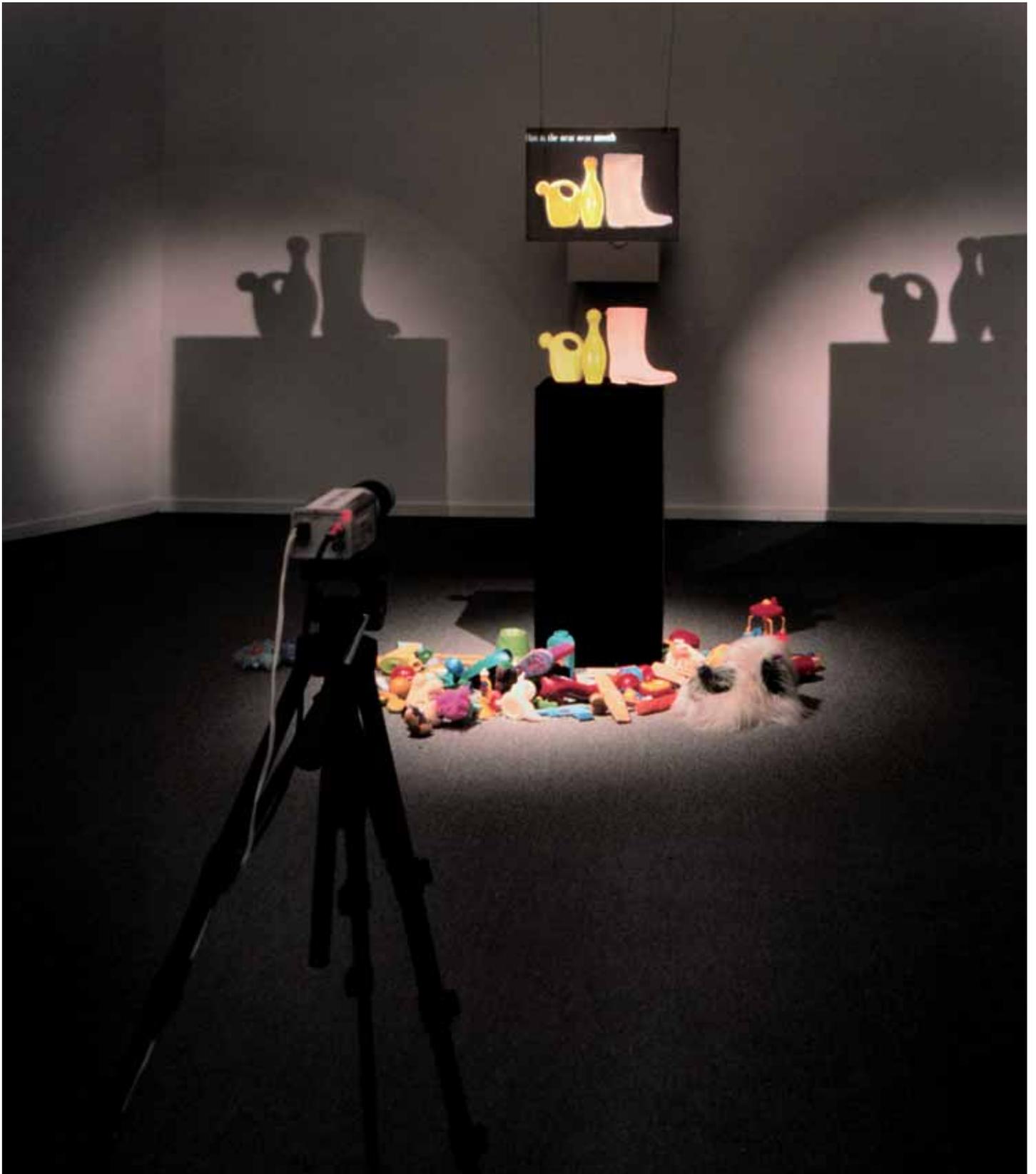
computer interface, decreases the likelihood of a user feeling ‘judged,’ as the simple act of moving rewards them with a seemingly open-ended and rich sonic experience.

Rokeby’s work *The Giver of Names* (1990–present) also uses the feedback loop as a means to construct a specific relationship between the work and its audience. In this instance however the loop is deliberately stretched, and the time lag between action and reaction creates a very different interactive dynamic. Viewers upon entering the space are confronted with a camera, a computer, a projector, a screen, a plinth and a pile of toys. When an object is placed on the plinth, it is captured by the camera and transmitted to the computer. The computer then processes the captured image through analysis of shape and colour and attempts to make sense of what it is ‘seeing.’ Unlike *Very Nervous System*’s seemingly organic and effortless call and response, in *The Giver of Names* the computer, and its process of computing, are central to the visual and conceptual nature of the work. The hardware is placed prominently in the space and a monitor shows an evocative visualization of the way the computer generates descriptions from its language database. This heightens the spectator’s awareness of computer intelligence, and creates the potential for ‘judgment,’ to which Rokeby refers. But rather than bringing this judgement down on the participant, Rokeby structures the relationship so that judgment falls instead upon the computer and its limited ability to ‘think’ and make sense of its surroundings.

As technology becomes more seamlessly integrated into our lives—barely noticeable but for the interaction and relations it enables—Rokeby’s deep explorations into interactivity confront and challenge our ever-changing relationships to it. By acknowledging that this relationship is often fraught with a host of social pressures and anxieties, he makes room for a range of audiences and interactive relationships. Active or passive, direct or indirect, the works and the level of interaction they allow for may have different outcomes, but all have a common desire to engage us and reflect back our feelings and assumptions about the technologies which surround us.

CAITLIN JONES

David Rokeby,
Very Nervous System (above)
1982–2004 and *Giver of Names*
(right) 1991–2004



JOHN TONKIN



Since the invention of the mirror, artists have explored the possibilities of the self-portrait. Artists such as Albrecht Dürer, Rembrandt and Frida Kahlo are some of the most significant experimenters, known for their deep explorations of their own self-images. Today, we are privileged to contemplate entire collections of artists' self-portraits, spanning decades of time and, in cases such as Rembrandt, almost an entire artistic life. We are able to observe considerable periods of time through these images within a moment.

As technology developed, investigations of human subjects extended beyond the simple image-reflection or psychological enquiries seen in portrait painting. The key examples are, of course, Étienne-Jules Marey's and Eadweard Muybridge's scientifically motivated analyses of motion with film, in the late 1800s. In the 1960s Andy Warhol's photographically based screen prints of public figures began to consider the image's power through repetition, creating, in a sense, a series of works reflecting the time and space of cinema, with multiple prints. Through this technique time is experienced again through the portrait, but differently. Rather than viewing the chronological development of a face through time, the duration remains within the present, extending our ideas of the present, by expanding the moment.

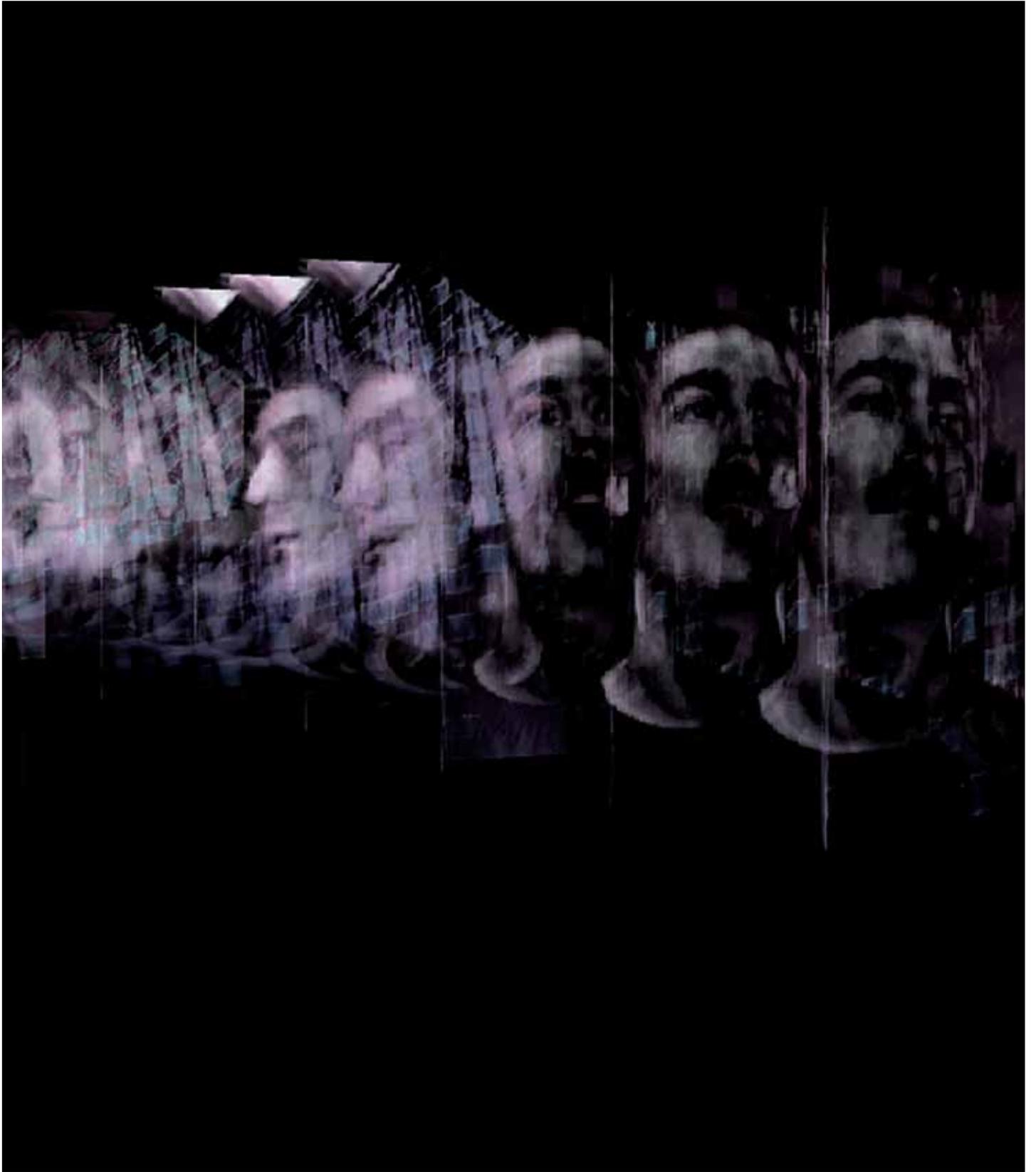
In John Tonkin's *time and motion study*, we experience yet another development of these investigations, made possible by a further advance in technology. Tonkin's project creates a visualisation of time passing, through the

collection of portraits. *time and motion study* builds up collateral in its database, made up by the movements of people engaging with the work—from the beginning of the work's exhibition, until the end. Viewers are then able to view and manipulate material taken from the past or the present—themselves, or previous participants. In this sense time is collapsed and every image is brought into the present. Here Walter Benjamin's thoughts on portrait photography, and its inherent difference from previous means of portraiture, is exemplified visually and directly: "No matter how artful the photographer, no matter how carefully posed his subject, the beholder feels an irresistible urge to search a picture for the spark of contingency, of the Here and Now"¹. However, Tonkin's digital portrait bank also references the earlier studies of portraiture in painting, over an extended period of time. Because the work collects images over the course of its exhibition, viewers can access the work on a number of occasions. A participant could therefore witness changes in themselves, and potentially manipulate—through three-dimensional space—images of themselves from different points in time.

The significant difference, then, is essentially one of speed, and the power of the viewer to not only observe, but also manipulate the portraits created by the work. Within the context of a 'user-generated content' society, Tonkin's project could perhaps be understood in these terms. However Tonkin's work is also a critique of technology's ability to extend existing art histories with greater velocity. If Rembrandt's self-portrait studies used the techniques of his time in order to investigate the individual's psyche in visual terms, then Tonkin's investigations with the technologies of his time also comment on technology's impact on the way we experience the world and ourselves.

TANIA DOROPOULOS

¹ Walter Benjamin, "A Short History of Photography", reprinted in Charles Merewether, ed., *The Archive: Documents of Contemporary Art*, Whitechapel, London and The MIT Press, Cambridge, Massachusetts, 2006.



MARI VELONAKI



WITH DAVID RYE, STEVE SCHEDING
AND STEPHAN WILLIAMS

“By intimate use, machines take on a certain personal, I-and-thou quality in relation to their operator” Lewis Mumford *Art and Technics* (1952)

Mari Velonaki is one of the most distinguished media artists in Australia who has pursued and sustained an innovative exploration of the relationship between art and technology. Informed by her early involvement in performance art and interests in the body, subjectivity and interaction, kinetic sculpture, and pre-cinematic devices such as mechanical toys and Theatre Optique, Velonaki's recent artworks reflect the more complex and beguiling dynamics that have evolved between ourselves, art and technics.

On first encounter, *Fish-Bird: Circle C—Movement B* and *Circle D: Fragile Balances* may resemble, respectively, pre-industrial automata and eighteenth century wonder boxes. However, the deceptive simplicity of both artworks belies their ingenious conceptual rigour, technical sophistication, and aesthetic subtlety.

Fish-Bird and *Fragile Balances* were produced by Velonaki, principally in collaboration with robotic scientists David Rye, Steve Scheduling, and Stefan Williams (*Fish-Bird*), at the Australian Centre for Field Robotics, University of Sydney. The first of their three collaborative projects, a light-reactive installation titled *Embrace* (2003)—in which a younger and an older woman repeatedly move towards each other, in either an affectionate or loathing embrace, then disappear utilised a specially constructed photodynamic screen.

Each of these works involves dual protagonists who are engaged in a delicate yet ambiguous relationship. In the case of *Fish-Bird* and *Fragile Balances*, we affect the state of their relationships the more we interact with them. In the process, we are simultaneously delighted and unsettled by their uncanny responsive behaviours, and, by our own empathetic connection to their individual ‘personalities’.

Fish-Bird: Circle C—Movement B was inspired by a Greek fairy tale about a fish and a bird who fall in love but cannot be together because of their differences. In Velonaki's work, the ill-fated characters are embodied as autonomous robotic wheelchairs two temperamental desiring machines that learn to communicate intimately with each other, and with their visitors, via movement and printed text. A distributed network of sensors monitor the ‘body language’ of the wheelchairs and participants, while the information is communicated wirelessly.

In *Circle D: Fragile Balances*, the characters are embodied as two luminous cubes, each comprised of four high resolution crystal screens and Bluetooth wireless links. Fragments of personalised messages wrap around each cube, and also flow between the two objects. If abruptly handled by the visitor, the texts become disturbed and barely readable. The visitor must therefore establish a delicate and respectful relationship with the objects in order for them to yield their messages.

As with Velonaki's earlier interactive works most notably, *Unstill Life* (2000) and *Pin Cushion* (2000) *Fish-Bird* and *Fragile Balances* elegantly explore the intricate interplay between artwork and audience/participant, based on notions of trust and shared intimacy. For Mari Velonaki the dialogues between Human and Machine are personal and poetic, revealing not only the creative potentials between art and technology, but also the profound implications of our *being* with technology.

ALESSIO CAVALLARO

Mari Velonaki
*Fish-Bird: Circle C—Movement
B* (above) 2005 and *Circle D:
Fragile Balances* (right) 2008
Photo: Paul Grosby



REFLECTED SELVES

In nature there are no upright reflective surfaces. The only reflections in the natural environment in which our sensory systems evolved were bodies of water. These, Jonathan Miller suggests, presented a useful interpretive challenge¹. By offering a puzzling visual inconsistency with their non-reflective surroundings they created not only a visual reflection of the onlooker, but also a *moment of reflection*—a pause—a reconsideration of the nature of the thing being looked at and its implications. This moment of reflection, and the consequent cautious investigation of the environment (a limb dabbed suspiciously in a puddle or a lake) might save the onlooker from drowning. Mirrors have continued to represent these dual, and in some ways contradictory orders of reflection. On one hand reflection *of* oneself—the seductive allure of the reflected image, narcissism and self-absorption. On the other hand reflection *on* oneself—enquiry into the relationship between self and world, self knowledge, and wisdom. Driven by these two impulses, human kind has busied itself throughout the ages with the making of mirrors.

As our technologies have advanced, our mechanisms for seeing ourselves have become more and more sophisticated and complex. Our understanding of the mirror exceeds its origins as a surface that conjures an image by coherently reflecting light. It has become instead a powerful metaphor for man-made things which offer a likeness of and a challenge to our understanding of ourselves.

Photography, film and virtual reality, for example, allow us to capture and displace our images over time and space. But our reflections are not limited to our physical appearance. The computer, which can generate and manipulate all these forms of imagery, is a powerful reflective medium in itself—mirroring not our outward form, but our minds. Sherry Turkle argues that the computer is the first technology that reflects the human mind in its power, interactivity, flexibility and opacity². “We search for ways to see ourselves,” she writes, “the computer is a new mirror, the first psychological machine”. The idea of the mind as machine is powerful not because it is true, but because it provokes thought. By causing us to

probe the differences and similarities between our technologies and ourselves, the computer asks us to reflect on our assumptions and beliefs about our subjectivity, including notions of free will, consciousness and our relationship to our bodies and our mortality.

Art is also a form of man-made reflection, and mirrors have always played a powerful role in its symbolic language. An artist’s use of a mirror in a painting often draws the viewer’s attention to the rhetoric and operation of art itself. Like a message between artist and viewer, a mirror highlights the work the artist has done in constructing a point of view, and the work demanded of the onlooker in occupying it. It is hardly surprising, then, that mirrors should be central to the aesthetics of interactive art—a form which calls into question our traditional understanding of the operation of art, and relies on the reflective medium of computation. Interactive artworks, like those in *Mirror States*, foreground the audience’s active role in the construction of the work by creating real-time reflections of their participants.

David Rokeby has suggested that, whilst all interactive technologies are mirror-like, interactive artworks are “transforming mirrors”³. Their aesthetic power lies in the fact that they not only reflect, but also refract our self-image. This refraction is the difference between a “closed system” of self absorption (the first order of reflection), and an “open system”, in which a dialogue is generated “between the self and the world beyond” (the second order of reflection).

The works in *Mirror States* draw attention to the ways in which our intimate relationship to the mirror of computer-technology is shaping our understanding of ourselves. David Rokeby’s own work, *Very Nervous System*, creates a sensitive invisible interface in which the participant’s every movement is transformed into sound. The work creates an unusual experience of our bodies’ relationship to space, in which we feel connected viscerally to the surrounding environment. The air itself seems charged with potential, but our power is far from absolute. Rokeby has intentionally created a system with unpredictable behaviour, which draws into it the complexity of our broader interaction with the world. We cannot “control”

the *Very Nervous System*, in the way that we might usually expect to control a computer, because we are part of it. Instead we enter into a seductive and unpredictable dialogue with the refracted echoes of our own actions.

George Khut's work also augments our experience of our bodies. Using biofeedback technology, *The Heart Library* creates an intimate portrait of the participant, generated from the patterns of their heart rate. The installation makes visible an internal landscape that not only reflects physiological data but also psychological states. Our levels of alertness, tension and relaxation are all reflected, obliquely, in this mirror. By revealing the relationship between our body and mind, Khut suggests we can have influence over aspects of ourselves that we normally imagine to be beyond our control.

John Tonkin's work refracts the participant's image over time and space. *time and motion study* visualizes the continuous flow of time, through the accumulation of instants. It creates, and constantly overlays, endless snap-shots of the participant, each one a frozen moment reflecting a slight change in the expression of the face or the attitude of the body. The work creates a beautiful composite portrait, but as the images multiply and snake backwards endlessly into the screen, they also have a vertiginous quality. The pleasure of the single photograph is the way it enables us to freeze the endless flow of time, to press pause, isolate a moment and create a memory. *time and motion study*, however, refuses to pause; each instant gives way, ceaselessly, to the next. Our past moments draw away from us into the screen and offer a three dimensional reminder of time's inexorable motion.

Alex Davies' *Dislocation* presents us with a simple video image of ourselves, with one important quirk. Peering into the video portals inset in one wall in the gallery we can see ourselves—looking—from behind. This simple switch in point of view has a disconcerting effect; in this installation we are at once observer and observed. From our disembodied point of view we are able to see a series of more or less weird, interesting and innocuous characters enter the space behind our backs. If we can tear our eyes away from the

monitor and glance over our shoulder, we will find that these visitors are figments—ghosts in the machine. The installation creates and unpicks an illusion of presence, creating a visceral realization of the power and vulnerability of our sensory hold on the world.

Janine Randerson's *albedo of clouds* causes us to reflect upon the origin of all natural optical reflection—the sun. Suspended in the gallery are two circular screens showing two views of the clouds. One view shows us the light from the sun that is transmitted through the clouds to the earth; the other view shows the light that bounces back from the earth and the clouds into space. A pin-hole camera captures the movement of the audience, which influences the simulated atmosphere of the installation, appearing as changes in light and colour. By implicating the participant in this radiant study of celestial reflection, the work alludes to the paradox of the human relationship to our environment. Each of us is so tiny on a cosmic scale, and yet we have catastrophic collective power. How can we balance our individual powerlessness and responsibility? This question is at the heart of our relationship to technology—a force which we have used to make the world a more accommodating place, the process of which now threatens our very survival. Everyone who enters *Mirror States* will find many reflections of themselves. Like a digital hall of mirrors, these reflections will not give back the images we expect; they may provoke delight, confusion, wonder or fear. In doing so, the artworks in *Mirror States* produce both orders of reflection. They seduce us and compel us with our desire to see ourselves, but by refracting our self-image they allow us to re-examine our relationship to technology, creating that second order of reflection—self knowledge—which signifies a new understanding of our relationship to the world.

LIZZIE MULLER

¹ Jonathan Miller, *On Reflection*, 1998

² Sherry Turkle, *The Second Self : Computers and the Human Spirit*, 1984

³ David Rokeby, *Transforming Mirrors: Subjectivity and Control in Interactive Media*, 1996.

PROJECTED OTHERS

In *Mirror States* we enter a magical and responsive exhibition environment where art works don't just sit passively in the gallery waiting to be looked at, they actively engage the audience, interacting with us in real time, talking to us and positioning us as interactive partners not just mere observers.

Moving through the exhibition we interact with an intriguing series of digital 'others' in the form of simulated personas and intelligent computer systems. As human-computer interface designers strive to make our computers more 'user-friendly,' increasingly we are seeing the computer take on a human face in the form of simulated personas and virtual characters. Over the last 10 years we have seen a wide range of virtual humanoid characters appearing in our media—and cyberspheres offering new and seductive possibilities for encounters between humans and digital others.

Hye Rim Lee's digital character TOKI is a seductive vision of artificial beauty and allure. Inspired by Asian anime heroines, she is the ultimate virtual female fantasy figure, a classic anime beauty with petite mouth and nose, and large expressive eyes. She primps and preens in the mirror-like portals of *Powder Room* and comes over the virtual femme fatale in the giant projection of *Lash*. She coos and sighs at us, fluttering her eyelashes seductively but behind her surface beauty and seductiveness is a hint of hidden depths and dangers. Just who is this alien digital beauty and what does she want with us? Why won't she speak to us?

TOKI may not speak to us, but the digital personas in Anna Davis and Jason Gee's *Biohead Actualised* do nothing but talk. The bioheads—digitally animated images of ventriloquist doll heads—call out to audience members telling them their psychological problems and giving random unsolicited advice. Even though the bioheads are not truly interactive—their comments are pre-programmed—the audience is caught up in an engaging and humorous interaction with these uncanny and quirky personas.

With TOKI and the bioheads we see digital 'life' breathed into the digital other through a combination of computer graphics and animation techniques. Other art works in *Mirror States* take this process a step further by using sensing technologies and automated 'intelligent' programming to enable digital entities to more fully engage and interact with audience members.

As the digital other becomes animated, autonomous and responsive, it becomes a true digital subject capable of acting as a partner to its human interlocutors. The use of vision, motion and other sensing technologies to trigger autonomous actions and behaviours means that art works can interact with audiences in lively and unpredictable ways. These lively new digital entities don't necessarily have to look human, as long as they act and respond in life-like or human ways we will anthropomorphise them, projecting human-like meanings, motivations and emotions into their computer-generated outputs and behaviours. The digital other can also be embodied in the gallery space through physical objects and self-moving robotic devices.

The 'fish' and 'bird' characters in Mari Velonaki's *Fish-Bird: Circle C—Movement B* are artificially intelligent computer entities embodied in the form of robotic wheelchairs so they can move about in the gallery space interacting with each other and with audience members. At times shy and at times curious, they move around the gallery space communicating via poetic texts which are printed out and left strewn on the gallery floor. In another room 'fish' and 'bird' are reincarnated in *Circle D: Fragile Balances* as stationary interactive boxes relying on audience members to pick them up and move them about. The boxes have four luminous screens where their text messages are dynamically displayed, wrapping around from screen to screen as the viewer moves them around.

The endearing human-like characteristics of 'fish' and 'bird' provide a strong counterpoint to the alien non-human intelligence of David Rokeby's

The Giver of Names. Here we see the ‘mind’ of the computer system in action as it looks at a series of objects placed on a pedestal in front of it and decides what names to give them. The computer system sees the objects through a video camera and this image is projected onto a screen so we can see what the computer sees and watch the methodical machine-like way it analyses the object’s colour, shape and texture and component parts before ‘naming’ and describing it. The names and descriptions are drawn from a poetic database of known objects, ideas and sensations that are also displayed for us to see so we can witness the computer’s decision-making process. Watching this painstaking process of analysis, interpretation and naming, it’s impossible not to reflect on the difference between the holistic process of human vision and recognition—we see an object and know and name it automatically—and the alien ‘machinic’ thought processes of the digital other of the computer system.

In Sean Kerr’s work *Klunk, Clomp, Aaugh!*—*Friends Reunited* computer systems generate a series of playful interactions between the audience and art work. The cheeky agency of the computer system positions it as an ‘intelligent’ and sentient entity luring the audience members into humorous and unexpected encounters. The computer system senses our presence and movements and ‘watches’ us via a pair of giant cartoon-like eyes that follow us as we move around the gallery, makes rude sounds and inflates a giant plastic finger to ‘give us the finger.’

As well as these interactions with simulated personas and intelligent digital entities, in *Mirror States* we also see ourselves become ‘others’ as our images are digitally processed and transformed before our eyes. In *Camera Lucida*, Roland Barthes describes this uncanny splitting and doubling of the self as “the cunning advent of myself as other”¹. As the self is captured and projected we become part of the art work, our transformed images externalised in the gallery space for us to interrogate and interact with.

In Janine Randerson’s *albedo of clouds* our images are reflected back to us amidst shifting cloudscapes projected in perspex domes. With David Rokeby’s *Very Nervous System* we play and interact with our sonic doppelgängers and in *The Heart Library* George Khut uses biofeedback to trigger rippling audio-visual transformations in our captured images. Across the gallery in John Tonkin’s *time and motion study v2* the captured images of our bodies are projected as a series of still frames which are dynamically animated as a luminous sequence we can drag around and fly through. In these works we come face to face with our audiovisual doppelgängers projecting our identity into these transformed and defamiliarised others. In another room, we peer through the portals of Alex Davies’ *Dislocation* to see our video images merged in real-time with a series of pre-recorded video ‘phantoms’ creating uncanny mergers of the real and the virtual.

Both engaging and challenging, the art works we see in *Mirror States* show us a variety of different types of audience interaction with projected digital selves and digital others. The new digital ‘others’ we see in *Mirror States* are animated and responsive, sharing the characteristics and behaviours we associated with real living beings and starting to display signs of emergent life and subjectivity. Whether these new digital others are cute and friendly or truly alien, their lively and responsive behaviours position them as true interactive partners for their human cohorts, pointing to a shared future terrain where our digital selves and digital others will interact in ever more intimate ways.

KATHY CLELAND

¹ Roland Barthes, *Camera lucida: reflections on photography*, 1980.

INSIDE OUTSIDE

As David Rokeby observed in his crucial essay, 'Transforming Mirrors', artists often make interactive, immersive installations in order to create *relationships* rather than *finished artworks*. Such artists set up systems that 'reflect the consequences of our actions back to us'¹. When you encounter such artworks you get a feeling for the endless flux and paradoxically patterned unpredictability that are always coursing through the world. The *Mirror States* exhibition is comprised of works like this, works that encourage an understanding of how you and the world are in and of each other, how you and the world are constituent of the other and mutually obliged. The artworks in *Mirror States* can help you know the complexity that plays out when individuals, their environments and their communities insinuate each other.

Complexity—it's so much more slippery than intricacy or complication. In a lucid book on the subject, the philosopher Paul Cilliers explains how 'complexity is diverse but organised' and 'descriptions of it cannot be reduced to simple, coherent and universally valid discourses'. Complexity emerges and evolves systematically. To know a system, it's best to describe it, and 'to describe a system,' Cilliers observes, 'you have... to repeat the system' and watch how it differs with each repetition.² You cannot reduce a complex circumstance to a static, schematic model, because complexity is definitively dynamic, relationally intricate and always adjusting. You need to experience a complex circumstance, to be with its changes through time, to feel its shifts whilst also being attuned to the historically determined tendencies and the feedback patterns of stimuli and responses that are organising it at any particular moment. As Cilliers explains, 'complex systems have to grapple with a changing environment. ... To cope with these demands the system must have two capabilities: it must be able to store information concerning the environment for future use; and it must be able to adapt... when necessary.'³

With traditional artforms, artists often conjure an

impression of complexity either by manipulating absences or inserting deliberate contradictions which goad the perceiver's imagination. William Empson's *Seven Types of Ambiguity* is the classic study of this aesthetic and semantic plenitude in literature.⁴ More recently, Andrew Benjamin's investigation of the phenomenon of 'incompletion' in painting has added to our understanding of the importance of an organised kind of indeterminacy in an artwork.⁵ In traditional artforms like literature and painting, the adaptability and complexity occur in a 'space' between the perceiver's self and the artwork, in the strummed intellect, memory and senses of the person engaging with the work at a particular instant.

In more recent times, digital-computational systems have emerged that enable an artwork itself—not just the relationship between the work and the perceiver—to transmogrify in response to stimuli and at the behest of active and activating codes written into it. The artists in *Mirror States* all find their particular ways to reflect this 'quickness' back to the viewer. Rokeby's jittery systems, for example, take their nervous energy from the viewer's incursive presence. George Khut's or John Tonkin's uncanny feedback reflectors, offer the viewers compelling yet disturbing ways to investigate one's own distinctive self, ways to be inside and outside oneself, to be both in charge of oneself and at the behest of an inquisitor who knows one all too well. In such artworks the adaptability and the complexity are to be found *in the work* as well as in an imaginative 'space' between the perceiver and the work. Rather than being implicit and always somewhat opaque inside the ruminations of each perceiver, the complex of relationships and repercussions activated by a participant's engagement with an interactive-immersive environment can now also be made explicit in the work itself.

The drive to understand the dynamics of what Cilliers calls 'constrained diversity'⁶ appears to be

strengthening in contemporary culture. Doubtless this reflects how everyday experience is becoming more complex. Which brings us to the nub of Cilliers' and Rokeby's theses about the most effective way to know such experience. Instead of producing a schematised blueprint or a snapshot of complexity, a viewer or participant of a dynamic-complex artwork needs to generate *an interrelated set of narratives* that encourage speculations about the endless dynamics of the system. In this way the viewer is emboldened to become not only a participant but also an investigator, someone who proposes 'what if' scenarios, who pursues several ways to sense the probabilities in the situation. Delving inside the system whilst also maintaining a critical distance on it, one cross-references these tendency-governed probabilities against one's own history and desires. And one observes and describes what's going on while the system reflects the consequences of our actions back to us. In other words, one waits and *gets a feeling* for the way the system is tending. As fuzzy as it sounds, this heuristic, intuitive attitude is true to the workings of complexity.

'Complex systems are open systems' writes Cilliers. Their constituent parts (including yourself, if you are amidst them) and their dominant actions all change from moment to moment, which means often 'the very distinction between "inside" and "outside" the system becomes problematic'.⁷ Complexity is not especially tractable to analysis, therefore, because the 'object' under analysis is altering from moment to moment. In Cilliers' words, 'a complex system is not constituted merely by the sum of its components, but also by the intricate *relationships* between those components'.⁸ If we try to map those relationships as an active network, 'any given narrative will form a path, or trajectory, through the network. ... [and] as we trace various narrative paths through it, it changes'.⁹ If we were to 'cut up' a complex system, we would find that our 'analytical method destroys what it

seeks to understand'.¹⁰ Thus we need to treat all discernible patterns as momentary, contingent sets of principles; then we have to take those principles *into* the meretricious environment, knowing that the pre-set principles will eventually fail or need adjustment. Once we sense those failures and adjustments registering in our analytical faculties, we are set apart again, organizing another batch of contingent principles which we then take back into the system.

Inside—but also outside—but also inside—but also outside—but also inside. This rhythm is restless. And it's necessary. Because the world of lived experience is restless like this, not simple, static or stable.

Being thus immersed and extracted, involved yet also critically distanced, when you investigate and participate in *Mirror States* you stand a chance of knowing both the world and yourself more comprehensively, not only more intuitively but also more analytically. It's the paradoxical capability that we need for finding our way through the complex world. It's the lived, designed and dynamic paradox that this exhibition, *Mirror States*, lets us know from inside and out.

ROSS GIBSON

1 David Rokeby, *Transforming Mirrors: Subjectivity and Control in Interactive Media*, 1995

2 Paul Cilliers, *Complexity and Postmodernism*, 1998, p. 130 and 10 respectively.

3 Cilliers, p. 10.

4 William Empson, *Seven Types of Ambiguity*, 1947 (first published, 1930)

5 Andrew Benjamin, *Disclosing spaces: on painting*, 2004.

6 Cilliers, p. 127.

7 Cilliers, p. 99.

8 Cilliers, p. 2.

9 Cilliers, p. 130.

10 Cilliers, p. 2.

BIOGRAPHIES

CURATORS

KATHY CLELAND is a curator, writer and lecturer specialising in new media art and digital culture. She lectures in The Digital Cultures Program at The University of Sydney and is currently completing a PhD investigating avatars, digital portraiture, virtual characters and representations of the self in virtual environments. Her curatorial projects include *ARTificial LIFE* at Artspace, Auckland, NZ (1998), the *Cyber Cultures* exhibition series which toured to over 20 venues in Australia and New Zealand from 2000–2003, and the Australian component of the *St@rt Up* exhibition at Te Papa Museum in Wellington, NZ (2002–2003). Cleland writes for a number of arts and cultural publications and was guest editor of a special new media issue of Artlink magazine, “e-volution of new media” [Vol 21, No.3, 2001]. She was president of the Sydney-based dLux media arts organisation from 1997 to 2002.

LIZZIE MULLER is a curator and writer specialising in interaction, audience experience and interdisciplinary collaboration. She is currently completing a practice based PhD with the Creativity and Cognition Studios at the University of Technology, Sydney. In 2007 she was resident researcher at the Daniel Langlois Foundation, Montreal. Muller was founding curator of Beta_space, a dedicated venue for exhibiting “prototypes” of interactive artworks at the Powerhouse Museum, Sydney, 2004–2006. From 1999–2004 she was Digital Arts Producer for the Junction Art Centre, Cambridge, UK. In the field of funding and policy development Muller has worked for Arts Council England and the National Endowment of Science Technology and the Arts. Select committee positions include Chair of the panel for the BAFTA Interactive Art Award in 2003, and Co-Chair of the symposium *Engage: Interaction, Art and Audience Experience* at the University of Technology, Sydney in 2006.

ARTISTS

ALEX DAVIES b.1977, Sydney, Australia. Currently resides Linz, Austria. Exhibitions include *Re:search/Art collaboration of Australia and Japan*, Sendai Mediatheque, Japan (2006); *Platform*, The Art Center, Chulalongkorn University, Bangkok (2006); *Dislocation*, FACT Liverpool, UK (2006); *Flutter*, Artspace, Sydney Australia (2006); *Grudge Match*, Gertrude Contemporary Art Spaces, Melbourne, Australia (2006). Awards include Australia Council Inter-Arts Board Grant (2007); Sendai Mediatheque Japan Commission (2006); Asialink Residency, Chulalongkorn University, Bangkok Thailand (2006); Australia Council Music Board Grant (2005); Australia Council Visual Arts And Craft Grant (2005).

Davies is a Sydney artist, currently based in Austria working with Time's Up. He is currently a PhD Candidate at the College of Fine Arts, University of NSW researching, developing and presenting audio-visual installations. Davies' practice spans a diverse range of media including film, photography, network, realtime audio-visual manipulations and responsive installations; his current practice is based on the development of evolving audio-visual installations in which individuals and dynamic environmental factors shift the conditions of a controlled space.

ANNA DAVIS b. 1974, Sydney, Australia. Currently resides Sydney, Australia. Has an Advanced Certificate in Interactive Multimedia Metro Screen, Sydney (2000) and a Bachelor of Fine Arts with Hons, College of Fine Arts, UNSW.

JASON GEE b. 1965, Darwin, Australia. Currently resides Sydney, Australia. Has a Bachelor of Arts, Visual Arts, Sculpture Audio-visual, Sydney College of Fine Arts, University of Sydney (1988).

Collaborative exhibitions include *NOIR SCRATCH*, Sydney Festival, Hyde Park Barracks (2008); *BIOHEAD KAROKE*, Museum of Contemporary Art, Sydney, Art at Night Series (2005); *Plaything*, dLux media arts; Digital Games & Art Exhibition, at Lanfranchi's Memorial

Discotheque, Sydney (2005); Electrofringe Festival, This is Not Art, Newcastle (2005); Video projections at the Winston, The Netherlands (2005); Big Day Out music festival (2001–2007).

Davis and Gee are Sydney-based media artists who have been working together for the past six years. Their collaborative, audiovisual practice uses sampling, video scratch techniques, projection and cut-up to agitate the media environment. Collecting and manipulating fragments from film, television, computer games and the Internet, they scavenge the debris of popular culture to create 'absurdist mashups' and video collages exploring disturbing patterns and humour underlying the everyday.

SEAN KERR b.1968, Wellington, New Zealand. Currently resides Auckland, New Zealand. Has a Masters of Fine Arts, Elam School of Fine arts, University of Auckland. Recent exhibitions include *Music 4 4 Blackberrys*, live performance with 4 Blackberrys, Multi-user network, unique blackberry software application, sound and projected visuals, Gus Fisher Gallery, Auckland (2007); *Neighbourhood Watch*, mixed media installation, camera sensors, computers, electronics, sound, Scape Biennial, Christchurch (2006); *Music 4 100 Computers*, multi-user performance, Rhizome Commission, Rhizome.org, New Museum of New York, New York (2006); *The Mountain*, interactive installation, wood, computer, sound. *Prospects 2004*, Wellington City Art Gallery, Wellington (2004); *The Conversation*, computer installation, computer, sound. MEDIA CITY, Seoul Biennale, Seoul Museum of Art, Seoul, South Korea (2002).

Kerr is an artist and Senior Lecturer at Elam School of Fine Arts, University of Auckland. Within the broader field of visual arts, his work as an artist is distinguished by a sustained engagement with the emergent area of new media technologies. His work has featured regularly in public art galleries, performance spaces, film festivals and internationally recognised websites for new media, and he has established a national reputation within New Zealand and a growing international profile as an experimental artist engaged in new technologies, and working with new audiences and new artistic

communities. A number of his works have introduced cutting edge technology, breaking new ground in the visual arts. *The Binney Project*, commissioned by Te Papa Tongarewa in 2002, used multi-user technology with text messaging in a visual arts context and Sean's latest performance work, *Music 4 4 Blackberrys*, exhibited at the Gus Fisher Gallery in 2007, used multi-user technology, a unique blackberry software application, sound and projected visuals.

GEORGE KHUT b. 1969, Adelaide, Australia. Currently resides Sydney, Australia. Khut has a Doctorate of Creative Arts (Research) University of Western Sydney, Sydney (2007). Recent exhibitions include *I Took a Deep Breath*, Biennale of Electronic Arts Perth (BEAP) (2007); *Strange Attractors*, Zendai Museum of Modern Art, Shanghai, (2006); *This Secret Location*, Arnolfini, Bristol, UK (2006). Awards include Art Lab research grant Australia Council for the Arts, Inter-Art Office (2008); New Work grant Australia Council for the Arts, Visual Arts Board (2007); New Work grant Australia Council for the Arts, Inter-Art Office (2005); Australian Postgraduate Research Scholarship (2002-2005).

George Khut's art practice focuses on the use of biofeedback and physiologically responsive media as tools for sensing and re-imagining the lived experience of mind-body interrelation. His interactive installation works enable participants to experience and interpret aspects of their own bodily processes, as dynamic audio-visual environments. Recent works include *Drawing Breath* (with John Tonkin) and *Cardiomorphologies v.1* (with John Tonkin) and *Cardiomorphologies v.2* (with Lizzie Muller and Greg Turner), both of which were developed as part of his Doctorate of Creative Arts research. In addition to his recent work with interactive media, George has worked as a sound designer and video artist on numerous dance, theatre and community arts projects, and an arts administrator and professional development adviser (Salamanca Arts Centre, Hobart, TAS and Accessible Arts, Sydney, NSW).

JANINE RANDERSON b. 1974, Auckland, New Zealand. Currently resides Melbourne, Australia. Has a Master of Fine Arts, RMIT University, Melbourne (2001). Exhibitions include *Anemocinegraph* in 'The Trouble with the Weather', UTS gallery, Sydney, Australia (2007); *Remote Senses; Storms nearby*, in 'Ecomatics and Geomatics', III International Exhibition of Art and Science, Shanghai, China (2007); *Rorschach Clouds*, ISEA: Remote Symposium, San Jose, USA (2006); *Lure of the Islands*, in 'The Greenhouse', Open Art Gallery, Frankfurt, Germany (2004); *Sky Views*, DVD projection, Centre for Contemporary Photography (CCP), Melbourne, Australia (2001). Awards and residencies include Australian Postgraduate Association scholarship (APA), University of Melbourne (2007); Digital Art Residency, University of Waikato, Hamilton, New Zealand (2006); Corban Art Estate, Site Specific installation Award, Auckland (2005); Fellowship with Human Interface Technology laboratory, Christchurch (2005); *Panasonic Independent Video Award*, Auckland, New Zealand (1996). Collections include Pitt Rivers Museum, Oxford, U.K.; The National Film Archive, Wellington, NZ; MIC Archive, Auckland NZ.

Randerson is a New Zealand artist who employs a range of time-based media, including 16mm film, digital audio and video and computer programmed interaction design. Her art practice includes both site-specific work and single channel video. A recurrent theme in her work is the play with systems of observation; from the microcosmic imagery to the remote view of satellite imaging. In 2006 she collaborated with meteorologists as the digital artist in residence at the University of Waikato. Currently she is on the guest editorial panel of a special issue of MIT's *Leonardo Journal*. Randerson is a board member of ADA (Aotearoa Digital Arts network), and a member of *Synapse*, the art-science collaboration network in Australia. In 2008, as a PhD candidate at the University of Melbourne, she is researching historical observation practices at the Melbourne Museum and the Australian Bureau of Meteorology.

HYE RIM LEE b. 1963, Seoul, Korea. Currently resides in New York, USA and Auckland, New Zealand. Has a Bachelor of Fine Arts (Intermedia) Elam School of Fine Arts, The University of Auckland, New Zealand. Exhibitions include *Crystal City*, Diehl Projects, Galerie Volker Diehl, Berlin, Max Lang Gallery, New York (2008); *Videoteque*, Art Unlimited, Art Basel, Basel (2007); *Group Show Part 2*, Kukje Gallery, Seoul (2007); *The sea that has two names, video art from Korea*, Casa Asia, Barcelona, (2006); *Fiction@ Love/Forever Young Land*, MoCA Shanghai, China (2006); *Powder Room*, The Gus Fisher Gallery, Auckland (2005). Awards and residencies include International Studio and Curatorial Program artist in residence New York (2007); Screen Innovation Production Fund, A partnership between Creative New Zealand and the NZ Film Commission (2006); Ssamzie Space Studio Programme artist in residence, Seoul, Korea (2006); Arts Board: Creative and Professional Development, Creative New Zealand (2005). Collections include The Museum of New Zealand, Te Papa Tongarewa, Wellington; Coreana Art Museum, Seoul; Saatchi & Saatchi NZ, Auckland; National Museum of Contemporary Art, Gwacheon, Korea; Govett-Brewster Art Gallery, New Plymouth.

Lee is a New York/Auckland based Korean artist. Her work questions new technology's role in image making and representation, primarily through game structures and working with 3D animation. Lee reexamines aspects of popular culture in relation to notions of femininity and looks at the way fictional animated identities are propagated within contemporary culture. Her work has conceptually evolved through the representation of TOKI character in her ongoing *TOKI/Cyborg Project* since 2002. Her evolving computer-generated character TOKI—a female cyborg, through which Lee explores issues of femininity, plastic surgery, projection of desire, control and technological manipulation—she has promised a continuation of her challenge to what she calls the "phallic motivations" of dominant cyber culture, computer gaming, contemporary myth and animamix through her *TOKI/Cyborg Project*. In so doing she has demonstrated the

progressive role an art form can play in the engagement with high technology and popular culture. Lee's work has been exhibited widely in New Zealand, and in Asia, Europe and New York.

DAVID ROKEBY b.1960 Tillsonburg, Ontario, Canada. Currently residing Toronto, Ontario, Canada. He has a honours degree from the Ontario College of Art. Recent exhibitions include "e-art", Musée des Beaux Arts de Montréal, Montréal, Canada (2007); *Profiling*, Whitney Museum of American Art, New York City, U.S.A (2007); *Feedback*, Laboral, Gijón, Spain (2007); *David Rokeby, Silicon Remembers Carbon (retrospective)*, FACT, Liverpool, UK (2007); *Algrithmische Revolution*, Zentrum für Kunst und Media, Karlsruhe, Germany (2004-7). Awards include 2007 *idmaa Award for Innovation in Media Arts*, Philadelphia, USA (2007); *2004 World Technology Award for the Arts*, San Francisco, USA (2004); *Prix Ars Electronica Golden Nica for Interactive Art*, Linz, Austria (2002); *Governor General's Award in Visual and Media Arts* (2002); *BAFTA Award for Interactive Art*, (British Academy of Film and Television Arts) (2000). Collections include Fondation Daniel Langlois, Montréal, Canada; Ontario Science Centre, Toronto, Canada; Fundació Sorigué, Lleida, Spain; Oakville Galleries, Oakville, Canada. Rokeby is represented by the Pari Nadimi Gallery.

Rokeby's early work *Véry Nervous System* (1982-2004) was a pioneering work of interactive art, translating physical gestures into real-time interactive sound environments. It was presented at the Venice Biennale in 1986, and was awarded a Prix Ars Electronica Award of Distinction for Interactive Art in 1991. Several of his works have addressed issues of digital surveillance, including *Taken* (2002), and *Sorting Daemon* (2003). Other works engage in a critical examination of the differences between human and artificial intelligence. *The Giver of Names* (1991-2004) and *n-cha(n)t* (2001) are artificial subjective entities, provoked by objects or spoken words in their immediate environment to formulate sentences and speak them aloud. Rokeby has exhibited and lectured extensively in the Americas, Europe and Asia, In 2007, he completed major art commissions

for the Ontario Science Centre in Toronto and the Daniel Langlois Foundation in Montréal.

JOHN TONKIN b. 1963, Adelaide. Currently resides in Sydney. Exhibitions include *Workin' Down Under*, Wood Street Galleries, Pittsburgh USA (2007); *Interactive Cities*, International Symposium on Electronic Art (ISEA) San Jose, USA (2006); *Strange Weather (v1.0 beta)*, Sherman Galleries, Sydney (2005); *Digital Sublime—New Masters of Universe*, Museum of Contemporary Art, Taipei (2004); *Personal Eugenics*, Centenary of Faces, Queensland Art Gallery (2001). Awards and residencies include residency - Arts SA, Returning Artists Scheme (2002); Fellowship, Australia Council's New Media Arts Board (1999-2000); new work grant—Australia Council, New Media Arts Fund (1996); *these are the days*, honorable mention—Prix Ars Electronica, Austria (1994) residency at University of Adelaide, Computer Science Department, Australia Council, Artists and New Technology Program (1987). Collections include Kaldor Art Projects; Move:Video Art in Schools; Queensland Art Gallery; Griffith Art Works.

Tonkin began making experimental film and video in the early 1980s, after studying biological sciences. He started making computer animation in 1985. Tonkin makes his works using his own custom software developed in programming languages such as Java. He currently lectures within the Digital Cultures Program at The University of Sydney.

In 1995 Tonkin began making interactive art works that were designed to be exhibited both as installations and online. *meniscus* (1995-99) is a series of three works that explore ideas relating to subjectivity, scientific belief systems and the body. His recent works involve building frameworks /tools/toys in which the artwork is formed through the accumulated interactions of its users. He is currently working on a number of projects that use real-time 3d animation, visualisation and data-mapping technologies. These include *Strange Weather*, a visualisation tool for making sense of life, and time and motion study.

MARI VELONAKI b.1968, Athens, Greece. Currently resides in Sydney, Australia. Velonaki has worked in the field of interactive installation art since 1995. Her practice engages the spectator/participant with digital and robotic 'characters' in interplays stimulated by sensory triggered interfaces. She has worked with speech (1995), touch (1997), breath (1998), electrostatic charge (2000), vision system (2000), light (2003) and robotics (2003). She was awarded a PhD in Media Arts at the College of Fine Arts, University of NSW in 2003. Velonaki's installations have been widely exhibited. Exhibitions include: ZENDAI Museum of Modern Art, Shanghai, Wood Street Galleries, Pittsburgh, Millennium Museum—Beijing Biennale of Electronic Arts, Ars Electronica, Austria, Biennale of Electronic Arts, Perth, Adelaide Biennial of Australian Art, Conde Duque Museum, Madrid, European Media Arts Festival, Osnabruck, Te Papa Tongarewa Museum of New Zealand, Institute of Modern Art, Brisbane, Arco, Madrid, Museum of Contemporary Art, Sydney. In 2006, with Dr David Rye, she co-founded the Centre for Social Robotics within the Australian Centre for Field Robotics¹ at the University of Sydney. Velonaki is currently the recipient of an Australia Council Visual Arts Fellowship (2007–09).

¹The Australian Centre for Field Robotics (ACFR) is a partner in the ARC Centre of Excellence in Autonomous Systems. Drs David Rye, Steve Scheding, Mari Velonaki and Stefan Williams form the core art/science collaboration at this institution. Areas of research include robotics, distributed and decentralised systems and human/machine interaction.

MARI VELONAKI'S COLLABORATORS:

DAVID RYE works in embedded and applied control of machinery, and in the design and implementation of computer-controlled systems. Although his background is in mechanical engineering (BE, University of Adelaide 1981; PhD, The University of Sydney 1986), he now works principally on computerised machinery, electronics, software and systems design. Rye has conducted a number of industrial research and development projects related to automation and control of machinery, including methods for reduction of load sway in shipboard cranes; reeving arrangements for cranes used for container handling and the system design of an

autonomous container handling vehicle. Rye is also internationally recognised as a pioneer in the introduction and development of university teaching in mechatronics, having instituted the first Australian Bachelor of Engineering in Mechatronic Engineering in 1990.

STEVE SCHEDING'S research concentrates on the acquisition, representation, interpretation and visualisation of three-dimensional environmental data. He has used disparate sensors, such as laser, radar, cameras and multi-spectral sensors for capturing data from outdoor terrains.

The data include information such as range, reflectivity etc., as well as terrain properties such as colour and plant health. Scheding's innovative software enables the acquisition-representation-visualisation pipeline to operate in real-time. Scheding has a PhD (1998) and a BE (1995), both in Mechatronics from The University of Sydney. Apart from his work in representation and visualisation, he has conducted extensive R&D work on the automation of land vehicles and mining machinery.

STEFAN WILLIAMS' current research focus deals with architectures for autonomous systems. He is interested particularly in the area of distributed and decentralised data fusion, and in how systems can be designed to enable autonomy. An important research question arises from the interaction of autonomous systems with an audience. How can people be integrated into these systems, either as an audience or from the point of view of control? Stefan has a PhD in Field Robotics from The University of Sydney (2001), and a BAsC in Systems Design Engineering from the University of Waterloo (1998). He is currently working on demonstrating multi-vehicle Simultaneous Localisation and Mapping using a newly created indoor robotics facility at the ACFR. This work will be adapted to field environments as it matures. His field work focuses on the area of marine systems, where he is deploying an Unmanned Underwater Vehicle for surveying marine habitats, including coral reefs.

WRITERS

JON BYWATER is a member of the collectives Local Time and Cuckoo and teaches as Programme Leader, Critical Studies, Elam School of Fine Arts, The University of Auckland, Aotearoa New Zealand. With Danny Butt and Nova Paul he is co-editor of the book *PLACE: Local Knowledge and New Media Practice* forthcoming with Cambridge Scholars Press.

MARGIE BORSCHKE is a Sydney-based writer and a PhD candidate at the Centre for Social Research in Journalism and Communication at University of New South Wales. Her academic research investigates the use of copies and duplication as creative practices and communication tools in digital networks and natural systems. As a journalist, Borschke has contributed to and reported for a wide variety of respected international publications including *The New York Times Magazine*, *The Times* (UK), *Harper's Magazine*, and *Metropolis*. In the mid-nineties, in New York City, she also worked to produce and launch some of the first experiments in web-based publishing. In 2002, she relocated from New York to Sydney with her Australian partner, and has since added many Australian publications to her portfolio including *The Weekend Australian*, *Spectrum*, *Vogue* and *Harper's Bazaar*. She is also a member of NUCA, the Network of Uncollectable Artists.

ALESSIO CAVALLARO has been a leading figure in the development of electronic arts in Australia for over twenty years, primarily as a curator, producer, and publications editor in film, video, new media, and sound arts. Since 2000, he has been Senior Curator at the Australian Centre for the Moving Image, Melbourne (www.acmi.net.au). Major exhibitions include *Tiansfigure* (2003/04), *SenseSurround* (2004), *World Without End* (2005), and *2006 Contemporary Commonwealth*. Alessio was founding Director of dLux media arts, Sydney (1997–2000), where he initiated and produced a range of innovative programs, including the international annual

events *d>art* and *futureScreen*. He was co-producer/curator of ISEA 92, and the Australian Film Commission's seminal *Filmmaker and Multimedia* events (1993 & 95); and an inaugural member of the New Media Arts Board of the Australia Council for the Arts (1997–2000). Publications (as co-editor) include *OnScreen/RealTime* (1996–2000) and *Prefiguring Cyberculture* (MIT Press/Power, 2002).

SEAN CUBITT is Director of the Program in Media and Communications at the University of Melbourne and Honorary Professor of the University of Dundee. His publications include *Timeshift: On Video Culture, Videography: Video Media as Art and Culture, Digital Aesthetics, Simulation and Social Theory, The Cinema Effect* and *EcoMedia*. He is the series editor for Leonardo Books at MIT Press. His current research is on public screens and the transformation of public space; and on genealogies of digital light.

TANIA DOROPOULOS is a Sydney-based curator and writer, and currently holds the position of Curator, Anna Schwartz Gallery Sydney. Previously she was Curator, Sherman Galleries, and Program Manager, Artspace, Sydney. Her recent curatorial projects include *eternal beautiful now* (2007), a group exhibition involving local and international artists, Sherman Galleries, Sydney; *Grudge Match* (2006), a group exhibition of new contemporary projects by emerging artists, Gertrude Contemporary Art Spaces, Melbourne; *Ten[d]ancy* (2006), a group exhibition of newly commissioned, site-specific projects, Elizabeth Bay House, Sydney. Forthcoming projects include an international group exhibition, opening in August 2008.

Doropoulos has been published in numerous exhibition catalogues and publications, as well as Australian art journals. She has sat on numerous arts boards, presented lectures and participated in panel discussions throughout Australia.

CHARLOTTE HUDDLESTON is currently Curator of Contemporary Art at The Museum of New Zealand, Te Papa Tongarewa. Huddleston

has previously written about Lee's work for the *Powder Room* catalogue, published in 2006. She is currently working on projects with artists Ronnie van Hout and Seung Yul Oh to open on the Te Papa Sculpture Terrace in late 2008 and, along with colleague Megan Tamati-Quennell, a project with James Luna as part of One Day Sculpture (www.onedaysculpture.org.nz).

ROSS GIBSON makes books, films and art installations. Recent works include the book *Seven Versions of an Australian Badland*, the video installation *Street X-Rays* and the interactive audiovisual environment *BYSTANDER* (a collaboration with Kate Richards). He is the Professor of New Media & Digital Culture at the University of Technology, Sydney.

ANNEKE JASPERS is an emerging writer, curator and arts administrator based in Sydney. She is currently Project Assistant for British Council Australia, having worked previously as Assistant Curator, UTS Gallery, and Gallery Associate at the commercial space GRANTPIRRIE. Jaspers writes regularly on contemporary Australian art, and has published in platforms including *Column Journal* (Artspace), *Artlink*, *Runway* and *RealTime*, in addition to commissioned catalogue essays for regional, commercial and artist-run galleries. She is the forthcoming guest Co-editor of Runway Issue #11 themed 'conversation', and in 2007 curated the project 'between you and me' as part of Firstdraft's Emerging Curators Program.

CAITLIN JONES is a Brooklyn based independent curator and writer, most recently a regular contributor to Rhizome.org. In 2007 she was Researcher in Residence at the Daniel Langlois Foundation. In 2006 Jones was the Director of Programming at Bryce Wolkowitz Gallery in New York and from 2001 to 2006, she held a combined curatorial and conservation position at the Solomon R. Guggenheim Museum. She co-curated the groundbreaking exhibition *Seeing Double: Emulation in Theory and Practice*, and was Assistant Curator of the

Deutsche Guggenheim exhibition, *Nam June Paik: Global Groove 2004*. As one of the lead researchers and organizers of the international Variable Media Network, Caitlin has been responsible for developing important tools and policy for the preservation of electronic and ephemeral artworks. Her writings on new media art presentation and preservation have appeared in a wide range of catalogues and international publications.

DAVID TEH is an independent critic and curator based in Bangkok. He studied critical theory at the Power Institute, University of Sydney, receiving his PhD in 2005. He has lectured widely on the history and theory of art and visual culture, with emphases on postmodern theory and new media cultures. He has contributed to numerous journals, newspapers and magazines including *Art Asia Pacific*, *Art & Australia*, *Eyeline* and *The Bangkok Post*. In 2006, Teh co-curated *Platform*, a showcase of emerging Thai installation artists (The Queen's Gallery and The Art Center, Chulalongkorn University), and was a moderator of *Cultural Ecologies: Communicating Contemporary Art in the 21st Century* at the Asian Cultural Co-operation Forum in Hong Kong. He is also co-founder and moderator of the *FibreCulture* forum for internet culture, and a director of Chalk Horse Gallery, Sydney. He is currently the curator of the 5th Bangkok Experimental Film Festival (supported by MAAF-Multimedia Arts Asia Pacific).

LIST OF WORKS

ALEX DAVIES

Dislocation 2005

4 x 8 m, mdf plywood, lcd monitors, speakers, amplifiers, video hardware, computer hardware, custom software commissioned by Experimenta Media Arts supported by Viewsonic, Altronics

ANNA DAVIES & JASON GEE

Biohead-Actualized 2008

dimensions variable, single screen video installation constructed from found sounds and re-animated digital photos.

Biohead Karaoke 2005-2008

20 min video projection, dimensions variable, constructed from found sounds, a cappella vocals and re-animated digital photos

SEAN KERR

Klunk, Clomp, Aaugh!—Friends Reunited 2008

dimensions variable, computers, multi-user network, unique software, micro controllers, inflatable and misc electronics. courtesy Michael Lett Gallery, Auckland

GEORGE KHUT

The Heart Library Project: Biofeedback Mirror 2008, with Greg Turner and David Morris-Oliveros: heart rate sensors with interactive sound and video projection.

The Heart Library Project: Body Maps 2007-2008, with Caitlin Newton-Broad: drawings on paper by project participants and video documentation. This project was supported by Australia Council for the Arts, Visual Arts Board (New Work grant), UTS Creativity & Cognition Studios, Xenian, UTS Gallery, Greg Turner (interaction design and signal analysis tools), David Morris-Oliveros (computer visualisation system, and photography), Caitlin Newton-Broad and Naomi Derrick (audience participation and drawing component).

JANINE RANDERSON

albedo of clouds 2008

2 x round screens 840 diameter each

perspex, computers, projectors, pinhole cameras

Audio design: Jason Johnston

Visible Image Satellite Images: Australian Bureau of Meteorology

HYE RIM LEE

Lash, 2005

3D animation, 4' 44" looped

Courtesy the artist, Starkwhite, Auckland and

Kukje Gallery, Seoul

Lash was funded by Screen Innovation Production

Fund, A partnership between Creative New

Zealand and the NZ Film Commission

Powder Room, 2005

four channel DVD installation, 3D animation,

approx. 6 mins each, looped

Courtesy the artist, Starkwhite Auckland, and

Kukje Gallery Seoul

DAVID ROKEBY

Very Nervous System 1982-2004

dimensions variable, video camera, computer,

custom software, amplifier and speakers

The Giver of Names 1991-2004

dimensions variable, video camera, computer,

custom software, objects, pedestal, video projector,

rear-projection screen, small multimedia speakers

JOHN TONKIN

time and motion study 2006

dimensions variable, interactive video installation,

custom software, webcam, computer, lcd tv

MARIVELONAKI

Fish-Bird: Circle B—Movement C

2004-2006

dimensions variable, interactive installation, custom

made steel wheelchairs, custom-made vision and

laser measurement systems, multiple computers

with wired and Bluetooth wireless networks.

This artwork was produced by the artist in

collaboration with David Rye: mechatronic

systems design; Steve Scheduling: software

architecture; Stefan Williams: tracking system. The

production was assisted by a Linkage Grant from

the Australian Research Council and sponsored by Australia Council for the Arts; Australian Centre for Field Robotics Artspace, Sydney; Australian Network for Art and Technology; Museum of Contemporary Art, Sydney; Patrick Technology and Systems. Substantial contributions were made by the following: Lead programmer: James Hudson; Mechanical fabrication: Bruce Crundwell; Plastics fabrication: Alan Trinder; Upholstery: Grant Panozzo; Research and prototyping: Martin Edgren & Erik Wahlström; Bluetooth circuitry and firmware: Alex Green; Wheelchair trajectory generation: Luke Sassé; Visual tracking algorithms and software: Alex Brooks; Network and communications software: Alexei Makarenko, Matt Ridley & Alex Brooks; Font manipulation and text processing: Dave Wood; 'Handwriting' trajectory generation: Andrew Hill; Technical support: Chris Mifsud, Richard Grover & Jeremy Randle.

Circle D: Fragile Balances 2008

base 28.0 cm deep x 60.0 cm wide x 96.5 cm high approx.

cubes (2) 12.1 cm deep x 12.1 cm wide x 10.5 cm high approx.

interactive installation, black bean timber, lcdscreens, 3140 aircraft grade steel tube, custom-made microcomputers (3 per cube), power supplies, sensors and amplifiers.

This artwork was produced by the artist in collaboration with David Rye: mechatronic systems design and Steve Scheduling: software architecture. The production was sponsored by Centre for Social Robotics, Australian Centre for Field Robotics (ACFR), The University of Sydney and supported by Iain Brown: Detail mechanical design of cube, machining and assembly; Bruce Crundwell: Steel fabrication and precision component machining; Andrew Hill: 'Handwriting' trajectory generation; Craig Rodgers: Electronics development; David Silvera: Prototype cube design and programming; Geoff Tonkin: Timber milling and base construction.

ACKNOWLEDGEMENTS

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WITH THANKS

The Curators would like to thank all the artists in the exhibition, whose works have unfailingly stimulated and challenged us as curators. We are grateful to the writers who have contributed texts to this catalogue; their insights shed new light on all the art works. We also thank Ross Gibson, whose essay draws out the complexity underlying the experience of digital interaction that characterises the works in the show.

We are very grateful to the Campbelltown Arts Centre, Sydney and MĪC Toi Rerehiko, Auckland for their support. *Mirror States* is ambitious in collecting so many digital and interactive artworks together in one exhibition. Both have embraced this challenge with gusto, driven by their enthusiasm for bringing new kinds of art-experience to their audiences. Finally we are grateful to the audiences, whose participation is the magic ingredient which brings *Mirror States* to life.

