I, ROBOT: RETHINKING JACK BURNHAM'S SYSTEMS ESTHETICS

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In the 1960's and 70's, American art critic Jack Burnham shifted the emphasis away from artefacts – fixed, static objects - and towards the idea of networks and systems. This paper examines Burnham's 'systems esthetics' and tests his ideas against recent 'robotic' works by four Australian artists. Not all of these artists use cutting edge technology but each artist seeks to do more than simply imitate life.

What if you could bring a sculpture to life? The story of a sculpture that comes to life is one of western culture's oldest myths. From Ovid's Pygmalion to the making of the Golem from clay in Jewish folklore, the creation of life from inanimate matter has been a persistent fantasy. However since 1948 and the publishing of Norbert Wiener's book *Cybernetics: or control and communication in the animal and the machine,* [1] there has been strong interest in artificial life processes. One approach focuses on developing intelligent machines – machines that can regulate their own behaviour and more recently, 'learn' new behaviours.

Artists have taken a critical interest in interactive and intelligent machines. Early work in this area was promoted in exhibitions like *Cybernetic Serendipity* at the Institute of Contemporary Art, London in 1968 and in Jack Burnham's book *Beyond modern sculpture: the effects of science and technology on the sculpture of this century.* [2] Jack Burnham was an American artist, art historian and art critic. He was initially drawn to vitalistic art – for example the works of Henry Moore, Constantin Brancusi and Jean Arp – but by 1968 when he published his book *Beyond modern sculpture*, Burnham was championing a new type of art, one that would combine "machines with the qualities of living matter." [3] Tracing the development from what he saw as early proto-automata though to kinetic and robotic art of the 1960s, Burnham agues that the machine is the future of art and of sculpture in particular. For Burnham, cybernetics provides the key to this future. He describes Norbert Wiener's book on cybernetics as "the scientific inception of a dream which had haunted the makers of automata all through the ages – that of creating mechanical analogues to the nervous systems of animals, and through this gradually effecting some level of intelligence in the machine." [4]

Burnham was one of the first to acknowledge this new direction in art. He described sculptors in the 60's moving away from making artefacts – fixed, static objects – and instead building 'systems'. These systems were not simple repeated cycles, but were altered according to feedback loops through which the system becomes self-regulating. Moving beyond a formalist critique of machine aesthetics, Burnham helped establish the foundations for future research at the intersection of art and science. However his insistence on the mimetic nature of art is based on very traditional notions. In *Beyond modern sculpture* Burnham argues that sculptors in the past had to content themselves with life-like but static representations of human or animal figures. In contrast Burnham sees technology as heralding a critical transition for the whole of the human species – substituting organic life with sophisticated forms of synthetic life. He believes art has a key role to play in this transition. In doing so he places art in the service of technology, giving sculpture a new goal – that of creating a blueprint for "our destination as a post-human species." [5] In this paper I examine the work of four contemporary Australian artists to see in what ways they either adopt or challenge Burnham's thesis about the necessary goal of art.

Mari Velonaki's interactive work *Fish-Bird Circle B – Movement C* was made collaboratively with scientists David Rye, Steve Scheding and Steven Williams at the Australian Centre for Field Robotics, University of Sydney. The work was inspired by the story of a fish and a bird that fall in love but are unable to get together because of their differences. *Fish-Bird* consists of two computer-controlled custom-made wheelchairs, which are programmed to respond in complex and subtle ways to each other and to viewers. The wheelchairs navigate the exhibition space and periodically produce written messages thereby simulating dialogic exchange between each other and between human and machine. The first prototype of *Fish-Bird* was presented at Ars Electronica in 2004 as part of the *Unnatural Selection – Australian Media Art* exhibition. At this stage the motion control of the wheelchairs was relatively simple. As the project progressed detailed motion tracking and more refined behaviours were added.

I saw *Fish-Bird* in 2008 at the Campbelltown Arts Centre where it was exhibited as part of the *Mirror States* exhibition curated by Kathy Cleland and Lizzie Muller. By this stage complex behavioural patterns linked to the seven days of the week had been added along with "artificial 'emotional' states that describe how each robot 'feels' about itself, about the other robot, and about the participants in the installation space." [6] I had traveled to Campbelltown to take part in a symposium held in conjunction with the exhibition. In a quiet moment between sessions I ventured over to the *Fish-Bird* installation. The space was empty apart from two wheelchairs located in the centre of the room. The floor was littered with small pieces of paper. As I entered the space the wheelchairs separated, each moving to an opposite corner of the room. I stood still. After a few minutes one of the wheelchairs moved toward me and ejected a printed message that dropped at my feet. 'Deconstruct any notion of central consciousness', it read.

Fish-Bird, with its 'emotional states' assigned to each wheelchair, takes concepts associated with human behaviour and applies them to machines. This translation of concepts from one field to another also works in reverse. Just as machines of the past provided metaphors for understanding the human body and human subjectivity (think of Leonardo Da Vinci's cross-sections and exploded diagrams of the human body and their analogous relation to mechanical inventions of his time), computers are changing the way we think about ourselves. The language of cybernetics for example has provided new ways of thinking about human action, interaction and subjectivity. Concepts like 'feedback' have gained ubiquity. Interaction is now seen to be everywhere. The idea of feedback has shifted attention away from individualism, which highlighted a non-circular cause and effect way of understanding things. Instead of imagining that we exist independently of others and independently of chance events occurring in the environment, we now think in terms of networks, systems and programs. While some people feel this undermines our humanity, others like Donna Haraway see great promise in rethinking our relationship with machines.

Machines today are very different from the hulking monsters of the industrial age. Our laptops computers and mobile phones are portable user-friendly devices. Donna Haraway describes them as being "made of sunshine …all light and clean because they are nothing but signals, electromagnetic waves, a section of a spectrum." [7] Because we are intimately enmeshed with our machines Haraway argues that today we are all cyborgs, "theorized and fabricated hybrids of machines and organisms." [8] If we agree with Haraway, this is not a bad thing. The cyborg, part machine/part organism opens up the question of how bodies are formed in particular historical situations. The body is not seen as 'natural' but rather as simultaneously symbolically, biologically and socially produced. Velonaki's work, like Haraway's cyborg, encourages us to question some of the binary oppositions –human/machine, intelligent/programmed – that have traditionally structured ideas of the self in western societies.

In contrast to the technical sophistication of Velonaki's *Fish-Bird*, Simon Yates' artworks are lo-tech, hand-made replicas of outmoded or improbable machines. He has created walking sculptural figures, which are constructed with a lightweight armature and covered with tissue paper. Suspended beneath helium balloons, these motorized figures take small steps to propel themselves around the room. In a work entitled *Rhabdomancy,* which was exhibited in the *New09* exhibition at the Australian Centre for Contemporary Art in Melbourne, Yates created life-size versions of himself and writer Vanessa Berry. Unlike Velonaki's custom-built wheelchairs, Yates' work has a DIY aesthetic. His figures are carefully put together using simple materials. Again, contrasting with the complex range of responses evident in Velonaki's *Fish-Bird*, Yates' motorized figures are decidedly unresponsive. Oblivious to each other and to curious spectators they instead seem completely absorbed in the task at hand – staying upright and moving slowly forward. A more recent work by Yates, modelled on the robot Maria from Fritz Lang's 1927 film *Metropolis,* was shown in the exhibition *Awfully Wonderful: Science Fiction in Contemporary Art.* Curated by Bec Dean and Lizzie Muller for Performance Space, the exhibition was presented in the foyer of Carriageworks, an art centre housed in the old Eveleigh Rail Yards in Sydney. The papery fragility of *Metropolis Robot (Futura),* which was buoyed up beneath gold helium balloons, lent the figure a spectral aspect. It seemed as if the ghost of the robot Maria had returned to walk the cavernous halls of the building, itself a repurposed industrial site with many of its original features still intact.

Yates' work might at first glance appear to be the antithesis of *Fish-Bird*. His low-tech robots are vastly different from Velonaki's cutting edge computer programmed wheelchairs*.* The figurative form of Yates' work also contrasts with Velonaki's nonfigurative approach, which instead suggests the absence of the body. While the physical components of Yates' work are very simple – helium balloons support the weight of the robot while a small motor operating a cam causes first one leg and the other to step forward – both Velonaki's and Yates' robots evoke a sense of wonder. In Yates' work this is partly because of the fragility of the robots. Everything is in perfect balance. Should one element fail, the walking robot's progress would cease. In *Rhabdomancy,* Yates has created body doubles or avatars of himself and Vanessa Berry that occupy real space. Unlike static sculptural portraits that fix a likeness for all time, Yates highlights his robots' frailty.

Wade Marynowsky has, in a different sense than Yates, also made avatars – physical avatars he can inhabit. In his work *The Discreet Charm Of The Bourgeoisie Robot*, exhibited at The Institute of Contemporary Art Newtown (ICAN) in 2008, Marynowsky presented a robot wearing a hoop skirt and topped with a perspex dome 'head'. Recalling the automatons of the 18th and 19th centuries as well as the science fiction robots called daleks from the well-known TV series *Dr Who*, Marynowsky's 'bourgeoisie robot' is operated telematically over the internet. Marynowsky says of this work, the "charming robot avatar waits for visitors to enter the space and then converses with them in a polite and pleasant manner." [9] Dressed in a black tunic with a white lace collar, the robot seemed friendly and eager to please. Without the dalek-like head and the speed with which it could spin on its axis to track an unsuspecting viewer, the robot might have appeared benign. However an uncomfortable feeling persisted. With the battle cry 'EXTERMINATE!!!' would it suddenly reveal more sinister motives?

Marynowsky's more recent work *The Hosts: A Masquerade of Improvising Automatons,* exhibited at Performance Space in Sydney in 2009, comprises five robots dressed in elaborate costumes. Each robot represents a different character or personality – for example 'the cowgirl' and 'the princess'. Together they roam around like guests at a masquerade ball and periodically emit strange vocalizations or spin giddily on one spot. Taking on board Japanese roboticist Masahiro Mori's theory of the uncanny valley (1970), that if robots are too life-like they cause us to recoil, Marynowsky doesn't aim for human likeness. Like his earlier 'bourgeoisie robot', each 'host' wears a hoop skirt which provides space for, but also hides,

the mechanical and electronic components. Each robot is also crowned with a dalek-like domed head from which shines a beam of light or alternatively two bright blue or red 'eyes'.

Implied in the sub-title, the theme of the masquerade or disguise is central to this work. Marynowsky is interested in the point at which one thing flips over to become the opposite – an uncanny moment when the familiar becomes strange. *The Hosts* perform this crossing over on many levels. They are at the same time a figure and a machine as well as male and female – Marynowsky describes them as transgendered. The robots are also 'hosts' in more ways than one – as organizers of the party perhaps but also because they harbor another entity or parasite in the form of the computer program or programmer.

While Marynowsky has given each of his robots an individual 'character' which is expressed in their costume, he deliberately avoids using realistic human forms. Instead he humorously gives us a double serving of mimicry. Marynowsky's robots are daleks cross-dressing as 18th century automata – machines that mimic other earlier machines made to mimic humans. This self-reflexive aspect of Marynowsky's work playfully mocks the Faustian goal Burnham assigns to artists. Instead Marynowsky is interested in society's fascination with robots and our ambivalent responses to them.

My own work *Angelica* (2008) is hardly a robot. *Angelica* does not have any moving mechanical parts or feedback systems. Instead it is a three-dimensional work that resembles a modified factory chair. Two LCD screen are incorporated into the metal frame of the chair. One screen replaces the seat of the chair and the other becomes the backrest. Two moving images are displayed on the screens. One shows the exterior of the body and the other is an MRI scan showing the body's interior. The images on the screens are in a constant state of transformation. A fluid line sweeps across the surface – peeling back the exterior of the body to reveal the interior. The transition resembles a digital wipe. However instead of being created on the computer, the effect was made by casting a shadow over two projected images and filming the result. The back and forth motion of the shadow is similar to the movement of a scanner converting analogue into digital information.

I made the work after spending time in hospital where I underwent a series of tests.Hooked up to various diagnostic machines I was reminded of Donna Haraway's comment that today "machines are disturbingly lively, and we ourselves frighteningly inert. [10] The machines beeped and crackled as they probed and scanned. In contrast I had to lie still and wait for the results. When I was discharged I was given copies of the scan images. To me they appeared strangely robotic. It was as if the scanner had transformed my body into another machine – one with distinct muscle groups which when rendered in black and white took on the metallic sheen of a robot.

In *Angelica* I am interested in the shift from analogue to machine vision and also in cultural representations of women and technology, particularly in science fiction films. These films often reveal a deepseated anxiety associated with robots which is played out in narratives of mastery and slavery. For example, Fritz Lang's 1927 film *Metropolis* [11] presents a dystopian vision of the future where technology has enslaved the workers. Women, represented by the real and false Marias, are depicted as either angels or whores. Embodied in the figure of the false Maria, who when captured and burnt at the stake resumes her robot form, both women and technology are represented as a threat to life. The message is that, like women, technology may be seductive but it is also out-of-control.

Ridley Scott's 1982 film *Blade Runner* [12] presents a much more nuanced investigation of the relationship between the human and the non-human. Rather than *Metropolis*' tale of good versus evil, the narrative in *Blade Runner* turns around the theme of doubt – how can you tell a replicant from a human when each has memories? When the replicant Rachel asks Deckard if he has ever taken the Voight-Kampff empathy test she throws the question back onto him – how does he know that he isn't also a replicant? The ontological doubt arising from the increasingly blurred boundary between human and machine marks the distance travelled between representations of robots in *Metropolis* and in *Blade Runner.*

Instead of Burnham's idea that artists are preparing a blueprint for a post-human species, blurring the boundaries between humans and machines might be a better way to understand the works of the artists I have discussed. This blurring is a two way street. While machines have become more intelligent there is also the possibility that humans might recognize they are not always masters of rationality. In his book *Tarrying with the Negative: Kant, Hegel, and the critique of ideology* cultural critic and theorist Slavoj Zizek poses the question 'Do computers think?' He argues that even though it is clear that the computer in some sense only simulates thought, yet "*how does the total simulation of thought differ from real thought?*" [13] Zizek's answer is to reverse the metaphor and instead of seeing the computer as a model of the human brain, to see the brain as a "computer made of flesh and blood." [14] By extension a robot is not an artificial man, rather man is a 'natural robot'. Writing from a Lacanian perspective, Zizek uses this reversed metaphor to underscore his ideas about the split subject, who can never fully know him or herself and for whom "*something must remain unthought.*" [15]

I have argued that contrary to Burnham's thesis, many artists do not aim to recreate life. Some explore our persistent fascination with machines while others perform a de-naturing of the body, showing that the boundaries between human and non-human are not clear-cut. The question is not whether our machines are alive but in what ways we, like our machines, are hybrid creatures - a blend of natural and artificial, intelligent and programmed. Seen from this perspective, robots remind us there is nothing essential about humans. Instead we are formed in particular historical and social contexts. Acknowledging this might as Haraway argues, give us the best chance of developing new forms of subjectivity, which conscious of our kinship with other animals and machines do not simply repeat patterns of domination and control.

References and Notes:

1. Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (Cambridge, MA: The MIT Press, 1961).
2. Jack Burnham, *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of this Century* (New York: G. Braziller, 1968).
3. Ibid., 314.
4. Ibid., 315.
5. Ibid., 371.
6. Centre for Social Robotics, "Fish-Bird: Background," Centre for Social Robotics' Web Site, http://www.csr.acfr.usyd.edu.au/projects/Fish-Bird/Background.htm (accessed June 5, 2012).
7. Donna Haraway, "A Cyborg Manifesto: Science, Technology and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991), 153.
8. Ibid., 150.
9. Wade Marynowsky, "The Discreet Charm Of The Bourgeoisie Robot," Wade Marynowsky's Web Site, http://www.marynowsky.net/bourgeoisie4.html (accessed June 5, 2012).
10. Donna Haraway, "A Cyborg Manifesto: Science, Technology and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991), 152.
11. *Metropolis*, dir. Fritz Lang (1927).
12. *Blade Runner*, dir. Ridley Scott, based on the novel "Do Androids Dream of Electric Sheep" by Philip K. Dick, screenplay by Hampton Fancher and David Peoples (1982).
13. Slavoj Zizek, *Tarrying with the Negative: Kant, Hegel, and the Critique of Ideology* (Duke University Press, 1993), 43.
14. Ibid.
15. Ibid., 44.