Capricious Creatures: Animal Behavior as a Model for Robotic Art

Treva Michelle Pullen

Concordia University
Montréal, Québec, Canada
trevamichelle@gmail.com

Abstract

This paper examines issues related to playfulness, cuteness and the modeling of animal behaviors toward the designs of robotic art. Exploring historical and contemporary case studies of the playful ecology and creations of robotic art, as entry points to a multi-faceted discussion of human-machine engagements considering the lenses of philosophical, art historical and curatorial methodological research this text tracks an abbreviated legacy of new media art production beginning with the animal modeled works of Canadian artist Norman White.

In assessing characteristic features of a selection of robotic art works, such as its playfulness, use of humor, and critique/ reconfiguration of cuteness as a mode of critical engagement, this paper aims to unpack the motivations behind artist's aesthetically and behaviorally oriented merging of the nonhuman robot with lively, soft, emotive and fussy animal creatures.

Case studies of animal modeled robotics point to the accessibility of employing animal behaviors and their powers to engage with humans on a level that is productive and non-confrontational. Animal behaviors and zoomorphic aesthetics appear to appeal to audiences in a way that would not be possible for confrontational and/or anthropomorphic bots.

Keywords

Art, Robotics, Play, Animal, Nonhuman, Behavior, Cute, Kawaii, Media, Zoomorphic

Introduction: Modeling Animals

The lure of animal instinct appears to be an important consideration for the development of intelligent (or simulated intelligent) robotic creatures. Studying the behaviors and playful engagements of animals (like humans) provides robotic artists with a plethora of actions from which to draw and mimic in their development of whimsical behaving robot bodies. Animals, as the human other, present us with a counterpoint from which we can study robots as lively entities. I would like to begin this exploration with the work of Norman White whose *Ménage*, 1974, (fig. 1) combines the artist's interest in spontaneous chance interactions and the behavioral study of the animal kingdom. *Ménage*, was an installation of five interactive robots that played and engaged with one another. The work was inspired by Grey Walter's experimental tortoises, which were some of the first electronic autonomous robots.

Walter's first set of robots, named Elmer and Elsie (fig. 2) were constructed between 1948 and 1949. The robots were oft described as tortoises due to their aesthetic appearance as tortoise-like beings as well as their slow rate of movement. The tortoises were developed to participate in a number of experiments that Walter conducted in order to study the ways in which the brain worked - through mechanical beings (Pickering 2010). One such experiment of Elmer and Elsie tested the robots' ability to become self-aware. Walter attached a light to the 'nose' of the tortoises and watched the robots as they observed themselves in a mirror. The bots flickered, jiggled and twitched like a 'clumsy Narcissus' according to Walter as he argued that the tortoises had displayed some evidence of being self-aware.

The interest in creating artificial life echoes far beyond Walter's tortoises as, according to Edward Shanken's study of the historical legacy of new media art, "in many cases, artists have attempted to bridge the apparent divide between carbon-based organisms and silicon forms of intelligence and life, between the real and the artificial, suggesting that these distinctions are becoming increasingly blurry and permeable" (Shanken 2009; 38).

White's *Ménage* follows in the footsteps of Walter's intelligent behaving robot creatures as he creates experimental works that explore the potential of animal behaviors in autonomous machines. Animal behaviors, like human's, are expressed through actions. Robert Fagen's canonical text on animal play divides these actions into five unique, though fuzzy, types of play engagement in which animals participate. The five types of play are; (1) Isolated play presented through repetitive

and brief movements, (2) non-contact solo play/social play of moving bodies through space, (3) social play (with or without contact) that involves chasing or sparring/wrestling, (4) complex social play that involves the inclusion of objects and features of the landscape and finally (5) mother-infant games such as peekaboo or building and breaking structures composed of smaller objects (Fagen 1981; Sutton-Smith 1997). He also asserts that only a small number of animal types have the capacity for play, "mammals and birds, and perhaps a few fish and reptiles are the only kinds of animals known to play" (Fagen 1995; 24). Their ability to play is expressed through "specific movement qualities and signal pattens" (Fagen 1995; 24) which enable us to visual see that they are playing. It is interesting to note that the robotics presented

Figure 1. Norman White with Ménage, 1974. Image courtesy of the artist

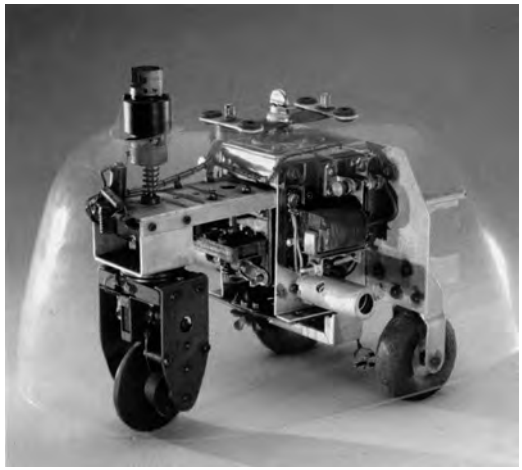

Figure 2. Grey Walter's Tortoise *Elsie*. Photo by Eric Long of the second generation Grey Walter turtle in the collection of the Smithsonian Institution

in this paper on modeling animals do in fact conform to Fagen's assertion that play is reserved to mammals, birds and a few fish and reptiles. None of the robotic creatures' animal models fall outside of these categories.

Let us turn back to the work of art in order to more fully understand Fagen modes of animal play as they relate to bot behaviors. *Ménage*'s five light-sensing robots played and engaged with one another through their sensory perceptions and programmed desires to interact. Four of the robots were mounted to ceiling tracks from which they could move back and forth around the room, across paths limited by the tracks. The fifth robot was positioned on the floor and could move around more freely. Each of the five creatures was equipped with a scanner that was able to sense strong light-sources and communicate the sense perceptions to a computer controlling the bots' behaviors. Each robot was also equipped with a spotlight mounted to their centre body. The robots would lock onto each other's 'gazes' as their spotlights would intersect and compel the bots to move together. The autonomy of the ceiling robots was somewhat compromised in that they could be controlled and pulled apart by non-responsive track-motors. The simplistic response and control systems of the robots created unique and complex behaviors amongst the creatures as they locked 'eyes', connected for a brief moment before being pulled apart and again

beginning their search for a new light source to capture their attention. The robots have a lively quality that pushes and pulls them to act, behave and play amongst one another.

Fagen's third form of animal behavior, that of social play, is echoed in the behaviors of the *Ménage* robots. As the robots chase one another around the room they seem to be modeling the behaviors of most primates and carnivores, pinnipeds, marsupials and some birds through their participation in the social play of chasing (Sutton-Smith 1997; 23). For Fagen, the characteristics of animal play, related to the social play interaction of chasing, are; repetition, reversal, fragmentation, exaggeration, inhibition and unpredictability. For Norman White, the unpredictability of the robots' playful interactions would likely be most important, however, the bots also participate in an engagement that is repetitive (through the ongoing quest to move towards one another), reversed (as their actions to draw together are denied by the track's integrated programming to pull them apart), fragmented (as their playful engagement may be interrupted by human interlopers), exaggerated (by their mechanical bodies as they whizz and whur around the gallery space) inhibited (by their programming to play above all else) and of course unpredictable as their multiplicity of possible movements and interactions make manifest the randomness of their performance. It is through the narrative of animal interaction that *Ménage*'s performance is born. This is only one example of animal behaviors being presented in robotic art. I would like to continue this exploration of animal influence through a more specific lens - which I have observed is a reoccurring theme in robotic art and robotics in culture - that of 'cuteness'.

The Little Pygmalion: Cuteness as Critique

Following in legacy of Norman White's lively and interactive robotic beings Jim Pallas' *Nose Wazoo*, 1990, (fig. 3) appears as an object pulled from a children's novel. To quote Pallas' webpage from the *Nose Wazoo*, "in the Frankenstein myth, man created a being that destroys him. While the myth is often associated with technology, I'm more interested in Pygmalia who creates something to fall in love with." Looking at the five-foot tall furry creature it certainly appears as an object to love rather than fear. The *Nose Wazoo* is equipped with four photocell eyes and an infrared sensor enabling it to observe it's surrounding environment. The creature seeks out and responds to humans as it flexes its long neck and extends its nose up to 20 inches towards a person as it attempts to nudge them to get some attention. Its lower body is covered in sisal fibers, beads and wires while its head, though also furry, is much more mechanical looking with the exception of a molded human nose at the tip of an extendable metal pole. The *Nose Wazoo* gathers viewers through its silly performances as it flings its body around with "back flips" and "floorscrapes". Once it has gathered a crowd with its enchanting performance the creature will try to nudge humans nearby with its extendable nose. The *Nose Wazoo* is unexpectedly temperamental and can easily retreat from its peacocking display to sulk if it is teased by a human through an excess of stimuli. The *Nose Wazoo* is playful and engaging and can enthrall viewers through its seemingly humanistic and

Figure 3. Jim Pallas' *Nose Wazoo*, 1990. Image courtesy of the artist

lively behaviors. The creature is furry and fuzzy and in some way cute. According to zoologist Konrad Lorenz infantile or cute features trigger a nurturing response in adults, this is cross-cultural phenomena that is triggered by certain stereotypes of cuteness which include smallness and furriness.

I think it is important to note that these robotic creatures often take the role of prey as opposed to predator or cute

as opposed to frightening or unpleasant. Works such as the *Nose Wazoo*, and *Ménage* are non-confrontational, cute and even cowardly. These bots do not impose themselves of the viewer but are rather friendly bodies that enter in the sphere of liveliness in such a way as not to induce fear. Robotic art, in the survey presented thus far and to come, is allowed to become lively, behavioral, playful and agentic due to nonthreatening status. These bots are not threatening or scary like the vengeful and humanesque robots in films such as *I, Robot* (2004) and *Ex Machina* (2015). While the humanoid robot army in *I, Robot* and the intelligent Ava from *Ex Machina*, who appear to have minds of their own, present us with an image of robots as technological renditions of humans and thus, a threat to our own humanity, while cute and animalistic lively robotic art objects present us with a more palatable - though potentially as critical and subversive (see *Little Brother*) - form of artificial life and intelligence.

The smallness, cuteness and quaintness of whimsy are represented in the aesthetic and performative behaviors of the *Nose Wazoo*. Its mischievous movements draw the focus to endearing attempts to gain attention. The creature is lovable and sweet as it compels the viewer to engage and even nurture the misbehaving machine. Even the name *Nose Wazoo* triggers a sense of silliness for the human viewer.

Cuteness can also function as a mode of subversive activism in robotic art. *Pamphleteer aka "Little Brother"* (fig. 4) was a propaganda robot developed in 1998 by the Institute for Applied Autonomy (IAA). The adorable and small robot is a simplified creature constructed of metal with claw shaped 'hands' and large oval shaped 'eyes' that cover nearly the whole head of the bot. The *Little Brother*'s limited features and solid square body make the robot appear as an even more streamline version of ASIMO. The robots massive sad eyes instill empathy in the viewer as they watch the cute robot distribute flyers to passersby. *Little Brother* capitalizes on its cute aesthetic in order to distribute various subversive propaganda literature to the public. Automating the oft dangerous act of activist campaigning and making the distributer adorable allows the bot to infiltrate spaces that would likely be inaccessible to humans. The robot has been sent out in various field tests and the viewer responses have nearly unanimously attributed the robots cuteness to its ability to act in a subversive and critical manner without a negative response. The bot, who has also been adopted as the IAA's spokesman, is able to veil its cultural and social criticisms underneath its nonthreatening aesthetic. In this case the cuteness of the bot enables it to stealthily enter into a minefield of social criticism relatively unscathed.

Figure 4. Institute for Applied Autonomy, *Little Brother*, 1998. Image courtesy of the IAA

How are cute things such as *Little Brother* able to navigate social spheres and interface with humans while enabling us to more easily adopt autonomous robots? I would like to explore the Japanese phenomena of Kawaii; a tool used to soften the hardness of Japanese technological culture with the cuteness of kitties, bears and puppies and their large heart-melting eyes and rosy cheeks. "The Japanese style of 'Kawaii' embodies a special kind of cute design that could be used to inform designers of interactive media how to engage users in a way which reduces fear and makes dreary information more acceptable and appealing. An analogy could be thought of as the bitter pill with a flavored layer that makes the consumption of the medicine more agreeable" (Cheok 2010; 299). The analogy of a bitter pill can also be applied to the 'cute' robotic works I have previously mentioned. For example, *Little Brother* is a confrontational activist who assaults humans with controversial views on social and cultural climates by offering them pamphlets. Though his social and political criticisms remain veiled underneath the sweet 'flavored layer' of the bot's sweet and adorable aesthetic. Adrian Cheok expands upon this analogy to address a parallel between the "cold, digital, electronic, and unsettling internal components of a system and the bitter pill" while on the other hand "the 'flavored coating' is the cute user interface, which is made more agreeable by establishing

a relationship with the user and delivering the content of a system in a more friendly and attractive way" (Cheok 2010; 299). Therefore, the content, or message, communicated by the work of art is softened and made more palatable for the human spectator. Reducing fear and apprehension towards new technologies and the insinuated terror of autonomous robots or artificial life these bots enter the human realm by means of their innocence.

Robotic art may also fall under the category of Kawaii due to the fact that the viewer is oft presented with a 'trick' or surprise. Interactivity is essential to Kawaii as the surprise presented "to the user plants the initial emotion through which the continuing experience is colored," which, beings the 'mirco-relationship' between user and object. (Cheok 2010; 300). Creatures such as the *Nose Wazoo* present the viewer with an interactive surprise in the form of the object's performativity and its quest to reach out and tap human's with its extendable nose. This micro-relationship is a short lived superficial relationship between the cute object or creature and the human. It is likely not lasting, and may lack critical depth, however it may be extremely impactful as a memory, a mode of provoking thought or a highly emotional and possibly even loving engagement.

For Kawaii, and cuteness more generally, the defining characteristics of the aforementioned creatures are "the feelings and emotions that are caused by experiencing something that is charming, cheerful, happy, funny, or something that is very sweet innocent or pure. It can stimulate a feeling of adoration, sympathy, or stimulating the care response" (Cheok 2010; 301).

An example of this more visceral emotive connection to cute robotics is Cynthia Breazeal absolutely adorable social bot *Leonardo* (fig. 5). Breazeal's work on social robots with the MIT lab has brought forth a number of cute and interactive robot creatures such as *Kismit*, the world's first social robot. However, it seems to me that the robotic creation able to steal the most hearts is undoubtably *Leo*. *Leonardo* is a 2.5 foot tall, highly expressive sensing and interactive robot. He is highly responsive to environmental cues and can be taught to mimic human reactions, responses and feelings. He is able to reflect our emotions and console through mimicry. *Leonardo*'s soft fur, small stature, large brown eyes and big floppy ears make him a symbol of cuteness that appeals to human's desires and embedded emotional responses. Leo is cute and kawaii which enables him to act as a what Breazeal describes as a 'social robot'. For her, robots can be used as tools for social technology, as companions, friends, pets, etc. that aid in human's social interactions with the world.

Figure 5. Cynthia Breazeal and the MIT Lab, *Leonardo*, 2002. Image courtesy of the artist

I will draw upon one final example of cute robotics, this one more exposed hardware than soft fuzzy fur.

Imagine a small autonomous robot with light sensors - symbolizing 'eyes' - attached to gangly protruding wires that bobble around atop its body. The creature zooms around the hardwood floor of an at gallery; it is part of an experimental test project, which features a set of eight autonomous interactive sensing robots with the ability to "explore simple behavioral rule systems in an embodied context" (Daniels 2015). This is *Whimsy*, 2007, (fig. 6) by Canadian artist Steve Daniels.

The material and electronic setup of the project is as follows: the robots, or 'whimsies', are equipped with sensory-actuator routing rules and real-time feedback systems controlled by visual sensors attached to the body of the machine using wobbly lengths of metal - different heights on each individual bot - that extend the visual sensors, or 'eyes', out above the bots. Aesthetically the whimsies can be regarded as simplistic DIY constructions in that they celebrate the hand-made nature of the machine through exposed hardware components such as circuitry and a heaping bunch of multicolored wires housed inside a wooden construction. The scale of the robots is friendly; reaching only slightly

higher than the viewers' ankles. During the experiment they are unleashed into a large open space where they are able to move around and interact with one another as their sensual data is transformed into real-time action. Their movements, controlled by sensory motivated routing rules, can be interrupted or rerouted based upon their relations.

The foregrounding of the *Whimsy* bots' eyes draws attention to the fact that Daniels's robots are programmed to *see*. The are small, quaint and interactive and appear to function in their own network of interactivity. We can observe the bots from outside, as opposed to directly interacting with them, and still find fascination and an emotional connection through their smallness, persistence and silly mechanical eyes bobbing around atop their tiny bodies.

To return to Fagen's analysis of animals' modes of play, Daniels' *Whimsy* bots seems to exchbit two of the actions of play. Firstly, non-contact solo play/social play of moving bodies through space and secondly, social play (with or without contact) that involves chasing or sparring/ wrestling.

These are not the cold, clean humanoid robots of our cinematic nightmares. Rather, they are silly, cute, and playful. Exploring this constellation of cute robots I wonder how can cuteness be used as a tool of manipulation? In the context of artistic production.

Conclusion: Unruly Artificial Animals

Robotic art, and often new media art more generally, faces inherent problems of display such as the stranding of such work onto the peripheral spaces of the gallery and a separation of 'Art' from 'new media art'. The potentially unruly, animalistic, behaving creatures threaten to break free from the more traditional modern white cube and explore the wilderness of interactivity, liveliness and play. As Christiane Paul notes the segregation of new media art to exterior zones such as 'new media spaces' or 'lounges' oft provokes a "'ghettoization' - contributing to the separation of the art form from more tradition media and epitomizing the un - easy relationship that institutions tend to have with the medium at this point in time" (Paul 2012; 170). We can continue to question the space of new media as it grows ever-more complicated with the production of new work continuing the legacies of participatory, evocative, playful and behaving creatures that are literally and figuratively hard to pin down. In doing so let us develop spaces for robots that are inherently lively and engaging; they may be cute, sweet, human or animal though they consistently appear as vivacious, engaging and animated. In order to create such spaces for robotic art let us consider the behavioral aspects of such creatures in an attempt to comprehend their essence and experience of the world apart from human beings.

Figure 6. Steve Daniels' *Whimsy* playing with a baby, 2007. Image courtesy of the artist

References

Cheok, Adrian David. (2010). "Kawaii/Interactive Media." *Art and Technology of Entertainment Computing and Communication: Advances in Interactive New Media for Entertainment Computing.* London: Springer, 295-309.

Daniels, Steve. "Art That Behaves: Agents, Interfaces, and ! Ecologies." School of !Media Research Lunch. Ryerson ! University, Toronto. 16 Nov. 2015.

Fagen, Robert. (1981). *Animal Play Behavior.* New York: Oxford UP.

Fagen, Robert. (1995). "Animal Play, Games of Angels: Biology and Brain." *The Future of Play Theory: A Mutidisciplinary Inquiry into the Contributions of*

Brian Sutton-Smith. Ed. Brian Sutton-Smith and Anthony D. Pellegrini. Albany: State U of New York, 24.

Paul, Christiane. "The Myth of Immateriality - Presenting New Media Art." *Technoetic Arts: A Journal of Specu lative Research 10.2 & 3 (2012): 167-72. Intellect Ltd.* Web. 3 Feb. 2016.

Pickering, Andrew. *The Cybernetic Brain: Sketches of An other Future.* Chicago: U of Chicago, 2010.

Shanken, Edward A. *Art and Electronic Media*. London: ! Phaidon, 2009.

Sutton-Smith, Brian. *The Ambiguity of Play*. Cambridge, MA: Harvard UP, 1997.

Author Biography

Treva Pullen is an interdisciplinary researcher, curator, artist and PhD candidate in Communication Studies at Concordia University, Montréal, Canada. Her research explores the playful and agentic capacities of media art through the lens of 'whimsical bodies'; a term she uses as an evocative metaphor for the lively, humorous and often reciprocally engaging nature of media art objects. Her doctoral studies merge critical theory and curatorial practice based research to explore methods of display for the whimsical bodies presented through bio art; facilitating human nonhuman engagements/learning, and unpacking feminist maker methodologies enacted in bioart laboratories.

Her work has been published in *The Senses & Society, InterARTive, JAWS* and *AlterNative: An International Journal of Indigenous Peoples*. She has also curated new media based exhibitions such as *#NATURE* (2016) and *Influenc(Ed.) Machines* (2015).

The author holds an MA from OCAD University in Contemporary Art, Design and New Media Art Histories, with a focus in new media, and a BFA from OCAD University majoring in Criticism and Curatorial Practice.