FCJ-203 Issue 28 : Creative Robotics – Rethinking Human Machine Configurations

Petra Gemeinboeck, Elena Knox and Jill Bennett.

doi: 10.15307/fcj.28

issue doi:10.15307/fcj.28

introduction doi:10.15307/fcj.28.203.2017

Introduction by **Petra Gemeinboeck** of the Creative Robotics Lab, National Institute for Experimental Arts, University of New South Wales.

'I like your dress. You must be a fashionista.' 'Really? Thanks', I reply, looking into the enormous, cartoony eyes of a child-sized robot with soft, explicitly feminine contours and a perky, human voice. This isn't a subject of conversation I expected at a male-dominated robotics conference, and initiated by a robot of all things. 'I also like your shoes', the robot "girl" continues. 'I can't wear shoes because I don't have feet.' Pepper, as the robot is called, looks down, dramatically swinging both arms to point me to "her" lack of feet. Then, the robot girl gently tilts its head and starts talking about animals. I begin to wonder if it can actually understand any of my compliant replies and seek the attention of a nearby engineer, huddling behind a computer screen. I learn that Pepper currently only understands Japanese. Hah.

My first fake dialogue with Pepper, theatrically supplemented with soft shiny curves, head-tilting, gesticulating and an innocent, flirtatious cheekiness, left me with a bitter taste. It only took some unexpected, serendipitous attention, disguising of a random recording or, more likely, a hidden engineer's lucky choice, for me to readily suspend my disbelief and to think that Pepper *chose* to converse with me about fashion, in English. This is the more disturbing as I usually consider myself sceptical of, if not offended by, marketing campaigns that promise us a soon-to-arrive future with companions, maids, and carers – smart, friendly, gendered, and mechanical. Marketed as an "emotional" robot, 'Pepper the robot wants to be your friend. It can listen to you, can tell when you're feeling down, dance, and follow you around – all on its own' (Del Prado, 2015). How impressive must this mechanical charade be for a completely unsuspecting customer, trained by countless movies and, increasingly, news stories, to suspend their disbelief and embrace robotic friends?

While today's robotic "friends" are not nearly as smart or friendly as they are in the movies, both research and marketing strategies tap into the very same pool of desires and emotions to make robots likable. To make robots apparently social. The most common strategies for "socialising" robots follow a simple recipe: human or human-like appearance, human etiquette, (a hint of) gender, and human stereotypes. Pepper excels in all of these, which explains why it is so popular (so far only sold in Japan, any batch sells out in minutes (Del Prado, 2015)). But let's not forget that, in addition to their design and programming, robots thrive in a well-established social ecology of human-machine configurations. The current figure of the "social robot", particularly its commercial manifestations, is deliberately located in a conservative, rose-tinted, Disney-like version of this ecology, where robots are the friends or servants of a privileged few, and gender roles and divisions of labour are not only unquestioned but reaffirmed.

The Creative Robotics issue wants to wrestle with the figure of the robot as a historically and culturally constructed sociomaterial assemblage and with how it enacts a number of political, social and aesthetic questions. Aligning itself with the emerging practice of Creative Robotics, the issue deliberately positions itself at the uneasy nexus from which these assemblages emerge, while subscribing to a fundamentally experimental, embodied and performative approach. Creative Robotics is a transdisciplinary practice that builds on the history of robotic and cybernetic art to explore human–robot configurations from a critical, socio-cultural perspective. It brings together concepts and methods from experimental arts and engineering, performance and the social sciences, and it often materially experiments with what Lucy Suchman has succinctly described as 'material-discursive practices through which boundaries and associated entities are made' (2011: 121). Rather than being concerned with the constrained context of currently envisioned human-machine configurations, the issue aims to unhinge, open up and expand these

visions by exploring 'a more differentiated set of starting points for the robot' (Castañeda and Suchman, 2014: 340).

7 Probing and re-imagining our human-machine configurations is a very timely, if not urgent, matter. The United States, Europe and Asia are investing heavily in the area of Social Robotics; by 2013 Google alone has acquired eight leading robotics companies (Markoff, 2013), and a study by the Japanese *Ministry of Economy, Trade and Industry* forecasted that service and personal robots, directly interacting with humans, will account for 50 per cent of all robot sales by 2035 (Lechevalier et al., 2014). Needless to say, there's a lot at stake as we herald the integration of robots into our society and everyday lives, particularly as vulnerable groups such as patients, children, and the elderly are at the forefront of social experiments with robotic assistants or companions. Robots that mimic humans or pets, often in cute, caricatured ways, deliberately blur the difference between organic and mechanical bodies, as well as human and machine cognition, to elicit human investment based on superficial, and often fake, social cues. Suchman has argued that 'the figure of the humanoid robot sits provocatively on the boundary of subjects and objects, threatening its breakdown at the same time that it reiterates its founding identities and differences' (2011: 133). As if we were looking for a robotic counterpart, we seem to prefer to look into a mirror: a mirror that reflects a human- or pet-likeness, but which is predictable, programmable and replaceable.

8 Considered as an electro-mechanical artefact from an engineering point of view, the robot has to be implanted with the "social", like an alien, material Other, embellished with etiquette. But isn't a robot always already a social phenomenon, even before it is designed to appear social, or programmed to behave as if it were social? Inseparably entangled with, and dependent on, human labour and care (see Suchman, 2011) and, to no small degree, human affect, the robot certainly spawns from complex sociomaterial practices. Culture, and its countless, sometimes age-old, fictions, are also significant constituents in the manufacture of the robot. Indeed, for Chris Csikszentmihalyi, robotics in the twenty-first century is 'part of a dense stew of research, design, pop culture, commodity production, and fetishism' (2006: 125). Furthermore, the "social robot" is, to use Donna Haraway's term, a 'boundary project … a site of production' (1991: 201). It's not only the product of a history of practices, but actively recodes the meaning of "social".

9 Feminist perspectives, such as Suchman's critical research in STS (2009) and Karen Barad's concept of 'agential realism' (2003), allow us to refigure the robot, or, more precisely, to re*con*figure the figure of the robot. Here, the robot is no longer seen as a separate agent but is reconceptualised as an embodiment of particular practices, enacted within a particular human–machine configuration (which itself is always entangled in a much wider network of sociomaterial relations). This reconfiguration not only changes our viewpoint but, importantly, shifts the ground upon which many dominant assumptions in robotics and human–robot interaction are built. Looked at through a feminist lens, we can thus begin to unhinge these assumptions, together with their Cartesian-haunted politics. An experimental art practice informed by this diffractive lens, then, provides a productive and affective, material-discursive platform upon which to develop and materially "play out" a Posthumanist perspective that shifts our focus from representation to performativity. My own Creative Robotics practice challenges our humanist assumptions and anthropomorphic desires by engaging audiences in provocative encounters with strange, nonhuman machinic performers or human–nonhuman ecologies. As an artist, I also have firsthand experience with every audience member bringing with them their own vivid expectations of what a robot is, concocted from Csikszentmihalyi's 'dense stew'. Looking at human–machine configurations as complex sociomaterial assemblages allows us to understand not only the robot's agency as enacted in the dynamic in-between (see Barad, 2003), but also its social dimension. That is, more than embodying our history of practices 'as specific material configurations' (Barad, 2003: 814), robots also become specific social entities as we negotiate these material configurations. In my own creative research practice, notions of embodiment and movement (and their connection-making, worlding potential) become core constituents in these negotiations – similarly to an unfolding seam, along which negotiations can take place and affect is produced. Importantly, I believe that this "becoming of agency" promises to be the more transformative the more we embrace the differences (relative to humans) of machinic embodiment, movement and, consequently, cognition. Rather than investing in robots to make them more human, we need to investigate the ecology of relations by which a robot becomes an affective assemblage. That is, we

need to investigate how sociomaterial relations and dynamics are produced and activated and, furthermore, how alternative, posthumanist notions of intelligence are spawned from these (always material) interdependencies.

10 The articles gathered in this issue inquire into a wide range of robotic material practices, from "too-feminised" gynoids to maverick machines to Martian machinic life. It could be argued that each article develops its own boundary project or boundary-making practice to rethink human–machine configurations. In Suchman's words, '[d]oing this work requires slowing down the rhetorics of humanlike machines, and attending closely to material practices' (2011: 134). As editors, we were thus most interested in material practices of creative, critical investigation, and in critical, creative investigations of material practices that struggle with or trouble our visions of human–machine configurations. Some of the papers in this issue are situated directly within or closely aligned with a Creative Robotics practice, while others complicate or expand existing robotics practices.

11 Elena Knox's 'Degrees of Freedom' unreservedly confronts the 'rhetorics of humanlike machines' (Suchman, 2011: 134). In her performances, installations and screen works, Knox materialises a playful, feminist critique of "very humanlike" gynoid robots that 'trouble the gendered aesthetics predominant in this realm of engineering design'. Despite currently still being entirely controlled by humans, these android robots embody the vision of perfect(able) mechanical human mirrors. While much of the press coverage focuses on their humanlike appearance, Knox's article scratches beneath the surface to provoke crossdisciplinary interrogation and uncover the gendered stereotypes that these "too-feminised" gynoids seek to promote. Her video work *Radical Hospitality* performs the liminal act of hospitality as it precariously balances between welcoming and servanthood. Her work thus confronts us with 'the societal naturalisation of women behaving awkwardly' and, moreover, with this phenomenon's supposedly advanced technological manifestations. Here, "very humanlike" robots, Knox tells us, become 'the technologised and subcontracted gesture of conditional hospitality, a fearless front for the fearful wiles and mechanisms of global capitalism and authoritarianism'.

12 Katarina Damjanov's 'Life and Labour of Rovers on Mars: Toward Post-Terrestrial Futures of Creative Robotics' takes us into an extra-terrestrial milieu for human–robot assemblages, and follows four Earth-born, human-made robotic rovers roaming on Mars. Exploring 'new forms of Martian intimacies bred between the nodal, living, human–technological network of robotic agency and its new … planetary milieu', the article both uncovers and reassigns the (often hidden) labour propelling these assemblages. Though it is created and continuously sustained through human labour, on Mars, Damjanov argues, 'a rover both performs and transforms life itself, absorbing the biopolitical capacities of labour'. As human–nonhuman assemblages are extended beyond our own planetary realm, so are their biopolitics, embodied in what Damjanov terms 'cosmobiopower'. Her troubling of this interplanetary configuration also confronts us with the question of "life as it could be": to operate in this inhuman environment, the rovers' bodies, and their sensory and cognitive performances and situated interactions, are 'essentially Martian', thus shifting our 'ontological thinking about the nature of robotic ways of being'.

13 Maaike Bleeker's 'From Braitenberg's Vehicles to Jansen's Beach Animals: Towards an Ecological Approach to the Design of Non-Organic Intelligence' continues to explore conceptions of life, and in particular notions of intelligence from a post-anthropocentric perspective. Comparing Valentino Braitenberg's thought experiment in Synthetic Psychology (*Vehicles*, 1984) with Theo Jansen's *Strandbeesten* (in English, beach animals), Bleeker puts forward an ecological approach to non-organic intelligence as it emerges from the beach animals' response to their environment. Bleeker argues that the apparently intelligent behaviour of Braitenberg's vehicles is driven by a human conception of intelligence, whereas the beach animals' complex behaviours, resulting from 'a great number of individual causal interactions between elements of the animal, the sand, the wind, the water and so on', embody an alternative, non-organic perspective. This argument affirms the need for rethinking machinic agency and intelligence as emergent phenomena (rather than fixed, importable properties) that are intimately tied to questions of embodiment, movement and environmental relations. Her ecological, material perspective also opens up the possibility of conceiving of human–robot interaction as configurations for actualising 'still unrealised potentialities' in-between.

14

As we face increased automation and machine autonomy, human–machine assemblages become increasingly troubled by questions of accountability and responsibility. Michaela Davies' article 'Game On: A Creative Enquiry into Agency and the Nature of Cognition in Distributed Systems' extends the trope of machine agency to the issue of assigning responsibility, by exploring human–nonhuman systems that disrupt or extend our embodied experience and sense of agency. Davies' artwork *Game On* makes this question bodily felt by linking two human players via an electronic network, which turns signals into sensations. This work not only raises but materially enacts interesting questions about locating responsibility, as our decisions and actions are connected with and depend on increasingly autonomous machines. Davies argues that we 'cannot simply attribute responsibility on the basis of a particular agent's intentions', but rather need to understand the 'causal field' in which actions occur and are distributed. Looking at robots as intelligent, social agents, questions of control and intention are complicated even further, as will the causal field be, as it is enacted by human–robot configurations *at work*.

15 Paul Granjon's 'This Machine Could Bite: On the Role of Non-Benign Art Robots' unsettles current visions of the "social robot" and suggests that artists, whose output is relatively free from economic market pressures, can create more courageous scenarios of "socialising" with a robot: interacting with machines that bite, for example. In his performance practice, Granjon develops playfully provocative scenarios for open-ended relationships with whimsical, sometimes surrealist, and other times dangerous machinic performers to unfold within. His article looks at common approaches to social robotics and argues that anthropomorphic design and the roles of servant/pet/companion 'sum up the current status quo', wherein the 'machines have to comply to rules of safety, friendliness and legibility in order to facilitate interaction with the humans'. In contrast, maverick machines (see Pask, 1982), created by artists, manifest genuine "machinic life" to 'inject noise into this perfect landscape' and, according to Granjon, allow us to encounter and study the novel conditions they bring about, and thus 'produce awareness, resistance and knowledge'.

16 Angie Abdilla and Robert Fitch's 'Indigenous Knowledge Systems and Pattern Thinking' develops a dialogue between an Indigenous consultant in innovation, technology and culture, and a non-Indigenous roboticist, to investigate how 'Indigenous Pattern Thinking can lead to more effective [robotic] design that considers the entire system lifecycle along with diverse environmental impacts'. In the authors' First Indigenous Robotics Prototype Workshop, Australian Indigenous students were asked to adopt the robot's point of view to engage with its perceptual challenges. Indigenous mapping contextualised the programming exercises; for instance, social boundary-acknowledging protocols and 'the ceremonies central to Songlines' continuation through country and across territories were related to the protocols of code'. The synergies between Indigenous knowledge and technological advancement developed in this article show us how the making and recognising of boundaries can directly shape how we program robots. Moreover, the article suggests that notions of custodianship and a strong sense of the interconnectedness of human and nonhumans could render our human–machine configurations more complex and sustainable.

17 Lian Loke's article 'Falling Robots' employs strategies from dance and choreography to develop her proposition that falling as 'an aesthetic, creative act' can extend a robot's expressive behavioural repertoire. The article closely engages with current engineering approaches to humanoid robotics to link robotic design objectives with dancers' creative strategies for controlling a fall. In humanoid robotics, 'seemingly simple, everyday acts of standing and walking appear as complex, hard to solve problems' and falling poses a risk. This starkly contrasts 'Lepecki's (2006) thinking of dance as a challenge to verticality'. Drawing on her study with dancers, who interacted with a chair as part of stunt falling, Loke considers 'reflexes as producing expressive performance'. Similarly to Abdilla and Fitch's dialogue between Indigenous culture and robotics engineering, Loke's article draws on her background in both engineering and dance, allowing her to situate her investigation within humanoid robotics practices and the challenges they face, while opening them up to creative kinesthetic approaches from the field of performance. At this productive nexus, the problem of stability and safety becomes a matter of creative expression and social meaning.

18 Keith Armstrong's extended artist statement 'Embodying a Future for the Future: Creative Robotics and Ecosophical Praxis' explores how Armstrong's "ecosophical" practice in creative robotics can promote 'radically different frames of intention' from 'robotics as an industrially driven endeavor'. As in Granjon's investigation, Armstrong also explores notions of machinic life and an artwork's

capacity to critically engage audiences, however his motivation and approach are quite different to Granjon's. Armstrong's ecosophy seeks to 'redirect [our] attention toward urgent questions of the Anthropocene' by creating 'conversational experiences', which address and illuminate this complex issue. Developing his creative robotics practice, Armstrong explores what kind of conversations between artworks and audiences 'become conceivable and possible, when robotic actors [are] coupled with diverse media actors, materials and ecological thematics'. Similarly to the other artistic investigations we encounter in this issue, Armstrong's works offer a 'privileged view into the "life" of non-human entities whose experience remains outside of our knowing'. Doing so, they may also intimate the complex ecologies, minglings and reciprocal relations in which they are embedded.

19 Each of the articles in this *Fibreculture Creative Robotics* issue intervenes into the limited, binary figurations that dominate contemporary social robotics practices, whether manifested in robots masquerading as humanoid companions or in advanced mechanical replications of notions of servitude. They probe into, unhinge and transform the figure of the robot to explore complex human–nonhuman assemblages, to expose hidden sociomaterial practices or propose radical new ones, and to offer glimpses of nonorganic, intelligent "life" as it could be, once it is no longer arrested by our humanist views and assumptions.

Biographical Note

Petra Gemeinboeck (NIEA Creative Robotics Lab, University of New South Wales, Sydney) currently works across the fields of creative robotics, performance and feminist theory. Her experimental robotic art practice explores our entanglements with machines and seeks to make tangible vulnerabilities and politics involved. In her recent publications, Petra engaged with dance and machine learning, nonhuman agency, and machine creativity. Previously, she developed interactive installations and virtual environments and published widely on issues of embodiment and interactivity. Her works have been exhibited internationally, including at the Ars Electronica Festival, International Triennial of New Media Art at NAMOC, Beijing, Centre des Arts Enghien at Paris, Foundation for Art and Creative Technology (FACT), Liverpool, Gallery of Modern Art, Brisbane, ICC Tokyo, and MCA Chicago.

Acknowledgements

Petra Gemeinboeck would like to acknowledge the support of the Australian Research Council. This issue has been developed as part of a research project, funded by an ARC Discovery grant investigating non-anthropomorphic embodiment and kinesthetic machine learning, on which she works in collaboration with Rob Saunders, Maaike Bleeker and Ben Robins (DP160104706). She would also like to acknowledge the Creative Robotics Lab at the National Institute for Experimental Arts, University of New South Wales, Sydney.

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