

THE EMERGENCE OF CONSCIOUSNESS

Anna Dumitriu

The Emergence of Consciousness project is an artistic investigation of the scientific study of consciousness and the possibilities of 'machine consciousness' through the use of performance art and digital media. Dumitriu worked with sensory and movement deprivation (e.g. blindfolds, physical restraints etc.) and augmentation, in an attempt to take on the role of a robotic agent herself and try to understand what it *feels* like to be a robot.



"The Emergence of Consciousness" by Anna Dumitriu, performance with Bondage tape, lidocaine, robot, earplugs and digital projections, photograph copyright Anna Dumitriu.

The issue is that we tend to think we know what a *conscious* experience is and our inner mental lives are filled with assumptions about the conscious experiences of others, we believe we know how they feel and we assume they have some insight into what how we feel. We have what's known as a "theory of mind" and are able to identify other "minded" subjects. But these abilities are set to be thrown into question as developments in artificial life (AL) technologies lead to the potential to build robots that give the impression of being "minded" in some way. Thomas Nagel's paper "What is it like to be a bat" suggests that it is not possible for us to imagine how it would feel to be a bat because bats use sonar to navigate their world, something we could not imagine as we have no understanding or experience of it. However technological advances may offer us limited access to "new" senses, even in the short term and we can learn to incorporate them, perhaps enabling new insights. An example of this is the "Enactive Torch" built by Tom Froese and Adam Spiers, which: "provides the user with one continuous channel of vibro-tactile feedback to the hand, where the strength of stimulation depends on the distance to the object which is currently pointed at. The distance is measured using an ultrasonic sensor."

Working closely with researchers from the Centre for Computational Neuroscience and Robotics at The University of Sussex during her artist's residency there Dumitriu investigated notions of what "conscious

experience” might mean for a robotic agent in contrast to a human (the artist herself). The project, which was created as part of the London 2012 Cultural Olympiad is inspired by perspectives of embodiment as characterized by Francisco Varela, Evan Thompson and Eleanor Rosch, and situatedness as applied to evolutionary robotics by Rodney Brooks. This research was used to develop a new work, which was performed at Lighthouse in Brighton in July 2010. For the piece Dumitriu attempted to take on the role of a robot agent by reducing (as much as humanly possible) her sensory input down to that of her collaborator a medium sized robot whose only interaction with the world is through its limited sensors and wheels). Working with an assistant (Luke Robert Mason) her ears were blocked with earplugs, her head and body were wrapped in thick black bondage tape to block out her vision and restrict her movement and her skin was coated with Lidocaine cream (local anaesthetic). She was given a walking cane to sense her world with (as suggested by Dr Inman Harvey as being a close analogue for the robot’s sonar). In the performance the robot attempted to find the centre of the room using a control system evolved using a genetic algorithm and a single sonar sensor, Dumitriu attempted to find the centre of the room using her remaining sensory capacity and a counted the paces she took to get from one side to the other. The robot method is faster in this case and the Dumitriu’s very human approach is a demonstration of the incommensurability between artificial and biological life but nevertheless the work demonstrates clearly just how different ‘machine consciousness’ might be. These ideas were also brought out in digital projections to accompany the performance created artist Alex May.

Taking on the role of a robot agent is not a trivial process. The idea that a robot phenomenology is something that we could access is a contentious and flawed idea, however, an attempt to mimic the phenomenological experience of a robot should be of interest. The possibility of impoverishing the artist’s sensory experience to that of a robot is not achievable and neither is the idea of an artist replicating the functionality of a wheeled robot through her own physicality. However the ongoing performative experiments reveal to both the wider public and to invited scientists and philosophers many of the issues inherent in developing machine consciousness, potentially revealing new insights whilst acting as a form of public engagement in robotics research.

In her experiments Dumitriu has attempted to enact “robot experience” with particular focus on Francisco Varela’s work on how a robot might be considered to “mindfully” interact with the environment in which it is embedded. It focuses only on the sensor data it can receive and react to and not concerned with the floods of thoughts and emotions that fill (and pollute?) our human minds.

The practical aspects of the project are important to Dumitriu’s understanding and Dumitriu built the robot agent from scratch in collaboration with a robotics specialist. The wheeled robot has the capacity to take in a large number of sensory inputs but currently is just using sonar. It is important for the work that Dumitriu understands fully how the robot is constructed in order to deconstruct it psychologically for the audience.

The work done in the Emergence of Consciousness project is now being built on in Dumitriu’s new collaboration with the University of Hertfordshire where she and fellow artist collaborator Alex May have been appointed as Visiting Research Fellows: Artists in Residence in The Adaptive Systems Group (since January 2011). They are now working closely with Professor Kerstin Dautenhahn and Dr Mick Walters to develop a series of speculative robot heads designed to provoke the audience to think about their feelings about the possibilities of living with robot companions. It asks the audience to consider the field of social robotics and what they actually want in robot companions; how they should look, move and whether they should appear to be humanlike or ‘minded’. The first of these heads was exhibited at the Science Gallery in Dublin (April-June 2011) as part of their exhibition “HUMAN+ *The future of the*

species” and included a humanoid robot body built by the University of Hertfordshire with a head created using rear projection 3D video mapping and a hacked Microsoft Kinect that is able to take on the appearance of anyone looking at it (in group situations it creates a composite based on proximity). The idea is that users may prefer a familiar face but the work plays with the sense of the uncanny as users begin to recognise themselves (a disjuncture perhaps between the sensation that something is minded and the knowledge that it is not). The title of that head is “Familiar” and also references the idea of the ‘witches familiar’ (in mythology this is often a black cat), a creature which ‘appears only at a time of need’, ‘can act on the witch’s behalf’ and ‘can change shape’. Technology as witchcraft?

References and Notes:

Daniel Dennet, Consciousness Explained (London, Penguin, 1993)

Thomas Metzinger, Being No One (Cambridge, MA, MIT Press, 2004)

Thomas Nagel, “What is it like to be a bat?” In The Philosophical Review, 1974

Francisco Varela, Evan Thompson and Eleanor Rosch The Embodied Mind: Cognitive Science and Human Experience (MIT Press, 1992)

The Enactive Torch official blog <http://enactivetorch.wordpress.com/about/> (accessed 23 June 2011)

The Science Gallery official website “My Robot Companion” (accessed June 23, 2011)