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***Narratives
of
an
extended
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in
Guy
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**By
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Brain, rockstar, self? ***Narratives of an extended body in*** ***Guy Ben-Ary's cellF***

Every so often, an art piece comes along that is an instant rockstar. Guy Ben-Ary's cellF,¹ where the artist's skin cells transformed into neurons send signals to analogue synthesizers that "jam" with human musicians, is arguably such a piece within the realm of artscience. It was certainly created to be so. The artist had a childhood dream of becoming a rockstar, but never learnt how to play. For this piece, he wanted to "live [his] dream and be a musician".²

1. Pronounced "self".

2. Interview with Guy Ben-Ary, 7 May 2013.

3. Interview with Guy Ben-Ary, 7 May 2013.

4. Ben-Ary, Guy (2015). cellF. About. Retrieved 11 July 2018 from <http://guybenary.com/work/cellf/>

5. The piece was created in collaboration with Nathan Thompson, Andrew Fitch, Darren Moore, Stuart Hodgetts, Douglas Bakkum, and Michael Ede.

6. Moore, Darren, Guy Ben-Ary, Andrew Fitch, Nathan Thompson, Douglas Bakkum, Stuart Hodgetts, Amanda Morris (2016). cellF: a neuron-driven music synthesiser for real-time performance. *International Journal of Performance Arts and Digital Media*, 12(1): 31-43, p. 34.

To make cellF, skin cells from Guy Ben-Ary's forearm were biopsied, transformed using iPS technology into a stem cell-like stage, and differentiated into neurons, the nerve cells that transmit signals to and from our brains. The neurons were cultured in a petri dish containing a grid of electrodes (a multi-electrode array), which catch the signals from the neurons and connect them with a system of analogue synthesizers.

Ben-Ary conceptualised cellF as a "self-portrait", the neural network created from his skin cells becoming "a Guy brain growing outside of Guy's body".³ The artist refers to this as "an ultimately narcissistic desire to re-embody myself".⁴ The new "body" of his transformed cells consists of analogue modular synthesizers, which transform the signals of the neural network into sound.⁵

Although in his writing he stresses that discussing these neurons in a petri dish as an "external brain" is essentially symbolic, since the neural network's 100.000 cells is far from the vast complexity of the human brain,⁶ he uses this terminology throughout the project. For an audience member the "extended brain" and "sculptural

body” might well be how the work is remembered. He talks about cellF as his “rock-star alter ego”, and gives the impression that it is a stand-alone agent, a non-human musician that “acts” on its own and is “completely autonomous”.

The artist also refers to the neural network in interaction with the human musicians as “posthuman” and “non-human”. At the same time, he describes it as his “extended body”. Considering his artwork with this concept in mind can help us think about what it means to be a “self”. Where do I stop, and the other begin? What makes me human? Today, there is an increasing realisation that we were never as contained within our own skin as was previously thought. Trillions of microbes within our bodies help us be us, in terms of bodily functions, but even more strikingly, affecting our moods, behaviours, desires.⁷ In the extension of this, cellF latches onto the somewhat mind-boggling idea that parts of our body that we think of as fixed in categories – adult skin cells – can be coaxed to become pluripotent and stem cell-like, and then take on the entirely different properties of neurons.

The work is framed as a conceptual statement on future possibilities for life. In a previous work called *In Potentia* (2013), Ben-Ary, with co-creators Kirsten Hudson, Mark Lawson and Stuart Hodgetts, transformed foreskin cells into neurons, ironically presenting these within a phallic sculpture as a form of single-person procreation.⁸ The topic of life, procreation and agency is clearly a long-term interest. Ben-Ary emphasises his role as creator, as a father figure, but does this ironically and “ad absurdum”.

cellF is the last of a series of brain/body interactive sculptures made by Ben-Ary and various collaborators over fifteen years. In several previous pieces the neural

7. Mayer, E. (2016). *The Mind-Gut Connection: How the Hidden Conversation Within Our Bodies Impacts Our Mood, Our Choices, and Our Overall Health*. New York: HarperCollins.

8. Ben-Ary, Guy, & Gemma Ben-Ary (2016). *Bio-engineered Brains and Robotic Bodies: From Embodiment to Self-portraiture*. In D. Herath, C. Kroos, & Stelarc (Eds.) *Robots and Art: Exploring an Unlikely Symbiosis* (pp. 307-325). Singapore: Springer Singapore, p. 320, and interview with Ben-Ary, 7 May 2013.

networks had animated robotic bodies that visibly move, becoming a non-organic extension of the neurons, and as such a way of emphasising their “liveliness”.⁹ In relation with current developments in the sciences and, not least, imaginations of what is to come within science fiction, these pieces engage in a complex set of questions such as: Does our relationship with technology already make us cyborg? How will this be enhanced in the future? Might future humans all be about the brains, located inside largely robotic bodies that can give us greater strength, higher productivity, longer lives? Is my brain “I”?

This “rockstar in a petri dish”¹⁰ emerges at a time when a lot of attention is being given to the capacity of artificial intelligence for creativity and autonomy. Google’s Magenta project, for instance, seeks to explore how machines can learn creativity, to generate music and art.¹¹

Can we consider a non-human entity an artist? Who, or what, are the artists in cellF? Should we consider the neurons within the sculptural body to be making music, or is the music credited, ultimately, to the artist and his team who instigated the piece? So far, when machines “make art” the artistic credit is always given to the human artist,¹² and that is no different here than in any other hardware-generated art piece. The reasons for this are complex, but part of it is that in the contemporary view of art, artists are not required to actually make the piece; they can supply the idea, the creative juice, and order the execution from any number of professionals, from steel workers to scientists, using a range of technologies. This is not just about concept and intent, but about the role of artists within society. Art is fundamentally a social act; it communicates and shares perspectives, emotions, experiences.

9. Ben-Ary & Ben-Ary 2016, p. 310.

10. Ben-Ary 2015.

11. Some of the most promising artificial intelligence avenues involve artificial neural networks, which basically take cues from the complexity of the human brain in an act of biomimicry.

12. Hertzmann, Aaron (2018). Can Computers Create Art? *Arts*, 7(2), 18. In popular tech magazines, however, there are plenty of instances where machines are breezily described as artists, such as Dvorsky, George 2017. This Artificially Intelligent Robot Composes and Performs Its Own Music. *Gizmodo*, June 14.

Ben-Ary emphasises how the similarity of the analogue synthesizers to “an electrophysiological laboratory, fits my vision perfectly”.¹³ The multitude of wires pouring out of the analogue synthesizers at the front of the sculpture seems a very conscious aesthetic choice, showing that this is not a sleek computer system, but that the neurons communicate with the human musicians through an analogue interface.

An important part of this project is the exploration of how cellF reacts to different musical styles. This writes itself into the scientific quest to understand more about how neurons respond to different stimuli. In terms of the simple ways in which the neurons of cellF respond to stimuli, it is similar to a simple computer program. However, the liveness of the cells, their status as coming from a named human body and existing outside of it in a radically transformed state, makes a difference. Although the possible soundscapes – the frequencies of the “white noise” coming from the synthesizers – are determined by its human creators who set up the analogue interface, the neurons, through their “body”, are given a sense of agency, purpose; perhaps, as the artist claims, even autonomy.

What does it mean for this piece to be *post-human*?

To respond to this question it can be helpful to turn to N. Katherine Hayles’ critical vision of the posthuman as “a construction that participates in distributed cognition dispersed throughout the body and the environment. Agency still exists, but for the posthuman it becomes a distributed function”.¹⁴ Hayles is speaking against Cartesian mind-body dualism, the idea that the human soul and mind are distinctly separated from the human body. Instead, she pictures a “mindbody” in flux and continual emergence. This is still very much focused on human, embodied experience. The human perspective is not

13. Ben-Ary & Ben-Ary 2016, p. 323.

14. Hayles, N. Katherine (2002). *Flesh and Metal: Reconfiguring the Mindbody in Virtual Environments*. *Configurations* 10(2): 297-320, p. 319

something we can expect to escape. However, shifting our perception of our own bodies in relation to nonhuman others is a worthwhile exercise.

Does cellF, in a real sense, embody such a distribution of cognition? The neural cells exist at a relatively low level of complexity. They clearly are not *thinking*, in any sense of the word that we would recognise, and as far as the researchers can tell, they are not in a state where they can *feel* anything in particular, either. And yet, their latent potential for communication, signal and response, has been tapped through this piece.

Music, like other forms of art, has often been seen as something distinctly human. However, it can be hard to distinguish human-made sounds from the songs produced by certain kinds of birds. Music, therefore, potentially joins us with other parts of the living world, rather than setting us apart. In choosing this medium for cellF, Ben-Ary and his collaborators show us how communication does not need to be a human quality. Extending one named human body, that of the artist, makes it easy to follow the intuitive leap of communicating with something only partially human. Thus ever so subtly shifting the perspective outside of the human body, the piece moves beyond stimulating our thoughts about what (human) life is and can be, to showing us what it is not – yet.

