New Media Art and Embodiment:

Encountering Artificial Intelligence

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Contents

Introduction

Artificial intelligence has rapidly made its mark as the technology of our generation. In fact, the classic dystopian image of super-intelligent robots taking over human society seems almost naïve in light of the many actual applications of artificial intelligence in our current societal systems. I was recently listening to a conversation between Joi Ito, director of the MIT Media Lab, and Anjali Sastry, lecturer at MIT and Harvard, on system dynamics, cybernetics and society. Sastry noted at one moment that as humans we have evolved to adapt and form habits so quickly that we don't notice gradual changes until we are shocked by their effects. A truthful statement and one that makes sense with regards to the development of artificial intelligence as too with other complex systems. While artificial intelligence is making headlines in most fields relating to our organized societies by becoming a discrete companion to our existence, much of the educated public can still only relate to it through this lingering fear that it will someday become simultaneously autonomous and destructive. In the meantime, a majority are ignoring the fact that as a technological tool it is potentially equally, if not more powerful being under the control of human agents.

This conversation extends into many areas, most notably concerning the ethical and societal implications of AI (Artificial Intelligence) which are many and much in need of clarification. There is a more basic, underlying concern however that doesn't often make it into the discussion perhaps because it is so evident that intuitively we don't pay much attention to it. That is to acknowledge that what creates and what defines this technology is not its otherness to our culture and to society but its very sameness. Artificial intelligence is created to reflect the data and patterns that it is trained on, data that is collected from our day to day lives and our governing systems. When talking about the problems of AI, the dangers of bias, discrimination, surveillance and oppression that it can present, we are inevitably addressing the problems of reinforcing the existing biases and ideals that drive our societal systems. Recent attempts to apply predictive technologies to policing and the criminal justice system, for example, have blatantly revealed the inequality and the racial and economic discrimination that is inherent to our society. In an insightful article about algorithmic policing published by e-flux journal, Jackie Wang comments on the suggested

'neutrality' of PredPol, a software used to predict when and where crime will occur. She notes that "Crime has never been a neutral category. What counts as crime, who gets labeled criminal, and which areas are policed have historically been racialized."[1] The problem of bias is not a technological one but a cultural one and consequently a statistical one. "While the methods developed by PredPol themselves are not explicitly racialized, they are implicitly racialized insofar as geography is a proxy for race."[2] It may be more convenient to vilify the technology and to talk about it as an external agent than to confront the depth and breadth of our own influence in the society that it reflects. It is likely to be more constructive however to acknowledge this reality and to adjust our perspective and expectations with regards to the applications of Artificial Intelligence. In a clever title to a piece he contributed to *WIRED* online, Joi Ito suggests that "AI isn't a crystal ball, but it might be a mirror".[3]

As a reflection of humanity, from the sociological to the biological, Artificial Intelligence has the potential to contribute to our awareness and understanding both of the intricacies of the individual mind and body and of our collective being in the world. Research in Machine Learning has sparked new investigations in human cognition and has shed new light on the mind-body connection and its role in awareness, communication and interaction. In the March 2018 issue of *Scientific American*, Diana Kwon writes about a case where roboticists discovered that embodied interaction with objects enhanced the robot's ability to learn word associations. When the respective experiments were then repeated with infants as subjects, similar results were found which then created grounds to further explore these cognitive processes.[4] Such instances demonstrate an interesting and fruitful interchange between the technological and the biological where one informs and develops the other. This is not to suggest that this is the only purpose or success of Artificial Intelligence technology. AI is such an expansive and actively evolving field that it is impossible to address or even introduce it fully in the capacity of this thesis. The examples and comments made above aim to give an indication of the breadth of its influence and to touch upon some of the themes that have been more relevant to my research.

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[1] https://www.e-flux.com/journal/87/169043/this-is-a-story-about-nerds-and-cops-predpol-and-algorithmic-policing/ (17 May 2018)
[2] *Ibidem*
[3] https://www.wired.com/story/ideas-ai-as-mirror-not-crystal-ball (17 May 2018)
[4] Kwon 2018, p.29

This thesis was mainly inspired by the opportunity to explore the space between the parallels of art and technology, in light of the rise of Artificial Intelligence and the subsequently reignited dialogue around human cognition, embodied experience, relationality and posthumanism. The introspective view of humanity has guided artistic practices, with artists striving to communicate the mysteries of being and becoming, through all available media. As science and technology developed to constantly inform and challenge our ideas of perception and of what it means to be human, so too did they provide new media for artists to communicate visually, sensually and performatively. The 21st century has seen technology engage more intimately than ever with ideas of cognition and consciousness by exploring the possibilities of creating artificial life and intelligence in what can be described as a truly 'technoetic' era. In the introduction to his book *Reframing Consciousness: Art, Mind and Technology,* Roy Ascott explains that "More than simply marking the meeting of mind and machine (a familiar conjunction in 20th century art), technoetic is intended to signify the symbiosis of technology and consciousness (Gk *noetikos*) which characterizes the new cultural paradigm emerging at the turn of the millennium."[5] Currently, two decades into the 21st Century, new media art is performing this symbiosis, examining it, identifying its agents and re-imagining it by making use of new interactive technologies.

Artists' urgency to engage with such complex technologies is guiding the field into an all the more interdisciplinary direction and influencing the role of art in contemporary society by creating a wider and more free-form platform for the application of varying skills and expertise. Artificial Intelligence has been contributing to this momentum by emerging as the central focus in many contemporary art exhibitions, festivals and fairs but also in conversations relating art to other disciplines. AI was, for example, the theme of the 2017 Ars Electronica Festival, where I was first exposed to the multiplicity and diversity of its creative applications. This experience, followed by the time I spent as an intern at Galerija Kapelica in Ljubljana, kept me in constant interaction with art that is saturated with complex technologies and led me to consider both its promise and its shortcomings. Despite the complexity of the materials and the processes involved, I often found that the communicative power of the artworks continued to depend on creating a state of encounter in which the viewer can relate to their environment. As Nicolas Bourriaud states in *Relational Aesthetics*,

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[5] Roy Ascott 1999, p.1

"Each particular artwork is a proposal to live in a shared world, and the work of every artist is a bundle of relations with the world, giving rise to other relations, and so on and so forth, ad infinitum."[6] This caused me to wonder how the experience of art becomes relatable and to consider the role of embodiment and performativity in this exchange. To focus on creating an embodied experience is to focus on affecting the audience both instinctively and consciously, to trigger this back and forth stimulation of mind and body. In the case of art that uses and addresses Artificial Intelligence, this embodied awareness has the potential to become intriguingly layered as it emerges not only through the process of receiving the artwork but also as the subject and object of the work. With this and all of the above in mind, I wanted to use this thesis as an opportunity to pose the following question: To what extent can artistic practices involving new media reframe the way in which humans engage with artificial intelligence? I became interested to explore new media art in its inter-subjective cadre, to investigate how this contributes to the way in which we relate to intelligent technologies and to consider the potential of a transformative encounter with regards to the self, to our performed reality and to our becoming in a posthumanist environment.

In order to begin to address this research question and to explore the interesting concurrences between artistic practice, art theory and artificial intelligence, the first chapter of this thesis will focus on how we have come to understand the meaning of 'Being in the world'. The first part of this chapter will outline some of the main theories in cognition that have resurged following the development of AI and that contest the cartesian dualism between mind and matter. Informed mainly by ideas in philosophy and the social sciences and by the recently published book *Making Sense: Cognition, Computing, Art and Embodiment* by Simon Penny, this first section aims to provide the basis for understanding the meaning of the broadly-used term 'embodiment' in the context of this research topic. This will lead into a discussion of postcognitivist paradigms in relation to culture, the rise of artificial intelligence and new media art. The second part of Chapter one will consist of an analysis of the work *cellF* by Guy Ben-Ary, as performed with musical artist Lucas Abela at Ars Electronica in September 2017. Revolving around the themes of subjectivity and the hybridity of electronic and physical space, this section will present a case study for the communicative qualities of new media art that engages with intelligence and cognition. The main aim of this

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[6] Nicolas Bourriaud, 2002

first chapter is to provide an interdisciplinary context from which to consider the value of embodied experience, how it relates to our becoming in the world and how it leads us to perceive the self in its distributed forms. In the second half of the chapter this will be used to support the argument that the medium of new media art, with its particular subjectivities and material encounters, stimulates us to perceive our interaction and co-existence with intelligent technologies as intricate and uniquely entangled.

The second chapter of this thesis will zoom in on the area of inter-subjectivity and permeability between the human and the machine, using the lens of performativity and reflecting on how it is applied in novel ways within the field of new media art. Emerging from the context of embodied experience and its extensions in our interactive environment, as discussed in chapter one, this section will focus on the framing of reality within performed interactions that reach beyond the materialization and subjectivity of the human body. Referring to Karen Barad's writings on "posthumanist performativity" and embracing her theory of "agential realism" that locates agency in encounters with matter, chapter two will discuss the significance of acknowledging our posthuman environment as an inter-subjective space, defined only by an ongoing material discourse. This will develop further towards the re-consideration of notions of agency and empathy as liberated from their humanist paradigms and lead to an exploration of their distribution and influence in the affective interaction between human and artificial intelligence.

Parts two and three of this chapter will present two artistic works that experiment with applications of AI, as case studies to explore instances of posthumanist performativity that emerge from our digital cultures. Part two will discuss Oscar Sharp and Ross Goodwin's short science fiction film, *Sunspring*, which is the first to be written entirely by an artificial intelligence. In light of this unexpected encounter with AI in the role of screenwriter, this section will take the opportunity to explore the space where human and machine vision intercept, deconstruct and re-construct each other in a transformed creative process. This will reveal the confines of our reality and our fictions within cultural symbolisms and materializations and consider the value of AI as a deconstructive co-performer within this context. Part three will present the work *Tickle Salon,* by Driessens & Verstappen, and consider how it flirts with the idea of AI as a performative and affectionate companion to the human. While distinct to Sharp and Goodwin's work in both its realization and its medium,

Tickle Salon also evokes the intermingling of human and machine agency in the mutual exploration of their relationship. In this part, the focus will be on the implication of matter, whether physical, virtual or conceptual, in the affective interplay between human and machine bodies.

What both of these parts aim to reveal, to close this second and final chapter of the thesis, is that most of what we have come to define as human actually resides in matter that is not contained within the human itself and that the performed interaction of the human with the technological 'other' in art, allows us to encounter these constructs of our identity. Ultimately, this thesis will argue that what is prevalent in the presence of AI in the interactive space of new media art is the humanity that it reflects. As such, it will use art to reframe our engagement with AI, liberating it from the anxieties of the humanist self and enabling it to contribute to our ongoing conception of the world, the structures that organize our existence and even our emotional interactions in a postanthropocentric becoming.

Chapter 1   Being in the World

Ideas of cognition in science, philosophy, culture and art

1.1   Postcognitivism, embodiment and the influence of computation.

For most of the twentieth century, the western philosophical tradition was led by internalist views of cognition focusing on the duality between the mind and the body, the same principles that guided early research in intelligent computer systems. In order to make sense of this tradition and how it came to be the conventional view of human cognition, it is necessary to look back to the origins of the mind-body problem in modern history. Though versions of the mind-body dualism existed from the classics through the medieval period, the modern idea of *substance dualism* also referred to as *cartesian dualism* is attributed to René Descartes (1596-1650). Descartes famously based his theory on the distinction between mind and matter. He considered that the essential property of matter is that it extends spatially and that the essential property of the mind is that it is able to think. He concluded that mind cannot be matter since matter is divisible and the mind is indivisible and as such they are two separate substances that causally interact. How this causal interaction happens lays at the core of the mind-body problem and for philosophers such as Descartes and his contemporaries this was conveniently solved by their faith in an interventionist God. The idea that humans are made up of the physical body that is a subordinate to the thinking immaterial mind has since permeated our culture and the many ways in which we relate to ourselves and our environment.

In *Making Sense: Cognition, Computing, Art and Embodiment*, Penny relates this dualism to the software-hardware relationship in computer science which he says reinforces the distinction between information and matter. "Over the second half of the twentieth century, with the rise of digital computation, the notion of the separation of matter and information has transitioned from being an abstruse philosophical idea to a technological

fact."[7] Along with these parallelisms between the brain and the computer came the idea that intelligence is defined by the brain's ability to manipulate abstract symbols that are representations of the world. Based on this definition of human cognition, also known as Representationalism, the early community of AI researchers in the 1950s concluded that "every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it."[8] The rise of computation and artificial intelligence therefore indeed reified the mind-body dualism and continued to isolate intelligence within the brain, leaving no margin for exploring the role of embodied experience in cognitive processes. However, the assumptions made by this field with regards to simplifying and quantifying the essence of being human, also caused many to criticize early AI and eventually brought about a new wave of philosophical debates around intelligence and cognition.

Hubert Dreyfus (1929-2017), professor of philosophy at Berkley, made some of the most influential early criticisms of AI in his book *What Computers Can't Do,* first published in 1972 and then re-visited with a second and third edition in 1979 and 1992. His critique emphasized the need to assert an embodied understanding of intelligence and brought the ideas of philosophers such as Heidegger and Merleau-Ponty in confrontation with the foundations of AI. In *What Computers Still Can't Do*, Dreyfus notes that while the rise of AI reinforces the dualism between mind and body it also dismisses Descartes' insistence on the need for an immaterial soul to drive intelligence. Simultaneously this creates the opportunity to make a different objection regarding the intelligence of machines that is based on the importance of the ability to respond to situations physically as well as mentally. "After some attempts to program such a machine, it might become apparent that what distinguishes persons from machines, no matter how cleverly constructed, is not a detached, universal immaterial soul but an involved, situated, material body."[9] Such theoretical critiques of AI by Dreyfus and others caused the field of AI and of cognitive science to face a crisis and eventually, by the early 1990s, a transformation. The notion of cognition as computation and the representationalist definition of intelligence became outdated as the fields of AI and

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[7] Penny 2017, p. 6
[8] Penny 2017, p.98
[9] Dreyfus 1992, p.236

cognitive science opened up to an interdisciplinary investigation favouring a much more holistic approach to the nature of cognition.

Before moving on to the postcognitivist paradigms that emerged to assert the importance of embodiment in our relation to the world, I would like to make a reference to the concept of *information* and how it became an influential factor in our understanding of cognition at the intersection between brain and computer. This is both important and interesting to understand in terms of how the theory of information contributed to a misleading conceptualization of our interactive existence and why it is important to break it down in order to grasp the meaning of embodiment. The rise of computation was based on the foundation of information processing and aimed to make information as quantifiable and objective as possible, something it still strives towards today. To follow this paradigm when attempting to simulate cognitive processes and create intelligent systems is epistemologically inaccurate and misleading as it consists of "the application of reductive mechanistic explanation to complex biological and ecological systems."[10] In fact, information as far as people are concerned, is never free of context and is always relative to previous experiences. Meaning as such, is not intrinsic to the immaterial information but is derived from the process of receiving that information and from the acquired knowledge of the receiver. This rift between the mechanistic and humanistic mindset over the impossibility of an objective truth is one we still encounter in current debates about AI and the problem of data bias.[11] Understanding the complexity of the cognitive processes involved in deriving meaning from information and acknowledging that there can only be embodied information is essential in order to make sense of embodiment and of the challenges but perhaps also the opportunities that this presents for the field of AI.

With the above issues clarified, it is easier to understand what is meant by postcognitivist cognitive science and its foundation on the conception that cognition "occurs in a living body….and is (at least) markedly enhanced when that body is active in a pre-structured physical and social context."[12] From this basis, emerged different approaches to cognition, each emphasizing specific aspects and adding a new dimension to this general

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[10] Penny 2017, p.168
[11] See example in Introduction p. 1-2
[12] Penny 2017, p.198-199

understanding of immersive existence. *Embodied cognition* focuses on perception as cognition and locates intelligence in the instinctive processes of the body. Its purpose is mainly to contest the dualism between mind and body. *Enactive cognition* which also led to the term e*nactivism* encapsulates the nature of cognition more specifically as a constant sensorimotor feedback loop asserting that "our understanding of the world is not separate from our exploration of the world."[13] This extends cognition out of the body and into the spatiotemporal environment in which it exists. To further this idea, *extended condition* suggests that physical objects that enhance cognitive processes such as the use of a notebook as memory storage could be considered extensions of the mind or *cognitive prosthetics*. *Situated cognition* and *distributed cognition* also raise similar questions, negating the notion that cognition is isolated to the brain or the body and emphasizing the role of social and cultural interactions in our perception of the world and of ourselves. These new perspectives in cognition and intelligence therefore, re-frame our understanding of information, knowledge and embodiment by revealing the complexity of our systems of perception. Consequently, embodiment is understood not only as the experience of inhabiting a body but also as the experience of that body inhabiting its environment.

It is interesting to note how the development of computation and AI influenced our theoretical understanding of cognition and of embodiment and how these fields continue to co-develop and re-define each other in an ongoing feedback loop. Inevitably, these developments and particularly the shift from a dualist and internalist understanding of consciousness to the assertion of an embodied, enactive and situated cognitive process, have also influenced the theory and practice of contemporary art. Not only has computation and technology provided new media for artistic expression but it has also become a catalyst for the transformation of the experience of art. The emerging digital technologies along with the theoretical shift towards a meaning-making process that is embodied and immersive provided the grounds for new media art to adopt a strategy based on interaction, participation and open-endedness. "Art is no longer defined by the production of finished objects or polished forms, but is becoming an encounter – an event – in which audience, technological interface and institutional setting are increasingly implicated."[14]

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[13] Penny 2017, p.199
[14] McQuire, Radywyl 2010, p.14-15

New media art that engages with cognition and consciousness as both its subject and its object, has the potential to create an immersive environment that adds more levels and pathways for perception and for generating meaningful content. Roy Ascott refers to this as "an art set in unfolding fields of consciousness."[15]Such practices also play on the interesting paradox that has been unfolding since the rise of computation and artificial intelligence where computer technologies, thought to be contra-humanist and alienating, are acting as a vessel for communicating the complexities of embodied human experience. With this in mind and with a postcognitivist awareness we can perhaps shift our focus from what computers can't do to what they can do as an interactive element of the world. How do intelligent technologies participate in our perception of reality, of selfhood and of being in the world and how do they express a perception of their own? The following sections of this thesis will be considering this idea and how it is being explored in new media art practices that aspire to reveal the underlying processes that define our understanding of the world. Ultimately, this effort evokes "the condition of transformative process, where, at best, not only the structure of the 'artwork' undergoes change but the consciousness of the viewer is transformed."[16]

1.2   Hybrid cognitive art and multi-level encounters in the performance of Guy Ben-Ary's *cellF*.

In our technoetic[17]reality, where consciousness and technology exist in symbiosis and where Artificial Intelligence is gaining more and more ground, issues of the mind and body venture into the idea of transcendence. Ironically, a google search of the term 'transcendence' results in IMDb and Wikipedia entries for the 2014 film *Transcendence*, where Johnny Depp stars as an AI specialist who is controversially experimenting with the creation of sentient machines. Regardless of the fact that the film is apparently not worth much interest, this coincidence points towards the way in which these ideas have become culturally embedded. The relationship we have maintained with technology over the years essentially aspires towards

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[15] R. Ascott 1999, p.1
[16] *Ibidem*
[17] See reference in Introduction, p.3

"our eventual migration from the body into other forms of identity."[18] In other words, this can be expressed as transcending the biological and venturing into the post-biological by making use of various platforms for extended cognition.

The notion that there can be higher states of consciousness that transcend the material body and result in an experience that trespasses the biological boundaries of the self has been around for centuries in various expressions of religion and spirituality. However, the development of artificial life and artificial intelligence technologies is raising new questions about the possibilities of re-embodying consciousness. While this creates new perspectives from which to examine and challenge the humanist view of the self, it is important to maintain an understanding of the value of embodiment as the foundation of cognition and of our interaction with the world. In his essay on art and the technology of transcendence, Roy Ascott clarifies that "migration from the body does not imply its disappearance but the emergence of the multiple self, the distributed body, whose telepresent corporeality creates its own field of being."[19] On this note, I would like to introduce the interdisciplinary art project *cellF* by Guy Ben-Ary, which will be the focus of this section for the way in which it uses the platform of new media art to perform the intersection of cognition, biology, technology and culture. Following a brief reference to the background and material make-up of *cellF*, I will be analysing this work as a piece of hybrid cognitive art and discussing how it stimulates the audience to reconsider ideas of transcendence, embodiment and hybridity in relation to technological distributions of the self.

Guy Ben-Ary is an artist and interdisciplinary researcher based in Perth and currently working at SymbioticA, an artistic and scientific research laboratory at the University of Western Australia with a strong legacy in the field of Bio-art. Following years of research in bio-engineering the human brain, he expressed the desire to experiment with a re-embodiment of himself which led to the creation of *cellF*, the world's first neural synthesizer, completed in 2014. Essentially it is a sound generating machine made up of a biological 'brain' and a technological 'body'. Its nervous system consists of a petri dish containing a neural network of about one hundred thousand nerve cells, grown from Ben-Ary's own skin cells. A symbolic brain but one that is nonetheless able to generate and respond to a

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[18] R. Ascott 1999, p.66
[19] *Ibidem*, p. 67

significant amount of data. This nervous system, communicates with a body of analogue modular synthesizers via electrical signals, to generate sound (fig.1). The process of creating *cellF*, which can be found in more detail on the artist's website[20], required the collaboration of a diverse team covering the fields of art, music, science, engineering and medicine. The result is an autonomous and interactive 'wet-analogue' instrument, a hybrid biotechnological entity, that participates in performances alongside human musicians. For the purpose of this thesis I will be referring to a specific performance of *cellF* alongside musical artist Lucas Abela, that I had the opportunity to experience in person at Ars Electronica 2017. This choice was made not only because of the obvious advantage of being able to recount my own embodied and situated experience but also because the particular physicality of this performance contributed another dimension to the interplay between human and machine embodiment.
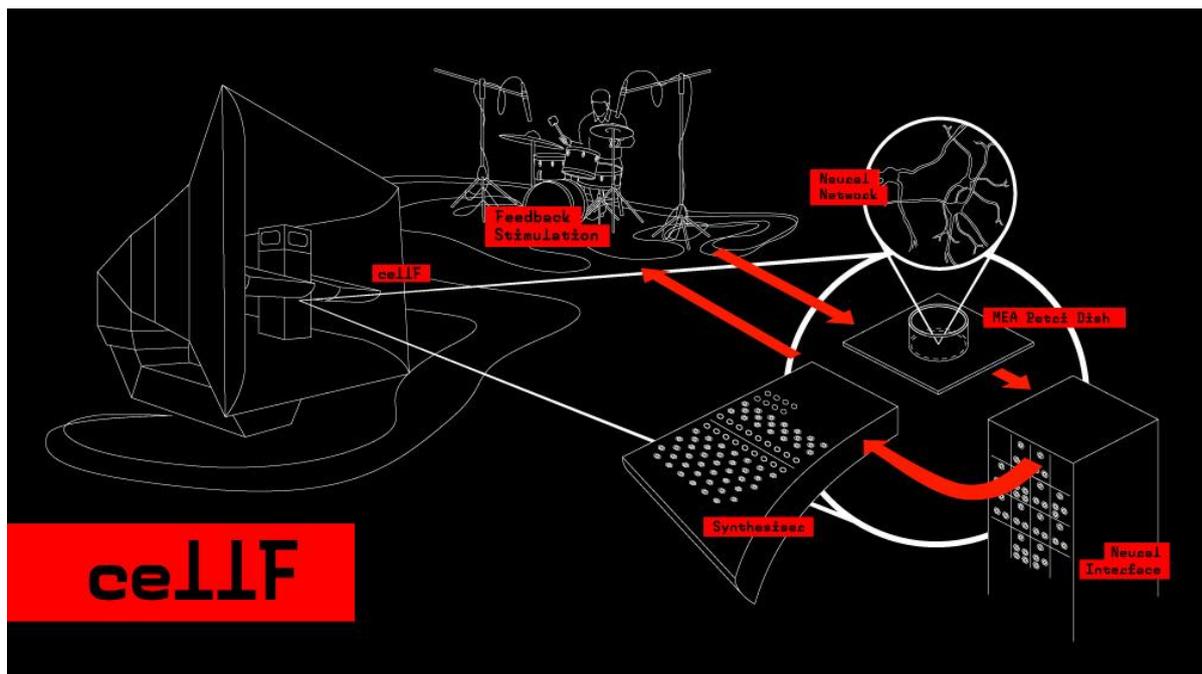

Fig.1 *Summary diagram of 'cellF' from the artist's website*

I would like to begin by situating *cellF* as a piece of hybrid cognitive art and by discussing the importance of performing the hybridity of human and machine when dealing with post-biological imaginations of intelligence and consciousness. As an installation, in its

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[20] http://guybenary.com/work/cellf/ (June 2018)

physical aesthetic sense, *cellF* is very machinic and imposing in the space it takes up. It stands rigid, square and invulnerable in the centre of the room like a huge computer with its guts exposed. Before the performance, it would be difficult to imagine its hybrid nature without knowing about the microscopic nerve cells engulfed by this frame of hardware. While structurally *cellF* already falls into the category of hybrid cognitive art in that it combines technological matter with biological brain matter, it is during its performance alongside the human form that this hybridity reveals itself most significantly. Once the human musician enters the scene, Lucas Abela in this case, he is the one to instigate the communication with *cellF*, to start the loop of action and re-action that defines this improvised co-performance. From one moment to the next, somewhat inexplicably or better perhaps intuitively, the audience's interest shifts from the domineering stature of the machine to the expressive physicality of the human musician. It happens like a shift of power, where the expectation to experience the transcendence of the body through the machine is overwhelmed by the complexity of human embodied communication. Suddenly, Abela becomes the centre of the performance with *cellF* taking on a supporting role and revealing a comparatively limited capacity to embody the self.

The presence of *cellF* as the machine co-performer is by no means rendered insignificant. In fact, it is precisely this presence that provides a frame of reference from which to interpret the performance. Undeniably, the structure and positioning of *cellF* opposite the human performer is what enables the beholder to perceive the contrast in materiality and physical expression between human and machine. The artificial intelligence in this artwork may not *appear* to lead the performance physically or expressively but it is quite obviously the conceptual driver of the experience. Only within this interplay between physical and electronic space can the vulnerability of existing in human form shine through Abela's performance. Performatively, *cellF* 's contribution is also essential to the evolution of the experience. It's technological nature, free of any physical implications, is evident in the way it frantically sends out electrical signals, effectively creating this anxious and incessant capsule of electronic noise in which the human musician is immersed. In effect, it is the hybrid biotechnological expression of the machine that is driving the performance and defining the intensity and physicality of the human expression. What pushes Lucas Abela in this case, to the limits of his bodily integrity and to the fully immersed communicative state

that captures the audience's attention, is the effort to keep up with the speed and continuity of signals emitted by *cellF*. The significance of the body in our relation to the world and to our awareness of the self, is revealed in this performance because of the exchange between the human and the machine and within the hybrid physical and electronic space.

All of this may seem to contradict what I stated earlier about Abela becoming the star of the show and about how the machine takes on a more background role but it is actually this transformation of the experience, mediated by the audience's perception, that makes the performance all the more interesting and relevant to the value of embodiment in the reception of art. Objectively, it could be said that the biological is in the shadow of the technological in this context but when it is experienced in relation to a 'self' which is the only way it can be experienced, this objectivity is lost and taken over by the subjective processes of perception. It is in the presence of the beholder that the shift of power that I mentioned earlier occurs, inevitably placing the machine in the shadow of the human. To make this correlation clearer, I will first expand on my own, personal experience of this performance. It was quite powerful to see it unfold in its spatiotemporal context, to notice how with the growing intensity of Abela's performance the audience gravitated more and more towards him. His body was entirely implicated in the process, gradually building up to an almost trance-like state of giving and receiving the music that left him bleeding onto his instrument, a piece of broken glass he played like a trumpet pursed to his lips. Collectively, the audience's gaze was transfixed on the musician at this point and there was a strange atmosphere of connection and unity in that huddled crowd. It is a feeling that is difficult to put into words but somehow captures the sharing of awe and appreciation and maybe ultimately it is the feeling of a consciousness transferred and transformed.

Abela's performance evoked a transcendence of its own in the way that he was driven by emotion and stimulation to sacrifice his physical integrity, seemingly unaware of the pain by being so fully immersed in the experience of communicating with a body that is communicating with its environment. This excruciating physicality, the sweat, the blood and the movement of a body in desperate expression is a vulnerability we instinctively relate to and empathize with. Comparatively, the materiality of *cellF*'s expression, its rigid and immobile frame internalizing its cognitive functions, failed to connect to what is essentially our legacy of embodied experience of the world. While its presence was very much

integrated into the experience and its role in the interchange with the human performer was nothing but formative of the entire outcome, in the physical, subjective space of perception it was the machine that became incapable of competing with the multiplicity of stimuli that were instigated by the embodied human performance.

Fig.2 *cellF playing with Lucas Abela at Ars Electronica*

In general, the way this experience unfolded felt like an unexpected twist to the plot and this is what I appreciated the most about it. What began as an anticipation to witness the transcendence of the body through science and technology, concluded with a testament to our long-standing relation to the materiality of the body as a vessel for expression, communication and being. In light of this, our attempts to re-embody intelligence in a machine form such as with *cellF,* appear to always begin with the biological and relate to our bodily experience of existence. As Simon Penny precisely states, "Our ability to predict - and find predictable - behaviors of digital systems is rooted in our evolutionary adaptation to embodied experience in the world."[21] This is what I was touching on earlier when I mentioned that from an embodied, human perspective the machine inevitably exists in the shadow of the biological. I would suggest that the way in which the experience of *cellF*

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[21] Penny 2017, p.364

cultivates this awareness of subjectivity and of encountering the self in the other, through the interaction of the audience's perception, the human performance and the machine performance, is what defines it as hybrid cognitive art. From my perspective it is also one of the most valuable ways in which *cellF* fulfills Guy Ben-Ary's ambition to address the question: "What is the potential for artworks using biological and robotic technologies to evoke responses in regards to shifting perceptions surrounding understandings of 'life' and the materiality of the human body?"[22]

In the introduction to this thesis I mentioned that an embodied experience of art is one where the audience is affected both instinctively and consciously, which I found to be true of this performance of *cellF*. The medium of art and performance enables communication to occur through many pathways of perception by playing with aesthetics, materiality, movement and by generally evoking multisensory reactions. This performance, like any art performance or installation, was curated and explicit choices were made regarding the aesthetics, the setting and the participating artists. At the same time, the way the experience was structured and framed in both space and time, accounted for the subjectivity of the audience's perception and remained open to individual interpretations and reactions. The reason for this, I believe, is that the performance of *cellF* was quite explicitly rooted in the experience of communication, communication through electricity, through materiality, through the body and through sound and space. As a result, the need for the audience as an embodied receptor but also as a participant in this exchange was felt strongly. The fact that each performance is abstract and inimitable and that it directly implicates each active component, allows for these individual and subjective perceptions to also coincide with a unique collective experience, once again evoking multi-level encounters and simultaneous layers of consciousness.

With all of the above in mind, it is clear that this analysis of the performance of *cellF* was defined by my own perspective, influenced by my own database of experiences and interactions and informed by the knowledge I have acquired and so it cannot reflect the perspective or awareness of the artist. More importantly, what this touches on is that the experience of art shouldn't seek to grasp the artist's own desires and perception but rather

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[22] http://guybenary.com/work/cellf/ (June 2018)

to communicate with the artist's expression so as to reveal one's own frame of consciousness and one's own sensitivities and preconceptions. As such, by engaging with an embodied experience and revealing the ways in which this contributes to the subjectivity of perception, artistic works such as *cellF* also challenge the ways in which we are often guided into an experience of art and the pre-determined meaning we seek to attribute to it. In extension, this creates the intrigue and interest to engage in conversation and to share individual thoughts, to become better aware of each other's point of view and to discuss the implications of this awareness to the individual but also to the collective. In anticipation that the other's perception will differ, to whichever extent, from my own, I am intrigued.

To conclude this chapter, I would like to note that while the encounter with artificial intelligence in the performance of *cellF,* as I experienced it, re-instated the importance and the complexity of the physical body in human cognition and communication, it did so while embracing the potential of intelligent technologies, rather than being dismissive or pessimistic about their future. The human musician and the hybrid biotechnological instrument co-created this heightened state of expression and immersion by responding to each other and even in its limited embodied state the neural network in *cellF* was able to contribute to the intensity and evolution of the performance. It provided support, stimulation, inspiration and perhaps acted as an extension of the musician's abilities to perceive and improvise. *CellF* does therefore present an optimism about the symbiosis of human and machine intelligence but it looks to the future with a newfound awareness as to the multiplicity of the self and the possibility of its extensions. This perhaps suggests that in light of the rise of artificial intelligence we should not look to locate or recreate the self intrinsically or as a whole but to acknowledge its distributed and plural nature and to embrace technology as a new platform for this continuing distribution of identities and of existence.

> "If there is a technological revolution in art it lies not simply in the global connectivity person to person, mind to mind (significant as that is), but in its power to provide for the release of the self, release from the self, the fictive 'unified self' of Western philosophy. It lies in our ability to be many selves,

telematically in many places at the same time, our self-creation leading to many personas and serial identities."[23]

[23] R. Ascott 2008, p.204

Chapter 2   Performative technologies in art

Interactions between human and artificial intelligence

2.1   Posthumanist performativity towards empathic communication in a technoetic present.

In the previous chapter, I began to address the role of performativity and embodiment in new media art and how it calls for a re-thinking of our approach to art as an experience. This first section of chapter two will focus more specifically on the ways in which the presence of performative technologies in art challenges conventional approaches to aesthetic experience, to artistic practice and to intelligent technologies, revealing a communicative process that is enactive, ongoing and embedded in its posthumanist context. In his book, Simon Penny speaks of an "Aesthetics of Behavior" which he introduces by stating that "As a result of a confluence of technological and cultural trends, we are presented with a new cultural scenario: a behaving cultural artifact…This condition of cultural interaction is as unfamiliar in the fine arts as it is in computer science. Practitioners, theorists, and students need ways to understand what's going on."[24] This new setting for interactivity and active engagement in new media art focuses on experience as a perceptual system of interactions, blurring the boundaries between object and subject and reframing our understanding of agency and empathy in human and machine coexistence. In the following paragraphs I will focus on the study of performativity in a techno-social setting, discussing how it relates to embodiment and materiality and how it emerges through the platform of new media art to trigger our awareness of the affective interaction between human and artificial intelligence.

As the reception of performative technologies through art becomes understood as an ever-evolving, audience-dependent and unstable process, the way in which artists participate in research and creation is also transformed. In place of the finite art project, artists engaging

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[24] Penny 2017, p.356

with new technologies and particularly with AI technologies, are releasing their ideas into the public as artistic experiments. This is perhaps partly due to the influence of the technical and scientific processes that artists have become more and more involved in but it is also due to an understanding that the experience of interactive art cannot be pre-determined by the artist but only designed to enable encounters and receive subjectivity. In fact, artists are taking advantage of artistic space as a unique platform for such public experiments to collect responses and data that can contribute to their research and further their practice. By engaging with performative technologies through artistic experiments and observing the interaction between humans and intelligent technologies on a more sensorial level, new media artists are able to open up novel conversations about AI as a companion to humanity. The interdisciplinary art and media space *V2_Lab for the Unstable Media* in Rotterdam, for example, recently hosted an expert meeting on Sensory Augmentation for Public Space, bringing together experts from various fields to discuss digital culture from a perspective that is obviously influenced by the convergence of technology, performativity and art. These encounters, or "techno-social interplays"[25] involving behaving artefacts, reveal the significance of performativity in the frame of interaction but also call for a re-thinking of conventional approaches to performativity that rely on the distinction between human and machine agency.

In her article, 'Posthumanist Performativity: Toward an Understanding of how Matter comes to Matter', American feminist theorist Karen Barad emphasizes the implication of the materiality of bodies, both human and non-human, in the performative becoming of the world. Through the lens of her own philosophical concept of "agential realism", Barad rejects anthropocentric definitions of agency and interaction, introducing the term *intra-action* instead to suggest that agency is not pre-assigned to individual subjects but emerges through the entanglement of biological, social and cultural materializations. Barad locates performativity in "material discursive phenomena"[26] where "matter does not refer to a fixed substance; rather, *matter is substance in its intra-active becoming—not a thing, but a doing, a congealing of agency*".[27] Barad's take on materiality and performativity aligns with the postcognitivist ideas discussed in chapter one in that it rejects representationalism for a

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[25] Leeker, Schipper and Beyes 2017, p.11
[26] Barad 2003, p.822
[27] *Ibidem*

relational understanding of the world in its becoming, negating the cartesian dualism between mind and matter and re-enforcing the notion that the world is conceived as it is experienced. What Barad's writings further lend to this chapter, is a closer inspection of the relevance of this framework with regards to questions of agency and co-performance in a posthumanist context. "Theories that focus exclusively on the materialization of 'human' bodies miss the crucial point that the very practices by which the differential boundaries of the 'human' and the 'nonhuman' are drawn are always already implicated in particular materializations."[28] What this understanding evokes with regards to performative technologies and human-machine relations is an acknowledgement of the distributed nature of identity, across different material discourses, contesting the setting of boundaries for what constitutes the human and what the technological 'other'.

With digital culture and social life developing towards an ever-greater intermingling of machine and human agency, evoking once again the notion of the 'technoetic', so do we become more and more immersed in an experience of posthumanist performativity. By staging instances of inter-performance between human and AI, often in the frame of observational experiments, new media art enables our awareness to linger on the affective processes involved in this interplay. To isolate such encounters and perform them outside of the every-day, becomes a successful strategy for temporarily overcoming the apathy we have developed towards these gradual transformations in our interactive environment. From this perspective, it is easier to grasp the link between an artistic practice and an experiment in the sense that both seem to isolate and magnify processes of interaction and transformation in order to be able first to observe them and then to make sense of them in their broader context. What is perhaps most significant in this process is that it implicates matter explicitly and that it does so by showcasing its instability, its ability to be affecting and responsive and to spill out of delineations of bodies whether they are human, non-human, machinic or virtual. These particular conditions of observation and involvement that are made possible in the frame of an experimental art practice, require an active, situated and embodied participation to a level which we do not usually afford to the more repetitive and functional inter-behaviours that frame our symbiotic existence.

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[28] Barad 2003, p.824

What I would like to explore further in light of these shifting views on performativity and agency through a posthumanist lens, is the possibility of extending this perspective towards a posthuman understanding of empathy. Definitions of empathy are often contextually and conceptually contained within a humanist frame. Can this be challenged in a similar way as Barad's notion of "agential realism" challenges the anthropocentric and individualist understanding of agency? In order to address this possibility, we would need to analyse instances where the inter-subjectivity and entanglement of human and machine agency are performed through embodied awareness and affective interaction. The notion of posthumanist empathy has already been explored to some extent, such as in the context of gaming between player and avatar, in the article 'Empathy at play: Embodying posthuman subjectivities in gaming' by Poppy Wilde and Adrienne Evans, published in 2017. The authors raise some interesting points about the experience of empathy through extensions of embodied awareness and distributed states of being. In this frame, they provide the following definition of empathy, which will be useful for the elaboration of this topic in relation to new media art practices: "empathy is more than the impulse to repeat but is a deeply felt perspective taking that produces affective reactions and extends the feeling of self."[29]

Roboticists have also been concerned with the notion of the empathic machine. Harvard University Press has recently published a book called *Living with Robots* written by Paul Dumouchel and Luisa Damiano and translated from the French by Malcolm DeBevoise, which explores the field of social robotics where robots function as social care agents by employing what the authors refer to as *artificial empathy*. Some examples of social robots include KASPAR, whose objective is to encourage interaction in autistic children and PARO, the famous robotic seal used to relieve feelings of loneliness, anxiety and depression in patients with cognitive disorders such as dementia and Alzheimer's. This field of AI has incited an interesting debate around the ethics of employing robots as care providers and also around the dynamics of the human-machine relationship. An edited excerpt of this book appears as an article entitled 'Embracing Mechanical Love' on *SLATE*[30] and holds a generally optimistic tone regarding the future of social robots emphasizing their ability to

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[29] Wilde, Evans 2017, p.10
[30] https://slate.com/technology/2018/03/the-kaspar-robot-that-aids-autistic-children-is-the-future-of-social-a-i.html (June 2018)

communicate without the usual tensions, pressures, expectations and misinterpretations present in social situations. The authors suggest that this encourages those who find social environments distressing and confusing, to access emotion and social skills by way of a safe and reassuring atmosphere.

On the other hand, an article published online by *The Spectator*, also referring to Dumouchel and Damiano's book, reacts with more suspicion to the idea of the social robot, fearing its role in promoting emotional laziness. The author, Simon Ings asks: "Assisted, cared for, and even seduced silly by machines, will we lower our expectations around concepts like 'conversation', 'care', 'companionship' and 'love'?"[31] While some of these fears appear to be justified (albeit by a slippery slope argument) as far as our current reputation as passive and irresponsible technological consumers is concerned, I find that Ings contradicts himself by establishing the value of such robots in revealing the intricacies of human behaviour and relationships but then dismissing them as non-intricate and selfless in their interactions. I would also contest his conclusion that "If we come to believe that the soul is nothing more than behaviour, then of course a robot will become just as good as a person."[32] This seems to adhere to more classical humanist ideals which are contested by the postcognitivist and posthumanist theories that this thesis elaborates on, where the equivalence of human consciousness to behaviour is understood not as reductive or limiting but as complex and enriching. With this in mind, I would not be so ready to dismiss the potential for AI to be emotionally affective and intricate as a companion. As the authors of Living with Robots argue:

> "Roboticists are beginning to abandon the mainstream (both classical and commonsensical) conception of emotions as essentially private events…The new approach to interaction between human and artificial agents sees emotion as 'interindividual'…the immediate result of a mechanism of affective coordination that allows partners to an interaction to align their dispositions to act."[33]

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[31] https://www.spectator.co.uk/2018/02/what-will-it-mean-for-mankind-when-robots-start-caring-for-us/
(June 2018)
[32] *Ibidem*
[33] Dumouchel, Damiano 2017, p.xi (Preface to the English Edition)

I would suggest that the ability of new media art to create an immersive and embodied experience, specifically with regards to interactions between humans and artificial intelligence, makes it a valuable site for exploring the notion of posthuman empathy. The study of performativity in a technoetic present is a perspective from which to consider and challenge the humanist paradigm for being in the world and to move towards a postanthropocentric recognition of our hybrid and entangled nature. This is perhaps the essence of what this thesis argues for, the deconstructive potential of techno-saturated art in its encounter with the humanist self. The introduction of Artificial Intelligence into this dynamic, where technology is able to perform to a more and more reflective and relative extent, has an even greater impact on the way we relate to our nature and culture. Through the perceptive mechanisms of art reception and the emergent focus on performativity and materiality, we can be stimulated to encounter the self in the technological other and to engage with AI by way of intra-action. If empathy is understood as an extension of the feeling of the self onto the other, in an affective interaction, then posthumanist empathy becomes a significant aspect of our engagement with Artificial Intelligence.

There is an important opportunity here to also contest the mainstream definition of the posthuman, triggered by the rise of AI, which usually resides either in a dystopian view of a technological take-over or in an idealistic view of human enhancement through technology. Such discussions project into the future in disjunction with the present moment, speculating through insecurity and uncertainty and are understandably often met with suspicion, anxiety and resistance. On the contrary, as feminist theorist and philosopher Rosi Braidotti states in discussing postanthropocentrism, "The posthuman dimension of postanthropocentrism can consequently be seen as a deconstructive move…What comes to the fore instead is a nature-culture continuum in the very embodied structure of the extended self."[34] This is a good point from which to refer back to Joi Ito's idea of looking at AI not as a crystal ball but as a mirror[35] and to note how this requires us to accept a position of responsibility as a species with regards to the past, present and future of both nature and technology. From this perspective, the way in which we engage with Artificial Intelligence becomes formative of our technoetic present and so to recognize the performative and affective processes that frame

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[34] Braidotti 2013, p.191
[35] Mentioned in Introduction, p.4

this engagement can be empowering and transformative both on a personal level but also in a broader, collective sense.

The rest of this chapter will focus on the encounter with a posthumanist performativity in new media art by discussing two very distinct case studies, that nonetheless take up common ground with regards to the coming together of human and machine vision. By making use of the performative platform of film and interactive installation respectively, both cases invite AI into a role that is unexpected and provocative in its confrontation with the humanist anxieties and reservations that are responsible for attempting to resist the influence of AI in certain areas of human experience. What will emerge is a contestation of the presumed 'purity' of human creativity and human affection and a proposal to embrace machine intelligence as an affective agent and counterpart to the human both in its individual and in its collective sense. Rather than removing from the intricacy of our cultural development and of our emotional relationships, the encounter with AI in creative and intimate areas of human experience will be revealed as inspiring and liberating and as evocative of a more expansive and perceptive posthumanist existence.

2.2   Meet me halfway: AI as deconstructive co-performer in Oscar Sharp and Ross Goodwin's *Sunspring*.

In part two of this chapter, I will be using the short film *Sunspring* by Oscar Sharp and Ross Goodwin as a case study to explore the deconstructive potential of AI in the role of screenwriter and how this contributes to establishing the nature-culture continuum that frames posthumanist performativity and enables posthumanist empathy. Sharp and Goodwin's science fiction short, *Sunspring*, realized in 2016, has received considerable attention in the media and in the fields of tech-art and film, for being the first screenplay to be written by an artificial intelligence. Most of the reactions to this venture centre around the fact that AI is now able to undertake creative and imaginative tasks that were thought to still be 'safe' from a technological take-over. I would argue that rather than expressing a premonition about the future of film-making, what *Sunspring* demonstrates most successfully

is the performed inter-subjectivity of humans and AI. A mostly nonsensical script somehow finds coherence via an embodied interpretation by the actors and a subsequent meta-interpretation by the audience that is heavily reliant on recognizing and relating to cultural behaviours and emotional states. In the following paragraphs, I will reflect on the presence of AI in the process of film-making and will aim to identify the potential to engage with AI in a way that not only challenges the humanist approach to intelligent technologies but also acts as a reflection in which we encounter the self in the plurality of its becoming.

Sunspring is a collaborative project between filmmaker Oscar Sharp and NYU AI researcher, Ross Goodwin. Goodwin wrote the code for the Artificial Intelligence, self-proclaimed Benjamin, that generated the entire script for the short sci-fi film, including stage directions and soundtrack. *Sunspring* was originally conceived for the 48hr Film Challenge of the film festival Sci-Fi-London where it participated with unexpected success and was later published online by Ars Technica.[36] I would like to first briefly explain how the AI was able to generate a sci-fi film script, as it is important in order to make sense of how the actors and the audience are able to relate to it, and to point to the unique ability of AI to deconstruct our cultural trends. Benjamin is a recurrent neural network of the type that is usually used in text recognition. The network was trained by being fed with a large corpus of sci-fi scripts mostly from the 80s and 90s that the creators could access online, largely consisting of classics such as Star Trek and X-Files. By studying the textual patterns, Benjamin taught itself to mimic the language of sci-fi film and was able to generate a new script that consequently reflects the trends it came to recognise in this genre. The screenplay, which can be found on the website of Oscar Sharp's films[37], is an amalgamation of sentences in a mostly nonsensical sequence that is nonetheless surprisingly imbued with pathos and intensity. This is where it starts to become interesting, as we find ourselves trying to come to terms with Benjamin's vision and to make it coherent while it remains linguistically ambiguous and undetermined. Is it precisely this ambiguity that allows us to respond to it in a meaningful way and if so how do we come to reconstruct this ambiguous space? Who or what, in fact, are we meeting at the halfway point of this interaction?

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[36] https://arstechnica.com/gaming/2016/06/an-ai-wrote-this-movie-and-its-strangely-moving/ (June 2018)
[37] http://www.thereforefilms.com/sunspring.html (June 2018)

The first instance of intermingled agency that occurs in this co-performance is between the AI, the director and the actors who are required to performatively embody the characters as they appear in the screenplay. In order to do so, in order to envision the environment in which they are present, to position themselves spatially amongst each other and to be able to physically interact they had to interpret the script so that it would form at least a loose narrative. In other words, they had to frame the absurdity with a reality that hosts human relations and human temperament, such that we can relate to it in our performative, social being. Just this process of projecting human experience onto the canvas that is opened up by the ambiguity of the language, I believe is enlightening with regards to the diverse subjectivities by which we relate to the self, to each other and to the constructs of human culture. In order for the characters to adopt a sense of agency, all these other aspects of their context and their physical surroundings need to materialize so that they can be identified within the interaction. What the artificial intelligence contributes to this creative experience is contrary to what a human writer would in its place, in the sense that rather than constructing a narrative that would guide the characters in their emotions, desires and behaviour, it effectively breaks down and randomizes the integrity of the narrative so that the process of making it discernible becomes active rather than passive. This demonstrates how, in a setting of posthumanist performativity, matter comes to matter and how the human is literally constructed through an interplay of diverse materializations.

Fig.3 *still from the sci-fi short, Sunspring*

The script of *Sunspring* was interpreted therefore, in the context of a love triangle between two men and a woman as they go through an existential and emotional crisis while navigating a futuristic, inter-dimensional environment. Unsurprisingly, this sounds like a very probable baseline for a sci-fi film plot, especially one that would have been present in the corpus that Benjamin was trained on. It is not so mysterious why in response to the AI writing "because you were so pretty", we would imagine the presence of a woman and of a romantic relation or why this would take the form of a love triangle when combined with two male characters exchanging expressions of insecurity and confrontation. What is intriguing however is that this reveals how automatically we are guided into recognizing cultural symbolisms in order to construct our reality and also how this cultural matter is constantly re-affirmed and recycled even in the fictional setting of, for example, cinema. I am reminded at this point, of a moment from Sophie Fienne's documentary, *The Pervert's Guide to Cinema*, in which Slovenian philosopher and psychoanalyst Slavoj Žižek comments on a scene from The Matrix. When Neo is offered the choice between maintaining his reality or indulging the fictions of the matrix, by form of taking the blue or the red pill, Žižek states: "But the choice between the blue and the red pill is not really a choice between illusion and reality. Of course, the matrix is a machine for fictions, but these are fictions which already structure our reality. If you take away from our reality the symbolic fictions that regulate it, you lose reality itself."[38] He then suggests that he would rather take the third pill, one that would "enable me to perceive not the reality behind the illusion but the reality in illusion itself."[39] Perhaps the way that we engage with AI in *Sunspring*, through this creative role of screenwriter, acts in a similar way as Žižek's third pill would and in doing so it also reframes our understanding of the humanist self, revealing it as illusory.

I have been focusing so far on how the encounter with AI in the process of making *Sunspring* requires us to confront the structures, fictions and symbolisms that form our sense of reality. I would suggest that this is the core of what makes *Sunspring* a valuable instance of inter-performance between human and AI, enabling both the human co-creators and the audience to then explore this performative space which is opened up and identify with the materializations of emotional interaction. I previously refered to the audience's

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[38] Žižek 2006
[39] *Ibidem*

interpretation of *Sunspring* as a meta-interpretation since it is already mediated by the performative realization of the script by the actors. The way that this mediation breaks with the language of the plot in certain instances serves to highlight not only the performative nature of our interactive and emotional reality but also how this performativity concerns the translation of symbolic matter through physical matter and vice versa. When for example, H2 voices the words "I know that it's a consequence. Whatever you want to know about the presence of the story, I'm a little bit of a boy on the floor," she gently places her hand to stroke C's arm, while she turns to look and smile at him. Suddenly the words are irrelevant and the scene makes perfect sense because of our ability to respond to gestures or material interactions as carriers of agency. While this is a process that we are exposed to constantly and especially in the performing arts, it is made blatantly obvious in this setting due to the necessity to appropriate the language to the familiar systems of human communication.

In a sense, *Sunspring* re-affirms our existence within a humanist frame and reveals the AI as lacking the conditioning to appropriate language and matter to the constructs of our reality. The script it comes up with resides in the breakdown of communication and a constant seeking to understand, expressed even through the dialogue between the characters. Sharp and Goodwin noticed this recurring pattern of doubt and uncertainty in the AI generated script, often repeating phrases like "I don't know", "what do you mean" and "I'm not sure". For Sharp, this pointed towards the general pattern in science fiction films of characters exploring their environment and using language to communicate its foreign structure and their insecurity within it. When Sharp then went on to write his own sci-fi screenplay, he became aware that his process was influenced and enlightened by the experience of working with the AI and that he was able to more consciously work with the dynamics within the language of science fiction for communicating a certain atmosphere. Speaking about this in an interview for Ars Technica, he eventually states the following with regards to Benjamin's influence: "Every time I use his tropes I think, oh of course. This is what sci-fi is about."[40]

Instances such as this and collaborative works such as *Sunspring*, open up an interesting discussion about the creative applications of AI and suggest that there is promise

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[40] https://arstechnica.com/gaming/2016/06/an-ai-wrote-this-movie-and-its-strangely-moving/

in a future of encounters between human and machine intelligence. Contrary to much of the current mainstream debate and preconceptions about the fate of human culture and emotional intelligence in light of the rise of machine intelligence, this performative engagement with the creative functions of AI, reveals a coming together towards an intricate and perceptive posthumanist future. I would suggest that what emerges from the intersection between human and machine vision, in this case, echoes what Rosi Braidotti has identified in the work of Donna Haraway and Giles Deleuze as a "serious neo-foundational materialism on the one hand and a rigorous theory of relationality on the other."[41] To consider how this then comes to influence our 'humanity' and our empathic co-existence, the following statement by Braidotti with regard to Haraway's work is also useful: "As a hybrid, or body-machine, the cyborg, or the companion species, is a connection-making entity; a figure of interrelationality, receptivity and global communication that deliberately blurs categorical distinctions (human/machine; nature/culture; male/female; oedipal/non-oedipal)."[42]

Couldn't we argue, at this point, that the 'me' that we are meeting halfway in the creative intermingling of human and AI, as demonstrated by *Sunsrping*, is the posthumanist self, a self that is perceptive of its own ambiguity and open-endedness? Perhaps it is in coming to terms with this, in facing our own illusory nature and culture, that we are able to experience a more developed sense of connection to the world that is based in more intricate empathic relations. Posthumanist empathy could then emerge as the ability to extend the feeling of self to the other on a much more expansive level which is not dependent on the compliance to a certain cultural code or system. I don't think it would be idealist therefore, to conclude that the encounter with AI in the role of deconstructive agent with regard to the reflection of human culture, can be destructive for many of our discriminatory behaviours. Meanwhile, we are witnessing the application of AI in functions that reinforce the discriminations within our culture and strengthen the foundations of our sociocultural constructs, as in some of the examples mentioned in the introduction to this thesis.[43] This is why I am proposing that the platform of new media art is able to reframe our engagement with artificial intelligence in valuable and necessary ways. As the case of *Sunspring* reveals, the use of AI within a creative, immersive and performative platform

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[41] Braidotti 2006, p.200
[42] Braidotti 2006, p.200
[43] See p.3-4

reveals that whatever form 'otherness' takes, it is never separable from the self and to acknowledge this, to relate to this, promotes an attitude of inclusivity as the only preservation of humanity.

2.3   Affective encounters with the machine in Driessens & Verstappen's *Tickle Salon*

Driessens & Verstappen's work *Tickle Salon*, takes a particularly tactile and sensual approach to the affective interaction between human and machine. The artist duo uses the human body as a site of mutual exploration for human and robot, experimenting with materiality and touch to reveal the affective mechanisms of posthumanist performativity. *Tickle Salon* reveals matter to be, as Barad has suggested, "a congealing of agency"[44] and plays with the idea of the robot as a care-giving and affectionate companion to the human. This instance of human-machine interaction explores the transforming dynamics in a pleasure inducing experience, when the human body is affected by the robotic body of an artificial intelligence, rather than a human counterpart. I will use the rest of this final section of chapter two to reflect on the posthumanist performative engagement with AI in Driessens & Verstappen's *Tickle Salon*, focusing on how it emerges through the concurrence of human and machine imagination and how it proposes an alternative setting for exploring the posthuman, free from the sociocultural predisposition to the dynamics of human to human affection.

Driessens & Verstappen take a truly experimental approach to their practice with automated and intelligent technologies and *Tickle Salon* emerged in 2002, following a series of different artistic experiments with robotic devices for caressing the body. The artists expressed an interest in exploring how unpredictability and variety of movement affects the pleasure inducing experience of being tickled and with *Tickle Salon* they aimed to develop a system capable of teasing and surprising its human counterpart. Consequently, they designed a tickling device, made of a metallic ball covered in tassels that is controlled by an intricate mechanism, navigating the body by detecting the loss of pressure upon touch and gathering

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[44] Barad 2003, p.822

the information as it explores, gradually building a digital map of the surface that it encounters. The more information it collects, the more accurately it is able to predict its collisions with the body, allowing it to perform more confidently and decisively and with a greater transmission of agency.
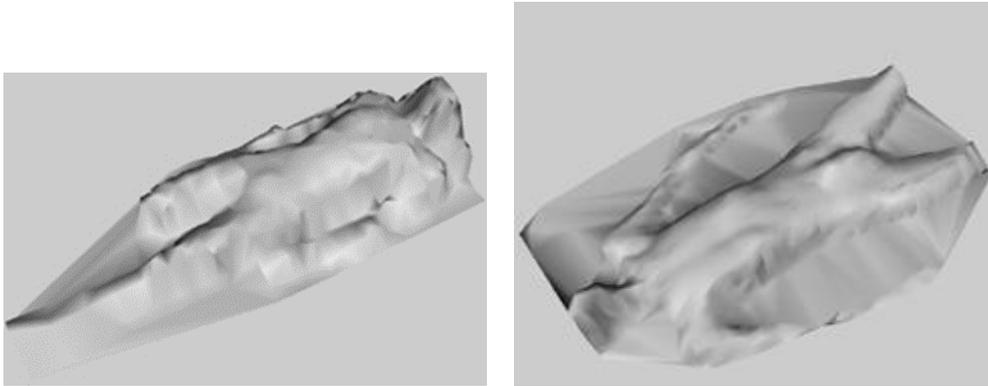

Fig. 4 *digital maps of the human body as imagined by the AI device in Tickle Salon*

What makes this performance installation unique in its involvement with AI is that it is played out within the frame of the intimacy of the caress in human experience. It takes this as a point of departure from which to explore the translation and transformation of affection in its materialized forms and to attempt to extend it beyond the conditions of a humanist empathy. I find that this makes *Tickle Salon* an interesting case to consider with regards to the debate around social robotics and the role that AI can play as a provider of care and rehabilitation. What is prevalent in both these manifestations of posthumanist performativity is precisely the inter-subjectivity of emotion and agency via a "neo-foundational materialism".[45] Having already elaborated on the broader, deconstructive and transformative confrontation between AI and human culture in the previous section, I would like to take this opportunity to employ a more microscopic lens on this work by Driessens & Verstappen and identify the implications of an inclusive approach to AI in this specific intimate and sensitive encounter. In doing so, I will focus on the instance of materialized stimulation and communication between the human and the robotic bodies and discuss the potential of this new dynamic frame for affective interaction to expand our permeability to emotional and pleasurable states.

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[45] Braidotti 2006, p.200

The Dutch artist duo have repeatedly shown an interest in exploring human responses to the unpredictability of sensory experiences that are not defined by an entirely human subjectivity. Their first attempt at an automated device for skin caress, which they named *Spear*, consisted of a robotic structure that imitated the random movement of grass as it is moved by the wind to gently brush against the skin. For *Tickle Salon*, they located their motivation in their own proclaimed tickle fetish and the frustration they encountered when it was left unsatisfied due to it being dependent on a human agent with exhaustible energy, patience and curiosity. Verstappen described this feeling as follows: "You don't want to ask another person to do something that he doesn't like, that's only for your pleasure, so that made us think of building a robot to tickle us."[46] I would suggest that while this appears to have been the source of the idea, the creative process that ensued to envision and build the installation and the subsequent performative interactions that it hosted, revealed a more intricate, inter-referential relationship with the machine that cannot reduce its role to that of a servant to human desire. What this points to, as in the other case studies I have included in this thesis for the encounter with AI in the embodied and performative setting of new media art, is that substance emerges not through a pre-determined concept but through a performative becoming.

At this point, I would like to expand on the materiality of this performance installation and how it is visualized in order to identify the "material discursive phenomena"[47], to use Barad's term, by which the participants to this experience are affected. The human subject of the performance strips down to their underwear and lies on a white mattress, in a room whose aesthetic seems deliberately minimalist, clean and functional. It is reminiscent of a medical or scientific facility, which I believe immediately positions the audience and the participant to

Fig.5 *Installation of Tickle Salon*

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[46] Anderson 2003
[47] Barad 2003, p.822

react to this space as one for experimentation and for engaging with matter in an observational and unbiased manner. This points simultaneously to the artists' own approach to the practice of art and to the general encounter with new processes of observation that have emerged in the field of new media art. In this specific installation, it is also a particularly effective aesthetic for translating the suggested uncluttering of symbolic and cultural appropriations in the AI's vision, at once making emotions more directly accessible and also causing us to become aware of the complex inter-dependencies and conditions by which we would otherwise relate and communicate. By positioning the human subject at the centre of this installation, to lay on the examination bed and be felt and explored by the artificial intelligence, the artists guide the audience's perspective to recognize that "in the domain of artificial intelligence we are no less experimental subjects than the machines we study."[48]

I find it useful at this point to refer back to the case of KASPAR, the social robot whose purpose is to interact with autistic children and consider the suggestion that the AI's externality to the human social dynamics opens up the pathways to communication and affect that are otherwise hindered by anxiety and social pressure. Could AI function in a similar way as a stand in for the human counterpart in the intimate bodily interaction of tickle or caress? These more instinctive psychosomatic responses to intimacy are also often privatized and kept separate from social situations, which relates to our anxiety of being vulnerable and uninhibited among the judgment of others. The intimate relationship that allows the physical and the emotional to coincide is one that necessitates trust. This could be one of the reasons why Driessens & Verstappen chose to make this the subject of a public performance and why they invite the audience to interact with their devices and to submit themselves to an unpredictable experience where they will confront their vulnerability. The participants are then prompted to navigate their encounter with these instances of exposure, of uninhibited behaviour, of trust and of sensual experience within a space of mutual exploration not only between human and machine but also between the private and the public.

Beside the bed on which the human subject lies, stands a screen in which the audience can observe the digital mapping of the body by the artificial intelligence as it

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[48] Dumouchel, Damiano 2017, p.xi (Preface to the English Edition)

develops during the performance. The juxtaposition of the digital body map with the physical human body, allows the observer to perceive them both simultaneously, aligning all three subjectivities of human, other and machine. The human subject, in the position of observer and observed encounters an interchanging sense of empowerment and vulnerability. In terms of social dynamics, the observer will feel empowered by his position to experience this sensual interaction from an outsider's point of view that does not directly implicate the intimate sensitivities of his own body. On the other hand, the observed will feel vulnerable for publicly exposing his body to the scrutiny of the other and to the unexpected pleasures of the machine's caress. In terms of the more privatized state of sensual interaction however, the subject whose sensitivities are exposed to the affection of the machine will be empowered by the experience of pleasure and the observer will find himself in a position of vulnerability pertaining to a feeling of longing to experience that pleasure.

The way the piece has been designed to receive the above subjectivities, reveals that we access emotions on different dimensions that are always relative to the sociocultural relations we hold with our partners in an interaction. What I find interesting is that the presence of the artificial intelligence, in the embodied form of the tickle robot, is able to bring these separate dimensions of the public and the private to intermingle. The promise of a purely sensual experience that carries no expectations for certain behaviour and no social determinisms, lures the subject into this sharing of intimate space. This is performed towards a mutual exploration of the self in confrontation with its inhibitions and in a quest for a greater release into sensory augmentation and unconditional affection. In this sense, the AI robot in this performance acquires the function of locating and projecting our desires in intimate interactions back onto ourselves. I would suggest that in doing so, particularly in the context of a public setting, it also evokes a greater capacity for empathic communication. This manifests not only between the human and the robot but also between the individual and the collective, through the exposure to another's vulnerability as the reflection of one's own and a coming to terms with the pressures and inhibitions of human social interaction. This perhaps points to a posthumanist empathy that will seek to overcome the internalization of pleasure and desire by overcoming the fear that it will be met with a lack of empathy in the public eye. One again the way that the AI transgresses the boundaries of social rules and symbolisms, evokes a sense of greater connection to the self and the collective of humanity.

What *Tickle Salon* proposes, in the various subjectivities that it engages and in employing AI in a role that is usually imbued with specific sociocultural expectations and pointers for behaviour, is the posthumanist setting of entangled human and machine agency as one that more freely assimilates trust and releases inhibitions. It allows us to engage with AI in a way that rather than expect it to mimic and replace the human, embraces its very incapacity to do so. This view opens up the dialogue for the inclusion of AI into the fields of social and personal care, for the augmentation of human communication and a more intricate existence in a posthumanist becoming. Ultimately, this resonates with the idea of promoting an inclusive attitude to AI, that I suggested at the end of the previous section in response to *Sunspring*. Contrary to popular belief, in blocking the application of AI in these domains, we are potentially also blocking the potential to overcome certain instances and states of alienation within our culture and society and thus hindering rather than maintaining our social evolution.

> "Sunch technologies are not somehow *bound* to create a state of alienation. To the contrary, introducing more and different artificial agents into our world is just as likely, maybe even more likely, to create stronger and more lasting social bonds."[49]

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[49] Dumouchel, Damiano 2017, p.xi (Preface to the English Edition)

Conclusion

In posing the question of the reframing of our engagement with artificial intelligence through the medium of new media art, this thesis suggests that there is a necessity to explore and expand our grasp on the dynamics of our symbiotic relationship with AI. This necessity is located in the fact that much of the mainstream discussion around the future of AI and the ethics of its employment, does not accurately reflect its role as a mirror to humanity and to the humanist self. We appear much too eager to grant AI an autonomy and an independence that this thesis has suggested to be illusory, even as we encounter it in ourselves. Rather than enabling a teleological approach to the human-machine relationship, this thesis proposes to linger in the moments of encounter between human and AI and to perceive the humanity within it and in extension, the otherness within ourselves. It is this ability to persist on and to magnify materialized and performed moments of interaction and to stimulate a relational identification, pertaining to our embodied experience of the world that has revealed the platform of new media to be a provocative setting for encountering artificial intelligence.

By intersecting the unique implications of physical and symbolic matter within the diverse disciplines of art, philosophy, science and technology, this thesis has aimed to approach the experience of new media art from a broad perspective and with an analytical understanding of its particular, affective mechanisms. It has been important to begin by providing an insight into the evolution of the term embodiment in cognitive science and in the subsequent study of postcogntivism and to establish how this has caused a transformative rift with the cartesian dualist understanding of human consciousness. The emergence of embodied cognition was a necessary departure point from which to begin to open up the self from the inside out, both in its relation to the experience of art as in its engagement with artificial intelligence. Both Simon Penny's book *Making Sense: Cognition, Computing, Art and Embodiment* and Roy Ascott's *Reframing Consciousness: Art, Mind and Technology* have been influential in providing the interdisciplinary context and setting the tone for this thesis to take off from a posthumanist understanding of embodiment. The subsequent encounter with Hubert Dreyfus' What Computers Still Can't Do allowed me to more clearly position the influence of computation with regards to the rise of postcognitivism

and the emergence of an ongoing becoming in and of the world. It is in relation to this that this research has turned its focus to what computers Can do as interactive agents in the world and proposed the platform of new media art as a dynamic, transformative platform for experimenting with a posthumanist becoming alongside AI. The analysis of Guy Ben-Ary's *cellF*, as an instance of encounter with artificial life in the frame of hybrid cognitive art, concluded chapter one with an emergence of the plurality of the self and the potential of its technological distributions.

Through the lens of embodied awareness, the affective encounter with artificial intelligence in new media art emerged from a radical re-engagement with matter and relationality through the setting of a posthumanist performativity. Karen Barad's writings on this topic and her theory of "agential realism" were useful to the second half of this thesis for encouraging the employment of an even more analytical and focused approach to this intra-active space of co-performance between human and AI. Consequently, chapter two took a more microscopic view of the instances of entanglement between human and machine agency and used the perspective of performativity to encounter within them notions of posthumanist agency and posthumanist empathy. This was located in the encounter with matter in all its affective forms, whether it be technological, biological, cultural or digital and the resulting confrontation with the symbolic constructs of our existence and the illusion in our reality. AI was revealed in its power of a deconstructive agent in the face of this illusion, due to its ability to be at once analytical, generative and unbiased as demonstrated by its creative applications as screenwriter in Sharp and Goodwin's *Sunspring* and as affectionate machine in Driessen's & Verstappen's *Tickle Robots*.

This thesis has therefore navigated the creative and performative encounter with Artificial Intelligence through the platform of new media art and has aimed to reveal how and why this becomes a transformative space with regards to human engagement with intelligent technologies. In extension, it has evoked the transformation of the practice and experience of art itself and revealed the benefit of applying an interdisciplinary approach to the field of contemporary art. From the outset, this research intended to deconstruct the humanist worldview in its relation to the field of Artificial Intelligence and to explore the instances in art where AI is used to encounter a posthumanist self and a posthumanist humanity. In order to realize this intention, I have attempted to encourage the reader as I have encouraged

myself to gradually allow the boundaries separating mind and body, self and other, human and machine and reality and illusion to become transparent and permeable. By revealing layer after layer of the embodied experience of being and becoming, through the exploration of the inter-subjective space of art, this thesis aspired to problematize attitudes of exclusion and discrimination towards AI that are based on its assumed non-humanity, frigidity and malicious intent. What it argues for instead, is to embrace AI with an inclusive attitude and to shift our attention towards a defining moment in the overlap of human and machine imagination that opens up the experience of the world to a promising reconfiguration.

List of Illustrations

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(Summary diagram of 'cellF' from the artist's website), [image online]:

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(*cellF playing with Lucas Abela at Ars Electronica*), [image online]:

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Fig.3 Oscar Sharp, Ross Goodwin, *Sunspring*, 2016, short film

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Fig.5 Driessens & Verstappen, *Tickle Salon*, 2002, multi-media performance installation
(*Installation of Tickle Salon)* [image online]:

https://notnot.home.xs4all.nl/ticklerobots/TickleSalon/TickleSalon.html

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