



University of Dundee

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Lushetich, Natasha

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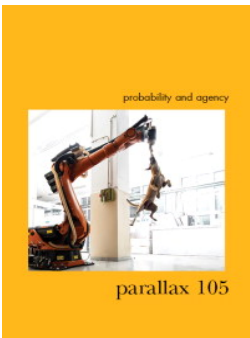
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Posthuman Agency as Influenced Intra-Action

Natasha Lushetich

Introduction

In a well-known 1994 book whose main thesis is succinctly summed up in the title *What Computers Still Can't Do*, Hubert Dreyfus turns to Pierre Bourdieu's notion of sedimentation to explain the impossibility of disembodied reason and disembodied agency, seen as cohesive action over time. Bourdieu writes: 'The active presence of past experiences [...] deposited in each organism in the form of schemes of perception, thought, and action, guarantees the 'correctness' of practices and their constancy over time, more reliably than all formal rules and explicit norms'.¹ A little less than three decades later, we know that artificial intelligence (AI) can and does indeed learn from 'experience', just as embodied organisms do.² The reason why Dreyfus and Bourdieu's analyses remain relevant, however, is that they link repetition, the sedimentation of events and actions – be they organic or machinic – to persistence over time, cohesion, and agency. Neither author was explicitly concerned with posthuman agency. Both however address processes that produce posthuman agency.

In a similarly non-specieist vein, in *An Inquiry into Modes of Existence*, Bruno Latour uses the term 'modes of existence' to refer to plants, animals, 'inanimate' objects, technologies, and human institutions such as law, politics and science, all of which, he argues, have their 'felicity/infelicity conditions' and 'types of beings to institute'.³ Science and law, for example, have different types of felicity and infelicity conditions; resultingly, they manifest agency – understood as self-reproduction over time – differently from mountains, which, too, 'make their way', in order to 'maintain [themselves] in existence'.⁴ In addition to such ontologically flattening views, which include disciplines as well as heterogeneous existents there is also an increasing number of everyday examples of posthuman agency. In 2010, two robots – Apollo Cluster and Daria XR-1029 – became partners in a law firm called Robot, Robot & Hwang. Many labs, such as the More-Than-Human Lab, routinely research the life of animals with the aid of multi-species ethnography.⁵ 'Hybrid matters' such as 'plastiglomerates' – the fusion of rocks and plastic – have, in recent years, been extensively studied, too.⁶ But perhaps the most exhilarating example is that of Wangahui River in Aotearoa, New Zealand. After 140 years of legal battle to recognise the river as a person – as the local Māori, who view the river as an ancestor, do – the river was finally granted

the legal status of a person in 2017, and crimes against the river can now legally be addressed as crimes against the Māori.

The question I wish to address in this article is how we can *feel our way into* the qualitative variety of actants and agentic processes, particularly those that are remote and/or imperceptible, in addition to understanding them intellectually and anecdotally. In other words, what is our posthuman horizon of expectations? I use the term ‘posthuman’ not so much in the sense of ‘humans who are, in this day and age, always already posthuman’ but in the sense of humans whose phenomenological (or sense of) agency and social agency are palpably interrelated with other-than-human agentic processes. It is true that the future has, to an extent, been colonised by forecasting.⁷ However, forecasting is not the only relationship to the future. Anticipation and feeling-imagining are future-orientated modes of thinking, too, that are essentially qualitative and impredictive. For example, we can say that biological systems are impredictive because their various forms of autopoiesis can never be ‘completely captured by any algorithmic (i.e. mechanistic) model’.⁸ In organic – and increasingly, in inorganic processes, such as unsupervised machine learning – impredictivity describes a mode of thinking the future very different from ‘the calculated human [or algorithmic] creation involving “plans plus time”’.⁹ This mode of thinking harbours unknowable potential.¹⁰

Feeling our way into complexly agentic futures involves an understanding of multi-species relational dynamics. The traditional separation of humans from the rest of the (animate or inanimate) world has, for centuries, been based on the uniqueness of human consciousness. However, as is well known, consciousness consists of the hazy and the clear horizon of consciousness.¹¹ The hazy horizon, present in humans as well as in animals, emerges from interoceptive modes of perception, those that don’t have external (exteroceptive) sense organs, such as eyes or ears, but refer to diffuse processes such as blood circulation, the working of the limbic system, and homeostasis more generally.¹² In recent years, interoception has also been increasingly used to describe machinic processes.¹³ The main premise here is that adaptive iterative and recursive behaviour, in/with which organic and inorganic entities adapt to and/or assimilate stimuli from their environment, is a form of autopoiesis¹⁴ that forms part of the entities’ relational architectures and dynamics.

To broach the horizon of expectation such as the one that, in human lives, is based on assimilated experiences and/or embodied knowledges of/about what is likely and what is probable, only including heterogeneous agential processes, I will look at three ‘strange objects’, a phrase coined by Andrew Pickering to describe the epistemic function of cross-disciplinary art-science experiments that reveal the less manifest cross-species intra-actions.¹⁵ After a brief explanation of human, phenomenological (or sense of) agency and social agency and ‘influenced intra-action’ – an expression I use to feel my way into multi-species agency – I will focus on prosthetic augmentation,

transgenics, and trans-species learning cycles, as they appear in the work of Stelarc, Eduardo Kac, and Maja Smrekar, in order to discuss three distinct but culturally equally proximate modalities of posthuman agency and their agentic processes.

Human (Phenomenological and Social) Agency

Phenomenologically speaking, human agency is the sensorially experienced responsibility over voluntary actions and their effects.¹⁶ This experience can be predictive – we press a light switch when we want a light to come on – or it can be postdictive – we infer agency from the fact that the pile of papers we have just swept off our desk is now lying on the floor. Predictive and postdictive agency are ways to identify our individual actions in the world. They are also ways to structure the difference between the possible and the probable as well as the foundation of legal responsibility, and crucially important to human health: clinical disorders such as depression and schizophrenia are narrowly related to abnormalities in the felt sense of agency – deficient agency in the case depression, misattributed agency in the case of schizophrenia.¹⁷

Social agency, by contrast, is a layered phenomenon with no clear cause-effect continuum. It involves the pre-reflective – or hazy – feeling of agency, based on sensorimotor processes that cannot be articulated in simple causal terms.¹⁸ It also involves judgment of agency, which includes reflective processes based on belief-like propositions of groups and individuals, and evaluative agency, which compares what can be done to what should be done in a given situation bringing established sociocultural norms into play. As inherited forms of behaviour are both preserved and modified, in the social realm, agency is essentially ‘influenced interaction’¹⁹ or, to put it differently, a ‘socioculturally mediated capacity to act’.²⁰ This is because acting is always predicated on past events and enabling conditions, which are in turn predicated on actions of countless groups and individuals, as well as on cultural sedimentations, that, like the above-mentioned agency of a particular formation or discipline, such as law or science, exercise diffuse, cross-temporal working.

In social theory, the word ‘interaction’ implies that entities (individuals or groups) pre-exist interaction while ‘influenced’ refers to iterative processes rather than to a single point of origin.²¹ The term I will use here, ‘influenced intra-action’, is indebted to Karen Barad’s interpretation of interaction, which combines different species, processes as well as different disciplinary agencies. Intra-action is ‘the mutual constitution of entangled agencies’,²² that, in contrast to ‘interaction’ – which assumes the existence of separate individual agencies – ‘recognizes that distinct agencies do not precede, but rather emerge through their intra-action’.²³ The agencies we perceive as distinct and belonging to specific things or beings are ‘distinct only in a relational sense’ as ‘relations do not follow relata, but the other way around’.²⁴ Given

that the individuality of all things and beings is carved out of ‘ontological (and semantic) indeterminacy’, intra-actions have an inscriptive effect in the sense that in producing multi-species relationality, they also produce the (post)human.²⁵

The Human as an Interface?

Stelarc’s work has often been seen as transhumanist.²⁶ This is not surprising, given that he considers the human body as obsolete, and treats it as a structure. As an artist, Stelarc is best known for projects such as the 1980–1999 *Third Hand*, a steel hand activated by electrical signals from his abdominal and leg muscles, and the 1996 *Ear on Arm*, a surgically-constructed, stem-cell-grown ear, the plan for which was – and still is – to become an internet-enabled, remote listening device for people on the other side of the globe.²⁷ The difference between Stelarc’s work and transhumanism is similar to the difference between posthumanism and transhumanism. While the horizon of transhumanism is essentially inorganic immortality – that is, the overcoming of human physical, temporal, cognitive, and political limitations with the aid of technology²⁸ (where technology is often seen as external to human beings), posthumanism is essentially about the integration, and joint or mutual reconfiguration of humans and other-than-humans.²⁹

Stelarc’s 2016 *Re-Wired/Re-Mixed: Event for Dismembered Body*, first presented at the ‘Radical Ecologies’ exhibition, PICA, Australia, is an example of this relation. *Re-Wired/Re-Mixed* was a five-day internet-enabled performance for, in Stelarc’s words, the ‘distributed, de-synchronized, and involuntary body’.³⁰ In the performance, a heads-up display (HUD) enabled Stelarc to ‘see’ with the eyes of someone physically located in London, and ‘hear’ with the ears of someone physically located in New York.³¹ Similarly, Stelarc’s body was augmented by an 8-degrees-of-freedom-of-movement exoskeleton. His right arm could be moved by anyone anywhere in the world with access to the online interface. In other words, Stelarc’s physical body was electronically dismembered and spatially distributed.

At first sight, we may think that that this work is about linear extension, distance, and remote manipulation. A more granular view will reveal that Stelarc’s movements and sensations were both constrained and enabled, which reflects the social field of enabling constraints³² that condition cycles of influenced intra-action and transindividuation. Constrained because Stelarc’s right arm was moved only by impulses external to the entity called Stelarc, echoing his 1999 work *Exoskeleton* in which he encased himself in a ‘jerky and powerful 600-kg machine’, powered by an external air compressor and eighteen pneumatic actuators that enabled the exoskeleton to move forward, backwards and sideways, but disabled all other bodily movements with the exception of his fingers, that, clad in gloves and equipped with magnetic sensors, cued the choreography and soundscape of the 600-kg machinery.³³ It is enabling not only because in *Rewired*, Stelarc could sensorially participate

(see and hear) in the actual public and domestic scenes unfolding in London and New York in real time, but also because of the entanglement of spatial, temporal, and technological agencies through the individual and social body, which are also bodies of knowledge.

Despite the fact that the physical body has been both the focus and the locus of critical reflection in performance art since its beginnings, what *Rewired* shows are forms of transindividuation that visibly include social generativity (or influenced intra-action).³⁴ For example, the viewers/interactants' reaction to previous interactants' manipulations of Stelarc's arm, which the interface visibly showed, and machinic generativity, as a process of recursive change. For Gilbert Simondon – perhaps the first posthumanist – individuation is essentially autopoiesis, as all existents, animate and inanimate, undergo individuation in a way similar to the way crystal undergoes the process of crystallisation.³⁵ Unlike crystals however, human-technical individuation is transindividuation not only because it is not exhausted in an x number of iterations, locales, or times, but because it mutates all the time,³⁶ a feature particularly relevant in the context of tertiary retentions.³⁷

While primary retention is the perception of present objects, and secondary retention the recollection of primary retentions, tertiary retention is memory that has been inscribed in material forms that transmit knowledge and affect across space and time.³⁸ All tertiary retentions, by definition, extend beyond the individual, the group, and beyond established practices associated with a specific epoch, 'forming a 'reserve' that has no specific [lived] time and place'.³⁹ However, this doesn't mean that the reserve is static. Rather, the reserve is the result of accumulation (as iterative intra-action) as well as a process of 'grammatisation' that structures ways of seeing, experiencing, memorising, and being.⁴⁰ While Bernard Stiegler's emphasis is on automation (grammatisation, for him, makes possible the automatic reproduction of an increasing number of human gestures and affects), grammatisation also configures the 'long' circuit' of the 'generations'⁴¹ through mediations that re-combine the existing in new ways opening up new spatial and temporal orientations.⁴² This makes tertiary retentions *differences-in-repetition*, an expression that could be used to describe the human senses, too: recall Karl Marx's famous remark that the senses are 'the labor of the entire history of the world down to the present'.⁴³ In addition to being coextensive with epistemic-aesthetic regimes, such as, say, the 'scopic regime of perspectival control',⁴⁴ the senses are also coextensive with variantology, a mode of participation in the world as unfinished and full of fault lines, turning points, and contingencies.⁴⁵

In *Re-Wired*, Stelarc's body is extended across three continents. It also exists in three different time zones and is exposed to different audiences and action-reaction sequences. This extended-ness is variantological as it collapses scales, directions, velocities, granularity and pixelation or amplification of the image/sound depending on internet speed, environment, light, focus, and

the materiality/aurality of the encountered objects. In other words, this work brings places, people, objects, gadgets, impulses, events, human and geo-spatial sedimentations (let's not forget that gadgets are made of materials such as nickel and steel) into the body exposing the co-modulatory agencies of these encounters (or clashes as the case may be) and phenomenologising, so to speak, the posthuman horizon. *Re-Wired* is, in this sense, simultaneously a response to the changing evolutionary horizon, with its temporal scale of centuries or millennia, and it generates a sense of agency that is physically and socially (in the gallery and on the internet) felt in the here and now. The mezzo-scale is not absent either – it is implicit in the status of these accumulated high-velocity retentions, in particular, their relation to inter-passivity.

As a concept, inter-passivity first appeared in the 1990s – the time of widespread, often mandatory participation in all spheres of life.⁴⁶ Coined by Robert Pfaller in a 1996 paper *Things Laugh in our Place*, it borrowed the example of canned laughter from Slavoj Žižek's 1989 *The Sublime Object of Ideology*.⁴⁷ In this book, Žižek argues that canned laughter is the contemporary counterpart of the funeral wailers, who, in some cultures, wail on behalf of the deceased's family.⁴⁸ Of particular interest here is the *immaterial agency of communal belief* which, in the example of canned laughter, is embedded in an object that performs both the belief and the action. Canned laughter is of course a once-removed 'reserve' that turns a cultural assumption into an affective prosthesis. Like all affective prostheses, it further influences cycles of behaviour. For example, today, children are socialised into a culture where platforms such as Facebook wish their friends happy birthdays instead of them.

Inter-passivity, obviously, uses the opposite of 'activity' to make a point. In the digital age, the human body is exposed to all manner of nudges, notifications, messages, and demands coming from an increasing number of automated agents. Consider, for instance, the wide-spread vibrating phone syndrome – the hallucination of the mobile phone's vibration when the phone is not vibrating at all.⁴⁹ But what is more interesting is the manner in which immaterial social agentic processes, those that regulate perception (what is seen, heard, and felt), affect (what can and cannot not be expressed), and belief (what is possible, necessary and desirable) are rendered material and palpable.⁵⁰ Once they take on a material existence, like Stelarc's sensorial and physiological dispersion across three continents and the open-ness of his body-as-structure (but also the epistemic backdrop which makes such work possible, necessary, and desirable), they become part of the reserve. They can be re-produced and repurposed, even at the level of the interface. In other words, they have an *energetic value* which can produce, cue, or influence something else, such as the recent use of human urine to generate electricity, practiced at the Glastonbury festival since 2015.⁵¹ Although Stelarc's work operates in the here and now of individual-social-technical agencies and their current ways of folding space-time, the work also questions the transformative – and transductive – effects of eventhood, reserve, reproduction, and value creation, a feature it shares with much transgenic art.

Transgenic futures?

Not unlike Stelarc's work, which brings the established agencies of several disciplines – art, computer science, and engineering – to bear on the phenomenology of posthuman agency, Kac's work mobilises the anthropological, botanical, biological, social and political realm. Despite the fact that transgenic art has existed for centuries, genetic manipulation, which, in allowing for biological steps to be skipped in ways unimaginable within the system of natural selection, and in crossing plants and animals that could never breed together, poses hitherto non-existent questions.⁵² Today, there are many existents that could be bred with other existents to create entirely new combinations. Consider, for instance, the human/cow embryos developed in the search for off-the-rack human organs, or tomatoes that carry the gene of a deep-water cod fish to make them less susceptible to freezing. We know that all life (plant, animal, or human) is composed of the same genetic alphabet – the chemical bases adenine, guanine, cytosine, and thymine. What the futural working of hybrid re-configurations of the existing combinations might be is much less known. The question here is therefore not only: 'what sort of hybridity is this?' but 'what is the future horizon of these hybrid forms?'

Crossbred organisms are of course not one-offs but will replicate their singularity through further breeding. In contrast to the popular mindset of the past two decades in which plants and animals are discussed as if they were particular arrangements of data to be re-arranged and/or patented, Kac's transgenics undertakes a more comprehensive crossbreeding. As his 'Natural History of the Enigma', whose focus is a plantimal – a hybrid of a plant and an animal, christened *Edunia* (from Eduardo + Petunia) – shows, creating a point of access for agentic behaviour makes it possible for us to perceive and analyse hybrid agency. *Edunia* is a genetically engineered flower with red veins and whitish pink petals that is a hybrid of Kac and Petunia. Its development took five years, from 2003 to 2008, and it was exhibited at the Weisman Art Museum in Minneapolis in 2009. As Kac notes, a gene of his was isolated and sequenced from his blood: '[t]he result of this molecular manipulation' was 'a bloom that creates the living image of human blood rushing through the veins of a flower.'⁵³ The obvious objection to this work, like Kac's famous (and much criticised) *GFP Bunny*, a bunny that glows in the dark, is that it imposes human agency on flowers and animals and can therefore be seen as a prototypical example of white, male, 'sole sovereign agent'-type behaviour.⁵⁴ After all: were flowers or bunnies asked whether they wanted to take part in Kac's experiments? Although I don't disagree with these objections it's important to bear in mind that the history of flowers and domestic animals is far from 'natural', as many species are the direct result of crossbreeding experiments.⁵⁵

What I see as more important in this debate is the fact that the gene Kac selected for crossbreeding is the gene responsible for the identification of foreign bodies, bodies that, in some cases, can be harmful to the organism in

question. It is thus precisely this ‘policing’ gene that regulates relations with otherness that Kac integrated into another organism in order to create a ‘new kind of self that is partially flower and partially human’.⁵⁶ A piece of DNA can be extracted from a human or an animal and made to perform its function inside bacteria and vice versa. In fact, this interchangeability has been one of the driving forces of all evolution. Once the DNA deciphered the code, so to speak, the code for creating blood cells, for instance, all future organisms adapted and further refined this code in a process of iteration (that can also be called influenced intra-action); they did not have to reinvent it. This ability of the DNA from one organism to interface smoothly with another, is at the heart of Kac’s project. *Edunia* is an example of bringing not one-off otherness but *continuous otherness* into the world as every time *Edunia* procreates through seeds, Kac’ gene will be a part of that procreation.

Kac created a limited edition of *Edunia* seed packs ‘in anticipation of a future in which *Edunias* can be distributed socially and planted everywhere’.⁵⁷ He also produced *Edunia Seed Pack Studies*, with the information about the plant’s blooming habits, the weather, and its nutritional requirements. Accompanying these instructions are also photographs in which Kac explores the relationship between life and communication.⁵⁸ This approach, which includes a concern for *Edunia*’s future breeding possibilities and hybrid status, highlights not only the interwoven-ness of life but the need to understand multi-species agency in a more granular way. The usual basis for association has, for humans, been identity, or companion species and those living in close proximity to humans, such as dogs. The form of association Kac proposes doesn’t use a common denominator, such as species, habitat, or procreating habits. In this project, *Edunia* is presented as a plantimal, which embodies many of the posthuman theories mentioned in the Introduction to this Special Issue.⁵⁹ She draws attention to hybrid human-plant as well as to discursive agency and suggests that we should consider plasticity beyond species boundaries.⁶⁰ For Catherine Malabou, plasticity is the formation of connections or ‘arborisations’ which ‘progressively sculpt the form of the system’, whether organic or inorganic.⁶¹ In this sense, plasticity is intrinsically related to processes of adaptation, learning, and memory⁶² as well as to reparative ability.⁶³ In addition to the aesthetic dimension, plasticity also has a political dimension, which resides in the responsibility for the ‘double movement of the receiving and the giving of form’.⁶⁴

The cross-species plasticity evident in the current as well as future iterations of *Edunia*, mediates between (the various categorisations of) ‘life’ as we know it and may know it in the future. As Michel Foucault reminds us: ‘[I]f life does not constitute an obvious threshold beyond which entirely new forms of knowledge are required. It is a category of classification, relative, like all other categories, to the criteria one adopts’.⁶⁵ *Edunia* can also be seen as exemplary of influenced intra-action in the disciplinary and social sense of the word, as described by Latour’s ANT, and in particular, the network’s entwined loops. These are: the importation of objects from the real world to the scientific

discourse; the autonomisation of the experimental work so that the work may gain legitimacy and form its own criteria; representation and public appearances; and the work itself.⁶⁶ As an agential dynamic, *Edunia* extends the concepts of biodiversity and evolution through genomics establishing an intersection at the threshold of science, biology, and aesthetics, where notions of otherness – and the concrete needs of that future otherness – may be sensed-imagined, through care, growth, procreation as well as discourse.

For Barad, discourse is an inseparable component of intra-action since the individuality of specific things is carved out of ‘the inherent ontological (and semantic) indeterminacy’.⁶⁷ Practices of knowing, doing and being are ‘not isolable’; ‘[t]he separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse’.⁶⁸ Barad’s point is not merely theoretical either, as we can see from phrases such as ‘biocapital’, which refers to genes, haplotypes, human tissue and immortalised cell lines, created by the biotech industry and marketed as biological objects.⁶⁹ In this sense, the posthuman agentic configuration seen in Kac’s work doesn’t deal with human-plant agencies alone, but with the agency of heterogenous systems, that are at once social, genetic, historical, and technological. The next logical question is thus: can we think posthuman agency beyond the living human or the life of plants and animals as a reserve that may be used by future (post)humans, in a re-integrated, perhaps even re-embodied way?

Artificial Systems Trained on Dogs?

Maja Smrekar’s 2016–present work investigates technogenetic otherness that engages animal imagination – that of dogs – and AI.⁷⁰ One of the recent (and widespread) developments in AI is human behavioural reinforcement with programmes that learn from the environment by repeating and replaying the agent’s actions and reactions.⁷¹ Smrekar uses the cognitive mapping of non-human others – dogs – to create new cross-species developmental architectures that investigate the possibilities of their evolution and/or modification. The work also introduces a cross-species element into what we may consider collective intelligence. Collective intelligence has of course animated the minds of many philosophers, biologists, political thinkers, and mathematicians, from Karl Marx and Jakob von Uexküll to Norbert Wiener, to mention but a few. In recent years, there has been an explosion of claims to animal, artificial, bacterial, plant, and mineral intelligence.⁷² Yet, most of these accounts are concerned with a single species. They also theorise intelligence, in Skinnerian vein, as the ability to reproduce learnt behaviour. The crucial difference with Smrekar’s work is that the work engages with a distinctly hybrid approach to cross-species agency as an iterative, intra-active phenomenon, and uses Skinnerian techniques of reinforced learning (widely used in digital programming), to very different ends.

Essentially, B.F. Skinner's work is rooted in the idea that all behaviour is a reaction to stimuli, rather than the effect of some sort of essence or identity. Behaviour can be controlled through conditioning and reinforcement of desired behaviour, the classical example being Pavlov's dogs. In this experiment, dogs initially salivated to the sight of food; they were subsequently made to salivate to the sound of the feeder's feet, then to the sound of a bell – an abstract stimulus reinforced with reward (food) that no longer had a concrete cause-effect relation to feeding.⁷³ This experiment relies on specific schedules of reinforcement – patterns of providing or withholding reinforcers. When not explicitly administered, reinforcement schedules are diluted in successive reinforcement – this is what occurs with softly coercive reinforcement methods on the internet, such as past-data-informed content creation.⁷⁴ While in the non-digital world, there are ways to break the chain of reinforcement, such as stimulus avoidance, self-administered satiation, or aversive stimulation (for instance, dipping cigarettes in tar to provoke disgust and break a smoking addiction), this is much more difficult to achieve in digital interaction.

Smrekar's 2019–present work *!brute_force* relies on an expression borrowed from computing where 'brute force attack' refers to automated software's use of a trial-error method to generate consecutive guesses at the potential value of the data under scrutiny. The reason for the 'brute force' part of the expression is that these operations produce a huge number of combinations very fast as they are based on colossal computing power. Extending her ongoing work with non-human companions, such as the 2016 *Hybrid Family*, *!brute_force* explores techno-otherness of algorithms and dogs.⁷⁵ In this work, Smrekar uses the cognitive mapping of dogs – which renders transparent the difference between the current state of AI and dogs' adaptability – to create what she refers to as the 'symbiotic code', a code the neural network can learn in a very precise way with the aid of Skinnerian techniques, in order to transfer dog's skills, such as orientational and cognitive patterns, to AI.⁷⁶

The project consists of several phases: a physical labyrinth made of movable identical blocks, and a robotic arm that assembles blocks into different compositions. The labyrinth is a place where the dog explores different movement possibilities and sequences through dog parcour-like play. The data of the dog's 'choices' is collected and processed through a computer-vision camera. The data is subsequently fed to the neural network that imitates the dog's 'thought loops' by making predictions on the basis of past 'choices'. In the following phase, the neural network sends the data to the robotic arm, which is located in the middle of the space. The arm re-arranges the labyrinth blocks to create a new spatial structure, marking the beginning of the next iteration – both a new configuration of the labyrinth and a new cycle of AI learning. Smrekar uses the labyrinth as a space where fractal patterns 'mirroring digital connections', seen as 'a web of connections in multidimensional space', combine and re-combine into new patterns.⁷⁷

The architecture of the actual environment is very similar to the architecture of the digital network, composed of vectors, lines of movement, and ‘mediated through connectivity and algorithmic revision’ because, as Smrekar suggests, the current ‘human actual-virtual landscape is itself a labyrinth of code’.⁷⁸ If such a system were used in everyday life, in human or other animal learning, it would enable humans, animals as well as machines to assimilate other species’ agentic behaviours and perceptual modalities. While dealing with cycles of cross-species intra-actions in a consecutive – one could even say linear and progressive way – this work nevertheless demonstrates how the influence of one agentic configuration – for instance, how dogs ‘read’ and react to space – can be felt, configured, and engineered in another, in this case AI. Apart from making the worrying efficacy of the widely used Skinnerian techniques transparent, the work also makes visible the necessary concern with other forms of behaviour, which transhumanism, like xenotransplantation (foreign-body transplantation), tends to ignore.

But, can we integrate the expanded agentic field of intra-action, as elaborated by the three ‘strange objects’ that Stelarc, Kac and Smrekar have created, into human subjectivity, seen as collective agency? Rosi Braidotti emphasises the importance of rethinking subjectivity as a collective agency that encompasses multiple compositions and collective practices of a post-humanist-becoming, human, other-than-human, and machinic.⁷⁹ While the rapprochement of ‘I’, ‘they’, and (any kind of) ‘it’ is directly related to the protentional field of care, and therefore a valid concern, I doubt whether ‘subjectivity’ can be the anchor – or even an umbrella term – for the differences in persistence and coherence over time (as theorised by Bourdieu, Dreyfuss, and Latour and mentioned at the beginning of this article), that machinic, algorithmic, prosthetic, transgenic and transductive processes, such as the ones discussed above, have already created. Instead of subsuming heterogenous agentic processes under a single notion, whatever it may be, the question, for me, is rather one of method: how can we feel our way into a field of enabling constraints that bypass humanly imaginable spatial and temporal, perhaps even ontological frames?

The answer to this question is by no means obvious but we may come a little closer if we substitute the usual (phenomenologically felt, rather than theoretical) understanding of action as essentially based on the Aristotelian unity of time, place, and action – where in order for an action to exist, it has to have a (humanly perceivable) locus, and unfold in (humanly conceivable) time – for the one derived from, say, Native Science, among other possibilities. Native Science understands the world as multi-agentic in the *felt* sense of the word: things, beings, and phenomena all have agency, as do the elements, seasons, and, more generally, change of any kind and scale.⁸⁰ All are also ‘others’; humans are catalysts, because of their developed cognitive abilities, however this function is not innate – there is a methodology for sensing other agentic behaviours such as storied participation in other-than-human narratives.⁸¹ Needless to say, these stories have, for centuries, been epistemically denigrated and portrayed as ‘mere’ fantasies or naivetes.⁸² But they are really sensing-feeling methods for imagining a horizon that is multi-

locational, multi-temporal, multi-species, unknown, perhaps even unknowable, in an anticipatory yet not predictive way.

At this point in time, it is important to be able to sense-imagine a further collapse of space and time (like the long series of technologically induced spatial and temporal collapses that have taken place since the Industrial Revolution) and a further merging of humans and machines. It is also vitally important to sense-imagine features that can resurface in the tenth or twentieth generation of transgenic creatures, and new cross-species learning cycles. This requires that we apply *protentional* posthumanist thinking to (largely, although not solely) transhumanist concerns.

Notes

¹ Bourdieu, Pierre, quoted in Dreyfuss, *What Computers Still Can't Do*, Xxiii.

² For a discussion of artificial systems and William James's notion of experience see, MacKenzie, Adrian and Anna Munster, "Oscilloscopes, Slide-rules, and Nematodes: Towards Heterogenic Perception in/of AI" in *Distributed Perception: Resonances and Axiologies*, edited by Natasha Lushetich and Iain Campbell. London and New York: Routledge, 2021: 64–81.

³ Latour, *An Inquiry into Modes of Existence*, 488–89.

⁴ *Ibid.*, 488.

⁵ See <http://www.morethanhumanlab.nz/>

⁶ Lindström and Ståhl, "Plastic Imaginaries."

⁷ See, for instance, Zuboff, Shoshana. *The Age of Surveillance Capitalism*, London: Profile Books, 2019, and Berardi, Franco 'Bifo' "Simulated Replicants Forever? Big Data, Engendered Determinism, and the End of Prophecy" In *Big Data: A New Medium?* Edited by Natasha Lushetich. London and New York: Routledge, 2020: 32–45.

⁸ Poli, Roberto. *Introduction to Anticipation Studies*, 19.

⁹ Prusak quoted in Poli, *Ibid.*

¹⁰ Beyond dualistic, positive or negative, imaginaries.

¹¹ Nagatomo, *Attunement Through the Body*.

¹² For an in-depth discussion of interoception, see Leder, Drew. *The Absent Body*. Chicago: Chicago University Press, 1990.

¹³ See, for instance, Ernst, Wolfgang. "Do Media Have a Sense of 'Time'?": Chrono-Technical Interoception," in *Distributed Perception*, 99–113.

¹⁴ In one of the most relevant works on the topic, Maturana, H.R and Varela F.J, *Autopoiesis and Cognition: The Realization of the*

Living, Dordrecht: D. Reidel Publishing Company, 1980, the authors claim that autopoiesis is the characteristic of organic life. Machines, according to Maturana and Varela, are not capable of autopoiesis.

¹⁵ See Pickering, Andrew. *The Cybernetic Brain*.

¹⁶ Haggard, Patrick et al, "Voluntary action and conscious awareness."

¹⁷ Timmermans and Schilbach, "Investigating Alterations."

¹⁸ Archer, *Being Human*.

¹⁹ Gecas, "Self-Agency and the Life Course."

²⁰ Ahearn, Laura, "Language and Agency," 112.

²¹ Emirbayer and Mische, "What is Agency?."

²² Barad, Karen, *Meeting the Universe Half-Way*, 33.

²³ *Ibid.*

²⁴ *Ibid.*, 136–7.

²⁵ *Ibid.*, 150.

²⁶ See, for example: <https://www.vice.com/en/article/jpppx3/from-the-motherboard-vault-stelarc-2>

²⁷ See <http://stelarc.org/?catID=20242>

²⁸ See, for instance, Moravec, Hans. *Mind Children: The Future of Robot and Human Intelligence*. Harvard: Harvard University Press, 1990, or *The Transhumanist Reader* edited by Max More and Natasha Vita-More. Chichester: Wiley & Blackwell, 2013.

²⁹ See More, Max and Giulio Prisco's contributions to *The Transhumanist Reader: "Engines of Life: Identity and Beyond Death,"* 213–214, and "Transcendent Engineering", 234–240, among others.

³⁰ See <http://stelarc.org/?catID=20353>

³¹ A HUD is any transparent display, used in cars and aircrafts. It presents data without requiring the driver/pilot to look away. With a HUD the driver/pilot can view

information looking forward instead of angled down.

³² In the social field, actors act to the extent to which they have been constituted as actors through socially enabling constraints, such as language, gesture, socially ratified behaviour, however also the formatting of the senses. See Butler, Judith. *Excitable Speech: A Politics of the Performative*. London and New York: Routledge, 1997; and Levin, David Michael. *The Body's Recollection of Being*. Boston: Routledge and Kegan Paul, 1985.

³³ Stelarc, "Towards a Compliant Coupling."

³⁴ Much performance art takes a stance on being, which includes social, cultural and political impediments to being (e.g. class, gender, race, ability, etc. relations) as can be seen from the work of artists ranging from Gina Pane to Regina José Galindo.

³⁵ Simondon, "The Genesis of the Individual," 303–305.

³⁶ Ibid. 305.

³⁷ Stiegler and Lebedeva, "The Theater of Individuation."

³⁸ Stiegler, *For A New Critique*, 29–33.

³⁹ Ibid., 32.

⁴⁰ Ibid., 33.

⁴¹ Stiegler, *Uncontrollable Societies*.

⁴² For a more in-depth discussion of spatial and temporal tertiary retentions, see Withers, Deborah. *Feminism, Digital Culture and The Politics of Transmission*. Lanham: Rowman and Littlefield, 2015.

⁴³ Marx, *Economic & Philosophic Manuscripts*, 140.

⁴⁴ See Jay, Martin. *Downcast Eyes*. Los Angeles: University of California Press, 1993.

⁴⁵ Zielinski quoted in Parikka "Media Ecologies," 51.

⁴⁶ On the participation imperative see, for instance, Ehrenberg, Alain. *The Weariness of the Self: Diagnosing the History of Depression in the Contemporary Age*, Montreal: McGill University Press, 2009.

⁴⁷ For more on this notion, see Pfaller, Robert. *Interpassivity: The Aesthetics of Delegated Enjoyment* Edinburgh University Press Online, 2017: <https://academic.oup.com/edinburgh-scholarship-online/book/37328>

⁴⁸ Žižek, *The Sublime Object*.

⁴⁹ See Rothberg et al, "Phantom vibration syndrome."

⁵⁰ The popular 'common-sense' critique of such phenomena focuses on proprietary

software and corporations that deploy technology to create responsive body-minds.

⁵¹ See: <https://info.uwe.ac.uk/news/uweneews/news.aspx?id=3953>

⁵² See, for instance, Gessert, George "Notes on Transgenic Art," *Leonardo* 26, No.3: 205–211.

⁵³ Kac, "Natural History of the Enigma."

⁵⁴ See <https://www.ekac.org/gfpbunny.html>

⁵⁵ Gessert, "Transgenic Art," 205.

⁵⁶ Kac, "Natural History," np.

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Cross-reference to the Introduction.

⁶⁰ See Barad, Meeting the Universe and Latour, *Reassembling the Social: An Introduction to Actor-Network Theory*. Oxford: Oxford University Press, 2005.

⁶¹ Malabou, *What Should We Do*, 19.

⁶² Ibid., 23.

⁶³ Ibid., 25.

⁶⁴ Ibid., 30.

⁶⁵ Foucault, The Order of Things, 175.

⁶⁶ Latour, "On Recalling ANT," 106.

⁶⁷ Barad, Meeting the Universe, 150.

⁶⁸ Ibid., 185.

⁶⁹ Nelkin and Andrews "Homo Economicus."

⁷⁰ From the 2016 Hybrid Family onwards. See <https://www.majasmrekar.org/k-9topology-hybrid-family>

⁷¹ Azar, "POV-data-doubles."

⁷² See, for instance, Mancuso, Stefano. *The Revolutionary Genius of Plants: A New Understanding of Plant Intelligence and Behavior*. New York: Atria Books, 2018.

⁷³ Skinner, *About Behaviorism*.

⁷⁴ Azar, "POV," 179–181.

⁷⁵ See Smrekar's conversations with Hauser, Jens: <https://www.majasmrekar.org/k-9topology-hybrid-family>

⁷⁶ See https://www.majasmrekar.org/brute_force

⁷⁷ <https://nonbruteforce.net/> np.

⁷⁸ Ibid.

⁷⁹ Braidotti, "A Theoretical Framework."

⁸⁰ See Aristotle. *Poetics*. London: Penguin Classics, 1996 [335 BCE].

⁸¹ Cajete, "Relational Philosophy."

⁸² For a sense of the lasting effects of epistemic denigration see Bhargava, Rajeev, "Overcoming the Epistemic Injustice of Colonisation," *Global Policy*, V. 4, Issue 4, November 2013: 413–417.

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Natasha Lushetich is Professor of Contemporary Art, Media & Theory at the University of Dundee and AHRC Leadership Fellow. Her research is interdisciplinary and focuses on intermedia and critical mediality; global art; the status of sensory experience in cultural knowledge; biopolitics; performativity; and, more recently, datafication. She is the recipient of numerous fellowships such as Fulbright, Steim and ArtsLink. Her books include *Fluxus: The Practice of Non-Duality* (2014); *Interdisciplinary Performance* (2016); *The Aesthetics of Necropolitics* (2018), *Beyond Mind*; a special issue of *Symbolism* (2019); *Big Data: A New Medium?* (2020), and *Distributed Perception: Resonances and Axiologies*, co-edited with Iain Campbell (2021). Email: n.lushetich@dundee.ac.uk