Aesthetics of Biomachines
Guest Editors' Introduction

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Today, the distance between the organic and the machinic appears to be shrinking. The machinic processing, simulation or generation of processes of life, perhaps most commonly associated with DNA technologies, is taking novel and conspicuous forms that force themselves into the collective consciousness, sparking new uncertainties. The technical employment of biological processes to achieve repeatable ends is nothing new, however. Fermentation as a technique for the production of food and beverages dates back to the Neolithic period. The same period also saw the birth of animal breeding, equally a technique that intervenes in organic living material to re-engineer it for specific purposes. Yet, an expanding capacity to manipulate, informationalise, simulate and recontextualise organic material and integrate it into machinic circuits of cellular programming, planetary engineering, corporeal reproduction and enhancement, humanoid machines and artificial living raises fundamental questions about the meaning and characteristics of life and its evolving conditions. This special issue of *Culture Machine* on biomachines seeks to expand our understanding of the current state of the interactions between the biological and the machinic through an aesthetic lens. The articles in this volume all represent different configurations of the biological, the machinic and their interrelations and address different aspects of the biomachinic. It is therefore worth interrogating more closely here what the notion of the biomachine, broadly speaking, entails.

As Lewis Mumford (2010: 10) understands them, machines are manufactured to amplify 'the powers of the unarmed organism, or to manufacture outside of the body a set of conditions more favourable toward maintaining its equilibrium and ensuring its survival', and they do so with a certain degree of automatism and specialisation of function. The automatic machine, writes Mumford (2010: 11), 'is a very specialized kind of adaptation; it involves the notion of an external source of power, a more or less complicated inter-relation of parts, and a limited kind of activity'. Crucially, for Mumford (2010: 10–11, italics added), machines 'have developed out of a complex of

non-organic agents for converting energy, for performing work, for enlarging the mechanical or sensory capacities of the human body, or for reducing to a measurable order and regularity the processes of life'. Machines, in this sense, can work to mediate the natural environment and its elements, and they can even be modelled on them, as when the invention of the aeroplane was modelled on bird flight; but they are themselves distinct from the biological or organic world in their material constitution. The biomachine – the word's prefix signifies living organisms and vital processes unfolding in the natural or organic environment – complicates this matter by emphasising new interactive relations between biological and machinic components without necessarily assuming that the distinction between organic life and the inorganic automatic object is extinguished. Rather, the emergence and popularisation of large language models, artificial companions, deep fakes, digital implants, biosensors and more all point towards new relational configurations between the biological and the machinic. This special issue is an attempt to map the possibilities and changes vested in these configurations as they pertain to the contemporary media landscape.

The articles in this issue describe the constitution and implication of the meeting between the biological and the machinic in differing ways. While some contributors identify in the encounter composite forms that confuse the distinction between biology and machine, others focus on how computational mediation encloses biological processes for instrumental reasons while (intentionally or not) producing new forms of knowledge and affective entanglements. In other contributions, the transformative potentials that emerge in the meeting between humans and machines are assessed according to the power relations they construct, reproduce or challenge. It is common to all the contributions, however, that the terms and the constitution of relationality of *bios* and machine are a basic topic of enquiry that opens multiple affiliated questions and problems that sharpen our critical sense of our developing technological reality. Equally common to the contributions is a fundamental concern with aesthetics.

The notion of 'aesthetics' as regards biomachines invokes multiple instigations of the term. We employ it to refer to 1) the study of sensory knowledge, as defined in the work of Baumgarten (2007), and 2) the philosophical branch that studies art and its interpretation. Aligned with the original meaning of the Greek term *aisthēsis*, the first notion concerns aesthetics as sense perception specifically and as experience more broadly. The understanding of aesthetics as conveying the act of sensing is used because it can refer to a capacity not only of humans but also of other experiencing agents, such as

plants, animals and technical entities, including biomachines. Ascribing aesthetic properties to biomachines allows us to home in on the particulars of the techno-sensory experiences at work in their contemporary configurations. Here, aesthetics involves the experience *of* biomachines, that is, the experience of the machines themselves sensing and operating in the world. Additionally, the aesthetic perspective engages *our* experience of biomachines and our capacity to make sense of their forms and modes of sensation. Taken as a whole, the articles in this issue present a pervasive, although far from exhaustive, perspective on the complexities of sense perception. Some of them single out the sensory mechanisms of individual biomachines, and others interrogate the relational dynamic between humans and biomachines as they experience each other. Biomachines can be aesthetically known, and some of them approached and even appreciated, as artworks.

The second use of the term 'aesthetics' is a variation on its meaning as the philosophical study of beauty and taste (Britannica, n.d.). Here we are not concerned with judgement or appreciation of beauty, but rather with art as a locus of intervention that brackets the utilitarian existence of machines. The aesthetic conception of biomachines mobilised in this issue is pertinent in that it functions as a reflective lens for studying both artworks and phenomena that, in various ways, instantiate and negotiate the techno-sensory experiences of biomachines. In employing aesthetics as an approach or a practice that gives room to notions of the machinic outside its immediate instrumental context, the issue offers studies of biomachines that allow us to appreciate our new technological realities.

This special issue mobilises both of these meanings of the term 'aesthetics': as sensing, and as the study of aesthetic objects. The articles all explore phenomena that in one way or another are imbricated in the biomachinic relation, which produces new and evolving forms of being, sensing, and simulated realities. They do so, however, on hugely varied scales, from the very intimate experiences of tactile sensation, to the planetary level, where organic processes become encased and systematised by vast digital infrastructures. The biomachine, then, is an occurrence that appears on a spectrum that runs from the micro to the macro level. To explore these aesthetic dimensions, from sensory knowledge to artistic intervention, this special issue consists of eight articles that investigate our evolving biomachinic reality on different scales and through different objective and aesthetic phenomena.

We start on the intimate level of touch. In 'Artificial Touch in Contemporary Art and Culture', Mette-Marie Zacher Sørensen and

Lea Laura Michelsen stay with the finer features of the relational human sensorium and articulate what the mediation of tactility by biomachinic systems teaches us about the distinct and complex nature of the human sense of touch. By taking account of the tactile epistemology of the American writer Helen Keller, Zacher Sørensen and Michelsen distinguish the 'logic of touch reduction', which underpins the possible performance of haptic artificial intelligence (AI) biomachines, from the subtleties of human touch, thereby showcasing the unique embodied character of vibrant and resonating human touch. As Zacher Sørensen and Michelsen emphasise, artworks such as Paula Gaetano Adi's kinetic sculpture *Anima*, touch technologies such as AI skin pads, and the haptic biomachinic devices Kissenger and Huggy Pajama, although incapable of simulating the complex features of human touch, do reconfigure and reimagine what touch is and can be in a digitally mediated world populated by biomachines.

Moving further into the complexities of relational being, Henriette Steiner and Kristin Veel revisit Naomi Mitchison's 1962 novel *Memoirs of a Spacewoman* to explore how speculative fiction can function as a feminist-ethical archive of reproductive technologies. Focusing on episodes of grafting, haploid reproduction and interspecies conception, they conceptualise the biomachine as a reproductive configuration that operates across technological, ethical and affective domains. Through close attention to how bodies, temporalities and care practices are modulated in Mitchison's novel, Steiner and Veel show how reproductive technologies destabilise normative assumptions about gender, species and human continuity. Their reading positions the biomachine not as a fixed hybrid of organism and machine, but as a dynamic site of individuation and transformation.

Resonating with Mitchison's biomachinic subversion of gender, reproduction and family life, Annie Ring's analysis of Austrian filmmaker Sandra Wollner's 2020 film *The Trouble with Being Born* places the biomachine Elli, a child android, at the nexus of complex relations of abuse and subjugation that echo contemporary transhumanist fantasies of dominance, control and self-enhancement. Through a careful reading of the film, Ring excavates a critique of such masculine transhumanist ideas and associates them with Enlightenment ideals of reason and self-governance that legitimise contemporary forms of dominance of the other. Against the masculine transhumanism that suffuses the power relations depicted in the film, Ring identifies a counterweight in posthumanist ideals of individual decentring and uncanny social entanglements between diverse forms of life. In the counterrelations that form in the film

between biomachine, non-human animals and the natural environment, Ring finds a shared sense of vulnerability and risk that suggest the possibility of a more solidaristic and ethical future of cohabitation between human and non-human life.

Digging through the uncanny valley in 'Contagious Life: Clones, Deadbots, Digital Twins', Caroline Bassett unearths the framework for a new internet aesthetic by dwelling on the unsettling entanglements between humans, undead digital materials and the 'thanobots' that arise in our shared digital spaces. In a critical confrontation with the prevailing tendency to revert to an anthropomorphic frame of reference when accounting for the unsettling characteristics of non-human technical beings, Bassett instead suggests that staying in the uncanny valley may get us closer to appreciating the undecidability of liveness in an age of AI and the aesthetic our confrontation with it harbours. As Bassett argues, deadbots, animated ancestors and digital twins represent more than simulations of life. They perform a new, uncanny biomachinic aesthetic born from contagious entanglements between the living and the algorithmic unliving.

Diving yet deeper into the potentials of new forms of human-machine relations, Nicole De Brabandere investigates the situated companionable potential of deep learning AI models by drawing on a queer theoretical approach to otherness as relation. As De Brabandere argues, the incommensurate operational registers at play in human-machine encounters create openings for speculative negotiations of relational potential. Exploring how these potentials are articulated and temporally organised in the works of Canadian artists Nicolas Bourgeois and Maxime Alexander-Gosselin, Turkish artist Memo Akten and Irish composer Jennifer Walshe, as well as in the US TV show *Sunny*, De Brabandere foregrounds the intricate and difficult but possibly caring modes of co-presence with AI technologies.

In the same vein of thought as De Brabandere, Joanna Zylinska's 'Bio-AI: The Aesthetics and Ethics of Data Animism' explores how generative AI functions as a relational technology that animates life across ecological, cultural and technological domains. Drawing parallels between early cinema's animist aesthetics and contemporary AI-driven media installations, she proposes the concept of 'data animism' to describe how AI renders life through immersive visual experiences. Zylinska critiques both the seductive spectacle and the extractive infrastructure of such works, while calling for an ethical data animism that is attentive to ecological entanglements, non-human agencies and systemic inequalities. Through analysis of artworks by Refik Anadol, Anna Ridler and Mat Collishaw, alongside

her own AI-generated piece *Les Fleurs du métal*, she interrogates how flowers, glitches and machinic perception mediate our sense of being alive in a deeply technological world. The article advocates a rethinking of lifeness, affect and embodiment under algorithmic conditions.

Equally concerned with the artistic treatment of the relationship between machine and life, Kathrin Maurer examines Pierre Huyghe's art through the lens of the biomachine, a concept that for her captures the generative interplay between biological life, machinic processes and evolving aesthetic forms. Focusing on the key works *Zoodram 4, UUmwelt*, *Variants* and *Camata*, Maurer argues that Huyghe's installations create 'aesthetic lifeworlds' that are dynamic, non-anthropocentric, and alive in their own right. Drawing on thinkers including Henri Bergson and Gilbert Simondon, the article examines how Huyghe's use of living matter, machine learning and open-ended temporalities challenges distinctions between organic and inorganic, human and machine. Rather than collapsing these categories, Maurer shows, Huyghe's works generate processes of becoming that preserve ontological difference while questioning what counts as life.

Finally, bringing relational dynamism to a planetary level by considering the deepening integration of computational infrastructures and the natural global environment, Thomas Storey reviews the contemporary discursive tendency to conceptualise the planet as a biomachine that is fully integrated into cybernetic networks of dynamic environmental monitoring and control. While acknowledging the capacity of techno-ecological systems to mediate the biosphere and produce new sensory circuits between the planet and digital interfaces, Storey focuses on the excesses caused by climate change to question the extent to which nature can be subsumed and controlled through planetary computational systems. For Storey, the planetary biomachine is not a complete or fully integrated whole, but a modular system of systems that can only ever provide incomplete knowledge, as the machine and its object – the planet – never fully coincide.

Many of these contributions are based on presentations given at the conference *The Aesthetics of Biomachines and the Question of Life*. The conference took place in Denmark on 13–14 June 2024 at the University of Copenhagen in collaboration with the University of Southern Denmark, and it was organised by Johan Lau Munkholm, Patrick Sloan and Naja Grundtmann. The conference was sponsored by the research project "The Aesthetics of Biomachines and the Question of Life" (The Velux Foundations), led by Kathrin Maurer and Kristin Veel as co-investigators. We express our sincerest

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