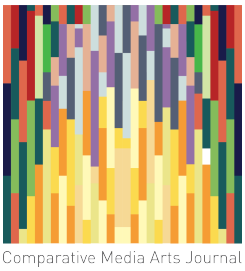
Comparative Media Arts Journal
Original Paper

# Planetary Re-Enchantment: Human-Animal Entanglements in Victoria Vesna's *Octopus Brainstorming*

Cristina Albu




This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License
Published online: August 2021 © CMAJournal

## Abstract

In 2016, artist Victoria Vesna collaborated with scientist Mark S. Cohen on staging *Octopus Brainstorming*, a performative installation based on electroencephalography (EEG) technology. The work explores a long-lasting philosophical dilemma concerning humans' ability to envision the experience of other sentient beings. Two participants wore octopus-shaped crowns with dangling arms while their brainwave rhythms were made visible to the audience through colored lights and sounds. When participants entered a meditative state, the visual and acoustic signals synchronized to indicate mental attunement. In the background, video projections of a moving octopus enhanced the longing for connection to these intelligent invertebrates.

Unlike most artworks based on biofeedback, Vesna's project prioritizes thinking about inhabiting a different cognizant body over pondering human abilities for regulating neural oscillations. By generating affective and cognitive engagement, it elicits an enhanced consciousness of relations that surpass species boundaries. In this paper, I examine how Vesna's *Octopus Brainstorming* generates planetary re-enchantment by merging scientific inquiry into brain-to-brain communication with speculation on human and animal consciousness. I place Vesna's work in dialogue with Roy Ascott's notion of "planetary technoetics" and Varela's and Thompson's theory of the embodied mind in order to show how the convergence of technological and biological media can expand consciousness and enhance connectivity. I argue that while the work may fall short of enabling participants to understand the sentience of octopuses, it successfully inspires mindfulness and ecological thinking by challenging misconceptions about body-mind relations and self-centered models of consciousness. Through intermingling metaphorical thinking with scientific facts, Vesna heightens awareness of the way humans modulate their perception of the world in tandem with others.

**Keywords:** affect, biofeedback, consciousness, participatory art, re-enchantment

At the opening of the UCLA Luskin Conference Center in 2016, artist Victoria

Vesna and neuroscientist Mark S. Cohen staged *Octopus Brainstorming*––a recurring performative installation, which invited two audience participants at a time, to envision inhabiting the bodies of other beings and communicating through otherwise invisible energy waves. Donning octopus-shaped crowns on top of electroencephalography (EEG) headsets that measured their neural frequencies, the participants embraced a performative role.[1] They sat at an octagonal table while measurements of their brainwave oscillations and video images of octopuses were projected on two background screens. Information from the EEG sensors was transmitted wirelessly to computers that analyzed the brainwave frequency signals to determine the similarities between the performers' neural rhythms. The limbs of the octopus crowns made out of iridescent organza dangled over the performers' arms, locking them in an animal embrace that made them more aware of their bodies. Hundreds of LED lights in the crowns shifted colours in relation to the oscillating degree of synchronicity between participants' brainwave frequencies. Moreover, the neural information served as a basis for the modeling of a soundscape consisting of eight a cappella streams orchestrated by jazz musician Kenton Chen. The voices projected from multiple areas of the room, translating the performers' brain activity into an all-encompassing vibratory environment. *Figure 1.*

Each performance typically unfolded over the course of thirty minutes. At the beginning of every performance, one participant's crown emitted green light whereas the other's radiated red light. As their brainwave frequencies synchronized, the crown and the octagonal table turned indigo. Concomitantly, the black and white video projection of the moving octopus became infused with indigo, evoking a state of attunement which extended beyond interhuman communication. At this stage, the a cappella voices also became

increasingly harmonious, enhancing the balance of the entire environment. Usually, this transformation occurred when the performers reached a meditative state, producing alpha brainwaves of 8 to 12Hz.[2] Gradually, they intuitively learned to regulate their neural frequencies in relation to the variable sounds and light colors, thus adopting a more active role in shaping the environment which reflected their conscious and unconscious communication.

*Octopus Brainstorming* encourages participants to imagine communing with other sentient beings, be they human or animal. It sets into place two competing, yet interrelated agendas––an inquiry into the octopus's strikingly different body-mind complex, devoid of a singular brain centre of command and an exploration of the attunement established between the brain frequencies of two individuals engaged in non-verbal exchanges. In what follows, I examine how these competing performative stakes generate planetary re-enchantment by merging scientific inquiry into brain-to-brain communication with speculation on human and animal consciousness. *Figure 2.*

**The Expanding Field of Biofeedback Art**

Part of a lineage of biofeedback artworks,[3] *Octopus Brainstorming* echoes earlier uses of EEG technology to generate instantaneous feedback and foster expanded modes of consciousness that entwine self-reflection with interpersonal and collective awareness. Since the early 1970s, when several visual artists started to integrate EEG devices in their works, video has constituted a befitting interface for rendering the invisible perceptible and revealing the contingent web of relations shaping physical and psychic phenomena.

While scientists focused primarily on the use of biofeedback technology for individual therapy, artists introduced this apparatus into a more complex social context and used video to render neural attunements more visible.

In 1973, Chilean sculptor and architect Juan Downey staged *Plato Now*, a performance in which nine participants sat in meditation on a platform while facing a wall against which they could see their shadows. Wearing EEG electrodes and headphones on their heads, they could intermittently hear excerpts from Platonic dialogues once they reached relaxation and produced alpha brainwaves. The public could only see the performers' faces via a series of nine video monitors and had no access to the audio recording. Downey's setup placed onlookers in a more captive state than the performers by restricting their access to the full scope of the allegorical framework. The closed-circuit video feedback accentuated the mediation of representation and enhanced the desire for connection to the performers' thought processes. Downey believed that technology could unveil that humans are capable of more direct communicative acts even in the absence of such apparatuses (Downey 1973). The parallelism between brainwave oscillations and the electromagnetic field of video underscored these possibilities and implied that inconspicuous vibrations affect not only individuals but the whole environment they share.

Similarly enthused by the potential of modeling energy fields rather than visible matter, sculptor and video artist Nina Sobell conceived a participatory installation based on EEG and closed circuit feedback in 1974. Part of a series of works known as *Brainwave Drawings* (1974-1982), the installation invited pairs of participants to have their brainwave frequencies monitored as they watched live video image of themselves on a TV monitor. On the screen, they could also see an index of their respective neural oscillations

depicted as vibrating lines which converged when participants reached alpha brainwave state simultaneously. In addition to this, the pair could decide to switch off the live video feedback and watch a recording of their interaction. Similar to Downey, Sobell envisioned different degrees of participation in the work. Images of the performing pair were made visible to a secondary audience in a separate room via a large screen and a series of TV monitors that broadcast past and real-time communicative acts. *Figure 3.*

Combining biofeedback, closed circuit television, and performance, Sobell's and Downey's works departed from the "aesthetics of narcissism" that art theorist Rosalind Krauss associated with the video medium (Krauss 1976). The behavioral scenarios constructed by these artists did not only direct attention inward but made one aware of a broader environment where one's flow of consciousness can never be fully severed. Such works undermined the rigid bracketing between subject and object of analysis and framed a field of relations that is more permeable––modelled by energy exchanges that are not fully predictable.

Four decades after these early inquiries into alternative modes of communication via biofeedback processes, Vesna pushes the boundaries of such exchanges one step further by inviting correlations between human and animal forms of embodied intelligence. By connecting the neural entrainment of performers to octopus images shifting in colour, she evokes a symbiotic alignment with the brain rhythms of other beings. This opening up of the field of relations creates an impetus for an ecology of mind contingent on complex energy exchanges. Subject and object boundaries blur as the entire environment morphs through synchronizing bodily signals turned into light and sound waves. Re-enchantment re-emerges through a realization of contingence and the enfolding of humans into

planetary systems in which they act in tandem with other beings and unpredictable environmental changes. As Douglas Kahn posits, "energies are embedded and embodied in all phenomena," (Kahn 2019) and communication happens even in the absence of human intervention (Kahn 2013). This decentering of a human-focused perspective underlies Vesna's approach to artmaking. Her projects are oriented towards rendering perceptible co-evolving systems that extend beyond social exchanges.

**Human-Animal Relationships in Victoria Vesna's Practice**

Vesna has had an insatiable curiosity about science since an early age. Her father was a Yugoslavian diplomat, who was fascinated with Nikola Tesla's visionary inventions (Weintraub). To this day, Vesna retains a keen interest in Tesla's ideas regarding the transmission of energy through air. During the Covid-19 pandemic, she staged online meditations that anchored around the concepts of pre-existing artworks which could no longer be displayed publicly. Her installation *[Alien] Star Dust* at the National History Museum in Vienna closed down soon after its opening on March 10, 2020. It featured 3-D models of meteorites which had fallen in six different parts of the world and invited visitors to activate immersive audio-visual projections showcasing the permeable quality of all physical boundaries in the face of dust coming from outer space. In the pandemic context, Vesna designed an online meditation which expanded the initial concept of the work by referencing not only the worldwide dispersal of meteorite dust but also the global spread of Covid-19. On the day of the winter solstice in 2020, she performed *[Alien] Star Dust* at the Integratron, a domed structure built by ufologist George Van Tassel near the Joshua

Tree National Park.[4] Vesna wore a T-shirt with Tesla's portrait as she guided online participants to consider their entanglement in invisible fields of matter and energy. Starting from the notion that one needs to face anxieties rather than avoid them, Vesna invited the audience to envision how they regularly come into contact with meteorite particles, viruses, and dust specks which travel across long distances and connect all kinds of beings. Based on mesmerizing animations and sound orchestrations, [*Alien] Star Dust* enacted powerful emotional ties between online viewers who nonetheless remained strangers to each other. It brought into the perceptible realm what Sara Ahmed calls the stickiness of affect, which she associates with "the messiness of the experiential, the unfolding of bodies into worlds, and the drama of contingency" (Ahmed 2010, 30). The performance suggested that participants find solace in togetherness and confront their entanglement in systems that are not limited to human entities. *Figure 4.*

Vesna's art practice has repeatedly entwined aesthetic experimentation with scientific inquiries into species interconnections. Vesna espouses an ecofeminist stance, interrogating binary oppositions which reinforce hierarchies and legitimate oppressive power structures. She argues that "the exploitation of women, animals, and environments can be seen as mutually reinforcing systems and practices" (Vesna and Graff 2017). She invites reflection on the contiguities between the animal, human, and technological realms. Relentlessly optimistic, her projects celebrate enchantment with the complexity of the natural world and scientific discoveries while cautioning about ecological imbalances.

Vesna often resorts to devising environments and props that bring one closer to inhabiting the body and environment of other beings. For instance, the artwork *Blue Morph* (2007 – present) virtually immerses visitors in the cocoon of a morpho butterfly to hear the

amplified sounds of nanoscale transformations in the development of its wings. Enveloped in blue light, participants wear a turban-like contraption which extends into a crocheted net emulating the patterns of nano structures. Thus, they can acoustically experience the metamorphosis of a caterpillar into a butterfly––a phenomenon that involves otherwise imperceptible modifications of bodily structures. Similarly, the artwork *Bird Song Diamond* (2012 – present) encourages participants to relate to the movements and sounds of birds. Depending on their movements in the installation, they can contemplate different vantage points upon bird habitats. The iteration of this installation at the University of Tsukuba (Japan) included a contraption that had the semblance of a hybrid between a drone and a bird. Wearing this device, participants took turns hovering above the environment and observing the patterns of swarming birds visible in video projections and the movements of visitors of the project. The installation invited one to oscillate between a bird's eye view, a drone's perspective, and a human's viewpoint. These shifts in perception conjured feelings of both awe and anxiety by making evident patterns in collective behavior observable in the biological and technological realm.

Vesna endeavours to offer a unifying vision of the intricate web of relations that underlie planetary transformations. Through inviting imaginary acts of embodying animals, the artist is not encouraging escapist fantasies but challenging participants to face the contingent attributes of their perception and contemplate alternative sensory and cognitive scenarios. Alliances with other sentient beings serve as an instrument for destabilizing the presumed superiority of the human perspective. Vesna takes interest in the octopus because it embodies the notion of alienness. Through their plastic bodies, which can easily change shape because their decentralized nervous systems are distributed

across eight limbs, octopuses induce both fear and wonder. They have often been described as whimsical creatures, associated with sea monster archetypes and controlling ideologies. In the book *Soul of an Octopus*, Sy Montgomery suggests that "It's hard to find an animal more unlike a human than an octopus," and attempts to connect to their strikingly different forms of sensory experience and consciousness (Montgomery 2015, 1). Similarly, Peter Godfrey-Smith contends that envisioning how octopuses experience the world may be one of the greatest challenges. He notes that it is extremely hard for humans to imagine a relationship of kinship with octopuses (Godfrey-Smith 2017, 8). Octopuses can taste through their skin, deceive predators through changes in colour, and assign different functions to their limbs. They embody a high form of distributed intelligence which challenges notions of the brain as a unique center of command. Therefore, Vesna's choice to foster art participants' alliances with octopuses while considering invisible neural ties to others is very adroit. It signals that invisible forms of human communication resulting from the attunement of neural frequencies could find an explanation in the distributed model of the octopus's mind. Sensing that the presumed unity of one's mind may be a misconception, participants in *Octopus Brainstorming* acquire a different perspective not only on what happens within their brains but also on their relations to others and the environment. Plurality prevails over singularity as they modulate a field of light and sound based on the elusive attunement of their neural frequencies.

The relational quality of the mind is part and parcel of artist Roy Ascott's theory of "double consciousness," which posits that minds can pivot between internal transformations and external contingencies impacting awareness (Ascott 2000). Ascott served as Vesna's doctoral mentor at University of Wales where she completed a PhD thesis

on identity and virtual embodiment in online spaces. He advocates for convergences between biology, culture, and technology which can re-sensitize us to the oneness of the world and show that "we are actively responsible for the construction of our own realities" (Ascott 2004, 113). Vesna's artmaking process and writings are thoroughly informed by Ascott's idea that artists are increasingly focused on designing the context of aesthetic experience while giving viewers more agency to shape the meaning and content of the work (Lovejoy 2012). Moreover, her practice reflects the "technoetic culture" defined by Ascott in terms of a convergence between technology and moist media and an impetus for greater behavioral and mental attunement to changes in our environments. Ascott's *Groundcourse* taught at Ealing Art College and Ipswich Art Schools between 1961 and 1965 integrated cybernetic principles in the teaching of art and design (Sloan 2019). This two-year foundation course was based on innovative pedagogical methods which enabled students to gain more control over their creative potential by acknowledging perceptual and behavioral limitations. Ascott envisioned it as a flexible program focused on enhancing students' individual and social consciousness rather than on conveying fixed rules of artmaking. The course encouraged emerging artists to shift their human-centered perspectives on the world and gain insight into interdependent relations between individuals and their environment. One exercise asked students to imagine being a sponge for a day and to describe their experiences (Ascott 2003, 131). Vesna similarly encourages imaginary embodiments and asks participants of her works to modulate bodily and mental parameters together with others. Like Ascott, she takes a keen interest in the hybridity between technology and biology.

## The Meandering Collaboration on Octopus Brainstorming

Vesna's media projects develop organically, gaining new forms and meanings as she establishes new collaborations, displays the works in new settings, or observes unexpected responses to her works. *Octopus Brainstorming* grew out of two distinct projects that Vesna decided to pair. One of them was *Brain Storming* (2012), which brought people with expertise together in different domains. The participants debated the interconnections between meteorological phenomena, neural activity, and social movements while images of weather patterns around the globe were projected on the ceiling. Neuroscientist Mark S. Cohen was one of the participants, along with the artist, a computer scientist, a nanoscientist, and the artistic director of the Beall Center for Art + Technology where the event was organized. This discussion was the first public instantiation of Cohen's and Vesna's collaboration, who initially collaborated on writing a National Science Foundation (NSF) grant proposal for the foundation of a center for image research at University of California, Los Angeles (UCLA). In her role as Director of the Art | Sci Center at UCLA, Victoria is a catalyst of interdisciplinary education and research collaborations. Notably, academic settings offer a more even ground for creative partnerships between artists and scientists. *Octopus Brainstorming* received support through a UCLA Transdisciplinary Seed Grant and came to serve as a token of successful collaborations across disciplinary boundaries when it was featured at the opening of the UCLA Luskin Conference Center in 2016.

Around the same time, the artist was working on developing *Octopus Mandala*, a site-specific event commissioned for Santa Monica's Glow Festival in 2013. Participants of

this work rode on the Pacific Wheel while wearing LED lit octopus crowns. When they reached the highest height, they were asked to make a wish or chant while taking in the panoramic views of Los Angeles. Vesna viewed this spectacular event as a means of occupying the Ferris wheel––an icon of the industrial age that embodies the notion of serialized labour by evoking the segmentation of individual tasks meant to increase work efficiency. The octopus became a foil for this
symbol; its eight moving arms configure a mandala shape which epitomizes holism and collective agency. *Figure 5 and Figure 6.*

The merger of the brainstorm concept with the octopus symbol felt like an organic transition for Vesna but proved to be a stumbling block in her collaboration with Cohen. While they shared a mutual interest in what could occur when participants experienced their neural interconnectivity at the level of light and sound, they parted ways in their views on the correlations which could be drawn between the embodied intelligence of humans and that of octopuses. Vesna explains that Cohen "tolerated" her octopus idea (Albu and Vesna 2020) and Cohen is adamant about the fact that "the octopus has nothing to do with the project," at least not with how he envisioned it (Albu and Cohen 2020). Interestingly, Vesna points out that he also resisted the use of the term "embodiment" which undermines the dichotomic split between body and mind (Albu and Vesna 2020). Cohen probably rejected the analogy with the octopus because he feared it added scientific speculations to the project that did not seem feasible. Even though he vows that he considers himself an artist, he is resistant to claiming authorship over aspects of *Octopus Brainstorming* that are overly speculative. Cohen's enchantment with complexity falls short

when boundaries between species are crossed and metaphorical thinking intersects with empirical reasoning.

For Vesna, the octopus connection offered a means of dislodging a human-centred perspective that typically overshadows the cognitive abilities of other creatures. Most likely, the analogy also offered an optimum solution for overcoming the translation of human body data into abstract information. Vesna is cautious about erasing traces of the liveliness and materiality of bodies from which information is derived through technological means. She takes her cue from Katherine Hayles's posthuman reflections and her warning about the loss of body of information (Vesna 2000, 121). Vesna frequently resorts to metaphor to overcome this problem with relating to data. In her *Datamining Bodies* (2000), a site-specific installation exploring the exploitative implications of datamining technologies, she transferred information about bodies to tensegrity structures marked by chakra-like points of energy. Such ingenious analogies invite viewers to shift viewpoints and gain a better grasp of interdependent relations, be they between individuals and technology or humans and animals. The octopus metaphor is not just a whimsical trope meant to evoke one's experience of otherness. Vesna points out that the parallel between humans and octopuses is supported by some physiological resemblances such as the lens-based eye formation of the octopus which is similar to that of humans. As evolutionary biologist Richard Dawkins indicates, the eyes of human and octopuses share significant morphological similarities in terms of their inclusion of an iris and a circular lens even though their evolutionary paths are merely convergent and the wiring of the photoreceptor cells is significantly different. (Dawkins 1996, 94-95). Thus, Vesna's analogy with the octopus mind is informed to a certain degree by a factual basis which can serve as

an impetus for further speculations. Moreover, the distributed intelligence of the octopus offers her a model for understanding how human collectives work. Just as the limbs of an octopus can function both independently of each other and in unison, so can social groups coalesce or grow apart depending on shifting circumstances.

Intersections between art and science represent a fertile ground for retrieving a lost sense of interdependence which can render us more sensitive to imbalances in planetary relations. Despite the ups and downs of the collaborative relationship between Vesna and Cohen, *Octopus Brainstorming* successfully manages to convey the value of both empirical and intuitive approaches to rendering visible the planet's holistic nature. It creates the potential for converging scientific findings about humans' neural entrainment with speculations about the astounding abilities of octopuses to orchestrate their behavior through a distributed brain system. Overcoming binary modes of thinking that perpetuate rigid divisions between humans and other beings, the installation generates re-enchantment with co-evolving species and the plasticity of the embodied mind.

**Re-enchantment With Porous Boundaries Between Self and Others**

Through using technological interfaces, Vesna's *Octopus Brainstorming* extends the expressive abilities of participants and calls upon them to ponder an animal form of intelligence, which may be superior to that of humans. Participants in the installation experience their bodies differently with crowns attached to their heads and radiant arms embracing their shoulders. This augmentation of their corporeal presence enhances the ritualistic dimension of the aesthetic experience. It invites a shift in perspective from a

focus on self-centered and deterministic modes of knowledge making to transindividual experience of the embodied mind and its tentacular connections with others. For onlookers watching the exchange between participants wearing the octopus crowns, the video images serve as a surrogate for these technological prostheses enabling the imaginary embodiment of another being's mode of relating to the world. The performers almost never turn their gazes towards the images of the octopus, which, nonetheless, appears to be in communication with them. Thus, the video encourages the audience to envision environmental connections that lie beyond person-to-person interaction. It also anchors the work's concept in a biological framework that might otherwise be overshadowed by viewers' fascination with the technological interface.

Like other works based on neurofeedback, *Octopus Brainstorming* aims to enhance the immediacy of the experience of change. Performers are immersed in an oscillating visual and acoustic field that is attuned to their mental states. Nonetheless, performers feel they lack individual control since the environment is contingent on their capacity for attaining a meditative state simultaneously. The a cappella orchestration enhances this impression of co-dependence because it intertwines eight different voices transformed by the degree of neural synchronization between the performers' brainwave rhythms. The more in tune the participants are, the more harmonious the voices become. As Alfred Schütz explains, polyphonic music is the only kind of music that "has the magic power of realizing by its specific musical means the possibility of living simultaneously in two or more fluxes of events" (Schütz 1951, 92). The a cappella modulations in *Octopus Brainstorming* bring forth the simultaneity of experience as much as they underscore the more or less subtle incongruences between the performers' inner sense of time and

consciousness. Enveloped in a colour and sound environment, which is the product of their neural attunements, the two participants find it hard to objectify their surroundings and define themselves as separate from their surroundings. This aesthetic engagement with a world of one's own creation fosters their re-enchantment with an experience that is contingent on the subversion of strict delimitations between inner and outer realms, self and others. In the publication *The Reenchantment of Art*, Suzi Gablik explains that it is only "when we experience the world as our own body" that "illusions of duality dissolve, and with them, old assumptions about a distinct and separate ego – self-codified by our culture" (Gablik 1991, 54). *Octopus Brainstorming* encourages precisely such a mode of transcending the egotistic self. Through its analogies with the animal mind, it participates in what Gablik calls "the remythologizing of consciousness," (Gablik 1991, 48). This is a process that is essential for overturning reductive models of the human mind based on binary relations between input and output.

*Octopus Brainstorming* invites participants to form analogies that consider the similarities between the neural attunement of human minds and human communication with other beings. The ability to reach a meditative state with a co-participant is not the only stake of the installation. The artwork calls for a participant's imaginary relation to a being whose bodily and mental complexity continues to astound scientists. Those witnessing the performative interaction see video projections that show close-up images of an octopus's eye, skin, and suckers; the images cause the audience to form an affective connection to these invertebrates. The colour change of the octopus in the video images, in tandem with the performers' attunement, emulates the camouflage capacities of these animals and evokes interspecies entanglements that rest beneath the visible threshold.

The octopus metaphor is geared towards dislodging certainties about how the human brain works and how humans relate to others––human or not. Since this invertebrate thinks with its limbs, it is virtually impossible to conceive of its mind in isolation from its body. Such biological characteristics of other species may compel viewers to acknowledge the reductive computational models of the mind that associate the brain with a unique centre of command. Recent discoveries about the function of the gut microbiome in the modulation of neurotransmitters further interrogate this notion. Experiencing neural attunement aesthetically via sounds or colours, participants in *Octopus Brainstorming* gain a better sense of the malleability and contingent nature of brain activity. They also realize how difficult it is to identify their individual impact on the environment apart from the influence of others and their unpredictable bodily rhythms. The multiple limbs of the octopus, thus, serve as a symbol of intrinsic and extrinsic plurality. *Figure 7.*

Participants in the installation enter into an imaginary alliance with an invertebrate whose complex experiential attunements to its environment can be intuited in relation to its camouflage capacities. Nonetheless, the identification with the octopus inevitably remains incomplete, conditioned by a prop that cannot replicate the perception and consciousness of a differently bodied living being. This limitation also signals the bias implicit in any act of presuming to understand another fellow human by claiming that one can sense what they are sensing or develop the same train of thought. Just because performers' neural oscillations reach a similar level, and the octopus's arms concomitantly emit indigo light, does not mean that a perfect coincidence is attained. It merely signals a territory of experience that can be shared to a certain extent. In this sense, the installation

fosters re-enchantment and relations with other humans and animal beings, which cannot be fully decoded even when they are made evident through science and technology. As sociologist Richard Jenkins argues, we may need to "recognize the complexity of a world that is neither definitely enchanted nor disenchanted (and which was probably ever thus)" (Jenkins 2000, 17). *Octopus Brainstorming* embodies this aporia because it does not completely demystify the magic of mental attunement even though it offers neural evidence of its existence beyond the visible realm.

By exposing the challenges the participants face when attempting to decode their individual impact upon the environment apart from others, Vesna signals the urgent need for a planetary form of consciousness. Difficulties in anticipating the modulations of colour and sound in *Octopus Brainstorming* further amplify the poetic quality of the work and invite critical reflection on ecosystemic contingency. Addressing interactions with responsive environments in a dance context, Susan Kozel notes that "richer meaning and complexity in a system are achieved," when overly literal correspondences between kinetic input and acoustic output are avoided and unpredictable changes emerge (Kozel 2012, 65). In *Octopus Brainstorming*, hurdles in interpretation of neural attunements are not a source of disenchantment but a catalyst for considering alternative communicative exchanges that depart from a pre-established system of signs and causal relations. Such exchanges abide by physical laws of energy that apply to all interactions, irrespective of species distinctions.

Through its emphasis on overcoming body-mind dichotomies, *Octopus Brainstorming* resonates with Varela's and Thompson's model of enactive cognition which accounts for the embodied nature of the mind. According to these philosophers, scientific models of the mind need to be accompanied by practical methods that derive insight from

phenomenological experience. For them, a key method is Buddhist meditation, which stimulates a heightened sense of presence. They explain that while numerous Western interpretations align Buddhist practices of mindfulness with exceptional "altered forms of consciousness," these are actually supposed to prepare people to extend the awareness gained in meditation to everyday contexts (Varela and Thompson 1991, 23). In Varela's and Thompson's view, meditation does not offer a gateway to another world, rather a means of relating to one's present surroundings more attentively. As the philosophers argue, the goal "is not to avoid action but to be fully present in one's actions, so that one's behavior becomes progressively more responsive and aware." (Varela and Thompson 1991, 122). Thus, they point out that meditation can enhance the potential for agency in the world.

Vesna's *Octopus Brainstorming* is similarly oriented towards developing one's attunement to planetary connections that surpass the entanglements developed in the immersive installation space. Its participatory stakes are not limited to the fulfillment of a meditative state, which can offer evidence of neural synchronicity between the performers. Through its invitation to think deeply about octopuses and to embrace non-verbal communication, the work guides participants towards considering entanglements that surpass the immediately apparent network. Vesna asks installation visitors to consider how the experience of these contingent neural fluctuations can shift perspectives on selfhood and underscore the collective dimension of consciousness. Just like Buddhist meditative practices, art can serve as a medium for acquiring experiential knowledge and interfering with established beliefs or habits. Frankfurt School thinkers like Herbert Marcuse supported the notion that art can mediate an inward turn but were keen on defining it in terms as a *fictitious reality*––an act of imagination that transcends real time

and space and can reveal truths about the actual world that are otherwise hidden (Marcuse 1978, 54). Thinking primarily about art in terms of representation, the Frankfurt School thinkers emphasized its distinction from empirical reality and its indirect impact on practical activities. Yet, philosopher David Brubaker suggests that these opposite sides of these thinkers' dialectical theory can be reconciled and argues that "aesthetic experience arises from contact with nature, not from some escape to the supernal through a consciousness that transcends" (*Brubaker* 2000, 147). Calling attention to embodied knowledge and interdependence, *Octopus Brainstorming* invites re-enchantment through contingence and fosters awareness of ongoing attunements that extend beyond the exchanges between the two performers. The poetics of relation made evident by temporary colour and sound synchronizations are accompanied by a pragmatic stake: how can one remain open to these relations outside the scope of this artwork?

*Octopus Brainstorming* pairs technological interfaces with human bodies and animal guises to dislodge faith in an immutable notion of selfhood that controls experience. In an effective and affective manner, it brings out the interconnections between conscious reflection and unconscious mental processes, as well as between thoughts on human cognitive abilities and octopus intelligence. Experiencing neural changes aesthetically via sounds or colours, participants gain a better sense of the brain's plasticity and the entanglement of individuals in ecosystems molded by multiple actants, both human and non-human, visible and invisible. The work cultivates enchantment with the fuzzy thresholds of bodies and minds. It suggests that the much-praised concept of individuality impairs one's ability to grasp the collective dimension of consciousness and the holism of ecosystems binding us to other humans and non-humans.

[1] At the Luskin Center, performers included volunteers who had prior familiarity with Victoria Vesna. Artists Patricia Olynyk, Anna Dumitriu and Alex May performed on this occasion. In subsequent iterations such as the LA Art Show (2018), participation was opened up to anyone who signed up for the performance ahead of time. Three or four performances were scheduled on each day. The set up for the performance could last up to 30-40 minutes and the actual interaction would take about 30 minutes. Octopus crowns without EEG headsets were also made available to visitors who wanted to try them on and take pictures with them.

[2] Brainwave frequencies are categorized in relation to brain states. Alpha brainwaves (8-12Hz) correspond to a state of relaxation when an individual does not actively pursue a cognitive task. Typically, they are produced when one closes his/her eyes and rests. Meditation practitioners can also attain this restful state with open eyes. Through training based on auditory or luminous signals emitted when alpha brainwaves are produced, individuals can enhance their abilities to enter this state of mind.

[3] The term "biofeedback art" designates performative or participatory art practices which integrate electrical sensors used to register physiological signals with the aim of enabling one to exert more influence over bodily processes. These processes can be regulated through changes in posture, movements, breathing patterns, mental states, or interactions with others. Electrical sensors can measure not only brainwave frequencies but also muscle tension, heart rate variability, temperature changes, and skin humidity. Biofeedback artworks typically present participants with real time physiological data translated into images, lights, sounds, or haptic stimuli. The artist may assume the role of the performer or delegate this task to others.

[4] The Integratron was built in the 1950s in Landers, CA. It has special acoustic properties as a result of its 16-sided wooden structure which is free from metal joinery and framing. Originally, it was envisioned as a center for rejuvenation based on electromagnetic energy. Van Tassel claimed it could enable time travel. The Integratron is currently used a venue for relaxing sound baths created with resonating crystal bowls.

**Bibliography**


Ahmed, Sara. “Happy Objects” in Melissa Gregg and Gregory J. Seigworth ed., *The Affect Theory Reader,* 29-51. Durham: Duke University Press, 2010.

Albu, Cristina and Mark S. Cohen. “Interview with Mark S. Cohen,” July 21, 2020.

Albu, Cristina and Victoria Vesna. “Interview with Victoria Vesna,” July 23, 2020.

Ascott, Roy. "Planetary Technoetics: Art, Technology and Consciousness." *Leonardo* 37, 111-16. no. 2 (2004). http://www.jstor.org/stable/1577468.

Ascott, Roy. “The Bridge of Consciousness: Art, Media, and Mind in the 21st Century,” October 2000. https://www.academia.edu/3624701/The_Bridge_of_Consciousness_art_media_and_mind_in_the_21st_century_2000

Ascott, Roy. “The Construction of Change (1964).” *The New Media Reader,* 128-132. Edited by Noah Wardrip-Fruin and Nick Montfort eds. Cambridge: MIT Press, 2003.

Brubaker, David. “Art and The Reenchantment of Sensuous Human Activity.” *Analecta Husserliana. The Yearbook of Phenomenological Research,* 137-149. Edited by Marlies Kronegger and Anna-Teresa Tymieniecka. Vol. 65, 2000.

Dawkins, Richard. *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design.* New York: Norton, 1996.

Downey, Juan. “Technology and Beyond.” *Radical Software. Video and Environment,* 2-3. Winter, Vol. 2, No. 5, 1973.

Gablik, Suzi. *The Re-Enchantment of Art.* New York: Thames and Hudson, 1991.

Godfrey-Smith, Peter. *Other Minds: The Octopus and the Evolution of Intelligent Life, 8.* London: William Collins, 2017.

Jenkins, Richard. “Disenchantment, Enchantment, and Re-Enchantment: Max Weber at the Millennium,” *Max Weber Studies*, 11-32. Vol. 1, No. 1, November 2000.

Kahn, Douglas. *Energies in the Arts.* Cambridge: MIT Press, 2019.

Kahn, Douglas. *Earth Sound, Earth Signal: Energies and Earth Magnitudes in the Arts* Berkeley: University of California Press, 2013.

Kozel, Susan. "Embodying the Sonic Invisible: Sketching a Corporeal Ontology of Musical Interaction." *Bodily Expression in Electronic Music,* 61-70. Edited by Deniz Peters, Gerhard Eckel, and Andreas Dorschel. New York: Routledge, 2012.

Krauss, Rosalind. "Video: The Aesthetics of Narcissism." *October*, Vol. 1, 50-64. Spring, 1976.

Lovejoy, Margot, Christiane Paul, and Victoria Vesna. *Context Providers: Conditions of Meaning in Media Arts.* Bristol and Chicago: Intellect Press, 2012.

Marcuse, Herbert. *The Aesthetic Dimension: Toward a Critique of Marxist Aesthetics.* Boston: Beacon Press, 1978.

Montgomery, Sy. *Soul of An Octopus: A Surprising Exploration into the Wonders of Consciousness*. New York: Atria Paperback, 2015.

Schütz, Alfred. "Making Music Together – A Study in Social Relationship." *Social Research*, 76-97. Vol. 18, No. 1. March, 1951.

Sloan, Kate. *Art, Cybernetics and Pedagogy in Post-War Britain: Roy Ascott's Groundcourse.* New York: Routledge, 2019.

Varela, Francisco J., Evan Thompson, and Eleanor Rosch. *Embodied Mind: Cognitive Science and Human Experience.* Cambridge: MIT Press, 1991.

Vesna, Victoria and Vanessa Graff, "Feminism and Climate Change." *Ars Electronica*. September 5, 2017. https://ars.electronica.art/aeblog/en/2017/09/05/feminist-climate-change/

Vesna, Victoria. "Networked Public Spaces: An Investigation into Virtual Embodiment." PhD thesis, University of Wales College, Newport, 2000.

Weintraub, Linda. "Victoria Vesna: From the Ridiculous to the Sublime." http://lindaweintraub.com/victoria-vesna-from-the-ridiculous-to-the-sublime/

## About the Author

Cristina Albu is Associate Professor of Contemporary Art History and Theory at University of Missouri–Kansas City. Her research focuses on crossovers between contemporary art, cognitive sciences, and technology. She is the author of *Mirror Affect: Seeing Self, Observing Others in Contemporary Art* (2016) and the coeditor (with Dawna Schuld) of *Perception and Agency in Shared Spaces of Contemporary Art* (2018).