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It's alive! Or the Fascination WITH THE AUTOMATON AS CREATIVE TOOL

In my practice, I produce large-scale works of robotic art that react to the presence of viewers through sound, light, and movement. My aim is to create poetic worlds that could elicit empathy and catharsis by means of creatures that are objectively nothing but bits of jointed metal.

For many years, my research and creation process has centred on themes of an "ontology of the machine" and an "aesthetics of behaviour" with the goal of constructing the artificial largely based on the machine's visual appearance and the specific programming of its reactions. The aesthetics of the animated object thus rests on the nature of the simulacrum: it is not an anthropomorphic or zoomorphic representation of a living creature, but rather of a subjective illusion mainly produced by the movements and reactions of abstract metallic forms. My research explores notions of human-machine projection and empathy, which are the main themes underlying most of my creative projects.

From the very beginning, my artistic practice was strongly influenced by scientific principles related to artificial life and robotics. It revolved around creating original works by appropriating diverse scientific concepts and techniques, such as those of cellular automata, genetic algorithms, adaptive behaviours, and reinforcement learning, so as to divert them from their initial use. With time, a sort of drift toward the poetic rather than the poietic developed, and the staging of the work came to play an important role in its realization.

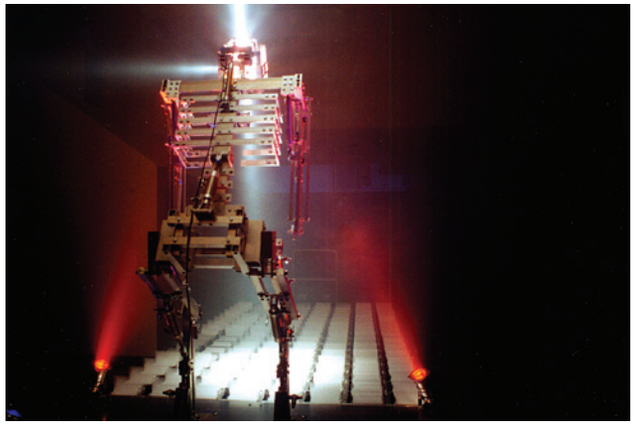
Robotic art is not a simple, homogeneous discipline; it is more an alloy of multiple technological specializations involving mechanics, electronics, and programming, as well as audiovisuals and multimedia. Similarly, my research and creation process does not focus on a single problem or field of study; it encompasses a large variety of projects that have one common feature: produce an artwork as the end result. This is why I develop projects that integrate, on the one hand, the machine's ontological aspects (its perception and actions) and, on the other hand, its aesthetic character (at the visual and behavioural levels), as well as its effect on the viewer.

One of my aims is to explore how the machine can eventually become a sensitive creature and give the impression of being alive and autonomous. In my view, behaviour is an essential element of designing and making biologically inspired robots. One can obtain a certain degree of realism thanks to the illusion caused by the actions and reactions of machines and animats; the success of the interaction depends on the effectiveness of the simulacrum. Since an effective simulation of a living thing is the result of many parameters (such as the visual aspect, the emission of sound, the physical movements) that trigger impressions and empathy, behaviour can be seen as the most convincing of these factors, as it elicits a strong impression of autonomy and consciousness.

I started making robotic art in 1992, initially by animating sound and light in a space in response to viewers' movements. *Espace Vectoriel* (1993), a collaboration with Louis-Philippe Demers, is a reactive mechatronic sculpture of eight identical motorized tubes that emit sound and light in a manner at times choreographed, at times chaotic, at times behavioural. Each tube contains a speaker and a light source and is mounted on a pan/tilt (panoramic and tilting) mechanism. A system of ultrasonic sensors detects the viewers' movements. This installation was presented at many international events of electronic art, and it led to other analogous projects. For example, *The Frenchman Lake* (1995) also used the concept of replicating an audiovisual robotic unit so as to construct a more complex environment.

Among these earlier works, *The Court of Miracles* (1997) definitely represents an important step in my trajectory. With this project, we moved away from basic replication to introduce various types (or "species") of robotic creatures, each displaying a particular behaviour in response to visitors. Using the conceptual framework of "machine misery" greatly inspired by Victor Hugo's work, these machines were designed to express notions like "grief" and "suffering," as if they bore profound pain and were victims of their condition. In this project, the viewer's attention was not directed to the machine population as a whole, but rather to each individual in the collective, since every robot had a distinct character.

The Trial (1999) was our first performance project and the next logical step in our approach to creating machines and cybernetic organisms with metaphorical behaviours and to inventing surreal immersive environments where viewers are both explorers and intruders. This entirely robotic performance symbolically depicts the trial of machines by humans, as well as that of humans by machines. It acts as a reflexive tribunal, where identities intermix, and judges, jurors, victims, and defendants are embodied by metal creatures born from our imagination.



Bill Vorn, *Stèle 01*, 2002. Photo: B. Vorn.

Onstage, the machines look more like sophisticated puppets than robots; they must follow a relatively linear but extremely rigorous programming, whereas this is not the case in an installation. However, just as in an installation, every aspect of the staging is important: lighting, sound, set design, ambiance, etc. Yet the variations have to be much more dynamic and frequent, so as to hold the viewer's attention.

The project *Hysterical Machines* (2006) was partly inspired by previous work dealing with the misery of the machines. It is based on the principles of deconstruction, suggesting dysfunctional, absurd, and deviant behaviours through functional machines. It works on two levels, expressing the paradoxical nature of artificial life (how can a creature be alive if it is artificial?). The first prototype of the *Hysterical Machine*, subsequently renamed *Prehysterical Machine*, was presented alone in 2002. Since then, I have built eleven other machines inspired by the prehysterical prototype that are part of a larger-scale environment.

Each *Hysterical Machine* has a spherical body and eight jointed arms made of aluminium tubing. Its sensing, motor, and control system functions like a fully autonomous nervous system. Each machine is suspended by a chain, and its limbs are activated by pneumatic valves and cylinders. Ultrasonic sensors enable the robot to detect the presence of viewers in the immediate environment. It reacts to their presence according to the amount of stimuli it receives. The perceived behaviour of the machine generates multiple interpretations based on a single dynamic sequence of events.

A more recent work, *DSM-VI* (2012), constructs a universe that stages creatures expressing symptoms of psychologically "abnormal" behaviour and struggling with serious "mental health" problems, such as neuroses, psychoses, personality disorders, paranoia, schizophrenia, depression, delusions, and other behavioural problems. The installation's title was inspired by the famous reference manual published by the American Psychiatric Association, the *DSM-IV* (*Diagnostic and Statistical Manual of Mental Disorders*).

The robotic creatures are both the characters and the actors in this unusual interactive allegory. They are built so as to evoke dysfunctional or aberrant behaviours that indicate their inner illness. Made of metal, plastic, and silicone, these

structures are not intended to visually represent some particular thing. It is their behaviour, above all, that gives them an organic, living aspect. At the centre of the installation, eight psychotic machines stand in various positions (upright, on their backs, on their sides) and are activated as visitors approach or respond to movements of their fellow machines. They seem to be on the verge of jumping or running away, but they are held in place, impotent, at times very calm, at times completely agitated, like a pack of chained animals.

Three other robots stand apart in the space. They seem to inhabit their own world, disconnected from their environment. These are the autistic machines, rotating turrets on which a robotic pneumatic arm animates something vaguely resembling a human face. The visual combination of a loudspeaker and a pair of robotic cameras gives the impression of a face. With these cameras, the robots observe their environment using face-tracking software. But instead of following the viewers' movements, as we might expect, they try to deliberately avoid them. Moreover, because of the limitations inherent to the tracking software, the autistic robots sometimes see faces where there are none and suddenly fall into a trance, contemplating a wall or the ceiling.

More recently and in collaboration with Demers, I developed the participatory project *Inferno* (2015). *Inferno* is a robotic art performance inspired by the representation of different "levels of hell," as described in Dante's *Inferno* or in *Ten Courts of Hell* by Singapore's Haw Par Villa. What distinguishes this robotic performance is the fact that the various machines are installed directly on the viewers' bodies. Audience members thus become the actors of the performance. Depending on the scene, participants are free to move about or are physically subjected to a system, forced by the machines to act/react in a particular way. Akin to exoskeletons, the mechanical structures force participants to perform specific movements, causing them to have certain physical reactions. With this work, our aim is to question the "cyborgization" of contemporary society, as well as the way in which technology imposes its own rules on us.

Copacabana Machine Sex (2016) is my most recent project. It is also a robotic performance, but one that can perhaps best be described as a mini cabaret show, in which kitsch and a techno-industrial aesthetic fuse to produce a theatrical delirium. The performance presents a sequence of different musical numbers performed onstage by machines turned actors, musicians, and dancers. It can be configured on a more traditional proscenium stage or in the centre of a black box theatre where the audience stands all around and is more active.

Loosely inspired by the robotic orchestras of the '90s, such as Chico MacMurtrie's *Robotic Opera* or Matt Heckert's *Mechanical Sound Orchestra*, the *Copacabana* project features not only musical machines but also acting and dancing robots onstage. My goal is not to imitate a genuine variety show, but to give an extravagant, metaphorical response to the question: "What would happen if machines took over the stage of a cabaret?"

Bill Vorn, *Inferno*, 2015. Festival Exit 2015. Photo: G. Bohnenblust.

The paradoxical nature of my work and the originality of my approach rest in the fact that I constantly explore both sides of an opposition: art and science, human and machine, reaction and cognition, reality and illusion. Ultimately, all the works I have created over the years aim to question, interpret, and reformulate the notions of projection, anthropomorphism, and empathy that characterize the relationships between humans and machines. For centuries, the automaton has been a mirror that fascinates us and makes us see ourselves differently.

Bill Vorn
Translated by Oana Avasilichioaei

Born in Montreal, **Bill Vorn** has been active in the international scene of robotic and electronic arts for almost twenty-five years. His installation and performance projects involve robotics, motion control, sound, noise, lighting, video, and cybernetic processes. He holds a PhD in Communication Studies from UQAM (Montreal) for his thesis *Artificial Life as Media* and teaches Electronic Arts in the Department of Studio Arts at Concordia University (Intermedia/Cyberarts Program), where he is a Full Professor.

Bill Vorn, with Emma Howes, *Grace State Machines*, 2007. Photo: B. Vorn.