

Writing and Language through Movement and Noise in the Machinic Work of Artist Rafael Lozano-Hemmer

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Artistic Mechanisms

This article reflects upon certain expressions triggered by machinic technologies with an artistic aim. I will explain how these types of machines allow us to access a conceptual and communicative domain, demarcated by the interplay between art and technology. Moreover, this domain is embodied by mechanisms that are based on movement and dynamism in real time.

Since the early twentieth century, such artistic/technological undertakings have allowed practitioners to explore a range of psychological reactions in the spectator, who might be moved to experience surprise, seduction, hypnotization, or fright. These oeuvres are even able to communicate a sign that can be interpreted in a sort of language and give the impression of telling a story. Through finely produced assemblies and elements, artistic mechanisms generate a grammar, a form of writing and de-writing, which the observer is invited to decode and interpret. Language is hence engendered and expressed through the motion produced in the mechanism. In this way, many different causes and effects are generated through the machine, causing an impact on the viewer. The size, duration, or technical complexity of an artistic mechanism is not the defining factor when it comes to analyzing the artistic quality of a particular piece. That is, the effect and poetic nature of such work depends on the artistic and communicative result it yields, not on the technique with which the mechanism was constructed.

Artistic mechanisms, then, are technological entities that produce sequences, dynamics, signs, and inscriptions or forms of “writing” in real time (Benítez 2010), which I will explain by providing some examples of Mexican-Canadian artist Rafael Lozano-Hemmer’s work. The mechanisms are conceived and constructed as peculiar machineries, according to the creator’s communicative intentions. He is, then, someone who not

only possesses technical skills but who also adopts the position of an artist seeking to express himself or note/indicate something through mechanisms and the effects they produce. Thus, the primary difference between these devices and other machinic objects is that we must view them as artistic mechanisms. These machines, moreover, are not designed to have a conventional, “practical” function, but rather to produce artistic poetics that differ considerably from conventional practicality. The presumption is that said objects embody an inspiration or intuition, and that they induce or translate innovative, effective aesthetic responses in the subjects who are exposed to them. This is the movement that the artist uses as a form of notation, through the machinic performance in his work.

An artistic mechanism can also contribute to a very particular experience, dynamic, or exchange with the spectator via sequences of cause and effect that we could define as mobile narrative forms. These artistic, technological products are therefore also poetic objects that explore and instate open territories and interpretations. However, these artistic mechanisms, which have no functional use, must not be reduced to mere objects built by the artist. Rather, they contain an active narrative and poetic principle that enables the creation of other representations and other means of sociability.

I have been analyzing and describing these kinds of mechanisms and their creators for over a decade: a time in which the field has evolved and my interest in studying them from various perspectives remains open. My studies have encompassed a range of interdisciplinary methodologies and visions, drawing primarily on science and culture (Benítez 2018a). My explorations have also been empirical, directly approaching and delving into the artistic works, their materials, and the artists behind them; interviewing the artists and observing the formation of their artistic/creative processes has allowed me to witness the assembly and aesthetic results of their work. In addition, I have studied and analyzed those results with the observing and participating public (Benítez 2018a, 53–58), and continued to monitor these processes up to the present day. Donna Haraway’s reflections and analyses (1988) on the production of what she calls “situated knowledge”, have guided me. According to Haraway, when knowledge is created, there is no neutral or objective point of view to generate the true reality of formal studies and theories. It is possible, she says, to produce knowledge or studies when situated in a specific perspective, one based on certain solid premises and specific interests to be obtained. As the product

of my analytical explorations, and from my own personal lens and methodological perspective, I have proposed two types of artistic-technological objects according to their mechanisms, rooting them primarily in the characteristics of machinic technological design (Benítez 2018b). These types are broadly divided into what I call “compact artistic mechanisms” and “modular artistic mechanisms.” The goal behind this typology is to explore characteristics and dynamics that said technical assemblies enable and which will be presented in what follows, as part of a broader discussion of my ideas. The key ideas I have developed by classifying artistic-technological objects serve to explain how said objects communicate with the world and what kinds of language they use. This proposal was developed by examining both the recesses and the intersections of technology and culture, as well as by closely studying how the work of iconic artist-builder Rafael Lozano-Hemmer¹ is created, conceptualized, and understood. I will present and explore several of his pieces in what follows.

Regarding compact artistic mechanisms, they are comprised of mechanical, electrical, or digital assemblies (or combinations thereof) that are clearly designed in such a way that the machinery itself will behave like a single mobile object. Thus, the kinetic work becomes the very conduit of the narration, translation, language, or aesthetic effect sought by the artist in three-dimensional space. These kinds of mobile machines – the first of which were built in the 1920s by Duchamp, Moholy Nagy, and

1 Rafael Lozano-Hemmer is a prolific, multifaceted Mexican-Canadian techno-artist born in Mexico City in 1967. He is adept at conceiving technological pieces of all kinds, complexities, and formats. His work generates and experiments with many different relationships between the art object, space, and the audience via the interactions among multiple elements: for example, architecture, performativity in the stage space, lighting, robotics, the expansion of the sound space, and others. In Lozano-Hemmer’s creative output, we glimpse profound comprehensions of the technological and artistic work that makes him a direct, active agent in the process of producing and shaping contemporary artistic technology. His highly varied pieces show that he is an artist who has forged new languages and new creative and perceptive experiences in different spaces. In his laboratory and studio, an entire interdisciplinary team (Antimodular Research) works to research, design, and create his poetic/artistic pieces in collaboration with him. All of these characteristics emerge from a crucible of elements accumulated throughout his personal life and professional trajectory. Lozano-Hemmer grew up immersed in the world of music, theater, spectacle, and culture: his parents owned the legendary cabaret *Los Infernos*, frequented by artists, writers, and intellectuals of the day. On the other hand, inspired by the chemical experiments conducted by his grandfather in his garage, he studied physical chemistry in Montreal. All of these factors influenced the development of one of the world’s most resourceful interdisciplinary artists at work today. The openness and versatility of his work make him a good example for me in developing the ideas I wish to discuss in this article.

Naum Gabo, among others – enable the transformative, revelatory effect of language when their materials begin to move. In such mechanisms, the combination of the mobile object’s dynamic and materiality is essential to the artistic result. Jean Tinguely described the opening caused by the effects of mechanisms starting in the 1950s:

I began to use movement simply to make a recreation. It was a way of doing a painting so that it would become infinite – it would go on making new compositions with the help of the physical and mechanical movements I gave it. Then I gradually understood that movement was an expressive possibility in itself (in Hultén 1987, 350).

With some exceptions, compact mechanisms are generally designed to be dynamic objects of contemplation. In other words, the dynamic created by such mechanisms is typically one-directional, and the action develops in real time: the work, its materials, are the elements in motion, the elements to be contemplated. Compact artistic mechanisms “speak” through the movement they produce; their own material movement in real time is part of their language, their means of self-expression in space. This artistic notion of the kinetic must be understood as a procedural condition (that is, in time) and not only as a spatial one. There is “something” that occurs, something that the artist himself wishes to narrate. Yet he narrates something specific that will have to be interpreted by the viewer; it is in this way that communication transpires and a message is sent and received. These mechanisms constitute another means of creating a dynamized narration or translation, of recounting a specific concept, of encapsulating a moment that seeks to be shared. Moreover, for each device, a specific artistic result is produced, a narrative or dynamic of its own – as is true of any conventional work of art. Hence my insistence on referring to these works as artistic mechanisms.

Therefore, a compact artistic mechanism applies its ability to move the material elements of an artistic work in order to alter or transform, for instance, the meaning of a sculpture, as recounted by the critic and curator Pontus Hultén in reference to works like Tinguely’s:

[...] when motionless, the “Balubas” are quite disappointing: a scattering of feathers, bits of cloth, fragments of iron. The electric motor plays a crucial role in the entire set, as [...] the melancholy produced by the combined scraps is transformed into joy when they suddenly come to life and rev into motion (Hultén, cited in Brett 2000, 9).

Accordingly, the language of a compact mechanism is produced by its technological mediums. Using materiality and numerical code as formats, other communicative and conceptual vocabularies are produced, as we will see below by discussing the case studies that imply Lozano-Hemmer's work.

As for the "modular artistic mechanisms", their components (mechanical, electrical, digital, or combinations thereof) are installed in different physical spaces. All modular parts or elements that constitute the artistic machinery are interrelated, comprising an entire chain of elements that function as a unit, so that they must be taken as a whole. This unfolding of the work of art makes it more complex but not less interesting, because, among other things, the narrative production and its vocabulary become more sophisticated – to the point that the audience interacts with the work. Thus, the audience becomes another direct, active, modular part of this symbolic and narrative chain of production, without whom the piece would not serve its purpose. In fact, one could say that without this interaction the piece "does not exist," because neither the action, the motion, or the artist's intended social, poetic language are triggered.

Within these modular artistic mechanisms, we can further distinguish two categories:² on the one hand, the mechanisms that are visible, and on the other, the invisible ones, which I will proceed to explain, taking two works by Lozano-Hemmer as an example.

"Visible modular artistic mechanisms" are the ones designed so that each module containing the machinery remains a conduit that is palpable and/or visible to the viewer. The experience takes the materiality and participation of the public into account. *Pulse Spiral* (2008), by Lozano-Hemmer exemplifies this quite well. As he puts it:

"Pulse Spiral" is a three-dimensional spiral paraboloid made up of 400 light bulbs arranged according to Fermat's equations – an efficient spatial distribution along a surface which is found in plant phyllotaxis (arrangement of leaves and cells in roots for example). The piece records and responds to the heart rate of participants who hold a sensor underneath. Commissioned for the opening of the Center for Contemporary Culture in Moscow in the constructivist Bakhmetevsky Bus Garage, the piece is inspired by engineer Vladimir Shukov who worked with Melnikov on this emblematic building from 1926-1928 (Lozano-Hemmer 2008, n.p.).

2 I would urge readers to consult the websites cited in the examples below. There, they will find videos depicting the operation of the artistic machines, including their use of language, motion, and sound.



Image 1: Rafael Lozano-Hemmer, “Pulse Spiral,” 2008. Photo by Antimodular Research.
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The observer will thus note the presence of all technical objects contained in the modular piece; in this way, he physically interacts and relates to it. Communication ensues between materiality and audience. The effect is a seduction, a dual social and technological production yielded by the poetic result.

By “invisible modular artistic mechanisms”, I am referring to those technical devices designed to produce immaterial relational artistic experiences. In other words, these technological mechanisms are not designed as objects to be contemplated, nor to be physically or directly interacted with. Instead, they become the channel, the means, the interface (which is sometimes even hidden) used to attain the objective and/or artistic experience of the work.

Lozano-Hemmer’s “Subtitled Public” (2005) is one example. This piece enables a bodily experience and a notable narrative and socio-communicative dynamic. The experience begins and unfolds when the public enters a seemingly dark and empty space. Inside, the hidden technology

“awaits the spectator”: detecting their presence (with sensors and digital code), the technological machinery is activated. At the same time, this machinery enables the viewer’s own bodily artistic poetics to transpire. The artist explains the piece as follows:

[It] consists of an empty exhibition space where visitors are detected by a computerised surveillance system. When people enter the space, the system generates a subtitle for each person and projects it onto him or her: the subtitle is chosen at random from a list of all the verbs conjugated in the third person. The only way of getting rid of a subtitle is to touch another person, which leads to the two subtitles being exchanged. The project exists in Spanish, English and French versions. “Subtitled Public” invades the supposedly neutral and public space of contemplation that exists in museums, underlining the violent and asymmetrical nature of observation. The piece also attempts to highlight the arbitrariness of computerized surveillance systems now used in public and private spaces that attempt to detect suspicious individuals and classify people by ethnic group for example. Finally, the installation is an ironic statement about the era of technological personalisation, literally branding observers and turning them into “thematic individuals” (Lozano-Hemmer 2005, n.p.).



Image 2: Rafael Lozano-Hemmer, “Subtitled Public,” 2005. Photo by Alex Dorfsman. © VG Bild-Kunst, Bonn 2021.

In this case, the artistic mechanism unleashes, through the language of numerical digital code and hidden technology, a bodily, social, and experiential vocabulary. Unexpected and reconfigured social relationships are produced: the languages of numerical code activate and reveal other forms of existence, and other forms of collective language, in a sort of translation.

Art critic Javier Chavarría uses the term “artist of the immaterial” to describe the type of creator who is interested in the interactions between the environment and the public, as well as in the experience shared with the audience:

I study a series of artists who don't constitute a school or a movement [...] our association isn't arbitrary, although it involves a slightly artificial generic title, created to talk about the characteristics shared by artists whose work raises questions about the challenge of knowing things about the world, about the concept of reality, about how to define and determine it [...] their responses and conclusions, their aptitudes and their work all point in the same direction. All define their work as an exercise in interaction between the proposed “environment” and the audience. All root their work in the experience of the viewer, who determines the work's ultimate “reality.” This is what makes them experiential pieces [...] All use “energy-based” elements rather than “solid” ones as their primary tools. In all possible disciplines of the immaterial, the field of study has been limited to all those artists who fundamentally use light as a raw material, as long as this is the essential axis of their output or a substantial part of it [...] These immaterial works occupy a more powerful reality in the viewer's own imagination and in the experience they entail for the public than what they offer as an artistic object [...] these and other shared experiences allow us to speak of these artists as a group, despite their numerous stylistic differences [...] (Chavarría 2002, 9).

Chavarría detects some of the characteristics that these modular mechanisms produce as poetic works. As I see it, however, the communicative experience that such work offers to the audience is even greater than what this author describes. After all, light and space are not the only elements to consider in this analysis. Other elements come into play as well: for example, sound, code, and language, among others. Yet I see Chavarría's remarks as a useful starting point for identifying features, approaches, and experimental and communicative spaces that artistic and modular mechanisms can produce.

Writing and Language Through Movement and Noise

I will focus on developing ideas that emerge from analyzing the characteristics of compact artistic mechanisms alone. I am interested in exposing the material capacity that an artistic mechanism possesses in producing vocabularies and communicative possibilities through motion as an expressive capacity of their own.³

Specifically, I will consider the act of “de-writing” based on sound and visibility in the compact mechanisms of the artist Rafael Lozano-Hemmer. I will discuss the importance of languages and notations that facilitate communication and assert these machines as representations of the world. Lozano-Hemmer has produced a rich, vast, high-quality set of compact machines. His work provides clear examples of how machinic art can yield communicative capacities and varied languages.

I will begin by analyzing the piece “Synaptic Caguamas,” the artist’s first compact work, before presenting a selection of machinic pieces I consider poetically notable. Those works – “Pulse Spiral,” “Subtitled Public,” and “Call on Water” – allow me to elaborate a clearer and more cohesive reflection on language. All of these artistic devices were entirely designed and produced at Antimodular Research, the factory/studio that Lozano-Hemmer conceptualized and founded around the turn of this century. Antimodular Research, which still operates today, is where the artist researches and experiments with a range of technological materials in order to produce artistic poetics and new communicative vocabularies.

“Synaptic Caguamas” (2004) is a compact, mechanical, digital artistic mechanism, which comprises a green wooden table from a Mexican cantina (87 x 210 x 180 cm). On top of the table is a lattice of 30 beer bottles lying on their sides. The glass bottles are *caguama*-sized (one liter) “Indio” brand of beer.⁴ They rotate on their own axes and occasionally pause at different angles (see Photo 3). Each bottle is subject to a digital motor, controlled in turn by a computer program. The 30 digital motors and the

3 The inclusion of the audience in the work involves another kind of communicative experience and other characteristics that space limitations will prevent me from discussing at length here.

4 In Mexican slang, the word *caguama* refers to something large; it is also a regional name for the loggerhead sea turtle, which is the world’s largest hard-shell turtle. Lozano-Hemmer uses the *caguama* beer bottle because it is among the most representative bottles in Mexico; beer sold in this format is popular for being inexpensive. The inclusion of this bottle grants a specific Mexicanness to the piece.

program were designed and constructed ad hoc by the artist's team that worked on this project. The bottles' movement-enabling mechanisms are not independent. Each robot, each bottle in the array, is connected to the others, its movement controlled by specific non-linear mathematical instructions generated by the numerical code.



Image 3: Rafael Lozano-Hemmer, "Synaptic Caguamas," Subsculpture 4, 2004. Photo: Antimodular Research. © VG Bild-Kunst, Bonn 2021.

The bottles do not move at random. Rather, they shift according to complex mathematical rules that imitate the brain's neural motion. Their movement depends on the information provided by a code that was previously entered into the computer. Thus, the vessels write, describe, simulate, and materialize the behavior of the brain's neural connections as they transpire. Once the machine receives an instruction, the program develops unplanned movements with a certain degree of freedom, enabling the bottles to dance and generate abstract mobile writings with their movement – writings controlled by no one. This work of art thus has "a mind of its own," and it draws, as it writes out a numerical code, the movement of neurons. Every three minutes, the patterns of motion come to a halt, the bottles align in a single direction, and the code asserts new conditions. The code, the language, will use the circular movement to write a new pattern and thus activate new

movements, new writings. In this way, the viewer can see neural movement materialized before his eyes. The mathematical notation – in this case, the numerical code – mimics the neural behavior we cannot usually see or hear, giving it visual and aural form in another language with machinic irony.

The compact artistic mechanism, “Subsculpture 4,” in addition to visually writing or delineating through the bottles’ circular motion, also produces noise; that is, this mobile sculpture is also a sound sculpture. When they move, the bottles emit “neural” sounds, produced by the creaking of the motors and the clinking of the glass. Listening to this experience is another experience altogether: another language. “Synaptic Caguamas” generates a concert of sound. The striking machinic noise, produced by the combination of rumbling motors and glass in this kinetic sculpture, evokes the artistic quests of avant-garde works like those Luigi Russolo described in 1913, in a letter to his friend Marinetti. Here is an excerpt:

[...] we shall enjoy distinguishing the ebbs of water, air, or gas in the metal tubes, the roar of the motors that snort and pulse with undeniable animality, the throb of the valves, the swinging of the pistons, the shrillness of the mechanical saws, the leaps of the tram across the rails.[...] We shall relish orchestrating, ideally together, the racket of the shop-shutters, the shaking of the doors, the murmur and stomping of the crowds, the different hubbubs of the stations, the spinning mills, the typographers, the electric plants and underground railroads. [...] We wish to harmoniously and rhythmically intone and regulate these most varied of noises [...] (Sarmiento 1914, n.p.).

However, Lozano-Hemmer’s piece is more mechanically sophisticated: the use of the numerical code, in conjunction with the production of movement, places it in a different creative dimension.

Another source of artistic inspiration in this shared realm of artistic sound products is the conceptualization of the sound compositions by musician Iannis Xenakis. In 1971, Xenakis used the laws of probability calculations (non-linear mathematics) in a musical composition. In doing so, he also used natural stochastic events like language. For example, he employed the collision of hail or rain onto hard surfaces to produce new sound pieces. Xenakis used the phrase “a new sound event,” following random and stochastic mathematical laws, to describe these sounds as a whole.

Through his compact mechanism and a mathematical language, Lozano-Hemmer successfully created two other parallel languages – one mobile, the other acoustic – that show us how neurons move and communicate in the brain. “Synaptic Caguamas” is thus a bilingual language-translating

machine. The sculpture dances and speaks according to the laws of complex mathematics. Both Xenakis and Lozano-Hemmer used non-linear mathematical languages or stochastic laws: the same ones that describe and create the movement of cicadas, rain, or hurricanes to produce sound. These are the stochastic laws of transition that range from absolute order to total disorder in a continuous or explosive way (Xenakis 1971).

As asserted by John Austin (1988 [1962]), we do not simply do things with language; when we represent something with language, we also transform the world. Representing, then, means creating other worlds. In this sense, Lozano-Hemmer is a world-creator, because he uses these complex mathematical languages to de-write, through materiality and sound, the neural behavior of our brains. In this way, he interacts with whomever observes and listens to his work.

Lozano-Hemmer has developed many other noteworthy mechanisms that write visual portraits and sound events through numerical code. In his beautiful piece “Call on Water” (2016), words are written in vapor. At the same time, we get to hear water’s fluid poetics. “Call on Water,” in the artist’s own words,

[...] is a fountain that writes words in mid-air with plumes of vapour that ascend from a water basin. Dozens of poems by Mexican writer Octavio Paz are presented which describe readable air, the moment when the written word is spoken and becomes the atmosphere itself. The poems’ content becomes tangible briefly, almost breathable, then disappears in turbulence. The fountain uses hundreds of computer-controlled ultrasonic atomizers, placed under the reflecting water pool, which produce the plumes of cold vapour (Lozano-Hemmer 2016, n.p.).

This artistic mechanism translates, produces, and writes poems with vapor and sound: verbal languages translated into other languages. We read words translated into motion and sound. The name and poetics of the piece were inspired by an excerpt of the poem “Niña” (“Girl”), by Octavio Paz. Wondrously, this poem describes Lozano-Hemmer’s piece:

You name the water, little girl.
 And the water wells up, I don’t know where,
 and bathes the black earth,
 the flower is restored to green, its leaves resplendent,
 transforming us into damp vapors.⁵

5 Paz 1960. The translation of this excerpt is by Robin Myers.

Words, then, are both vapor and sound (sweet currents of water): “the water wells up, I don’t know where [...] transforming us into damp vapors.” As Lozano-Hemmer’s piece writes, the word is named, the water rises up, and it bathes the atmosphere in humid steam, just like in the poem.

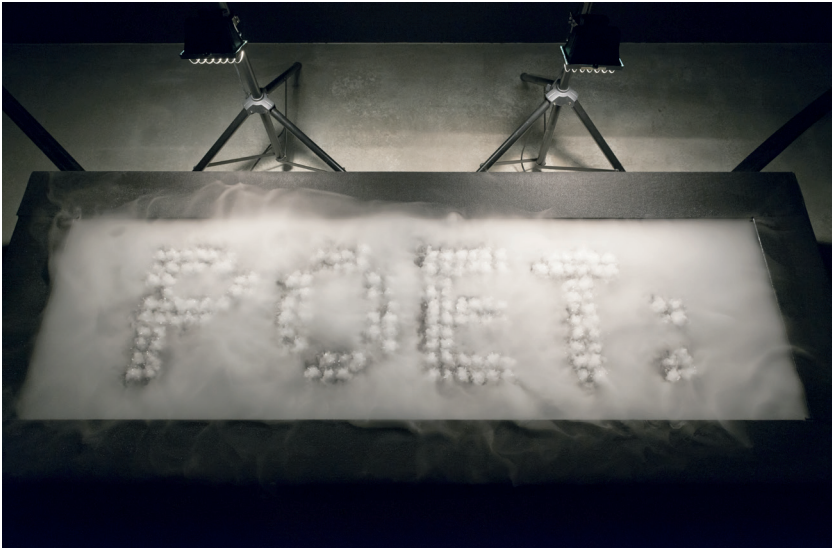


Image 4: Rafael Lozano-Hemmer, “Call on Water,” 2016. Photo by Franz J. Wamhof.
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Although the pieces described here are far more complex in their poetics and aesthetics than what I have been able to present in this article, I have focused my work on highlighting some of the material capacities possessed by compact artistic machines in order to produce and translate varied languages and representations of the world. We use language to represent, to discover worlds; we interact to understand them and understand each other. In this way, the epistemological and affective dimensions become interwoven in a complex but fascinating form of notation.

I have shown some of the mechanisms and layers of language produced within the artistic space when machines are designed for poetic means. Many cultures, including artistic culture, have created and used language to communicate, developing different forms of notational systems (Olson 1994; Harris 1995) that have facilitated communication between people and attain a certain representation of the world.

The mathematical notation (numerical codes) used by the artist Rafael Lozano-Hemmer produces conceptual languages (metaphors, impressions, sounds, movement) and materials determined by formats and technologies that enable inscription, documentation, and the representation of worlds. He employs symbolic creations (codes and materiality) as intermediaries, as resources, as tools to contemplate and communicate through his machinic works. These machinic works follow the very logic and richness of formal mathematical language, and he uses this language as a mediator to obtain free, personal, intimate expressions.

A curated selection of Rafael Lozano-Hemmer's works emphasizing their acoustic and visual characteristics as communicative language, allows us to incorporate new aesthetic elements into his oeuvre, which has thus far received little attention or been outright ignored by curators and critics.

Translated by Robin Myers

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