

# Nervous Systems—Composing Unruliness in the Technosphere

## Système nerveux – Composer l'indiscipline dans la technosphère

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Article abstract

*Proceeding from the contention that the dawn of the Anthropocene may have as much to do with our relationship to technology as it does with climate change, Stefan Maier discusses recent work that explores the unruly behaviours of particular sound technologies. As a foil to functionalist accounts of technology—accounts that attempt to understand technology entirely through the lens of normative utility—Maier discusses his idiosyncratic treatment of instruments, sound-systems and software. Here, tools are mined for their alien(ating) potential—the capacity of certain technologies to project well beyond their designated use, often to monstrous ends. In particular, Maier discusses his recent multi-media installation Deviant Chain (2019), which uses a machine-learning-driven speech-synthesizer to generate abject, nonsensical speech. These machinic glossolalia form the basis for a constructed language, which features extensively in the work.*

# Nervous Systems—Composing Unruliness in the Technosphere

Stefan Maier

**FIGURE 1** Sanzhi Pod City, *circa* 2008.



Construction of the Sanzhi Pod City, near New Taipei City, Taiwan, began in 1978. Originally planned as a utopian vacation retreat for US soldiers stationed in the South Pacific, the futuristic pod-like structures would never be completed [...] the project was abandoned in 1980. However, when demolition work began some 30 years later, it was discovered that where human construction had ended, not 1, but 5 hitherto unknown species of Orchid Mantises had speciated and multiplied to an estimated population of over 10 million insect inhabitants. Research revealed that the Mantis civilization, which developed inside, between and beneath the Pods, displayed highly unique behaviors [...] The Future [...] is not for us. The Anthropocene, the reframing of the Earth in the image of industrial modernity, will be short lived. It will be less of a geologic era than a geopolitical instant. Humans are already vanishing, even despite our growing aggregate biomass. Our cities are not our own. We are building habitats for other life forms. We are the tools wielded by these other forms.<sup>1</sup>

1. Bratton, 2015.

What if the catastrophic wreckage of industrial modernity were not *only* a source of mourning and pessimism? What if, contained within these ruins, we were to uncover hitherto unprecedented possibilities? Even in the face of the failure of modernity, what if new forms of human, nonhuman, animal, mineral and vegetable expression were to emerge from the destruction? What new strange forms of vitality, even intelligence, might be discovered? Between the ruins of our utopias, beneath our projective futurisms, and inside our tools of mastery, how might we conceive of different relations with a world that is not removed from the dynamic potential of materiality, but rather, continually animated and reinvented by it? Above all, how can we become sensitive to such unexpected forms of emergent alterity?—what music might accompany the strange dance of the Sanzhi Orchid Mantis and how can we hear it?

Through performance, installation, and composition, my artistic practice explores the chaotic flow of sonic matter through sound technologies, both emergent and historical. Highlighting material instability and seeking out the unruliness contained within even the most codified tools, my work uncovers alternate modes of authorship and listening. Against the conception of technology as passive and inert, my work seeks to engage these tools as vibrant and dynamic—endowed with the capacity for complex emergence, perhaps even forms of agency that we might call creativity. All of my work starts with an investigation of specific sound technologies: instrumental, electronic, computational, and even biological. Regardless of their designated use, through analysis and observation I seek to uncover the unexpected forms of material intelligence that hide behind (and perhaps even in spite of) the composure and normative projections we place on these tools. Normatively bound by myopic notions of “the musical” or “intelligibility,” these sound technologies can be understood as a platforms that actively invite repurposing and reassembly towards alternative ends—ends that challenge functionalist fixity—and open onto vistas of free exploration. Insisting that certain technologies may project well beyond the limits we ascribe to them, my research seeks to uncover the fecundity latent within such ossification. As an artist, my wager is that alien vectors, as yet untapped, lie dormant within even the most codified and repressed of tools. In making this bet, my work speculates on new forms of collaborative engagement with a more-than-human material world—a world no longer construed as dead and passive in its compliance with human mastery, but rather teeming with possibility and unruly potential.

In its most conventional form, my preoccupation with sound technology proceeds from an investigation of musical instruments. By deconstructing instruments into their discrete parts, materials, and constituent mechanisms, my artistic research attempts to attune itself to unexpected material states and to uncover inherent operative logics—operative logics that often defy my tastes, aesthetic predisposition and compositional sensibility. The musical instrument is not conceived as a placeholder for some *a priori* conception of music, nor as an icon or sign. Instead, it is abstracted, flayed, and mapped onto a fluid possibility-space of material dynamism to the end of uncovering contingency—the knowledge that any given material or law can be otherwise, that there is a difference between our conception of the apparatus and its underlying operational behavior.

For example, consider the piano, an instrument which features heavily in my chamber music and improvisatory practice. Historically, socially, and sonically overwrought, it is emblematic of projected musical fixity. Consider the mechanisms at play: a key is depressed, which triggers a felted hammer to strike of a string to produce an equal-tempered tone. A linear process, streamlined through hundreds of years of pedagogy, craftsmanship, and social rearing, its history of domestication has coalesced into the form we know today. My work asks: what other vibrations might be present behind the instrument's composure? What other sound can emerge when the instrument-body complex is disentangled? Bypassing the keyboard-hammer mechanism, resonances contained within horizontal percussive key-attacks are drawn out into smeared metallic blossoms through extreme preparations where the strings are irregularly activated through the use of smoothened stone, metal, and glass. Percussion becomes drone, and the discrete field of equal-tempered pitch transforms into the fluid domain of frequency.

Since 2016, this thinking has animated my exploration of various musical technologies and served as the basis for my artistic output. This includes musical works for chamber ensembles, such as *Grain, Vapor, Ray* (2020),<sup>2</sup> which explores highly unstable instrumental preparations in the context of field recordings from sites of primary resource extraction in Canada's North.<sup>3</sup> It also includes works that investigate the unruly materiality of consumer electronics, such as *Territories III* (2016-2017)<sup>4</sup> which instrumentalizes degraded radios and reel-to-reels, and *RARE EARTH* (2019)<sup>5</sup> which attempts to break open black-boxed digital technologies, exploring the sound and material byproducts of rare earth minerals—the minerals that form crucial components at the heart of many contemporary digital technologies. A machine-listening-based software system features prominently in *The Arranger* (2018)<sup>6</sup> which explores

2. Commissioned and premiered by Ensemble Contemporain de Montreal (ECM+). Additional information and documentation for all my works can be found at [www.stefanmaier.studio](http://www.stefanmaier.studio) (accessed November 15th, 2021).

3. By exploring the juxtaposition and fusion of field recordings from sites of the geological trauma with instruments rendered machinic and unpredictable, I suggest that the dawn of the Anthropocene may have as much to do with the ramifications of catastrophic terraforming as it does with challenging distinctions between nature and *teche*. Here, "natural" sonic characteristics of the Canadian landscape (bubbling brooks, birds, and the like) and the expected timbral identity of instrumental sounds are denied: instead, the hiss of motors on an oil rig in the tar sands contrasts with the harsh distortion of a heavily detuned cello string prepared with various clips; the wind rushing over an open pit mine is combined with a violin activated by crude motorized fans.

4. Commissioned by Vancouver New Music, premiered by Talea Ensemble.

5. Commissioned by Gaudeamus Muziekweek and premiered by Vicky Chow and the composer.

6. Commissioned by Haus der Kulturen der Welt, premiered by the composer.

FIGURE 2 Stefan Maier, *Inference*, 2018. Courtesy of the artist.



7. Both works were created in collaboration with Danish sound-artist Ragnhild May.

8. Commissioned by Ultima Festival, premiered at Gamle Museet for samtidskunst, Nasjonalmuseet Oslo.

9. Mashable Deals, “Google’s AI Assistant Can Now Make Real Phone Calls,” keynote by Sundar Pichai, Youtube, [https://www.youtube.com/watch?v=jvbHu\\_bVa\\_g&ab\\_channel=MashableDeals](https://www.youtube.com/watch?v=jvbHu_bVa_g&ab_channel=MashableDeals) (accessed November 15th, 2021).

10. Dieleman and van den Oord, 2016.

the differences between human listening and artificialized, computational models of such listening. Finally, in addition to these fixed-duration works, my installations explore similar themes: both *the walls are moving* (2017) and *Bellows* (2018)<sup>7</sup> instrumentalize entire buildings through the distribution of loudspeakers, microphones, and instruments that sound their resonant frequencies through acoustic feedback. In the following, I discuss my recent multimedia-installation, *Deviant Chain* (2019),<sup>8</sup> which focuses on bleeding-edge technology: namely, a custom machine-learning-based speech synthesizer. This synthesizer serves as the basis for a large scale musical composition, a series of episodic videos, and the invention of a new conlang—“a constructed language”—to speculate on possible futures for human language and physiology, and their relation to emergent technologies.

On March 27th, 2018, Google released its highly anticipated speech synthesizer, Wavenet. Heralded as a groundbreaking technology in sound synthesis, it uses machine-learning and artificial intelligence to model and synthesize artificial speech with stunning accuracy. As demonstrated by a Google Keynote lecture on May 8th, 2018, which featured recordings of Wavenet ordering food and booking appointments, the tool easily passes the infamous “Turing test.”<sup>9</sup> Speech synthesis researchers have long dreamed of a tool that could seamlessly interface with humans using verbal communication. That future seemed to have arrived. However, behind Wavenet’s remarkable displays of functionality, an unexpected byproduct was noted by the researchers who created it. Wavenet can “speak” on its own.<sup>10</sup> It can synthesize language-like glossolalia when removed from the ecosystem of software that ensures its

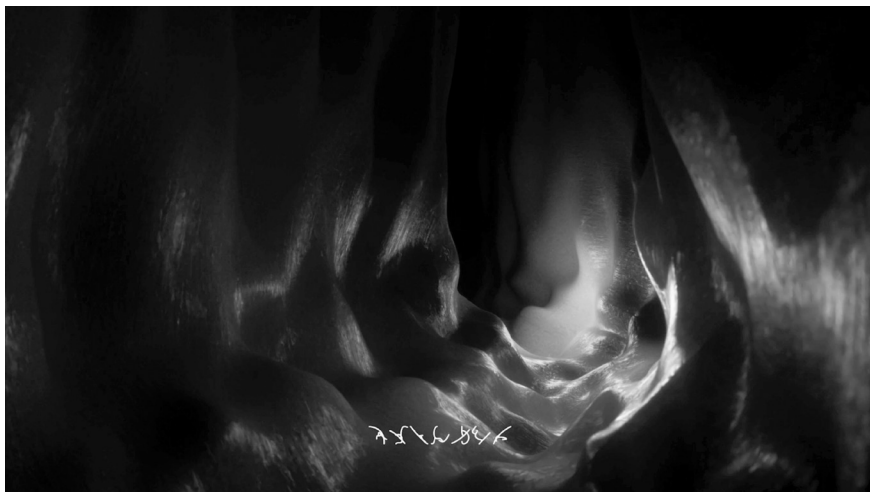
intended behavior. Based on statistical analyses derived from the recordings of speech upon which it was trained, Wavenet has gleaned abstract rules of human language. However, a human being listening to this generative speech immediately notes that these rules clearly do not result in human speech. One speech-element follows another in irregular fashion; stuttering and jerking phonemes start and stop, causing unpredictable interruptions. The speech has a bizarre semblance to language—one may perceive a certain syntax here—but the syntax is unintelligible. It follows the autonomy of machinic reason: rationality unhinged from functional application and the utilitarian limits we usually place upon technology.<sup>11</sup> Crucially, Wavenet speaks in an entirely rational manner—as evidenced by its algorithmic codification—that, nevertheless, differs wildly from our reified accounts of it. Therein lies its radical potential.

Using a custom wavenet-inspired speech synthesizer named *Inference*,<sup>12</sup> I explore the dynamics of this accidental machine-speech. Through idiosyncratic training, which exacerbates the alienness of these glossolalia, *Inference* produces irregular gasping from non-existent lungs, plosives generated from digital lips, the clicking of synthetic teeth and melted vowels from a contorted tongue. What kind of mouth could produce such nonsense? Listening to *Inference*'s synthetic speech, I feel it suggests a monstrous throat not of this world—not subject to the mechanisms underlying terrestrial evolution. But can any sense be gleaned from this display of digital abjection? Even more troubling: could we ever entrain to such alienating forms of language?

11. Negarestani, 2014.

12. *Inference* was designed and trained in close collaboration with American technologist and artist Victor Shepardson.

**FIGURE 3** Larynx descent, from Stefan Maier, *Deviant Chain*, 2019. Courtesy of the artist.



With these questions in mind, these sonic explorations inspired me to develop episodic videos to contextualize my emerging musical work. Set in an imagined future, the videos depict a world where humans have to grapple with non-human language and inhuman cognition—forms of cognition which may no longer correspond to inherited categories of human comprehension. In one scene, a character receives strange voice messages; in another, a biohacker inserts a magnet covered in inscriptions under her skin. Videos of this imagined future are enriched by portrayals of various moments when human language has undergone irreversible or otherwise remarkable transformations—the movement of the larynx down the throat of Homo Erectus over a million years, the first inscriptions of abstract symbols on a necklace of teeth during the upper paleolithic, among others. Drawing on deep-time genealogies of hominid language acquisition and capacity for symbolic abstraction, my goal is to show how the unexpected situation this imagined future portrays is, strictly speaking, not without precedence. Finally, the output of *Inference* is used as the basis for an imagined language: the phonetic material generated by the AI is used to construct a new phonology and alphabet specific to its garbled output.

**FIGURES 4 AND 5** Engraved teeth and writing a secret message in flesh, from Stefan Maier, *Deviant Chain*, 2019. Courtesy of the artist.



In its final form, *Deviant Chain* was presented as a large-scale video and sound installation through multiple adjoining rooms at Oslo's Gamle Museet for Samtidskunst with a large loudspeaker array, multichannel video, and light. Frustrating the prospect of an archimedean point, and highlighting provisional access and organization foreign to intuitive human capacities,

computer-controlled light and sound spatialization directed a mobile audience through a complex, non-linear interplay of synthetic language, abstract sound, and fragmentary exposition. The work premiered at the Ultima festival in 2019.

**FIGURE 6** A character from *Inference's* machine alphabet, from Stefan Maier, *Inference*, 2021. Courtesy of the artist.



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The unprecedented transformations heralded by the dawn of the Anthropocene are as much environmental as they are epistemic. Familiar distinctions between culture, technology and nature no longer pertain. The synthetic is coextensive with nature, while alienated nature appears to be de-naturalized. My work attempts to explore this shifting terrain. In particular, by fracturing monolithic accounts of technologies—as inert, dead, or artificial—and uncovering the latent mutability contained therein my work attends to such epistemic transformations. It does so through close attention to the inhuman logic contained within certain technologies—logics that follow their own rules and dynamics. Here lies a crucial insight of my work: the locus of our



13. Simondon, 2017.

alienation from modern technology and its attendant forms of destruction to the planet is not necessarily *caused* by the machine, but results from our inability to uncover its underlying inhuman form.<sup>13</sup> My work looks for a logic that leaps beyond ordinary conceptualizations and projections, a logic that requires that we revise our myopic formulations. My work aims to interface with such alienness and anticipate its constitution. It wants to stay with the trouble of our current nervous alienation; to map the dynamics of nervous perturbations as new equilibria form in the wake of catastrophe. Most radically, it wants to discover entirely new forms of vitality—unruly, nervous systems teeming with potentiality, with life.

14. Laboria Cuboniks, n. d.

Finally, my project attempts to respond to the increasing despondency many feel towards the encroachment of technology upon contemporary life and the planet. As the design of technology is ever more streamlined to serve the interests of the industrial-military-complex and neo-feudal digital empires, it is imperative that we uncover alternate futures *within* the tools at hand—that we discover an “outside,” even as we face the insidious inside.<sup>14</sup> However, as we entertain this notion, we must also be aware that our attempts at interfacing with machinic alterity will inevitably have unintended consequences. In the process of excavation, we must cultivate an openness to the possibility of leaving something behind. Even if it be “the human” or “the musical.”

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