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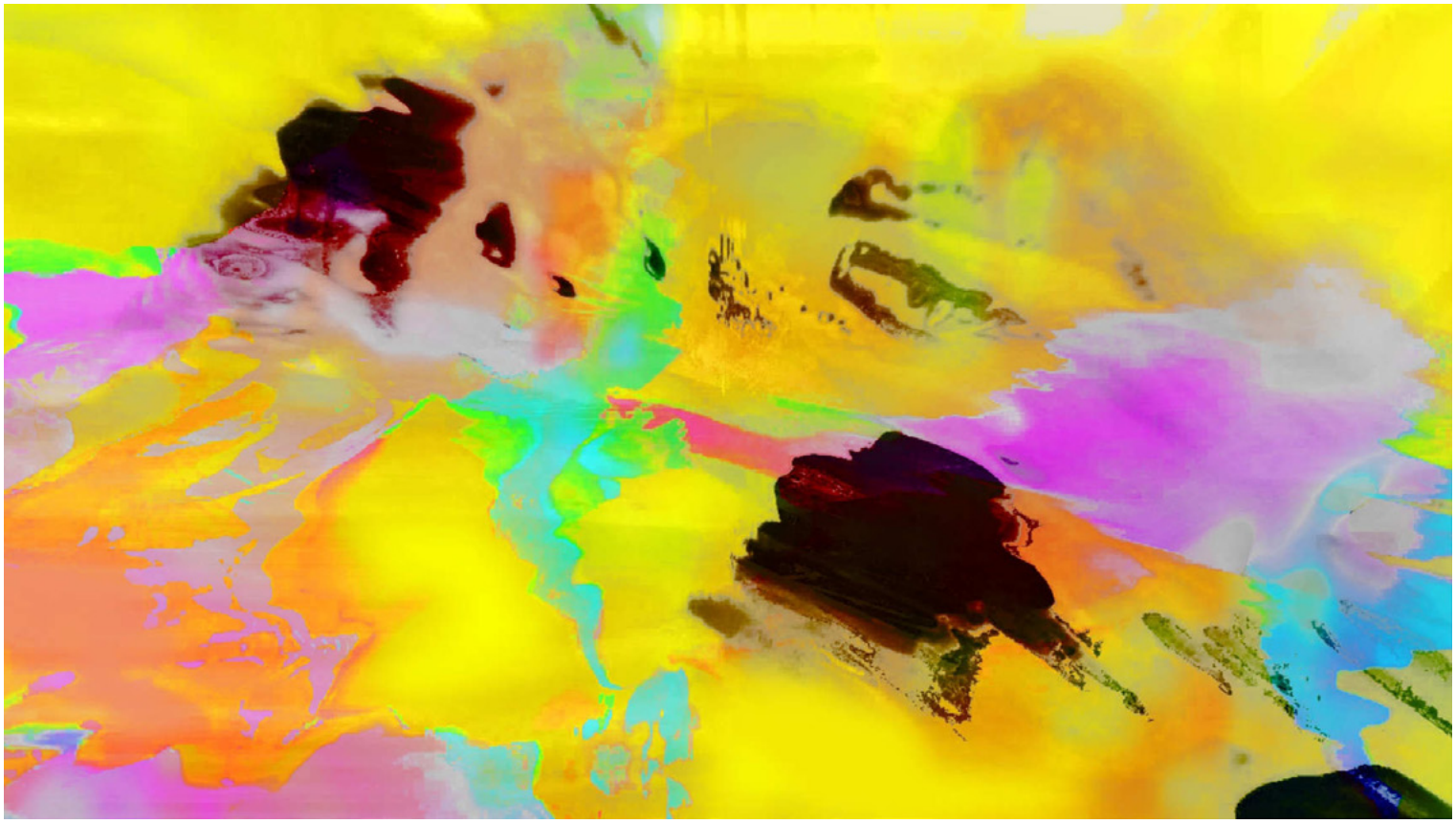

Datox

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Datox explores the imperceptible electromagnetic radiation generated by electronics and digital technologies as sonic material. The work is a music album and a live performance that creates an audiovisual environment that explores sonic possibilities through the amplification of imperceptible sounds. This aims to highlight a material layer that comes before data, the electricity that powers electronic devices. The music album and performance immerse the listener in a sonic environment of non-human agency, the electricity and its voltage differences at the circuitry level of computational devices. The work exposes the dependency of computational societies on energy production from non-renewable sources such as coal that contribute to environmental pollution and the climate crisis.

Keywords Experimental Music, Sound Art, Audiovisual Performance, Noise, Improvisation, Materialism, Post-digital Aesthetics, Environment

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The Computational Society

In computational societies, digital media technologies are part of our environment and intertwine with daily life. This is discussed in the scholarly domain as the post-digital condition, the state after the digital revolution where digital technologies permeate all aspects of everyday life (Cramer 2014; Berry 2014; Berry and Dieter 2015). Within the post-digital condition, digital technologies have become spatial and embedded in physical spaces, are mobile, smart, wearable and even incorporated into the human body. New relationships have emerged beyond the interface level of computers and the screen surface. Consequently, digital technologies are no longer new media and have become familiar technical objects and devices embedded into our daily routines.

However, the infrastructures of digital devices are, in part, invisible and imperceptible due to their immediacy and built-in blackboxing which obscure their inner mechanisms, such as algorithms or electronic circuits. These seem to become only perceptible in computational errors and failures such as stock market crashes, drone malfunctions, autonomous vehicle accidents, video streaming glitches, software bugs, social media server failures and data corruption, to name a few.

As a result of living in this condition, the work *Datox* (2022) intends to remove the utility and instrumentality embedded in digital technologies, as functional appliances of everyday life, to foreground a complex layer prior to data, to bring closer to the listener a hidden world of non-human agency, the electricity within digital devices.

The Materiality of Digital Technologies

The materiality of digital technologies is beyond the appearance of errors on the screen surface, and is not reducible to its code, software, or hardware; it is rather "a massively distributed reality that in turn conditions our perceptual realities" (Bishop et al. 2016, 13). The constellation of digital media materiality has to include energy production, distribution and consumption as these are fundamental to the networked society where "data feeds of the environment both through geology and the energy-demand" (Parikka 2015, 24). This is explored in the work *Datox* to unveil electricity, a material layer before data, which is part of the planetary distributed materiality of digital technologies.

Datox: Electricity and Non-human Agency

Datox (2022) is a music album and live performance that immerses the listener in a sonic environment of voltage differences at the circuitry level of computational devices. The work remixes the sound of electrons moving through electronics by

amplifying their electromagnetic fields (EMFs) as an artistic attempt to expose the materiality of digital technologies and their dependency on electricity that originates mainly from fossil fuels such as coal. As the scholar Jussi Parikka points out, coal is not only "one of the most significant energy sources, powering cloud computing data centers, but also an essential part of computer production itself" (Parikka 2015, 99). Thus, the networked society is highly dependent on non-renewable energy sources essential to the manufacture, distribution, powering and maintenance of digital technologies.

Performance

The live performance (Fig. 1) starts improvising with the raw sounds captured by coils. The hands of the performer hold a coil in each hand and search for EMFs over electronic devices. The coil acts as a sensor that captures and amplifies the imperceptible noise generated by digital technologies. After exploring the raw sounds, the noise builds up and is further combined with the manipulation of pre-recorded samples and improvisation with the live sound input. The sound manipulation is done through custom-made software built on SuperCollider.[1]

The music is punctuated with abstract visuals of video feedback to visualise electricity through a burst of colours and glitches. This aims to highlight electricity as digital materiality and its manifestation on the screen surface as pixels, the screen unit. It uses the live coding software aNa – analog Not analog developed by the artist Thomas Jourdan.[2]

The music improvisation and manipulation mixes both live input and samples until it reaches a point of overwhelming complexity where several noises are smashed together. Afterwards, a brief sequence of flashing images of coal mining and energy production is combined with the abstract visuals. The screen is extended with lights in the physical space through LED light strips that are reactive. The performance ends by returning briefly to the initial hand gestures that capture the raw sounds.

Album and Archive of Electronics' Noise

The album[3] was self-released in 2022 under the artist name Pedra Ferro. It was produced using the background noises generated by electronics, sampled using a coil, and manipulated live using the custom-made software. It was further arranged and composed using mainly the software Ardour for digital audio workstation (DAW). The process for the album production followed the instructions provided in the list below. With these instructions, anyone can easily replicate the artistic process and come up with completely different results.

The sample library[4] is made available online and archives the noise generated by consumer electronic devices including power banks, smartphones,

1. The *Datox* custom-made software was created on SuperCollider with the help of the artists and professors Hannes Hoelzl and Alberto de Campo. It can be downloaded here: https://pedroferreira.net/datox/code/

2. The visuals use layers of video samples that react to the sound through FFT. The open-source software aNa – analog Not analog is a live coding system for visuals developed by the artist Thomas Jourdan: https://gitlab.com/metagrowing/ana

3. The album was self-released as a vinyl record and cassette tape as a form of impure aesthetics that materialise digital technologies. This hybridisation is done as a counter-model of music consumption and distribution. The album is made available online here: https://pedraferro.bandcamp.com/album/datox

laptops, hard drives, scanners, computer fans, Wi-Fi modems as well as AC adapters, a wireless mouse, a video game console, a CD and media player, TVs and a laundry machine.

4. The sample library can be downloaded here: https://archive.org/details/datox_archive

Datox DIY Recipe

1. Use a coil soldered to a mono audio cable as a sensor to capture the EMFs. Connect it to an audio interface or sound recorder. Find and listen to hidden sounds generated by electronics and digital devices around you. Record the sounds and collect different samples.
2. Improvise, remix and manipulate further the live sound input and samples. Explore the live input, the sound samples, and manipulate it live using the provided SuperCollider code. Don't forget to record the live improvisation.
3. Arrange the improvisation recordings according to the judgment of taste. For example, edit the recording using DAW, such as Ardour or Audacity, and explore simple techniques such as cut and paste, repetition, pitch stretch, automation, and basic filters, amp, EQ, pitch shift, reverb, delay and compressor.
4. Repeat the process and have fun.

Datox or Data Overload Recovery

The aesthetics of the work *Datox* follows the experimental music tradition described by the scholar and artist Kim Cascone as a "post-digital aesthetics" which results from "the immersive experience of working in environments suffused with digital technology" (Cascone 2000, 12). However, the main focus of *Datox* is not exclusively to highlight the background of media or defy normal functions through glitches and errors. Rather, it amplifies the imperceptible and hidden world of non-human agency as actors within computational devices unveiled through gestures and movements of the performer's hands. This attempts to provide a direct expression of the noise of electronics to expose electricity as a fundamental facet that maintains the networked world.

The computational society is dependent on electricity produced mainly from non-renewable energy sources such as coal. Parikka describes this simply as new media being powered by archaic media—coal (Parikka 2015, 123). Within this context, the work *Datox* can be experienced as a sonic manifestation of electricity, as part of the planetary distributed materiality of digital technologies and its environmental consequences that result from the complex relationship between society, technology, and the environment.

Fig. 1. Live at Arkaoda (2020), Berlin, Germany.

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References

Berry, David M. and Michael Dieter. 2015. "Thinking Postdigital Aesthetics: Art, Computation and Design." In *Postdigital Aesthetics: Art, Computation and Design*, David M. Berry and Michael Dieter (Eds.), pp. 1-11. Hampshire, New York, USA: Palgrave Macmillan.

Berry, David. 2014. "Post-digital humanities: computation and cultural critique in the arts and humanities". *Educause Review* 49 (3). https://er.educause.edu/-/media/files/article-downloads/erm1433.pdf, date accessed 18 April 2022.

Bishop, Ryan, Kristoffer Gansing and Jussi Parikka. 2016. "Introduction." In *Across & Beyond –A Transmediale Reader on Post-digital: Practices, Concepts, and Institutions.* Bishop, Ryan, & Gansing, Kristoffer, & Parikka, Jussi (eds.), pp. 13-23. Berlin, Germany: transmediale e.V. and Sternberg Press.

Cascone, Kim. 2000. "The Aesthetics of Failure: 'Post-Digital' Tendencies in Contemporary Computer Music." *Computer Music Journal.* V. 24:4, pp. 12-18, Winter. Cambridge, Massachusetts, USA: Massachusetts Institute of Technology.

Cramer, Florian. 2014. "What Is 'Post-digital'?" *A Peer-Reviewed Journal About: Post-digital Research.* Christian Ulrik Andersen, Geoff Cox and Georgios Papadopoulos (Eds.), Vol. 3 No. 1, pp. 10-24. Aarhus, Denmark: Digital Aesthetics Research Centre, Aarhus University. https://aprja.net//article/view/116068/165295, date accessed 18 April 2020.

Parikka, Jussi. 2015. *A Geology of Media.* Minneapolis, Minnesota, USA: University of Minnesota Press.