

The Art & Signal of Noise

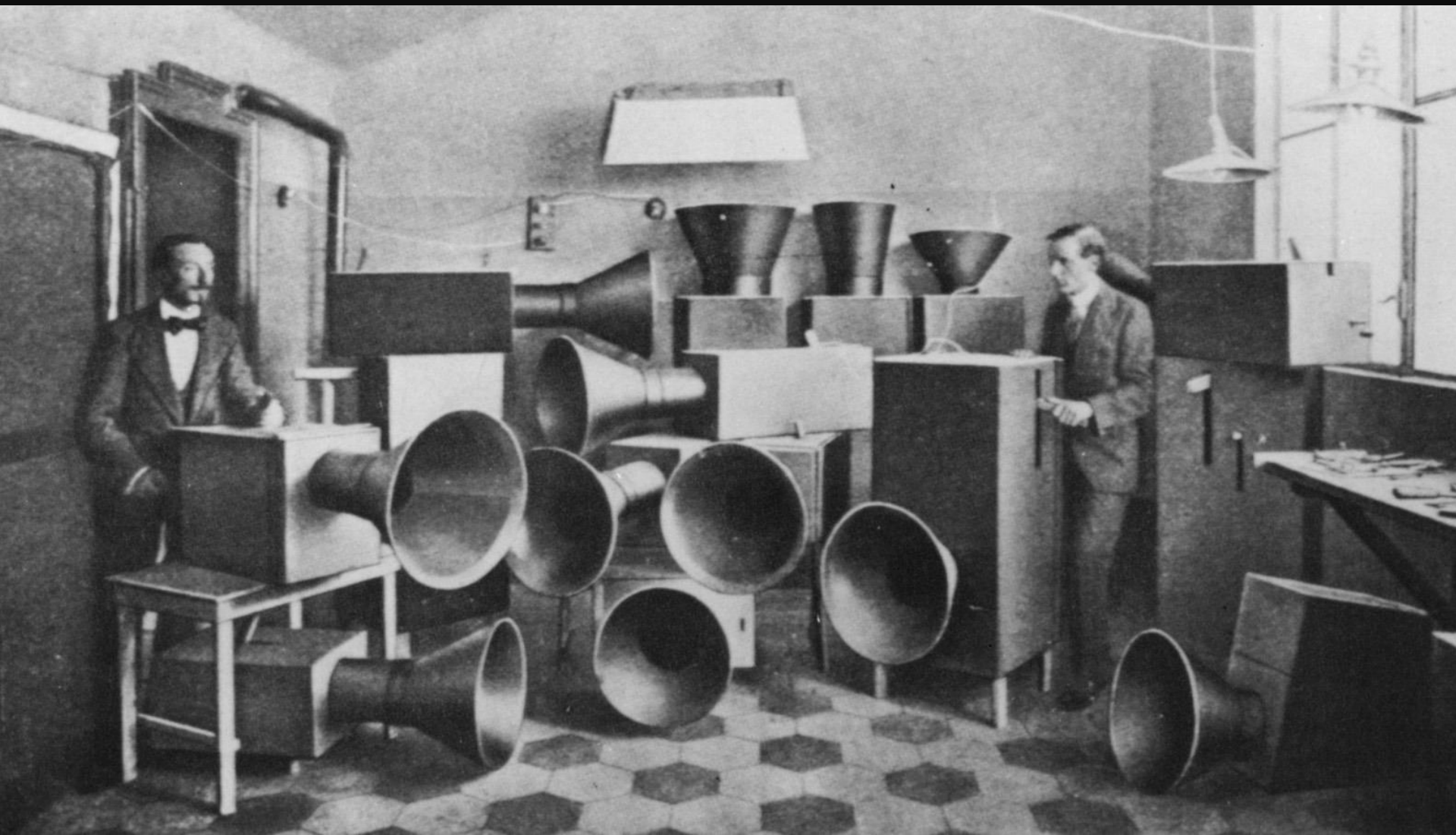
George Legrady © 2025

Experimental Visualization Lab

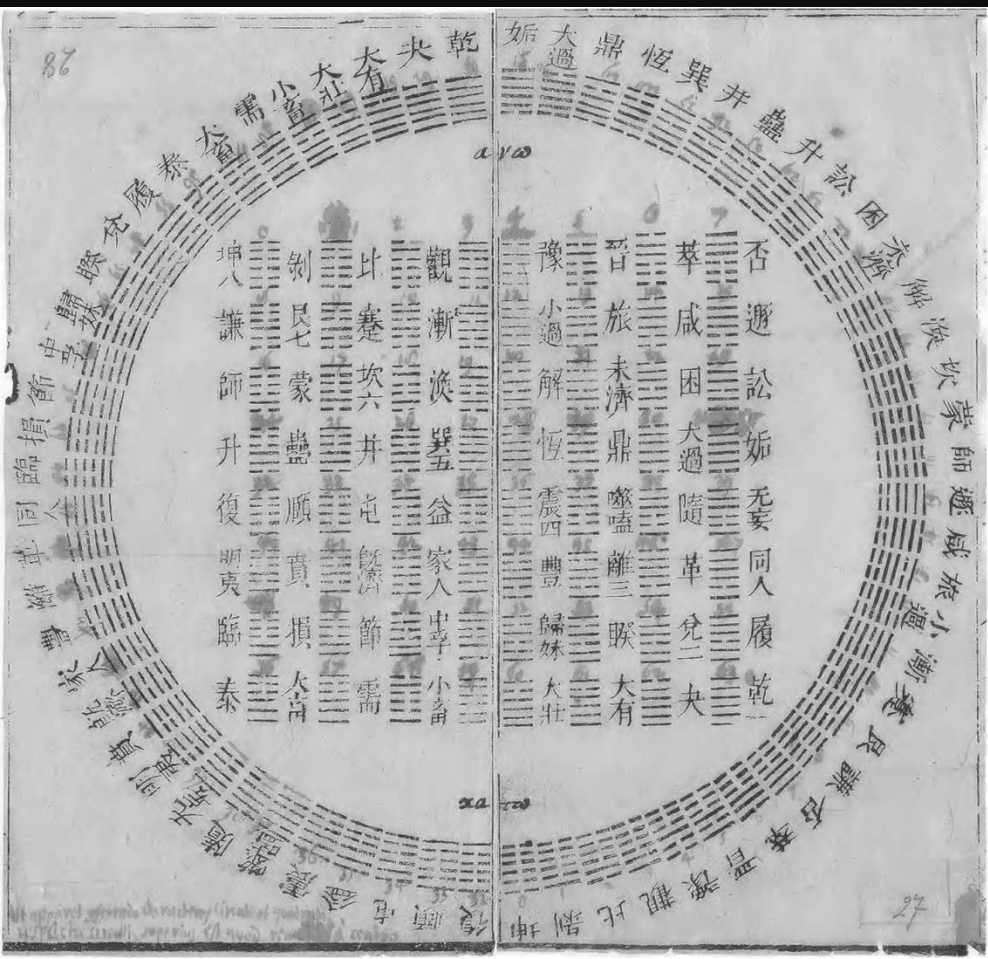
Media Arts & Technology

University of California, Santa Barbara

“The Art of Noise: Futurist Manifesto”, Luigi Russolo (1914)

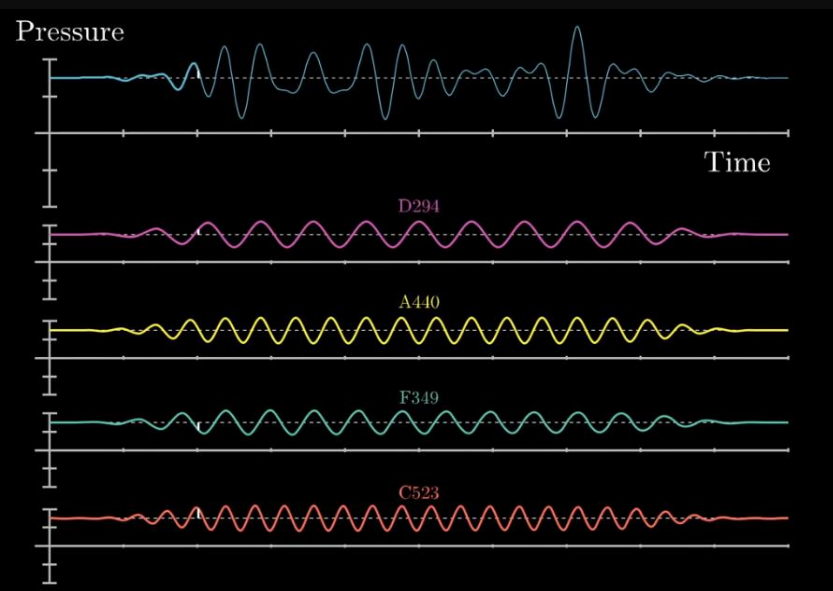
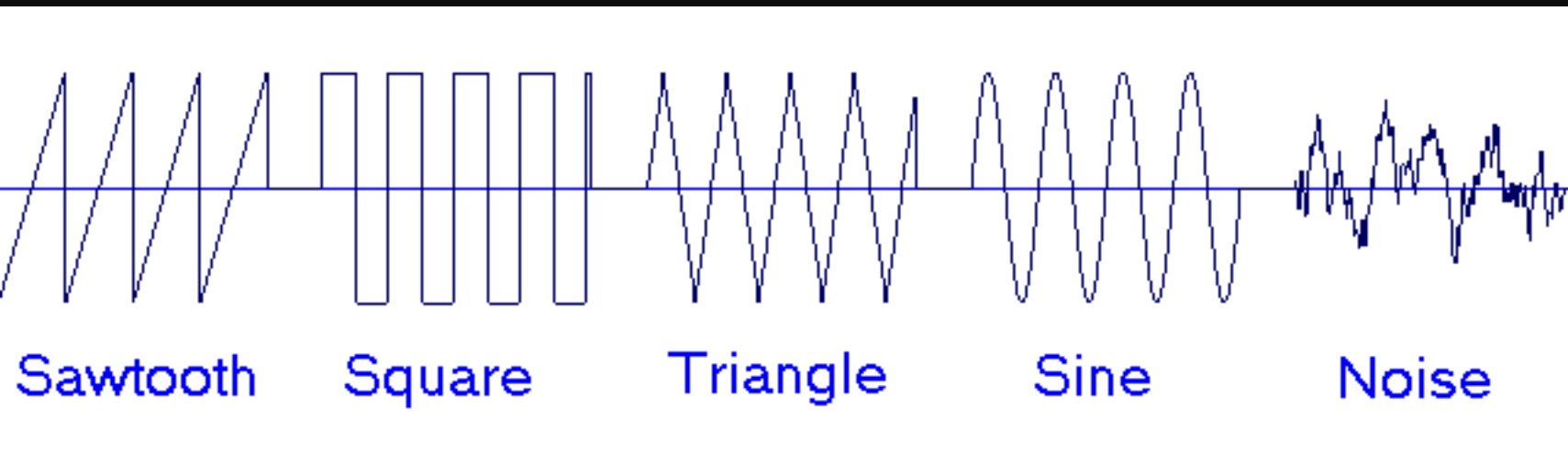


I Ching to Binary System, Gottfried Wilhelm Leibniz (1701)



Hexadecimal	Binary	Decimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
A	1010	10
B	1011	11
C	1100	12
D	1101	13
E	1110	14
F	1111	15

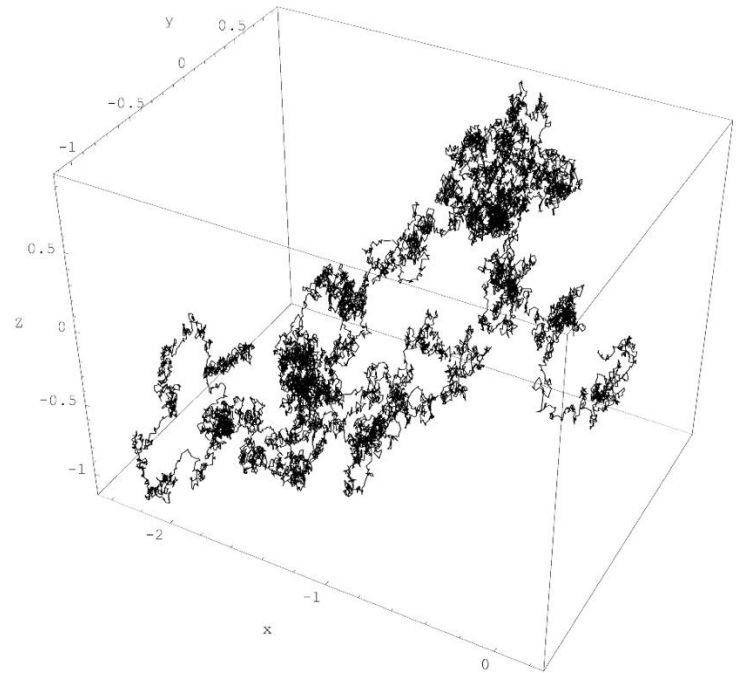
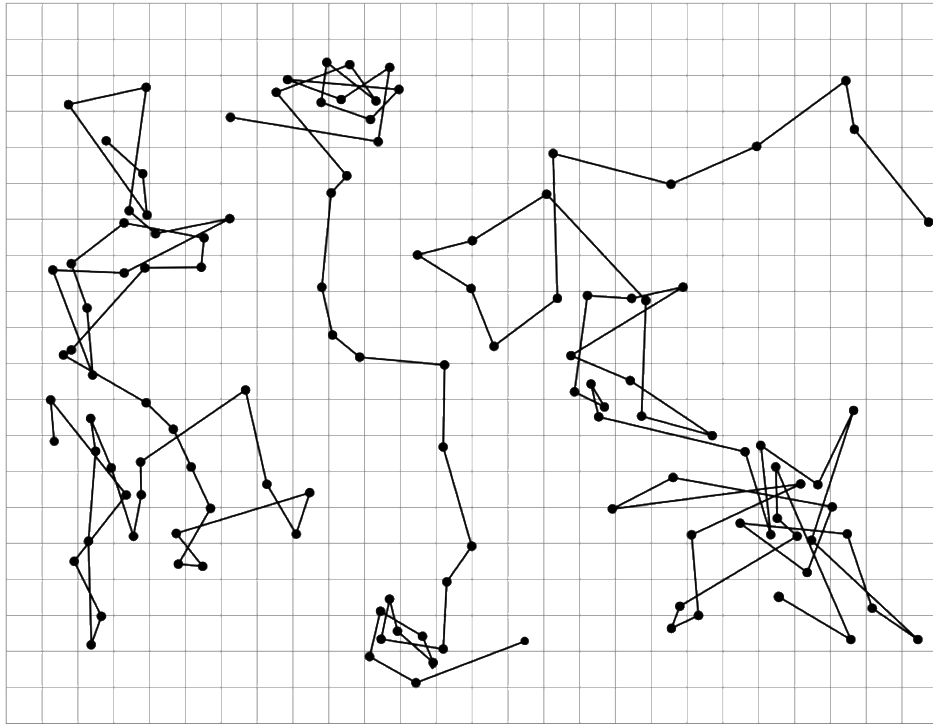
Analog Oscillators | Frequency Modulation | Fourier Transform



Frequency Modulation: Where one wave modulates another to get a complex signal

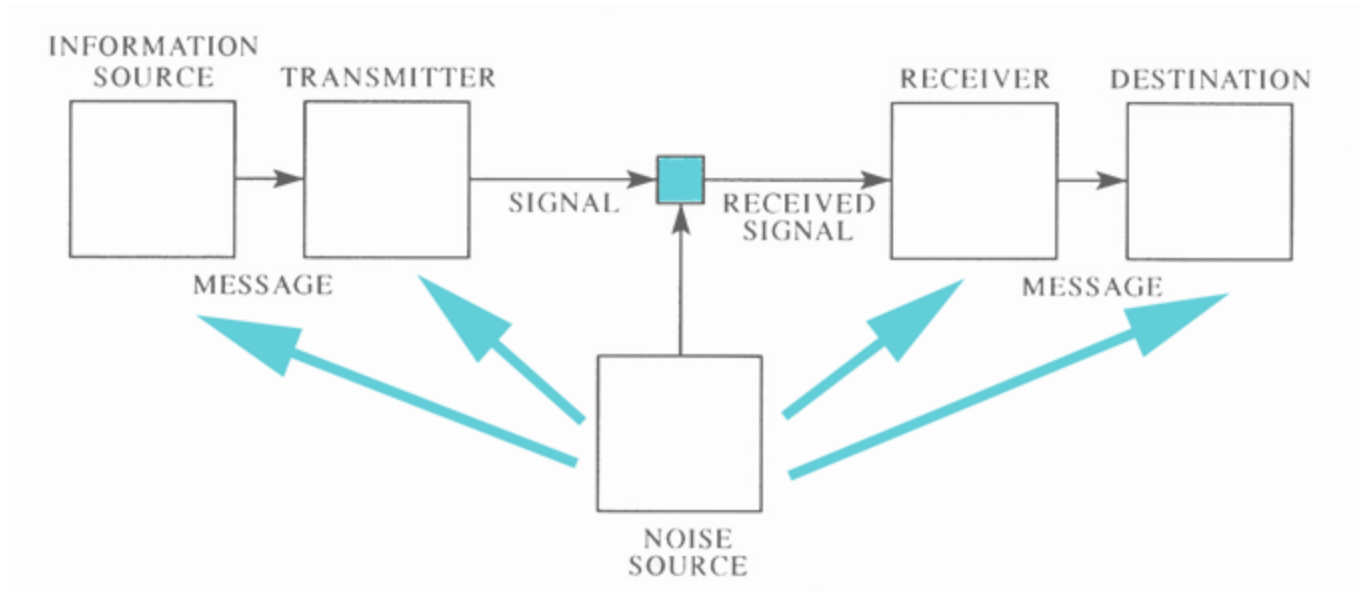
Fast Fourier Transform: A way to decompose a (complex) signal to its make-up of multiple basic frequencies

Brownian Noise | Random Walk

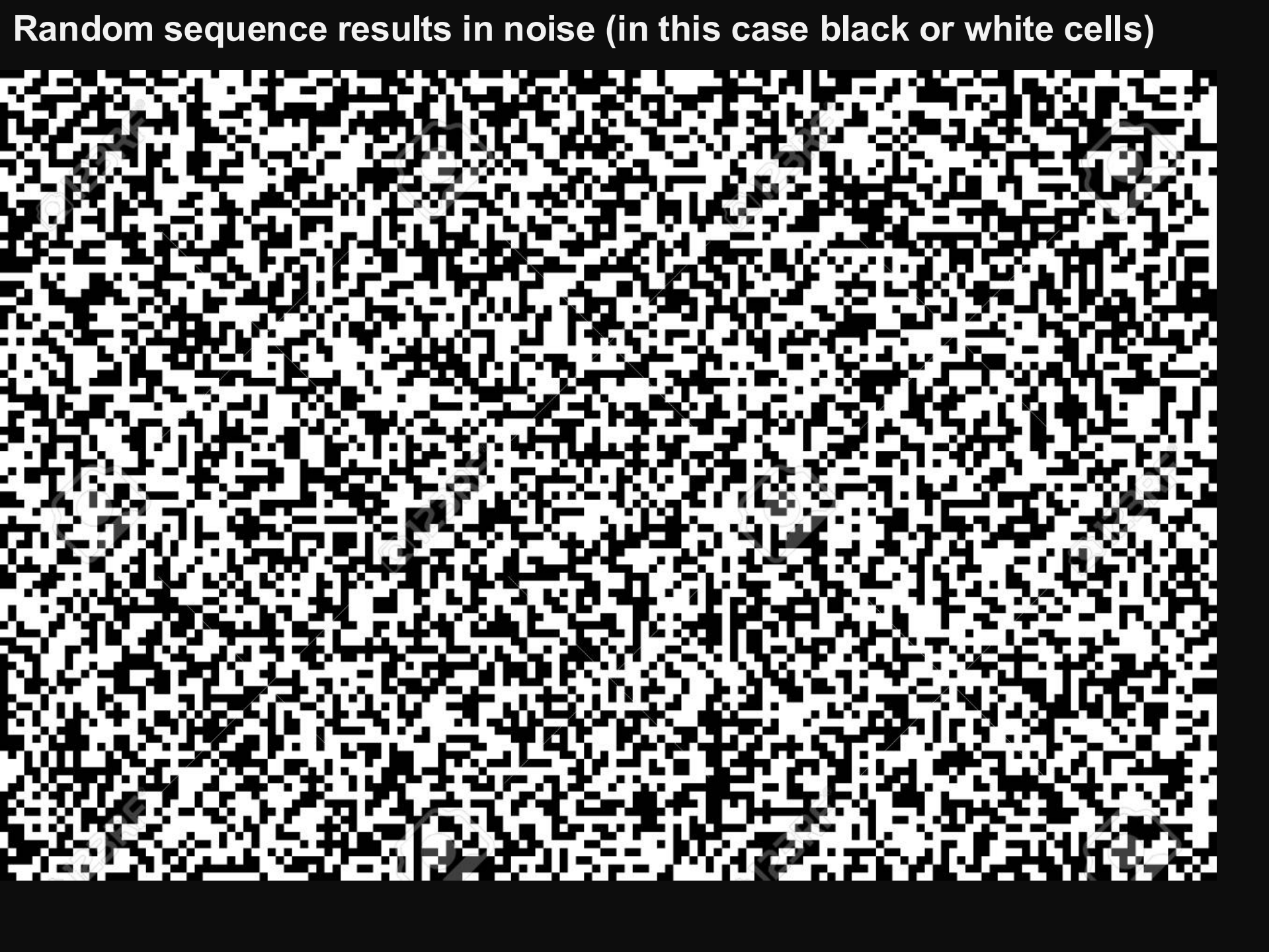


- **Brown (1827)** : Erratic motion of inanimate particles in water
- **Einstein (1905)** : Particles are moved/pushed by water molecules

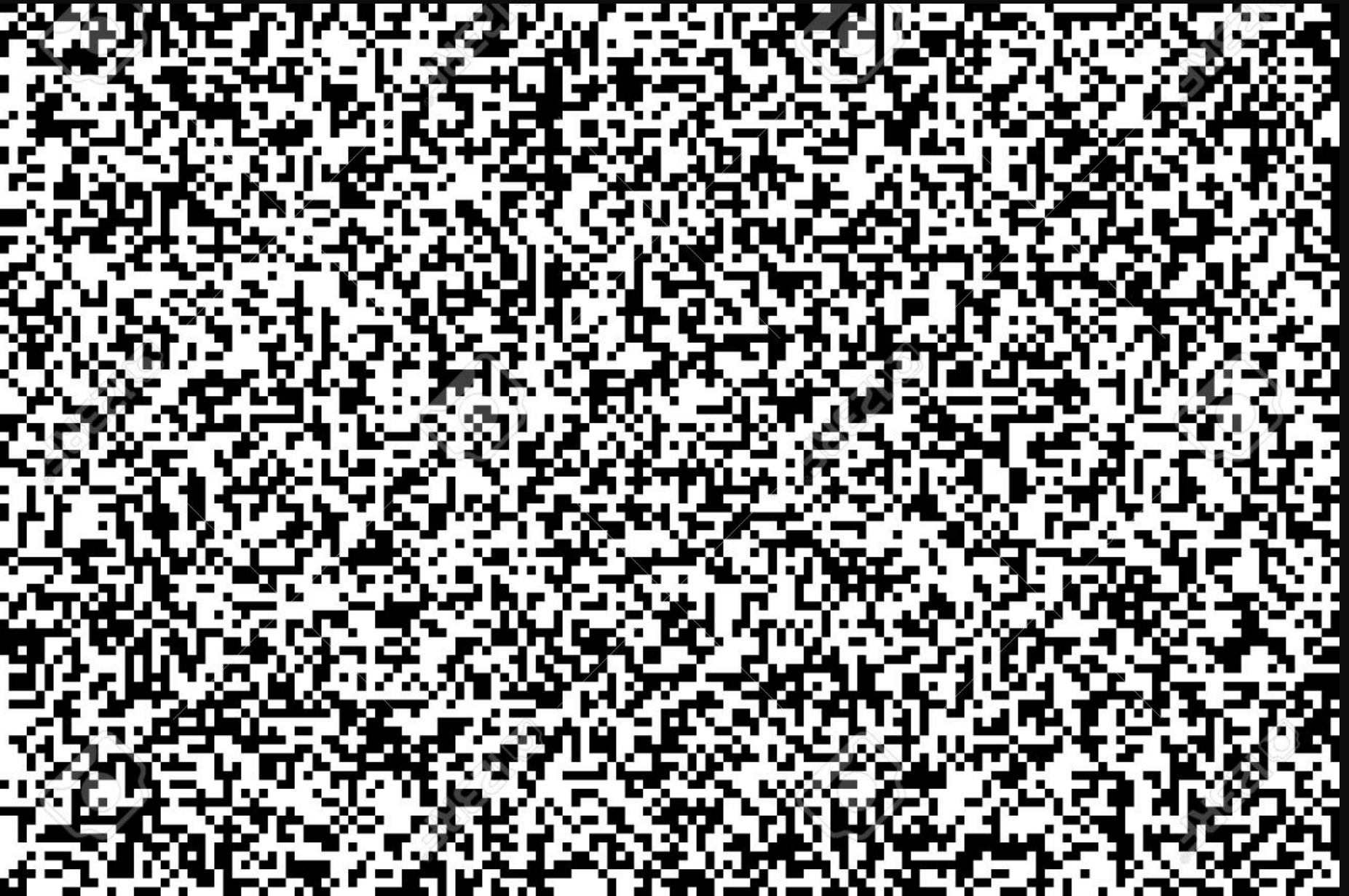
Claude Shannon's Information Theory of Signal & Noise



- **Signal:** Ordered information
- **Noise:** Unstructured, randomized information
- **Redundancy:** The measure of unnecessary, therefore “wasted” space. Functions to reduce errors
- **Entropy:** A measure of the average level of information, or uncertainty (noise) in a situation. How things result in relation to what is expected (probabilistic model)
- **Data compression:** Reduces the redundancy

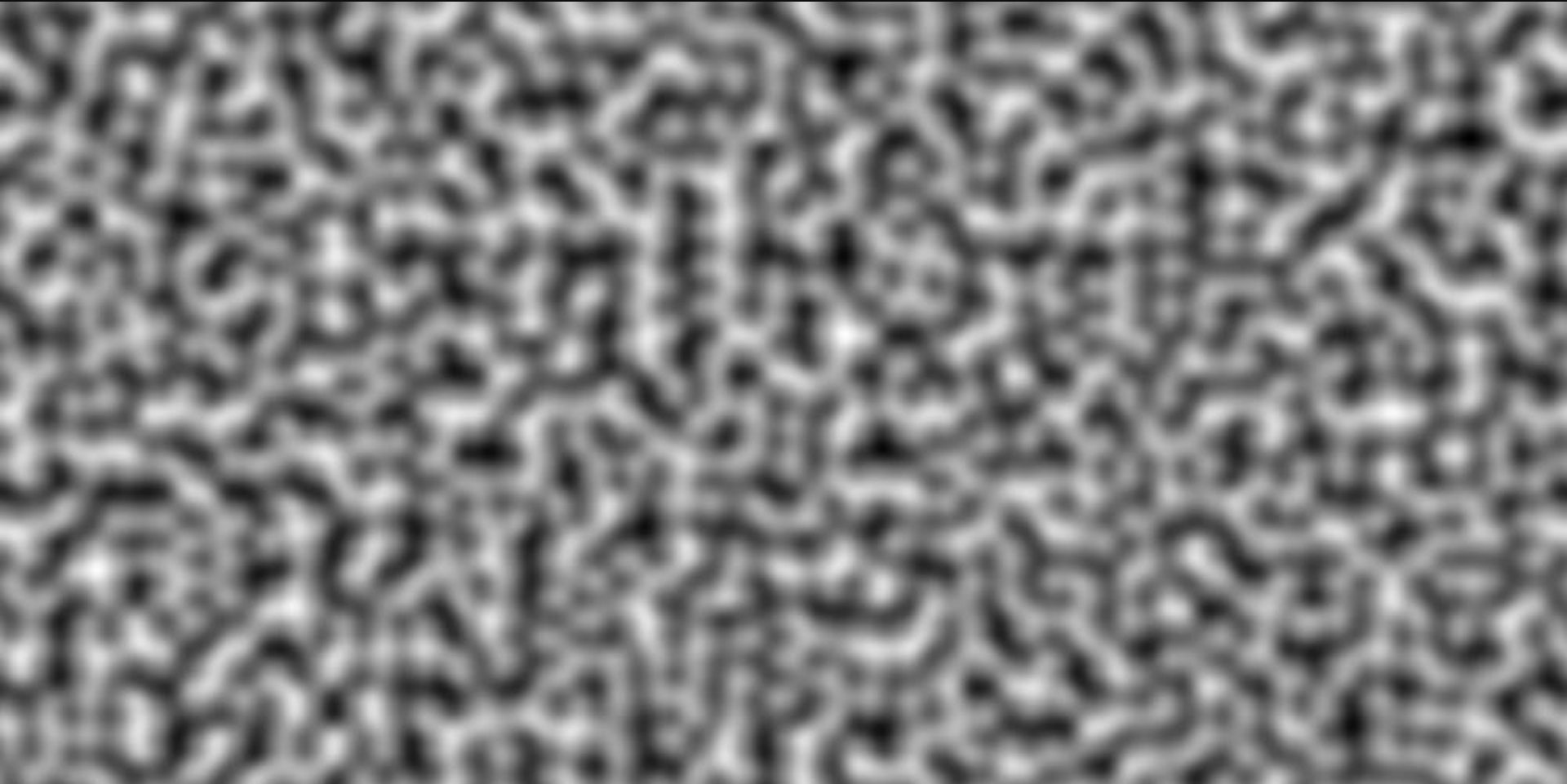


Markov Chain: *What is the probability of the next state based on what has previously happened*

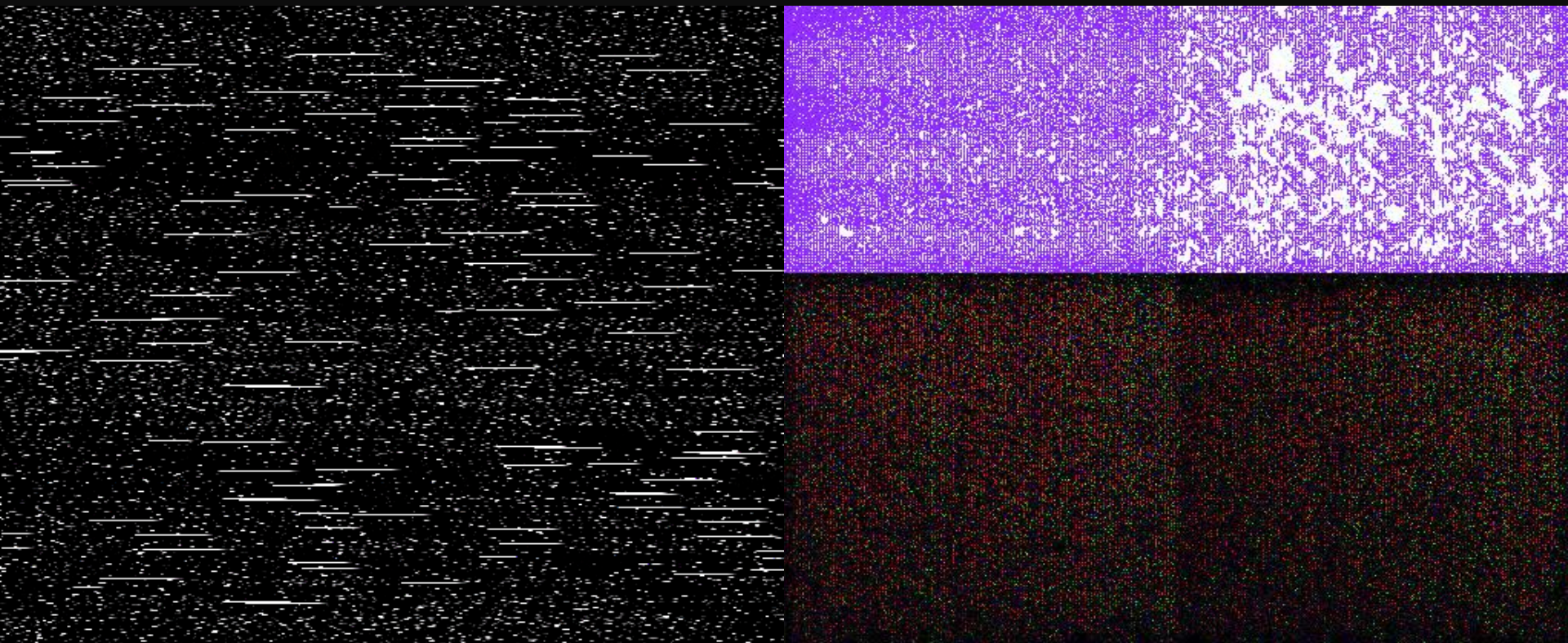


https://en.wikipedia.org/wiki/Markov_chain

Perlin noise, a function to enhance noise texture, Ken Perlin (1983)



Analog TV noise (left), Digital Noise (right), George Legrady (1985)



Glitch Art, Rosa Menkman (2010)



<http://transfergallery.com/rosa-menkman/>

The Glitch Moment(um)

ROSA MENKMAN

Network⁰⁴
Notebooks

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The Perception Of Glitch

*Our taverns and our metropolitan streets, our offices and furnished rooms, our railroad stations and our factories appeared to have us locked up hopelessly. Then came the film and burst this prison-world asunder by the dynamite of the tenth of the second, so that now, in the midst of its far-flung ruins and debris, we calmly and adventurously go traveling.*⁰¹

- WALTER BENJAMIN

THE MEANING OF NOISE

To develop a categorization of noise for contemporary audio-visual media theory, I have used Claude Shannon's mathematical theory of communication. In his definition of informational noise, Shannon conveniently focused on the transfer of information between machines, leaving human elements and context out of the equation. Drawing on Shannon's model, I was able to divide digital noise into three basic categories of noise artifacts: *encoding/decoding artifacts* (which are most often referred to as compression artifacts), *feedback artifacts* and the 'other' corruptions known as *glitch artifacts* – artifacts for which the causes are not (yet) known. It is important to realize that the difference between each of these artifacts is not rigid, as the description of a glitch artifact can be understood as a de/compression or feedback artifact (and visa versa), depending on the viewer's knowledge of the technology. In the context of human-computer communication, I also deviate from Shannon and Weaver and believe that the concept of noise becomes more complex as it connotes meaning and translation. Consequently, human-computer definitions of noise must also include social parameters and become more complex, inevitably negotiating questions of context, perception and aesthetics.

The etymological definition of noise refers to states of aggression, alarm and powerful sound phenomena in nature ('*rauschen*')⁰². When the concept of noise is approached within a social context, noise does not exist independently, but only in relation to what it is not. However complex or inclusive noise appears as a signifier, it is always a kind of negativity: it stands for unaccepted sound, not music, invalid information or the absence of a message. Noise is unwanted, other and unordered. Accordingly, there is also no unequivocal cultural definition of noise, because in the end, what noise is and what noise is not, is a social matter. As James Brady Cranfield-Rose writes, 'noise is a "cipher", a question mark, forever eluding fixed definitions'.⁰³ Furthermore, whichever way noise is defined, its negative orientation also has positive, critical dimensions. Noise tends to reflexively stage a reconsideration or re-view its opposite – the world of meaning, norms and regulations, goodness, or beauty.⁰⁴

01 | Walter Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', in Hannah Arendt (ed.) *Illuminations*, New York: Schocken, 1968, pp. 219-254. p. 236.

02 | Torben Sangild, *The Aesthetics of Noise*, Copenhagen: Datanom, 2002. www.ubu.com/papers/noise. p. 5-8.

03 | James Brady Cranfield-Rose, 'Tick-tick-tick-tick-tick... Oval, the glitch and the utopian politics of noise', unpublished master thesis, Burnaby, Canada: Simon Fraser University, 2004. p. 13, <http://lib-ir.lib.sfu.ca/handle/1892/8961>.

04 | Paul Hegarty, *Noise/Music: A History*, London and New York: Continuum, 2007. p. 5.

A Phenomenology Of Glitch Art

*"Failure" has become a prominent aesthetic in many of the arts in the late 20th century, reminding us that our control of technology is an illusion, and revealing digital tools to be only as perfect, precise, and efficient as the humans who build them.*⁰¹

- KIM CASCONI

THE PREDICAMENTS OF DEFINING GLITCH ART

Artists often find themselves on a frontline, reflecting on the cultures, politics and technologies of their time. Over the last decades, audiovisual media and computers have gradually gained more and more importance in an art field that is still fundamentally ruled by classical media forms and genres. Noise itself is of course not new; similarly, contemporary glitch art relates to a long history of noise art and artists battling in different ways against media forms and their flows and conventions, including especially what I have outlined as the convention of transparent immediacy.

While not being new, noise art arises unpredictably in new forms across different technologies and cultural scenes. Over time, noise artists have migrated from exploring the grain, the scratching and burning of celluloid (for example, A COLOUR BOX by Len Lye, 1937) to the magnetic distortion and scanning lines of the cathode ray tube (a significant work being Nam June Paik in MAGNETTV in 1965). Subsequently, glitch artists wandered the planes of phosphor burn-in, as Cory Arcangel did in PANASONIC TH-42PWD8UK PLASMA SCREEN BURN, in 2007. With the arrival of LCD (liquid crystal display) technologies, dead pixels were rubbed, bugs were trapped between liquid crystals or plastic displays and violent screen cracking LCD performances took place (of which my favorite is %SCR2, by Jodi, under the Pseudonym webcrash2800 in 2009).

To some artists, myself included, it has become a personal matter to break the assured informatic flows of media. While normally, transparent media screens generate conventional impressions of immediacy, there is a desire to force the viewer to think beyond his comfort zones. Glitch artists make use of the accident to 'disfigure' flow, image and information, or they exploit the void – a lack of information that creates space for deciphering or interpreting the process of creating (new kinds of) meaning. Through these tactics, glitch artists reveal the machine's techné and enable critical sensory experience to take place around materials, ideologies and (aesthetic) structures. Their destructive or disfiguring processes have no technological name, definition or explanation (yet). For this reason, it is necessary to not only define and categorize glitch at technological levels, but also to look closely at how specific media are exploited on a more complex techno-cultural level. The artists I discuss here include Ant Scott, 5VOLT CORE Gijis Gieskes and Jodi. Of course many other artists whose practices are invested in the moment(um) or culture of glitch could have been included here. An actual historiography would for instance also include signal processing artists like Karl Klomp, Lovid, Morgan Higby-Flowers and Max Capacity, aesthetic glitch-tricksters like Jon Satrom, jonCates, fabric artist Melissa Baron, and databend generative artists such as stAllio!, glitch-irion Pixelnozz and Hellocatfood. This historiography is still unwritten (partly because it is still in progress).

01 | Kim Cascone, 'The Aesthetics of Failure: Post-Digital Tendencies in Contemporary Computer Music', *Computer Music Journal* 24.4 (Winter 2000): p. 13.

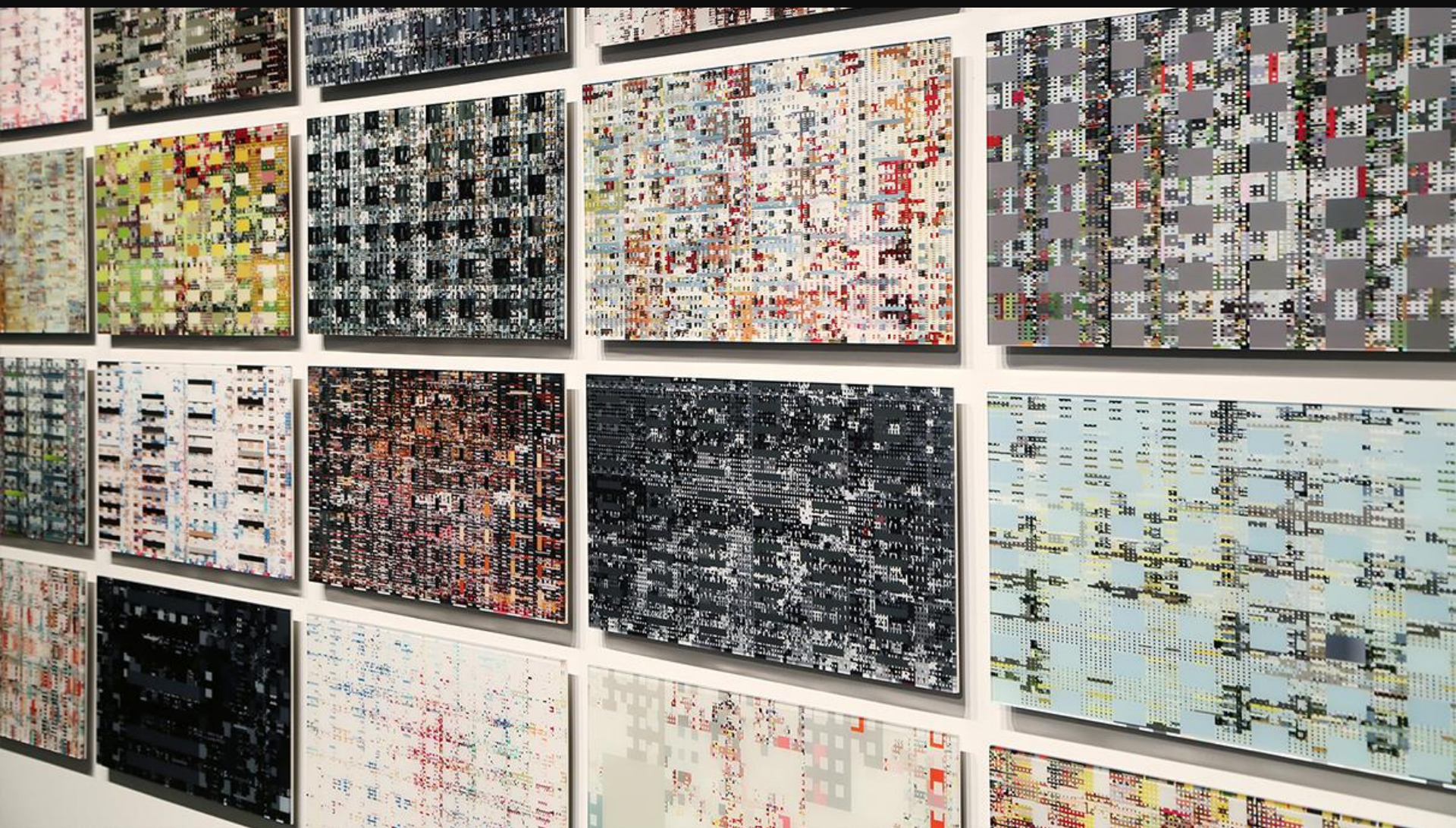
“Mathematical Theory of Communication”, Casey Reas (2014)



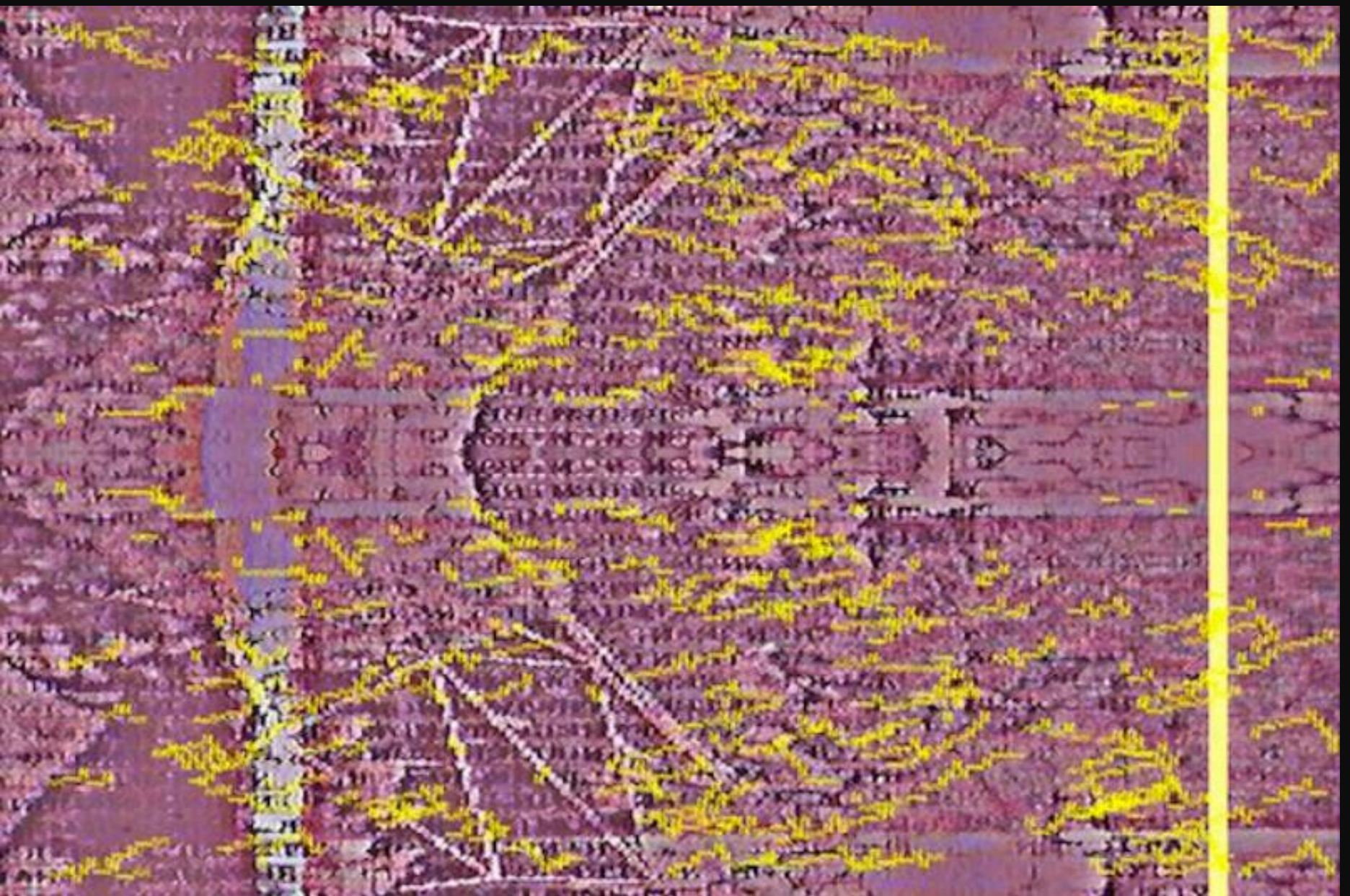
“Signal to Noise”, Casey Reas (2012)



“Control Room (You Haven’t Won)”, Casey Reas (2013)

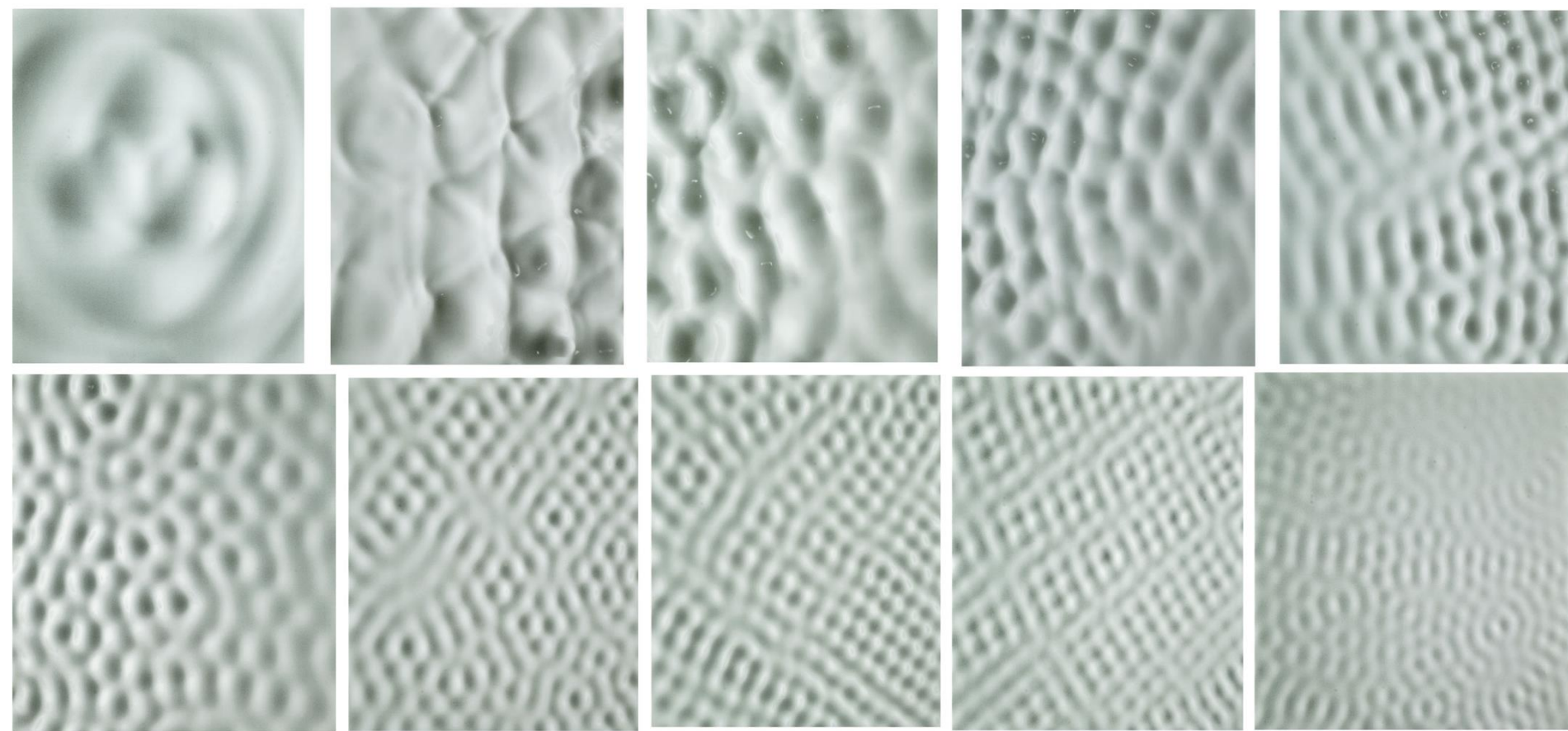


“Viral Attack Transmission”, Joseph Nechvatal (1993)

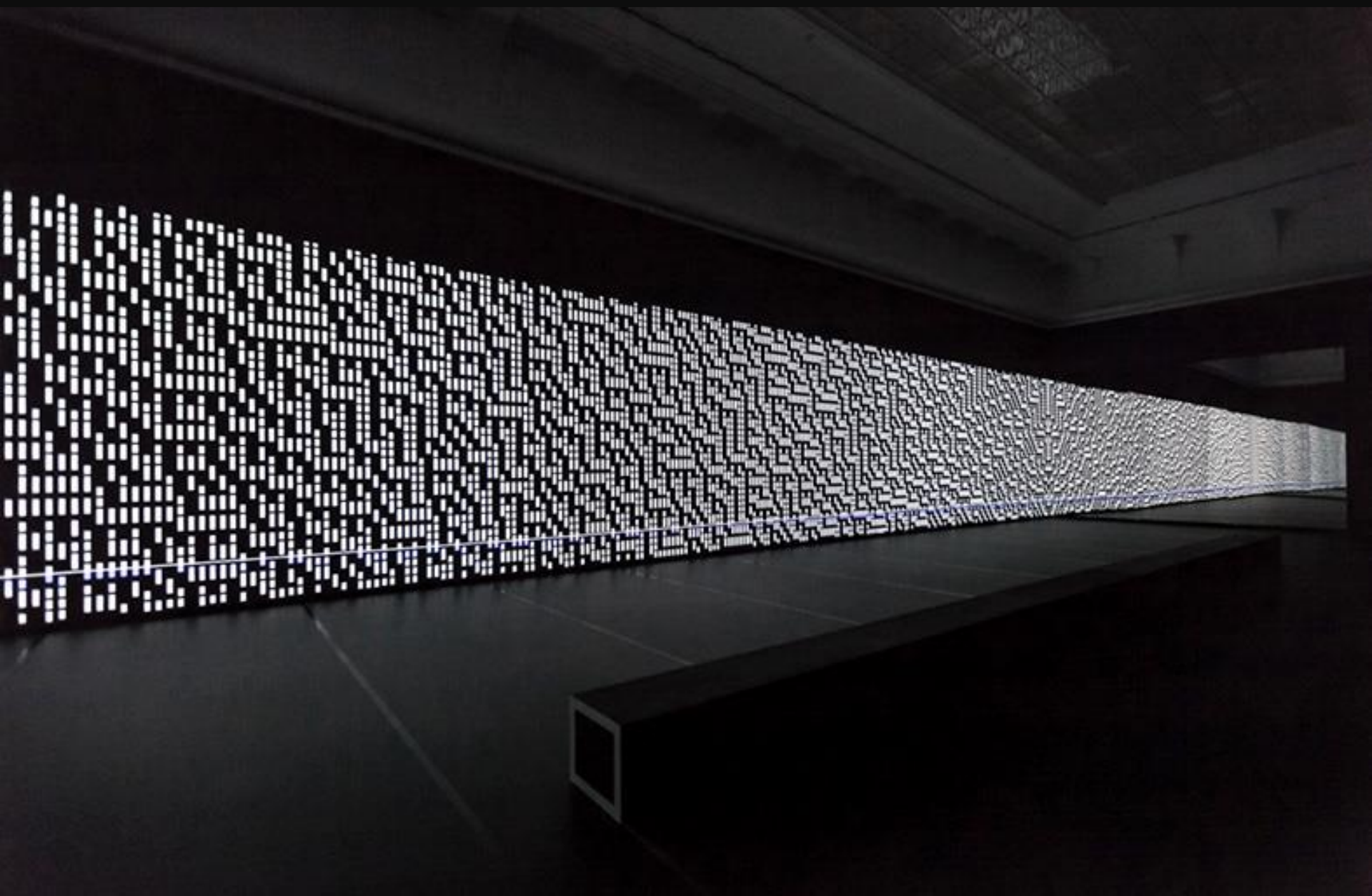


<https://www.vice.com/en/article/wnpqwb/artist-paints-with-artificial-life-and-computer-viruses>

“Milch, 10 Hz, 20 Hz, 25 Hz, 40 Hz, 95 Hz, 110 Hz”, Carsten Nicolai (2000)

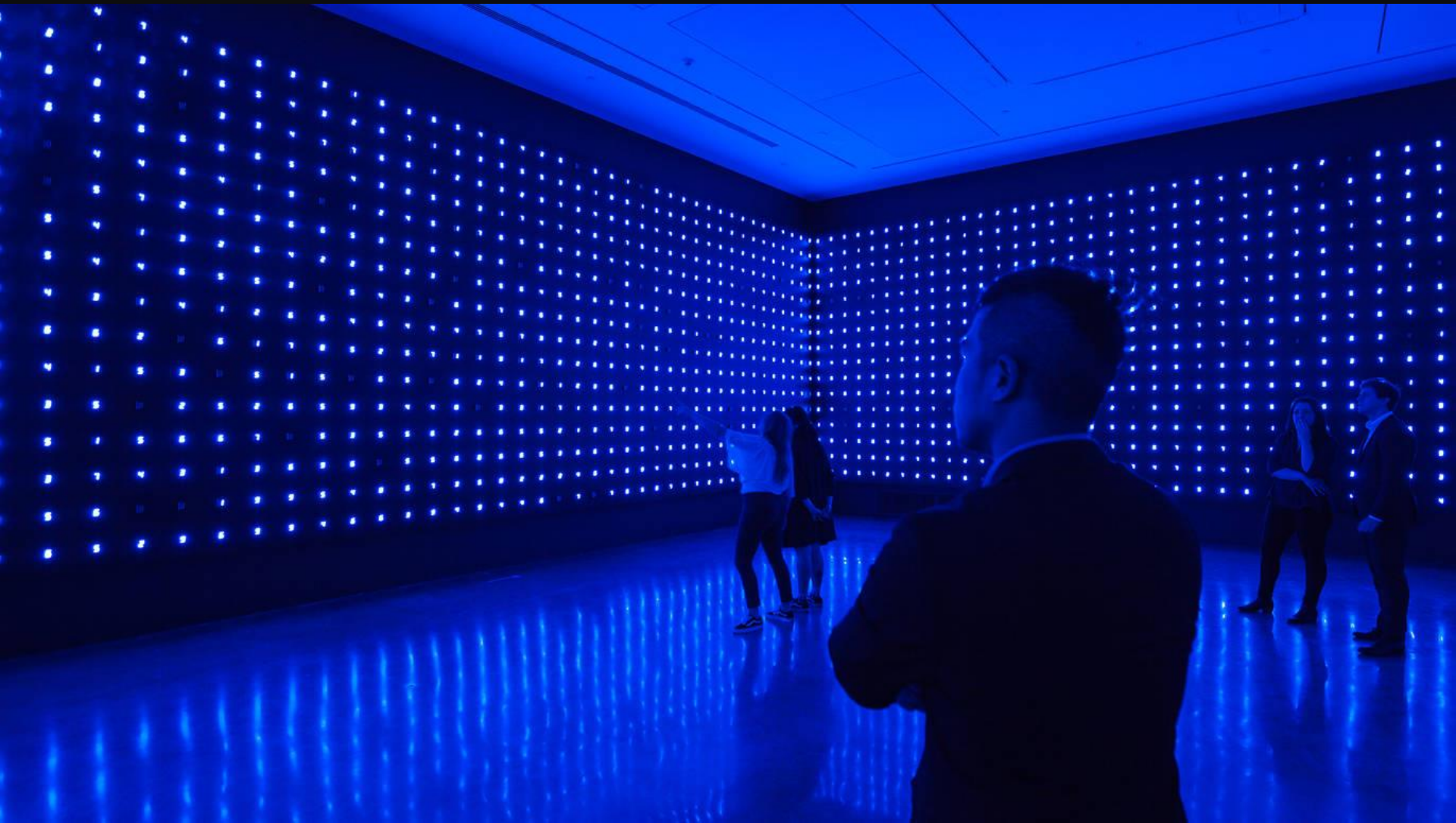


“Unitape”, Carsten Nicolai (2015)



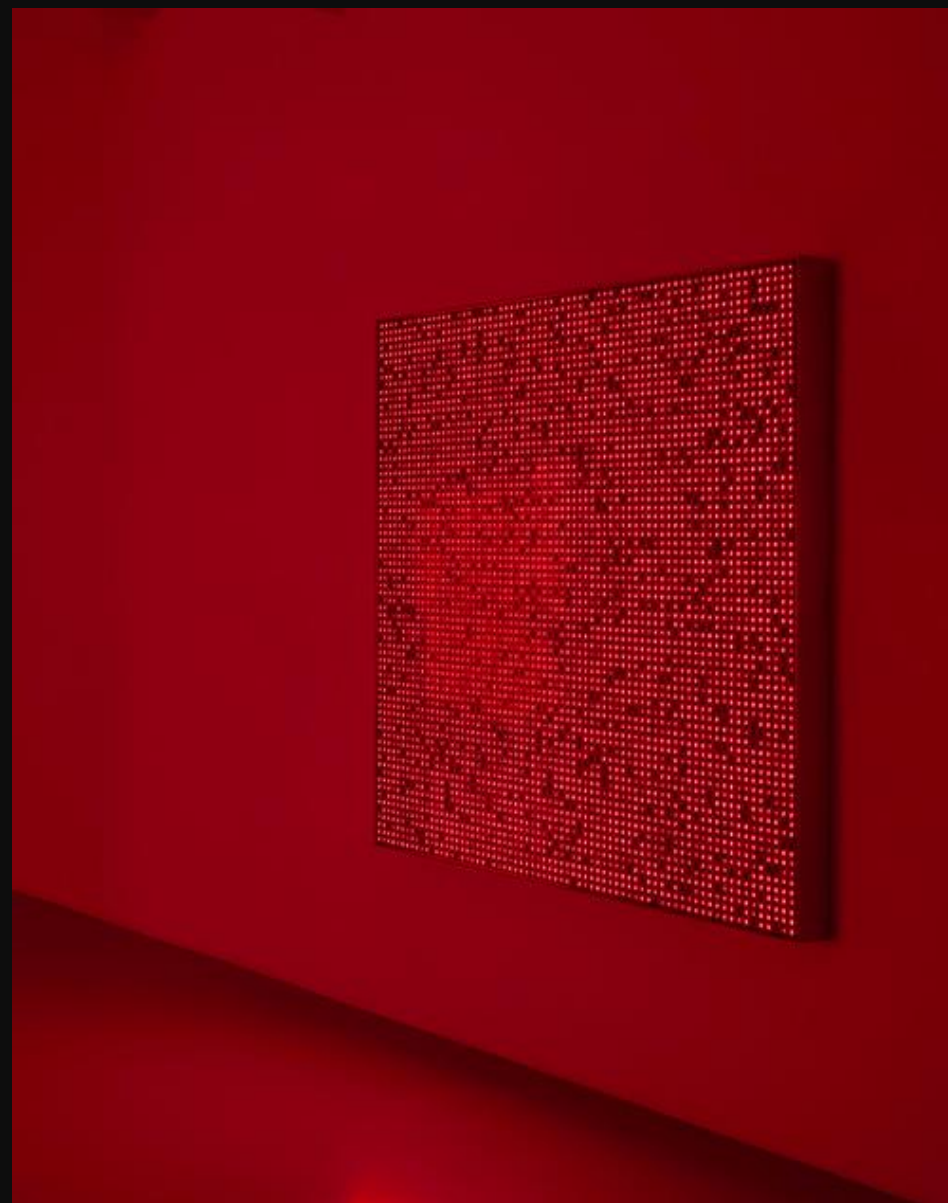
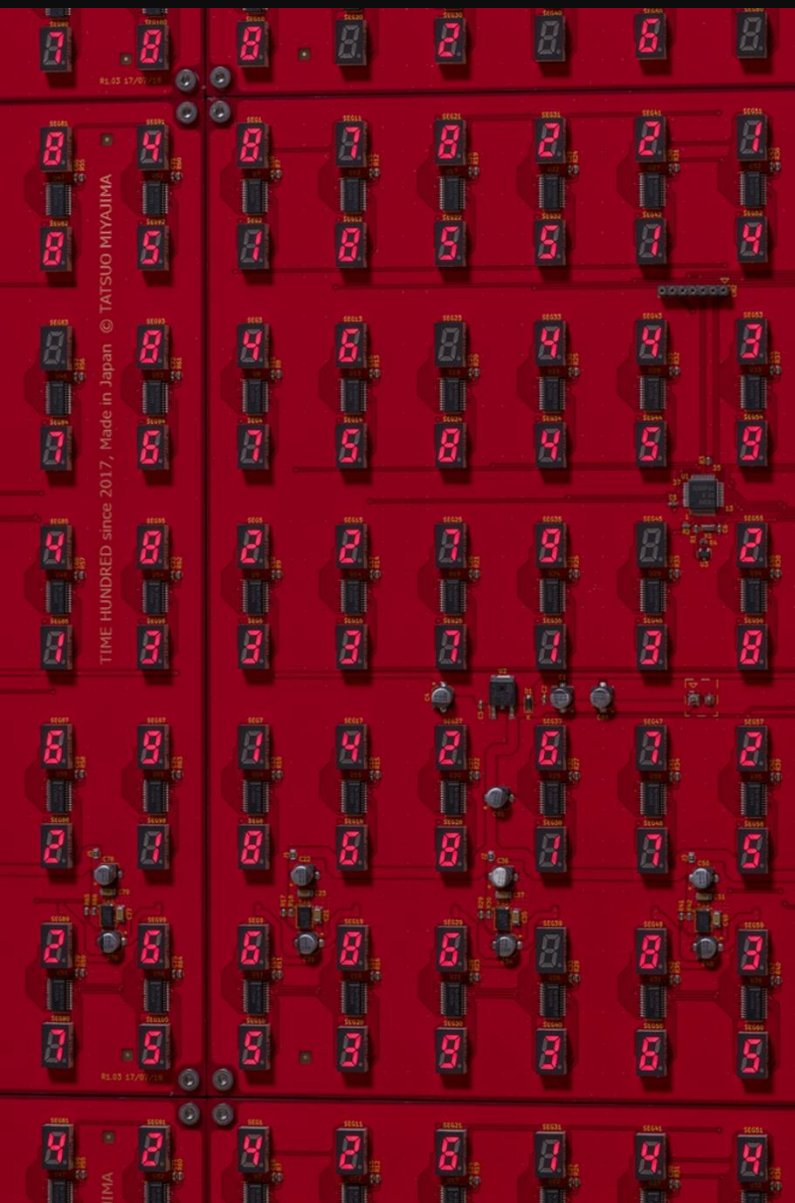
<http://www.carstennicolai.com/?c=works&w=unitape>

“Mega Death”, Tatsuo Miyajima (1995)



<https://www.mca.com.au/artists-works/exhibitions/tatsuo-miyajima-connecting-with-everything/>

“Innumerable Life / Buddha”, Tatsuo Miyajima (2019)

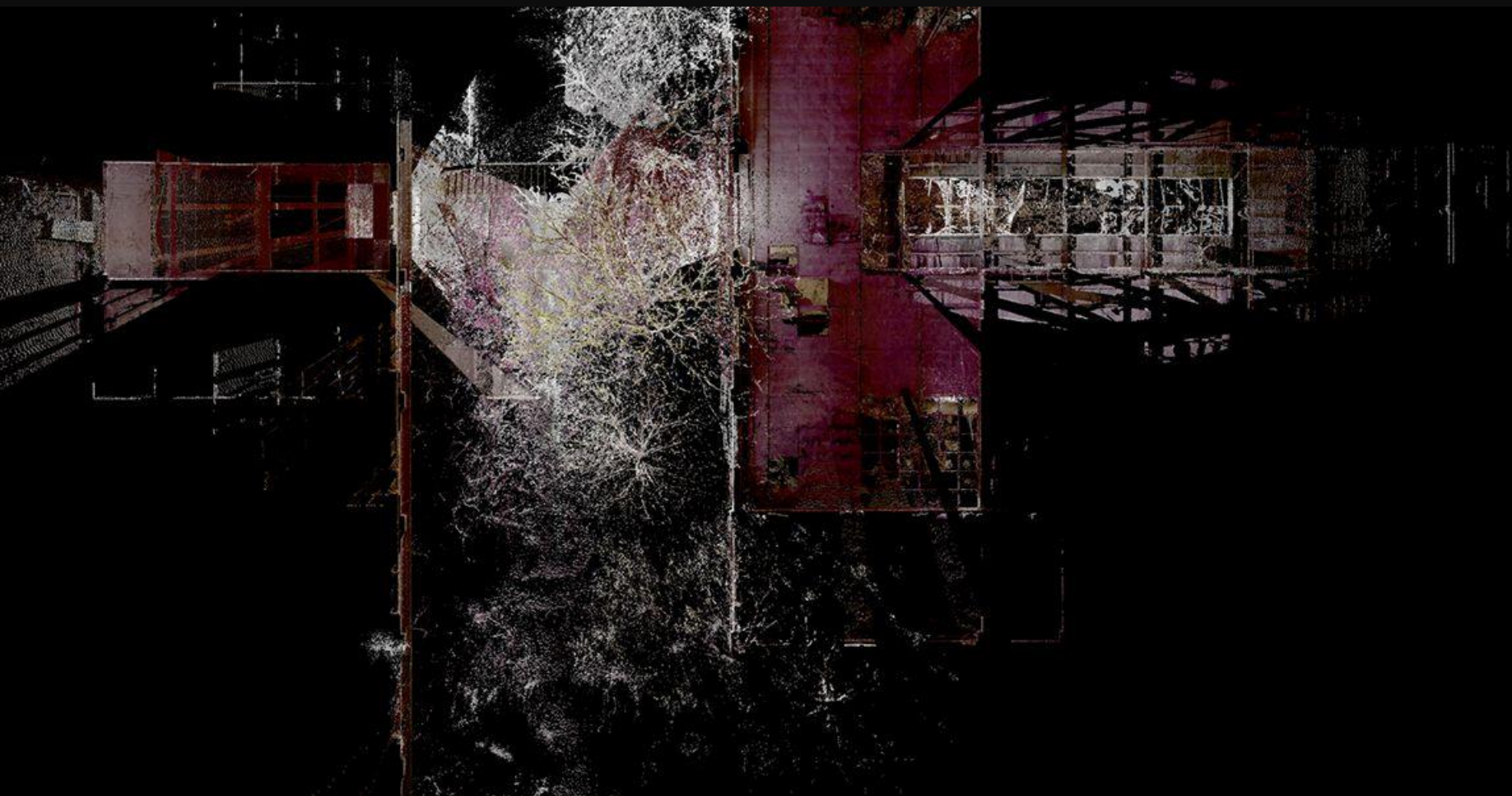


<https://www.lissongallery.com/exhibitions/tatsuo-miyajima-innumerable-life-buddha>

“syn_mod-1”, Ryoichi Kurokawa (2013)

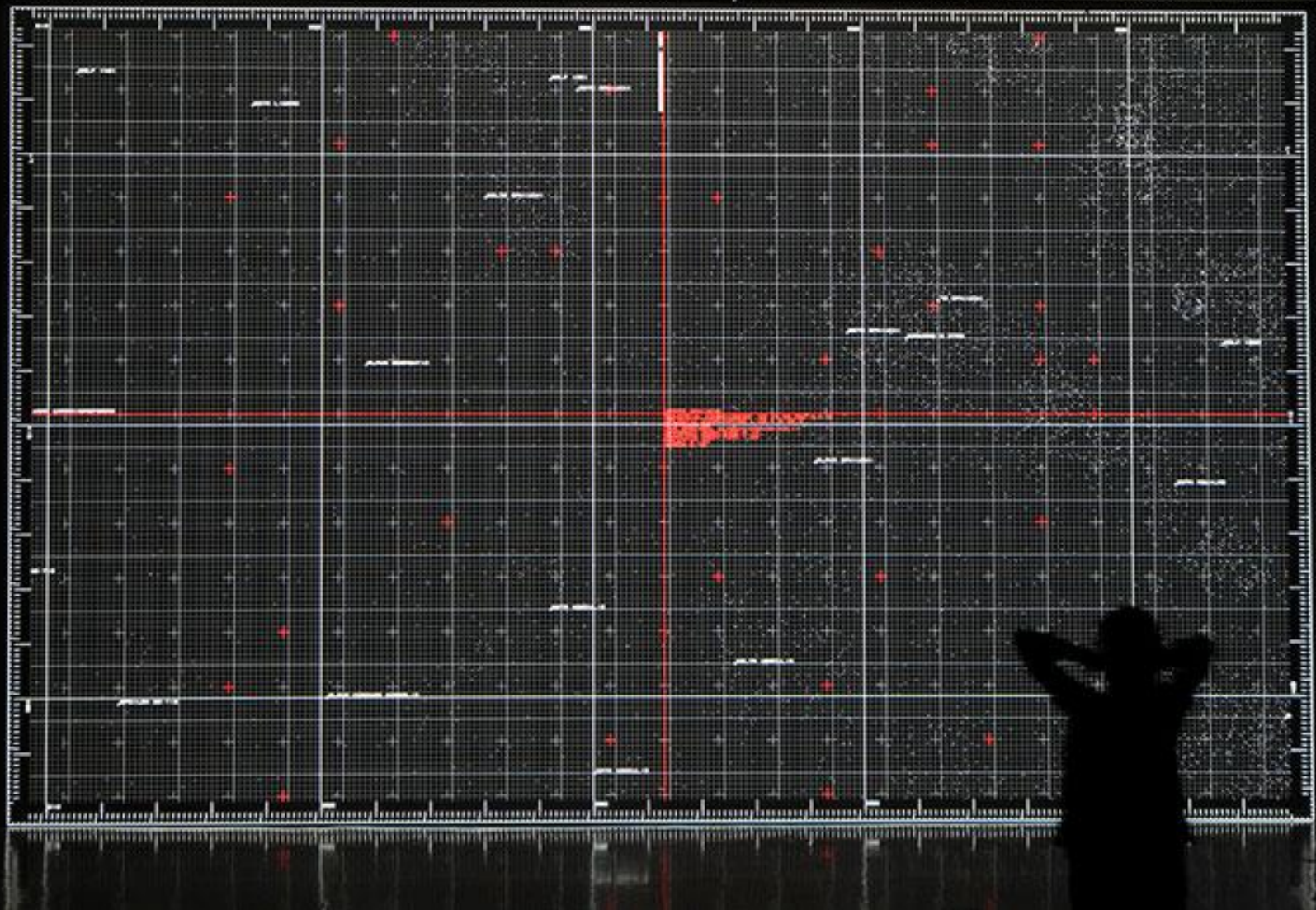


“Subassemblies”, Ryoichi Kurokawa (2018)



<https://levfestival.com/19/en/lev-madrid/ryoichi-kurokawa-subassemblies/>

“data.tron” (WUXGA version) , ryoji ikeda (2011)



“data.flux” (12 XGA version) , ryoji ikeda (2017)



“data.tron” (3 SXGA+ version), ryoji ikeda (2009)



Videos

Brownian Motion in Nature: <https://www.youtube.com/watch?v=89LP5pHWxM8>

Vasulka: [Transformations](#) | [Digital Images](#) | [Artifacts](#)

Casey Reas: <https://vimeo.com/144161213>

Carsten Nicolai: [a \[alpha\] pulse](#)

Tatsuo Miyajima, Australia: <https://www.mca.com.au/artists-works/exhibitions/tatsuo-miyajima-connecting-with-everything/>

Ryoichi Kurokawa: [Unfold](#) | [Synthetic Stimulation](#) | [S](#) | [Edition](#)

Rioji Ikeda: [Data-verse](#) | [data.matrix](#) | [code.verse](#)