

Then Try This • Algorithmic Pattern Salon

Guided by the motif, with an example of mereological sursumption.

Arthur Kuhn

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ABSTRACT

This paper is a practice-informed exploration of the role of patterns, in my latest artistic project called *melodia atomizacji* [*The melody of atomization*]. After a brief introduction to the project, I will explain how it illustrates the function patterns have primarily played in my creations as a structural force, before expanding on a more visual role they have taken on in a specific part of the project. As its content is rooted in the retelling of a personal practice, this paper comes from a place of subjectivity and personal (self-)interpretation, but still aims at providing an example of how a system-oriented aesthetic can work and intercommunicate on different levels.

Guided by the motif, with an example of mereological sursumption.**Figure 1**

Kuhn, Arthur - mereological painting by Sena Plinski, 2023 - image generated via a custom Machine-Learning model and photomontage

Introduction - The Melody of Atomization

First, a few words about the overarching project that will be discussed in this paper. *Melodia Atomizacji* is a transmedia art project, using texts, images and sound to explore the life and work of Sena Plincski, a polish artist from the early twentieth century. Born in 1887, Plincski was close to the polish, Krakow-based, *Formisci* (formism) movement¹, before he moved to Los Angeles in the 1920s, and then San Diego, where he disappeared in 1930. A poet, painter and engraver, he was fascinated by both the medieval tradition of hermeticism, and the mathematical breakthroughs of his time.

The main issue, regarding the study of his corpus and biography, is the fact the Sena Plincski never existed. He is a fictional character I created, as a front to explore, from a hands-on perspective, (1) the *ontology*² of Machine Learning (ML) technologies – that is, the current day Artificial Intelligences (AIs), and (2) the particular regime of truth and authorship the images they produce mobilizes. Through the production of images - shown both as Sena's artistic production, and counterfactual documentation about his life - and their staging in artistic installations, I aim at shifting away from the expected discussion framework of such contemporary and tech-related subjects.



Figure 2

Portrait of Sena Plincski in front of his *aging bench for medieval engravings* - as seen during the *des objets étranges* exhibition, Atelier Alain le Bras, Nantes, FR

1 - Starting with a Word

Describing the project in such a way goes, I hope, to show an important and structural dichotomy that constitutes the basis of my working methodology. Being first and foremost interested in the question of

systems and how, through their workings, informational noise becomes situated knowledge, there is, more often than not, in my work : (1) what I want to talk about, and (2) what I'm using to talk about it.

The former being, for example, how one constructs a legitimacy for oneself through metatextual elements, or the question “can one event in itself disrupt an entire political landscape ?”, or here, ML, its ontology and peculiar truth ; the latter, respectively, a self-published book by a local historian of Saint-Nazaire (FR), the schedule and technical details of a regional train line, and an old polish artistic movement that talked about getting rid of “meaning”.³

The separation between these two layers of content is obviously more of an interface, a place of mutual influence and communication, more than a strict separation. The perceived distance between them becoming an opportunity for a maze-like construction in which I'll invite the audience to get lost alongside me. This last point is crucial, as the moment I get lost, first and before anyone else, is the moment the work starts, and patterns appear.

Because, focusing once again on *melodia atomizacji*, the question of representation in a technology based entirely on asemic atomization (concerned only with statistical distribution and neighbouring probabilities) is immensely vast and goes well beyond the possibility of a single definitive answer. Same goes for the creation of a heteronym and the possibilities of biographical invention, particularly when one creates the biography of a forger. So the need arises for stumbling blocks. Arbitrarily chosen – and necessarily assumed as such – elements, that will impose certain choices regarding the organization of the project, that will divide an organizing system of its own, to which the project then must comply.

These elements can help drive a narrative, and come from the web of references and research the project has gotten enmeshed into : here, for example, the discovery of Tytus Czyzewski's work, particularly his *Melody of the Crowd*⁴ has been paramount to the overall aesthetic, and historical setting of Sena Plincski's biography ; or it can come from less expected inquiries, provided that they are, once again, assumed as arbitrary and purely structural. In *melodia atomizacji*, the need for such a structure had me using numerology on the name of Sena Plincski.

2 – Invisible yet Very Apparent Modeling

Before dwelling more into this aspect of the project, I'd like to affirm that I am in no way advocating for numerology as being able to extract a sort of hidden truth from anything. The use of such processes is a way of stumbling upon coincidences ; of having arbitrary fragments of informational noise emerge without much of my control.

$$S \quad E \quad N \quad A \quad = \quad 100 \quad 5 \quad 50 \quad 1 \quad = \quad 156=12=3$$

$$P \quad L \quad I \quad N \quad C \quad S \quad K \quad I \quad = \quad 70 \quad 30 \quad 9 \quad 50 \quad 3 \quad 100 \quad 20 \quad 9 \quad = \quad 291=12=3$$

Figure 3
numerological calculation of Sena and Plincski's secret values

Here, both of the words “*Sena*” and “*Plincski*” have a secret value of 3 through 12 ; which is, of course, the result of multiplying 3 by 4. On a most basic level, the presence of these numbers in my character's name explain why his paintings are presented in a 3 by 4 grid, or why the collection of his engravings amounts to 18 series (two collections of a 3 by 3 grid) of twelve iterations.



Figure 4
Kuhn, Arthur - *Sena Plincski's mereological paintings*, 2023 - as seen in the *des objets étranges* exhibition, Atelier Alain le Bras, Nantes, France.

Going further, this product of 3 by 4 made me think of a link between him and the figure of a *tetrahedron* (a triangular pyramid), as this geometrical shape can be noted {3,3}, and being the embodiment of triangle in a three dimensional world, through the addition of a fourth triangle. The assemblage of two mutually inscribed tetrahedrons is called a *Möbius configuration*⁵, which in turn can be written as a mathematical expression

known as the *Möbius-Kantor graph*⁶. This mathematical expression has then be used to “tint” the sounds generated and used in a noise performance⁷ related to the *melodia atomizacji* project via a technique called *waveshaping*.⁸

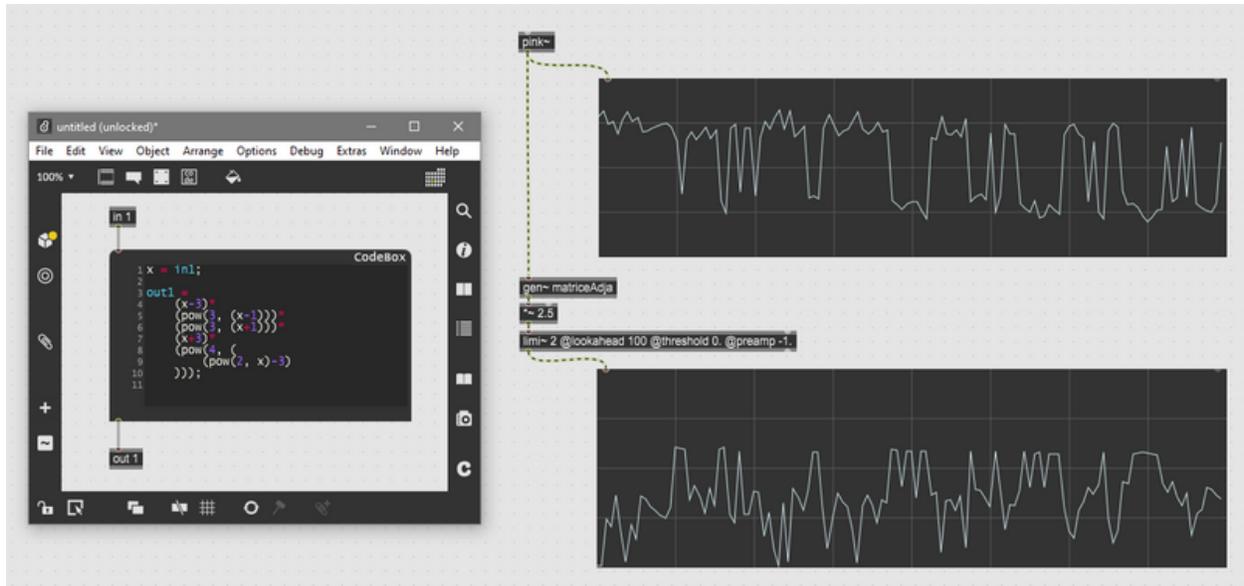


Figure 5

Screenshots from *Max/MSP* : top-right corner is the soundwave of a pink noise, bottom right is the same noise's audiowave after its been altered by the mathematical expression seen on the left.

Ultimately and as the most *mise en abime* example of this pattern-structuring, I used it in conjunction with another literary reference of this project : the *Atalanta Fugiens*, an alchemical emblem book from 1617 by Michael Maiers comprising 52 discourses.⁹ I won't, for brevity, detail the reason for using texts from the hermetic tradition in this project here, but writing the *Compendium for Hallucinatory Mereology* – a small book, written in the name of Sena Plincski as a part of this project – I very systematically divided it into 3 parts, that are made of 4 subparts, each of them constructed by three paragraphs of roughly the same length, quoting a discourse that exposes the 4 main tools one must equip oneself with, each of them detailed as 3 “versions” (what it is metaphorically, what it is as an object, what it teaches you).

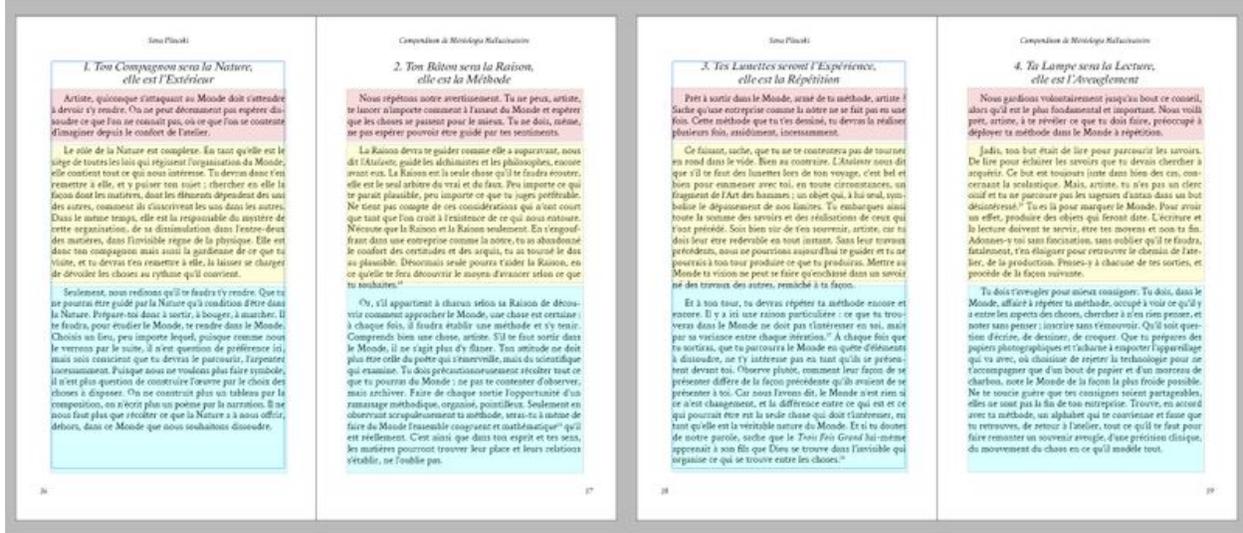


Figure 6
Kuhn, Arthur - Sena Plinski's *Compendium of Hallucinatory Mereology*, 2023 - inDesign screenshot

3 - Hallucinatory Mereology

As stated in this paper's title, this project also allowed me to try another use of patterns. Here, I'm using this notion, through Sena's "paintings" in a more visual and explicit way than usual, in what I think of as an example of mereological sursumption.



Figure 7

Kuhn, Arthur - *a mereological painting by Sena Plincski, 2023* - Custom Machine-Learning model and photomontage.

First, I'll briefly summarize what I've come to understand about mereology, and how I decided to use it. Mereology is a branch of mathematics concerned with the formalization of the relationships between a whole and its parts. It stems from early twentieth-century discussions about the set theory of Georg Cantor, and the term itself was coined by the Polish mathematician and logician Stanisław Leśniewski¹⁰; Sena was already Polish before I discovered that, but this is another very happy coincidence. Leśniewski's theory has been nicknamed formal mereology, because it thinks of numbers as almost physical entities, and not purely abstract objects, thus trying to avoid logical dead-ends such as the Russell's paradox.¹¹

Directly relevant to my approach of ML's ontology, this discussion about how to construct and define relationships between an ensemble and what comprises it echoes, for me, the question of aiming or not for a constructed definition of objects. Are we trying to explain the world in well-defined and discrete entities, displaying recognizable properties and specific behaviors? or, on the contrary, focusing only on the statistical relationships, proximity probabilities of voluntarily abstract and asemic entities?¹² In this context, mereology being the science of formalizing inclusion, exclusion, subsuming (to think of an object as part of a whole) and sursuming (to think of a part as a whole in itself), becomes the most well-fitted alphabet for writing such

relationships. But, as I had Sena write, as artists, we should mostly be concerned about subverting and turning it upside-down.

Keeping that in mind, I hereby present a “painting” by Sena Plincski. Its mereological – and pattern-centered – aspect of this image might not be obvious at first, but it directly stems from the way it was created.



Figure 8

Kuhn, Arthur - a mereological painting by Sena Plincski, probably inspired by the Big Bend National Park, 2023 - Custom Machine-Learning model

All of the pictures from the *mereological paintings* series are made with a custom-trained ML model. More precisely, a Denoising Diffusion Probabilistic Model¹³. Its principle consists, quoting the [keras website](#), in two operations: first, “we slowly add random noise to the data in a series of time steps (t_1, t_2, \dots, t_n). Samples at the current time step are drawn from a Gaussian distribution where the mean of the distribution is conditioned on the sample at the previous time step, and the variance of the distribution follows a fixed schedule. At the end of the forward process, the samples end up with a pure noise distribution.”; then, “During the reverse process, we try to undo the added noise at every time step. We start with the pure noise distribution (the last step of the forward process) and try to denoise the samples in the backward direction (t_n, t_{n-1}, \dots, t_1).” To summarize, the model learns how to recreate an image it’s been trained on from visual randomness, by a pareidolic process; that is, hallucinating the image in the noise.

The specific model I used in my project has been trained on still frames from various videos I had lying around. These are videos I shot during my time as a student, and the majority of it are DV Cam recordings of travelings. I chose to construct such a dataset because of its somewhat claustrophobic and unorganized nature.

As the images are stills from a video, they are similar enough to a point where the model can only recreate the appearance of a specific moment in a specific place. That is, encompassing the totality of its aesthetical possibilities to this small portion of time and space. There's already, in this choice, a desire for some sort of sursumption. Going away from the promise of an AI that could reproduce anything, anywhere, anywhen, this model is made so that a portion of reality is all we could ever see.

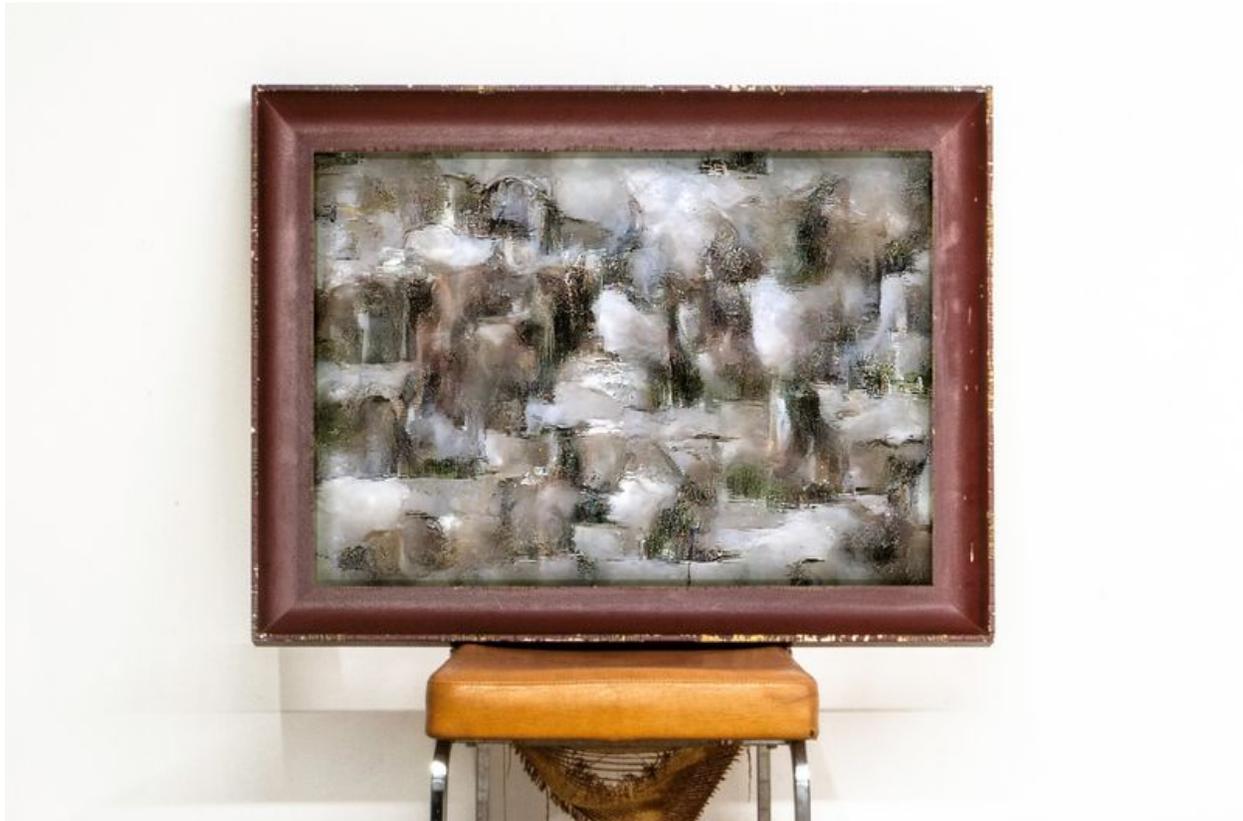


Figure 9

Kuhn, Arthur - a mereological painting by Sena Plinski, 2023 - Custom Machine-Learning model and photomontage

But the above image is obviously not a faithful rendering of the starting image. The reason for it, is that I chose to have the model behave in a, once again, sursuming way, while recreating the image. To explain what I mean by that, here are previews of the model's training. These are examples of what it grew able to reproduce.

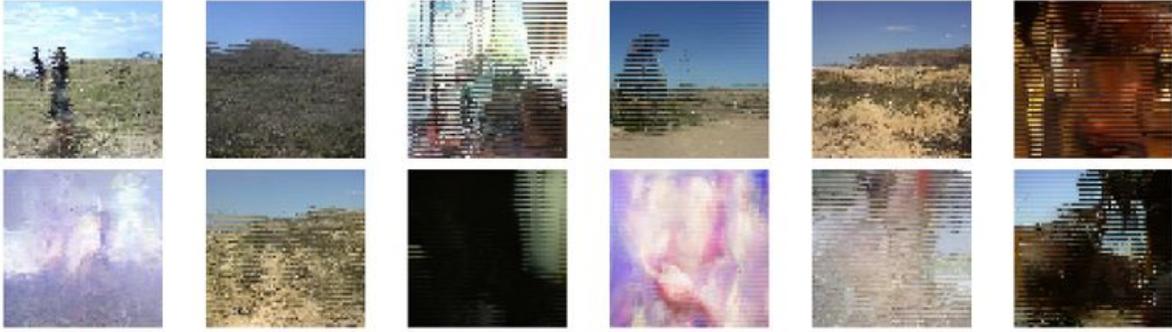


Figure 10

previews of the Sena Plincski's painting denoising model being trained on my personal dataset of images

But because of the way I have written the denoising loop it trained with, when asked for generating back an image from a format of 640 by 360 pixels visual noise, it would not do so by treating it as a whole image. From what I can fathom of the process – because ML models are before anything else black boxes – it would select an image from the dataset, according to its distribution’s “proximity to the noise”, and then, consider it as a bunch of 8 by 12 pixels squares of noise, and reproduce parts of the original image in them, merging them all in the end.



Figure 11

Kuhn, Arthur - *a mereological painting by Sena Plincski, probably inspired by a Rennes city subway station, 2023* - Custom Machine-Learning model

Which means, as I interpret it, that what we are seeing in these pictures are actually fragments of the whole, having completely inverted their relationships. As the model recreates fragment of the image, disregarding how they belong in the complete picture, The whole of the image is no longer the sum of its parts, but rather the parts have become the organizing principle that creates the whole through their iteration. Because it bases itself only on the gaussian distribution proximity to a certain fragment of visual noise – which, I think I can confidently say that this is not a criteria any human can relate to – we get a glimpse of purely relational and inhuman visualization.



Figure 12

Kuhn, Arthur - a mereological painting by Sena Plinski, 2023 - Custom Machine-Learning model and photomontage

Conclusion

As this paper is first and foremost a retelling of an ongoing artistic project, it is necessarily rooted in subjectivity and personal interpretation. I feel obliged, in particular, to acknowledge the fact that my knowledge of mathematical topics such as mereology is still superficial, and coming mostly from an epistemological point of view. Still, the exploration of this notion of patterns as both a hidden modeling force and a visual translation of a system's inner workings, can be – and is, at least to me – a helpful entry regarding art-making as a computational back and forth. The project *melodia atomizacji* is still very much ongoing, and it

should continue to explore the questions outlined here. I look very much forward to where these motifs might guide me.

Footnotes

1. Wróblewska, Magdalena. 2017. “Formism (Previously Known as Polish Expressionism).” Edited by TS. [Culture.pl. https://culture.pl/en/artist/formism-previously-known-as-polish-expressionism](https://culture.pl/en/artist/formism-previously-known-as-polish-expressionism). ↵

2. Smith, Brian Cantwell. 2019. *The Promise of Artificial Intelligence: Reckoning and Judgment*. Cambridge, MA London: The MIT Press. **“I use the term ‘ontology’ in its classical sense of being the branch of metaphysics concerned with the nature of reality and being – that is, as a rough synonym for ‘what there is in the world’.”** ↵

3.

Respectively, in french :

- *qu’en est-il de l’anguille ? [what about the eel ?]* : <https://kuhnhestale.fr/?portfolio=quen-est-il-de-languille>
- *la société des évènements [the society of events]* : <https://www.youtube.com/watch?v=WU4bz6kuB4Y>
- *melodia atomizacji* : <https://kuhnhestale.fr/?portfolio=melodia-atomizacji>

↵

4. For more informations about Tytus Czyzewski and te Formist movement, see, in french : Delaperrière, Maria. 2003. « La poésie polonaise face à l’avant-garde française : fascinations et réticences ». *Revue de littérature comparée* 307 (3): 355. <https://doi.org/10.3917/rlc.307.0355>. ↵

5. A configuration of Möbius is a geometrical euclidian configuration in which two tetrahedrons are inscribed as to have each tetrahedron’s vertices belonging to the plane of the other tetrahedron’s face. See (in french) : Gambier, Bertrand. 1939. « Couples de tétraèdres de Möbius ». *Annales scientifiques de l’École normale supérieure* 56: 71-118. <https://doi.org/10.24033/asens.876>. ↵

6. The Möbius-Kantor graph is the Möbius configuration’s corresponding Levi graph, a graphical and formulaic version of the geometrical shape. ↵

7. Kuhn, Arthur - *rituel de dissolution asemique [asemical dissolving ritual]*, 2023 : <https://kuhnhestale.fr/?portfolio=rituel-de-dissolution-asemique> ↵

8. Waveshaping, meaning, to summarize in a very broad way, having the sound going through a mathematical expression that will affect how each and every frequencies are modified. You can use almost anything for this mathematical expression, but polynomial tend to give good results. Using this technique, the mathematical formulation of a geometric shape can be used as a distortion. ↵

9. Maiers, Michael. 2015. *Atalanta Fugiens*. Old Book Publishing Ltd. For a contemporary edition of this text, see : Furnace and Fugue, an online complete reedition of the *Atalanta Fugiens*, by the University of Virginia Press. <https://furnaceandfugue.org> ↵
10. Urbaniak, Rafal. 2015. “Stanisław Leśniewski: Rethinking the Philosophy of Mathematics.” *European Review* 23 (1): 125–38. <https://doi.org/10.1017/S1062798714000611>. ↵
11. On this subject, see : Urbaniak, Rafal. 2015. « Stanisław Leśniewski: Rethinking the Philosophy of Mathematics ». *European Review* 23 (1): 125-38. <https://doi.org/10.1017/S1062798714000611>. ↵
12. This definition of the opposition between conceptions for what could be an “Artificial Intelligence” is directly borrowed from Brian Cantwell Smith.
See : Smith, Brian Cantwell. 2019. *The Promise of Artificial Intelligence: Reckoning and Judgment*. Cambridge, MA London: The MIT Press. ↵
13. See : Aakash Kumar Nain. 2022. « Denoising Diffusion Probabilistic Model ». <https://keras.io/examples/generative/ddpm/>. ↵