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The Golden Age of (Computational) Simulation

ABSTRACT: Computational simulations are about to enter an unexpectedly prosperous golden era. The advent of generative artificial intelligence (GenAI) is causing an emergent inflationary moment of machine simulations (words, images, tasks, and so on). This is a surprising, new 'catalogue of the real' that requires sophisticated technical and philosophical investigations. This short essay investigates the issue of this emerging simulative landscape culturally focusing on three prevalent expressions of contemporary computational simulations (texts, images, behaviors). Our exploration shows how both the novelty and the complexity of the machinical simulation evokes a new onto-epistemic power and vector: from the epistemological approximation to the reality to the ontological recreation of the real. The aim of this non-exhaustive cultural excursus is to emphasizes the urgent need to re-examine the morphing meaning that the philosophical question of simulation is rapidly gaining as a result of the generative artificial intelligence revolution.

SOMMARIO: Le simulazioni computazionali stanno per entrare in un'epoca d'oro inaspettatamente prospera. L'avvento dell'intelligenza artificiale generativa (GenAI) sta provocando un momento di inflazione emergente di simulazioni di macchine (parole, immagini, compiti e così via). Si tratta di un nuovo, sorprendente 'catalogo del reale' che richiede sofisticate indagini tecniche e filosofiche. Questo breve saggio indaga la questione di questo emergente paesaggio simulativo dal punto di vista culturale, concentrandosi su tre espressioni prevalenti delle simulazioni computazionali contemporanee (testi, immagini, comportamenti). La nostra esplorazione mostra come sia la novità che la complessità della simulazione macchinica evochino un nuovo potere e vettore onto-epistemico: dall'approssimazione epistemologica alla realtà alla ricreazione ontologica del reale. L'obiettivo di questo excursus culturale non esaustivo è quello di sottolineare l'urgenza di riesaminare il significato morfante che la questione filosofica della simulazione sta rapidamente acquisendo a seguito della rivoluzione dell'intelligenza artificiale generativa.

KEYWORDS: Philosophy; Computational Simulations; GenAI; Onto-epistemic

1. INTRODUCTION

The emergence of generative artificial intelligence (GenAI) heralds a new golden age of computational simulations. As a result, a new inflationary era of computer simulations has begun. Words, images, tasks that have been artificially and synthetically recreated are beginning to instantiate a new 'catalogue of reality'. However, the computational and simulation revolution is considerably more widespread. It represents a significant paradigm shift, a new revolution in science and engineering. It is also evolving into a new mode of thinking (both a new mindset and a new modus operandi) that balances opportunities and vulnerabilities. A point of arrival that is both culturally and strategically relevant as well as technologically. An advancement that reflects the major trans-

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formation that have occurred throughout time in the complex relationship between computation and simulation as pointed out by Johannes Lenhard in his *Calculated Surprises. A Philosophy of Computer Simulation*.[1] In a recent AI evolution path, we began to experience the eruption of 'machinic texts'.

However, the simulation of texts and writings is not just a technical improvement in the machinical processing and mirroring of natural language (though this is true as well). Rather, it is a shift in civilization that will have an impact on cultures and societies. On a more political and ethical level, it will affect future orders of discourse and regimes of power. The simulative AI era also exploits the possibilities (and vulnerabilities) of 'synthetic images' in many fields and sectors. But again, it is not merely a technological innovation. It will cause us to profoundly rethink the cultural connotations and strategic implications of visuality and, on a more philosophical level, the potency of data latency. Finally, after machinic texts and synthetic images, we explore the emerging topic of 'autonomic agents' deployed on a massive and rapid scale.

On the horizon, a computational army of operational artificial intelligences is on the way, capable of simulating a wide range of tasks and jobs in order to automate ecosystems flows, industrial processes, and societal services. But what does it mean for our civilization a simulational robot and its behaviors? In three succinct studies on generative AI, we analyze values and risks of these new uncanny valleys from a cultural and technical standpoint.

2. A NEW SIMULATIVE LANGUAGE

Facing the question of synthetic, simulative, and inflative languages means confronting a transformation of civilization that is epochal, not episodic. This is currently much commented upon, but little explored and poorly understood in terms of its cultural implications. From a technical point of view, the machine that instantiates a large language model (LLM) is a sociotechnical assemblage of diverse operational skills linked to multiple computational architectures and information resources. The ability to simulate language in its textual form, adapt it in contextual mode, store knowledge and information, execute linguistic instructions and tasks, summarize topics with scalar refinement, generate linguistic sequences and stepwise reasoning attempts, articulate responses and construct dialogues is the result of a complex orchestration of software programs, data and information stores, deep learning algorithms (including human reinforcement), and mathematical-stochastic models of language. It is thus a set of intertwined engineering-computational techniques and procedural operations (*training on code, transformers, pre-training modeling, instruction tuning, word tokenization, reinforcement learning with human feedback*) that are capable of statistically sequencing natural human languages. To balance and counteract the hype of the moment, as many say, this linguistic reproduction is performed without any meaningful reference and relation to reality. That is, without this machinic language actually knowing anything about the

1. Cfr. Lenhard 2019.

world in which we live and without having any understanding of its meanings. The term 'stochastic parrots' easily evokes this plausible but senseless simulation of language.

What exactly is a large language model? An LLM can be defined as a language-probabilistic sequencer with a low cross-entropy. Reduced to its most basic form, it is a mathematical model of the probability distribution of words in a written language that attempts to minimize cross-entropy (i.e., the gap between possible frequency distributions) while maximizing its predictive performance as a text predictor. This approach is the result of a long journey in the modern history[2] of natural language processing (NLP), beginning in the early twentieth century with Markov chains applied to literature (the sequence of vowels and consonants in a novel), moving through the work of Shannon and Weaver in the 1960s on entropy measurement and probability distribution (n-grams and the probabilistic sequence of words in language), and culminating in the early 2000s with the work of Bengio and colleagues applying artificial neural networks to natural language processing (neural NLP).[3] Even with important recent developments such as the use of transformers that can incorporate the contextual dimension of words/sentences into the probabilistic analysis of language, it is very important to have a good technical understanding of the operational workings of computational language models – invisible to most – in order to understand how they relate to and differ from human natural language. To pick up on Shanahan's caveat,[4] when we query such a linguistic machine by asking it to complete a sentence (e.g. "the author of the *Divine Comedy* is ...") and give a specific answer ("... Dante"), the human and the machine mean two very different things in this dialogue. We (humans) want to know who, in historical reality, wrote the famous poem. The machine, on the other hand, wants to know which word is statistically most likely to follow in the sequence of the sentence "The author of the *Divine Comedy* is..."? Within the corpora of information that feed the model, it will find that "Dante" is the word most often associated with the sequence of words in the sentence in question. In the present case, and on a more philosophical level, by asking this question, the human intends to say and assume to know an element of concrete 'historical truth' about the world. The machine, on the other hand, intends to process texts and can only return a result of pure 'linguistic probability' based thereon.

However, and this is the critical point, the human being, caught between anthropomorphisms and sociomorphisms, imagines that the machine understands the question and arrives at the answer in the same way as he does. So, in order not to fall victim to the machine (but also not to miss important social opportunities), it is necessary – as a long study on the dissociation between language and thinking in LLMs[5] shows – to distinguish between 'formal' language skills and 'functional' language skills. The former (formal) refers to the ability of machine processing of natural

2. Cfr. Binder 2022.
3. Bengio *et al.* 2003.
4. Shananan 2022.
5. Mahowald, *et al.* 2023.

language to recognize the syntactic structure of a language, its grammatical rules and its regularities in sentence construction, reproducing and simulating it probabilistically. The latter (functional) refers to the abilities of the human brain to construct a language that relates to the world and enables us to act cognitively in it, using perception and the senses, communication, reasoning and interactions. The success of LLMs in formal skills should not mislead us about their functional skills, which are still far from human capabilities. But the argument that LLMs are merely stochastic parrots misses the cultural significance of this shift to *non-human language*.

The historical prerogative of humans alone to (simulated) speech/writing is showing signs of waning. Furthermore, writing itself is becoming an "impermanent inscription"[6] dismissing its nature of persistent signature. Along with the crisis of the human authorship (as philosopher Gunkel correctly suggests) and the permanent writing, we are also at the beginning of a new inflationary era of the word (and of media in general). One that, like all inflationary media passages, both earthquake and terraform new orders of discourse, new regimes of truth and falsehood, new logics and dynamics of political economy and policy power. As we can sense, this new simulation of language represents a powerful deconstructive operation of many questions such as: the inside/outside of text, the native locus of meaning, the old function-author, the morphing dialectics of text (communication) vs code (computation), the foundation of social trust.

3. A NEW SIMULATIVE IMAGE

Besides language, the synthetic image is literally the other most visible and now increasingly present expression of the generative capacity of AI. The history of image processing is a long one: scientific, industrial, and artistic. Since the 1920s, it has been a journey that led the image first to digital production and then, with the first decade of the 2000s, to generative synthesis. Thus, over time, through a series of ontological discontinuities,[7] what we have called an 'image' has been represented first by digital processes, structures, and interfaces, and then, finally, simulated by its own re-creation through the use of deep artificial neural networks, surprisingly opening the new horizon of metacreativity.[8] But what do synthetic images such as those produced by stable diffusion models (SDM), and also those produced in various generative forms by DALL-E, Midjourney, Imagen, represent in philosophical terms? And how are they produced technically? Let us start with this last question. What is the engineering behind a synthetic image? A generative stable diffusion model typically starts with an image (interpreted by the machine as a numerical transposition, which is then its way of 'seeing' the world) that is corrupted and progressively degraded by the injection of Gaussian noise. The diffusive injection of noise into the image data continues until it is completely destroyed, at which point it becomes pure noise (forward diffusion process). Once this degrading diffusion of the decomposed image into chaotic pixels is

6. Accoto 2024.
7. See Nail 2019 and Thomson-Jones 2021.
8. Navas 2022.

complete, the generative technique reverses the process by instead training an artificial neural network to recreate the previously 'noisy' image used as input (reverse diffusion process). The denoising process reverses the perturbation phase to generate new images from the random noise state. When the denoising process is performed using the latent space[9] of an image (as in stable diffusion) rather than the image itself, it is called a Latent Diffusion Model (LDM). As we will now see, the inflative power of the synthetic image derives from this machinic ability to explore and exploit the latent space of the observed (but invisible to the human) data. Thus, in a text-to-image operational flow (from prompt to output), the generative machinic process technically reverses the classificatory process. The model does not classify given images by assigning them to a category (classifier), but rather generates a new image (generator) based on a textual input.

The computational assembly that generates the image from text is composed of several elements: text prompt, tokenization, embedding, text transformer, noise predictor, and more. Each of these moments and technicalities of the generative flow has specific functions, such as converting the initial textual prompt into machine-understandable linguistic tokens (which do not recognize human words as such), reducing the vector representational dimensionality of the data by searching for and preserving contextual similarities (such as semantic and sense proximity), predicting the latent noise in the latent image and then subtracting it in an iterative, sampled manner (thus creating a new latent image), finally transforming the latent image into an image pixel and returning it to the initial query as a new visual synthesis product. This new relationship between signal (image) and noise (degradation) is crucial. In a classical digital image, noise is the disturbance caused by the totality of the various physical degradations of the signal. Whereas in a digital image it is simply removed, in the synthetic image (and especially in its latent space) noise is first added and then removed. This is done because it is easier for artificial neural networks to reconstruct from a degraded image structure than to build from scratch. In addition, by working on the latent space of the images (which is small compared to the high-dimensional space of the original images), the computational effort of noise injection can be limited and efficient.

Of course, this is not only a question of efficiency. It is also relevant from the perspective of artistic and economic experience and the exercise of creativity.[10] But it is also and especially important from a more cultural and philosophical point of view. Latent space is the space that hosts and maps all possible dimensions (features) of the input data. These are the dimensions (patterns such as color, angle, size, orientation, etc.) that are automatically extracted by a trained artificial neural network. It will then be crucial for markets and businesses to explore, competitively and philosophically, this possible/impossible space of the latent observed/unobserved.

9. A latent space, also known as a latent feature space or embedding space, is an embedding of a set of items within a manifold in which items resembling each other are positioned closer to one another in the latent space. Position within the latent space can be viewed as being defined by a set of latent variables that emerge from the resemblances from the objects. Wikipedia: https://en.wikipedia.org/wiki/Latent_space (accessed 2/07/2024).

10. See Audry 2022; Yee-King 2022.

A concept of the latent image can also be found in the more classical photographic discourse. But the semantic and ontological distance between the two concepts marks a point of no return. If the latent image in a mechanical photographic process was produced chemically, the latent image in an artificially generative process is produced algorithmically. This is the origin of 'synthography', a neologism for the method of synthetically generating digital photography. We may even have to start using neologisms such as 'algorealism'[11] instead of the more classical 'photorealism'.

Even from this brief analysis, it is clear that the synthetic image is no longer simply an "isomorphic transcription of the real", as is a photorealistic image.[12] That is, it is no longer the visually realistic representation of real objects, environments, or people. With Generative AI, the image is continuing its transformative journey towards new natures, cultures, statutes, and domains at an accelerated pace. An epochal turn for the 'visual' towards novel and surprising features beyond the human: machine images for machines only, operational rather than representational of visual, simulative-predictive media purposes.

4. A NEW SIMULATIVE AGENT

The burgeoning era of generative AI is increasingly conjuring up on the horizon not only a new synthetic media ecology (text, image, sound, video) but, more profoundly, a new synthetic economy populated and animated by simulative autonomous agents. We are only at the beginning, of course, and the hype is growing, but the gradual adoption of artificial machines (embodied/disembodied) by corporations and institutions will disrupt and reconfigure old modes of production and old divisions of labor across all sectors and industries. Thus, an army of computational agents would be on its way, conceived to (re)organize, in an automated and autonomous way, the work needed to complete complex tasks (not just to produce a single image or a specific text, as is the case with current forms of generative AI).

We might then summarize the shift as a new focus of generative AI from mediality to productivity. In the era and economy of 'infinite transaction', the arrival of autonomous agents makes it possible to begin experimenting with artificial economies in new forms, reimagining value co-creation ecosystems and business architectures in an agent-based AI service logic. But first and foremost, what is an autonomous artificial agent? According to a recent market definition, "autonomous agents are AI-driven programs that, when given a goal, are able to create tasks for themselves, complete tasks, create new tasks, reprioritize their task list, complete the new top task, and loop until their goal is achieved".[13] Simply put, given a given goal, an autonomous agent defines the initial tasks by also drawing on its memory (short and long) and creating subtasks/goals, puts them into execution by invoking necessary tools and resources and collecting initial feedback from them, on the basis of which it generates new tasks by selectively prioritizing them, and then continues to iterate the process by improving loops

11. Accoto 2024.
12. Rodowick 2001: 36.
13. Schlicht 2023.

until the goal is finally achieved. This is done individually (simulative autonomous agents are often understood as co-pilots), but also progressively in a collective mode (mimicking computational multi-agent systems). For example, in a recent simulation experiment,[14] aggregations of agents with emergent autonomous coordination were examined. About 20 artificial agents (given the task of organizing a Valentine's Day party) began to autonomously simulate various activities related to the event. These autonomous agents are: "computational software agents that simulate believable human behavior. Generative agents wake up, cook breakfast, and go to work; artists paint while writers write; they form opinions, notice each other, and initiate conversations; they remember and reflect on past days as they plan for the next day".[15] This ability to plan is a characteristic of being an autonomous agent. After the technological success in identifying the sequence of words (large-scale language modeling), we moved on to identifying the sequence of actions (step-by-step planning agency). To acquire this agentive capacity, three simulative dimensions were key: (a) some ability to 'reason', realized in a chain of thought mode, that guides the language model towards the desired solution; (b) some ability to identify/execute the actions/subtasks to be taken and repeated autonomously until the assigned task is solved when the information produced by the first prompt is insufficient and further actions and observations are needed; and (c) some ability to prioritize and give a progressive sequential order (including dependencies and relative chaining) oriented towards task completion. This is a major shift in the history of programming: "The real unlock that makes agents an entirely new software paradigm lies in the modern LLM's ability to take in a goal, along with a set of facts and constraints, and then create a step-by-step plan for achieving that goal. Before LLMs, the programmer had to make the plan – a computer program is really just a step-by-step set of actions the machine must take to achieve a goal. But in the LLM era, the newly acquired ability of machines to make their own plans has everyone in a frenzy of either fear or greed".[16] From a more abstract and philosophical perspective, "prompt engineering is an immanent form of chaos engineering".[17] From this perspective, a cross-entropic catastrophe – anthropomorphically known as a hallucination – is revealed to be a surprising and revealing point of failure (POF) in user-agent assembly.

But what does 'reasoning' and 'planning' mean in the case of autonomous agents? Again, to avoid anthropomorphisms and sociomorphisms, it is appropriate to go into their simulative mechanics a bit. First, what we call an agent is actually a distributed, layered, and coordinated assembly of multiple functions/agents (e.g., execution agent, task creation agent, context agent, prioritization agent), each of which is responsible for performing specific operations and activating and dialoguing with the others iteratively and recursively across tools, resources, memories, and instructions.[18] Second, the di-

14. Park *et al.* 2023.
15. *Ibid.*: 1.
16. Stokes 2023.
17. Accoto 2024.
18. Wang 2023.

mension of 'reasoning' in LLMs is simulated as an emergent property of the 'chain-of-thought' (COT), the metacognitive mechanism by which the human-user guides the machine-agent to always discuss linguistically around the initial input by intermediate small steps (let's think step by step). Third, the dimension of the agent's action lies in its ability to self-explain and self-repeat the initial prompt with integrated observations, explanations, and suggestions. In doing so, the autonomous agent recursively refines the input/prompt by moving linguistically and recursively in the desired direction.[19]

It is important to be clear about these technicalities to avoid hype, disappointment, or misunderstanding. LLMs don't reason and plan like humans do. They just mimic and mirror human operational behavior. But are we sure we have explored the concept of computational simulation to the fullest extent possible?

5. A TALE OF TWO MEANINGS

We know that simulation is at the center of modern AI history. One of the well-known founding papers of AI is Turing's essay "Computing Machinery and Intelligence"[20] of 1950. In this paper, Alan Turing conceptually introduced and designed the *imitation* game (lately known as "Turing Test"). A machine (computer program) whose answers would imitate those of a human almost indistinguishably would pass the test, qualifying itself as intelligent (a machinical imitation is a sufficient condition of intelligence). In the introduction of "A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence" of 1955), *simulation* is at the core of machine intelligence process and output. In fact, the study [of artificial intelligence] is to proceed "on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it".[21] But, again, have we fully explored the concept of computational simulation in its philosophical density? It's interesting to quote, here, a passage of *Unconscious Networks*, a recent philosophical exploration of Possati:

> Let me be clearer on this using an example: a robot comes toward me and greets me. Why is that greeting a simulation? What is it a simulation of? Who is giving the greeting, the robot or the software that makes it work? There is no conscious intention in the software, so that greeting is not an intentional act; the robot recognizes a situation (i.e., someone entering the room) and then applies a procedure (i.e., giving the greeting). Where is the simulation? The simulation lies in the eyes of the human agent who receives the greeting; it is the human agent who expects to receive a greeting upon entering a room, who can explain the presence of that robot in that room as something that must welcome passersby, and who then interprets it in that way (i.e., by anthropomorphizing the robot). Furthermore, the simulation lies in the team of technicians who designed and created the robot to simulate a certain behavior, such as greeting people who enter the room. What if the intention of the technicians had been different? What if raising an arm and

19. Stokes 2023; Wang 2023; Chen 2023.
20. Turing 1950.
21. McCarthy *et al.* 1955.

> saying the word "hello" were the result of a technical error, a bug in the robot's software? Let us say that the software that runs in the robot was originally meant to allow the robot to illustrate an architectural project; a malfunction produced a bug, making the robot now only able to raise its arm and say "hello." The bug produces a crisis. Is the robot still simulating? What is it simulating – the action prepared by the designers or the one envisaged by the human agent it meets? When asked, "Does the robot simulate?", the designers would respond in the opposite way to the human agent who meets the robot. Let us take another case. Due to a bug in the software, the robot is not only unable to illustrate an architectural design (which it was sup- posed to do), but it cannot even say the word "hello" – meaning that its action is limited to raising its arm, in a rather fast and violent way. Let us say that a human agent, entering the room, interprets the raising of the robot's arm as a provocation – for example, as a Nazi salute. Another human agent who arrives at that moment interprets the raising of the robot's arm as a request for help; the human agent thinks that the robot is in danger, threatened by a person who wants to destroy it. I ask the same question as before: Is the robot simulating? What does it simulate? Is simulation really the central issue here?[22]

In fact, following this perspective, the paradoxical conclusion is that: "in a complex and unscheduled interaction situation, *everything can be a simulation of everything*".[23] This passage perfectly clarifies the complexity of what we tend to simply call 'simulation'. An even more epistemically relevant abyss of density is described in the following quote from Lenhard's *Calculated Surprises*:

> I want to distinguish two fundamentals but opposing conceptions of simulation. As I shall show, neither position can be defended in its pure form. The first conception starts from the observation that analytic means, in the technical mathematical sense, are often insufficient to solve mathematical equations. Consequently, simulations are conceived as *numerical solutions* of these equations. The second approach follows a different line of thought that does not involve the concept of solution. It takes simulation as the *imitation of the behavior* of a complex system by a computer model. These two conceptions conflict, and this conflict has shaped the typology of simulation right from the start.[24]

Lenhard illustrates this twofold by exploring the relationship between the simulation pioneers John von Neumann, who advocated the solution and Norbert Wiener, who advocated the imitation concept. As I wrote in my recent essay *Il mondo in sintesi. Cinque lezioni di filosofia della simulazione*,[25] it seems that a double perspective is emerging here oscillating – to propose another perspective – between 'simulation' and 'synthesis'. I would speak, to use a convenient assonance, of *mimesis* and *genesis*. The machine approaches the world through simulation (and better than the experimentation), but in building this epistemic proximity, it is also able to reconfigure the existence and the meaning of what we evoke as 'the real'.

22. Possati 2022: 136-137.
23. *Ibid.*: 137.
24. Lenhard 2019: 150.
25. Accoto 2022.

The computational simulation processes and produces an epistemological approximation of complex phenomena (from languages to proteins to markets), but this proximity means also a new synthetic recreation of the phenomenon. As recently happened for the protein three-dimensional shape question solved by AI. In this case, on the one hand, AI simulates the world of proteins in the sense of becoming more and more close to the real thing. The simulation of the volumetric and spatial structure of proteins can easily and quickly predict their 'real' topological configuration. On the other hand, its increasing autonomy and self-sufficiency also moves in the direction of recreating the world by replacing it with the modelled one as in the contemporary case of protein design (and biodesign more generally). From protein folding to protein designing, the continuum of AI simulation perfectly evokes and shows its ontogenetic power from approximation to recreation.

6. CONCLUSIONS

Even while many have long mistakenly restricted it to the technological dimension with its economic, legal, social, and ethical ramifications (reifying or personifying it as the case may be), the so-called 'artificial intelligence' is finally being revealed for what it has always been: a planetary political quest and question. And, if you will, a more vertical case of political economics and environmental policy within that. AI evokes and embodies the growth of a computational simulation which is gradually scaling up to the planetary level becoming the invisible infostructure of new volumetric (not only topographical or protocological) sovereignties and intelligences, as well as new geodesic and even cosmic forces (space engineering and ethics).

Now we must deal with the issue of an emerging planetary intelligence (its long eco-technical history and creation) stuck between biospheres and technospheres, both mature and immature. With the coming simulative AI, we face not only new technological and societal problems (algorithmic bias, data privacy, cyber security, copyright protection, market regulation, economic return, geopolitical strategy, business competition, epistemic crisis, job loss, energy consumption, material rarity, democracy failure, even existential risk for some), but also new or revived intellectual provocations. Provocations about our historical idea of nature, human, life, language, knowledge, creativity, economy, politics, law, society and more. And, just as *technological challenges* require new *engineering solutions*, *intellectual provocations* urge disruptive *cultural innovations*. That is to say: they provoke us to innovate in making sense and meaning for a new, digitally terraformed, world. Therefore, we must speculate beyond, for example, the naive idea of the human-in-the-loop. This is a very frequent expression today, and it is easy to agree with it. However, I would argue that it is also, in many ways, cosy and soothing. It strives – like other pleasant and reassuring statements (what I call *the anaesthetics of ethics*) – to relieve the restlessness and unsettling of human civilization in the face of new narcissistic wounds.

However, it barely meets the philosophical attitude of those who desire instead exploring the New and build the Next. By questioning assumptions and paradigms, we will discover that, in this new civilization change, the 'human' is no longer what it once was and that the 'loop' must be reinvented and renegotiated. This is what societies urgently need in order to walk, dwell, and prosper in new uncanny, artificially simulated, valleys.

This brief (non-exhaustive) excursus is an indication of the increasingly urgent need to re-examine the morphing of the signification and concretisation that the term simulation is gradually acquiring as a result of the ongoing AI technological transformations.

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