

Pharmacology of computational automata: from generative AI to contributive recommendation, toward future technologies

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Résumé

L'article propose une analyse pharmacologique des automates computationnels contemporains, en mobilisant le concept platonicien de *pharmakon* — à la fois remède et poison — afin de penser les effets ambivalents des technologies numériques actuelles. À partir du mythe de l'écriture dans le *Phèdre* de Platon, l'autrice montre que toute technique d'extériorisation de la mémoire implique à la fois une amplification et un risque d'appauvrissement des capacités humaines. Cette ambivalence est reprise pour analyser les dites intelligences artificielles génératives, qui accroissent la productivité textuelle et iconographique au prix d'une délégation des capacités expressives, interprétatives et imaginatives des sujets. Le texte soutient que ces systèmes ne constituent pas des formes de conscience artificielle, mais de nouveaux *pharmaka* numériques, responsables de processus de prolétarianisation de l'esprit, au sens de Bernard Stiegler, analogues à la prolétarianisation du travail décrite par Marx. En outre, l'autrice critique la notion d'« IA générative » et propose le concept d'IA extractive, dans la mesure où ces systèmes se nourrissent de l'exploitation non rémunérée des productions culturelles collectives, transformant la mémoire sociale en capital. L'article met également en évidence les risques d'homogénéisation culturelle, d'appauvrissement linguistique et de désinformation, aggravés par la circulation massive de contenus générés automatiquement et par les algorithmes de recommandation opaques des grandes plateformes numériques.

Mots-clés : Pharmakon numérique; Automates computationnels; Intelligence artificielle générative; Prolétarianisation de l'esprit; Extractivisme numérique.

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Abstract

The article proposes a pharmacological analysis of contemporary computational automata, mobilizing the Platonic concept of *pharmakon*—at once remedy and poison—in order to think through the ambivalent effects of current digital technologies. Drawing on the myth of writing in Plato’s *Phaedrus*, the author shows that every technique of exteriorizing memory entails both an amplification and a risk of impoverishment of human capacities. This ambivalence is taken up to analyze so-called generative artificial intelligences, which increase textual and visual productivity at the cost of delegating subjects’ expressive, interpretative, and imaginative capacities. The text argues that these systems do not constitute forms of artificial consciousness, but rather new digital *pharmaka*, responsible for processes of proletarianization of the mind, in Bernard Stiegler’s sense, analogous to the proletarianization of labor described by Marx. Moreover, the author criticizes the notion of “generative AI” and proposes the concept of extractive AI, insofar as these systems feed on the unpaid exploitation of collective cultural productions, transforming social memory into capital. The article also highlights the risks of cultural homogenization, linguistic impoverishment, and disinformation, exacerbated by the massive circulation of automatically generated content and by the opaque recommendation algorithms of major digital platforms.

Keywords: Digital *pharmakon*; Computational automata; Generative artificial intelligence; Proletarianization of the mind; Digital extractivism.

At the end of the dialogue titled Phaedrus¹, Plato recalls the Egyptian myth of the origin of writing. In this myth, the Egyptian god Theuth, inventor of writing as well as the science of numbers, calculation, geometry, and astronomy, presents his invention to the king of the Egyptians, Thamus. Theuth claims to have found a remedy for memory and learning: writing will allow knowledge to be preserved on a material support and remedy the flaws of individual memories. Not only do individuals never remember perfectly, but they also always end up disappearing, their memories falling into oblivion. Artificial memory through writing thus promises potential immortality. But King Thamus, for his part, distrusts the true effects of this new technique, which he sees as a danger: it risks making citizens’ souls forgetful, because they will stop exercising their memory, rely on written traces, and merely repeat speeches without making the effort to understand them. The king worries about the ambivalent nature of the increase promised by Theuth, which risks causing a

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decrease by weakening the mnemonic and interpretative capacities of the population. This is why the technique of writing is described by Plato as a *pharmakon*, a Greek term that means both remedy and poison: while the dead support is essential to assist the flaws of memory capacities, artificial memory always risks substituting for psychic memory—the auxiliary always risks destroying what it was meant to support.

The dangers of computational automata: toward a proletarianization of thought?

In *Schizophrénie numérique (Numerical schizophrenia)*², I tried to show that, however distant they may seem, these reflections of Plato can help us think about the challenges posed by the new writing and calculation machines we face today. Contrary to transhumanist ideologies that fuel promotional discourse about digital innovations, the pharmacological perspective requires abandoning the idea of pure technological “augmentation”: on the contrary, it suggests that technological augmentation always involves a risk of loss or reduction of capacities, against which we must fight. In the case of so-called “generative artificial intelligences” that are developing and spreading today, enabling the massive production of texts and images, the increase in productivity also goes hand in hand with a decrease in capacities. This time, it is no longer only mnemonic capacities that are threatened: when we ask ChatGPT to automatically generate a text, we also delegate our expressive capacities. Instead of forming and expressing our own thoughts, based on our experiences, memories, expectations, and desires, we place an order with a set of algorithmic automata that perform statistical calculations on massive amounts of data and generate probable sequences of signs, while reinforcing averages and majorities, thus amplifying biases. We thereby abandon our faculties of memory, synthesis, interpretation, and singular imagination, which are replaced by standardized mathematical procedures. Consequently, contrary to transhumanist speculations, these so-called “generative artificial intelligences” do not constitute new forms of algorithmic consciousness but new types of digital *pharmaka*, which profoundly affect mental, psychic, and cognitive capacities.

Just as know-how was externalized into machine tools in the form of mechanical automatisms, leading to what Karl Marx described as a process of proletarianization of workers³, so too, the know-how of writing or speaking now seems to be externalized into digital machines in the form of algorithmic automatisms, leading to what philosopher Bernard Stiegler described as a process of “generalized proletarianization”⁴ affecting not only know-how but also know-think (which is based on the practice of oral and written language). If machinic industrialization made it possible to

² Plato, 2006, *Phaedrus*, Paris, GF Flammarion.

³ Alombert, A., 2023, *Schizophrénie numérique*, Paris, Allia.

⁴ Marx, K., 1986, *Le Manifeste du parti communiste*, Paris, Éditions sociales [Original work: *Manifest der Kommunistischen Partei*, 1848].

produce many more objects much faster, this increase could only occur at the cost of uniformizing workers gestures, standardizing the objects produced, and exhausting the natural resources needed to operate industrial machines. Similarly, it now seems necessary to question the hidden costs of algorithmic industrialization, which will undoubtedly allow the production of many more texts and images at a much faster pace, but at what price? Probably at the cost of uniformizing our thinking capacities, standardizing the content produced, and progressively exhausting the linguistic and cultural resources available to operate algorithmic machines.

The limits of “extractive AI”: toward a capitalization of collective culture?

It indeed seems that the functioning of the computational automata developing today relies on the exploitation of collective symbolic resources sedimented on the digital network, which feed the databases on which the algorithms of large language models or image generators are trained. If “generative AIs” can produce highly plausible texts and images, it is because they draw on all the content shared on the Web: for example, on a collaborative encyclopedia like Wikipedia, to which individuals contribute voluntarily, or on various social networks through which individuals communicate daily. Yet content creators are not compensated for the content exploited; only the companies that own the automatic generation systems profit from it. The fascination with machine intelligence thus masks the dispossession of human contributors and the predation of intellectual works. Noam Chomsky has even referred to this as «the greatest theft of intellectual property since the arrival of European settlers on Native American lands»⁵, while Naomi Klein calls it «the greatest plunder in human history».⁶ For the same reasons, Jean Cattan and Célia Zolinski, specialists in digital law, propose speaking of “extractive AI” rather than ‘generative AI.’ In *The Capital That I Am Not! Putting Economy and Digital Technology at the Service of the Future*, we describe this phenomenon as an operation of capitalizing collective memory, which thus becomes a capitalizable stock or an available fund, from which a few hegemonic actors (such as OpenAI, Microsoft, Google, Meta, etc.) seek to profit by subjecting it to fully calculable criteria of selection and exploitation aimed at immediate profitability.

Not only do the designers of LLMs decide, in an opaque manner, the criteria by which certain content will be processed, but above all, these actors, primarily driven by the desire to accumulate capital, attract investments, and increase their market value, do nothing to renew the symbolic resources they exploit. Such renewal of collective culture would require not only compensating those who produce it but also valuing singular and minority expressions: whether artistic creation, technical innovation, theoretical invention, linguistic style, or scientific discovery, the new

⁵ Stiegler, B., 2015, *La société automatique*, t. 1, *L’avenir du travail*, Paris, Fayard.

⁶ Chomsky, N., 2023, “The False Promises of ChatGPT”, in *The New York Times*, March 8, <https://www.nytimes.com/2023/03/08/opinion/noam-chomsky-chatgpt-ai.html> (last accessed February 26, 2024).

always emerges against common sense, dominant habits, and majority opinions. Yet algorithmic operations based on probabilistic calculations do not account for original content, which is drowned and rendered invisible in the mass of analyzed material. Algorithms therefore only predict what is most likely to occur. By systematically eliminating any seed of novelty, computational automata tend to threaten linguistic and cultural renewal. Moreover, automatically generated content will soon become dominant on the Web: it will inevitably feed into the training data of algorithms, which will then perform probabilistic calculations on texts that have already been automatically produced. This squared probability can only lead to a progressive homogenization and uniformity of content generated online: what kinds of texts or images will we encounter when chatbots start quoting each other in self-referential loops, endlessly repeating their own artificial nonsense?

The risk of digital disinformation: toward generalized distrust?

This points to a considerable impoverishment of linguistic and expressive diversity, already largely reduced due to the dominance of English on the web and the automatic content recommendations that tend to amplify the most “liked” or “followed” content to keep users engaged on digital platforms, even when these clicks are automatically generated by fake accounts serving disinformation industries. In the context of the post-truth era, characterized by the viral circulation of false information, the rapid development of “extractive artificial intelligences” seems all the more risky. While automatically generated texts may appear well-constructed in terms of grammar, syntax, or spelling, their relationship to truth remains problematic, since they are produced based on statistical calculations. No process of interpretation, reflection, verification, deliberation, or certification governs the creation of these textual products: they therefore constitute neither reliable information nor certified knowledge, but probable sequences of signs (often based on nonexistent citations or references generated by the machine to fulfill a request). Similarly, automatically produced images are not viewpoints on the world, however fictional, but random pixel combinations that may nonetheless appear just as “real” as the photographs that feed their databases.

Automatically generated content can therefore convey all kinds of false information in a highly convincing way, making it indistinguishable from certified information. As a result, it may become difficult for individuals to trust what they read or see: soon everyone will know, through an implicit knowledge that will become common sense, that images may have been produced either by humans or automatically generated by algorithms. Everyone will also know that they cannot immediately distinguish between these two types of “manipulations”. Consequently, every piece of content received will have to be questioned: a generalized distrust is likely to develop, aggravated by disinformation industries that will exploit these new systems to create misleading content or fake profiles. In this context, it becomes

essential to rebuild trust in the digital information environment, notably by acting on recommendation systems, as proposed in a note published by the National Digital Council⁷. Currently, these systems are generally controlled by large private companies that own the most widely used platforms or social networks: tech giants deploy recommendation algorithms that automatically suggest the most viewed, sensational, and shocking content. Moreover, recommendation is made invisible: the user does not know that the recommendation algorithm was designed by a company seeking to capture and sell their attention time, and that the content they access is not representative of all the content circulating on the web.

Conclusion: toward hermeneutic and contributive digital technologies

As dangerous as this situation may be, it is not inevitable: it could be transformed if tech giants were forced to relinquish their monopoly over recommendation functions. Other companies, media outlets, associations, and citizens could then create and deploy their own unique recommendation systems. Indeed, if GAFAM refuse to be considered content publishers like print newspapers, why should they be allowed to impose an editorial line through their algorithms? Conversely, a true digital democracy requires that users of social networks like Facebook or TikTok have the choice between different recommendation systems: they could choose to receive recommendations from Facebook or TikTok if they wish, but also from other actors who would become new trusted third parties, insofar as their algorithms would rely on human evaluations and judgments, not just on quantitative algorithmic criteria. This is the goal of “unbundling” social networks, which many civil society actors advocate today, including the NGO Article 19⁸ and the National Digital Council, by proposing to require companies that own these networks to open up to other recommendation or moderation systems. Furthermore, projects like that of the Tournesol association⁹ demonstrate the possibility of developing collaborative and contributive recommendation systems, offering an algorithm based on citizen votes, inviting them to evaluate content according to explicit criteria (pedagogy, clarity, reliability, relevance, etc.) to recommend content of public utility. We can imagine a multiplicity of such recommendation systems, suggesting content according to diverse specific criteria, by combining algorithms with human evaluations. Such projects reconnect with Stiegler’s perspective of a “hermeneutic web” which proposed to « design and implement tools for (...) polemical communities that reintroduce non-automatic interpretation criteria »¹⁰ into algorithmic functioning, thereby transforming digital technologies into “spiritual instruments” that enable the exercise of judgment and

⁷ Klein, N., 2023, “AI Machines Aren’t ‘Hallucinating’. But Their Makers Are”, in *The Guardian*, May 8, <https://www.theguardian.com/commentisfree/2023/may/08/ai-machines-hallucinating-naomi-klein> (last accessed February 26, 2024).

⁸ Alombert, A., 2024, « Assurer nos libertés à l’ère de l’intelligence artificielle », *Conseil National du Numérique*, March 28, <https://cnnumerique.fr/assurer-nos-libertes-lere-de-lintelligence-artificielle>.

⁹ Article 19, n.d., *Website*, <https://www.article19.org/>.

¹⁰ Tournesol, n.d., *About*, <https://tournesol.app/about>.

deliberation. Instead of fearing supposed “digital minds” threatening humanity, as mentioned in the letter published by the Future of Life Institute co-signed by Elon Musk and many other experts following the release of ChatGPT¹¹, the goal should be to put computational automata at the service of collective intelligence, turning them into hermeneutic and contributive technologies - that is, technologies that carry a future.

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¹¹ Stiegler, B., 2014, “Pharmacologie de l'épistémè numérique”, in *Organologie des savoirs et technologies de la connaissance*, Stiegler, B. (ed.), Paris, FYP, p./pp.