

Siegfried Dubois

Enjeux sociaux et environnementaux de l'IA

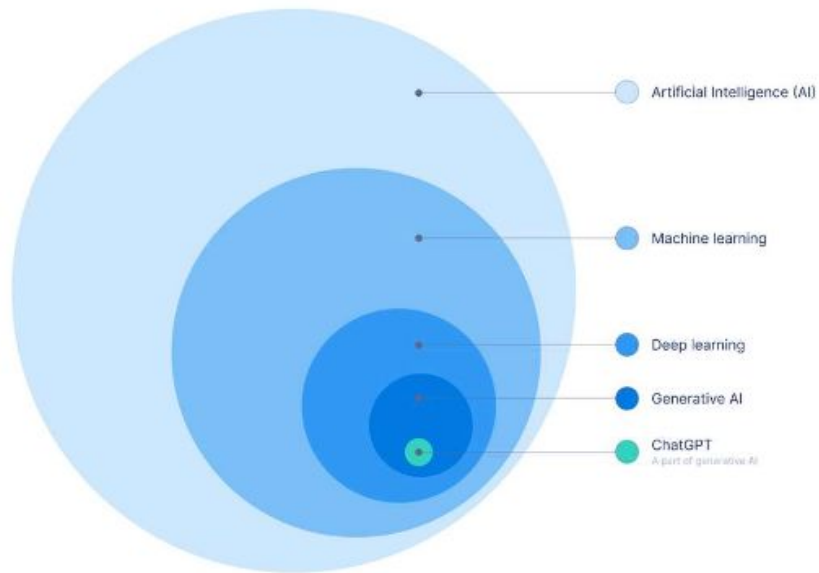
En vaut-elle le coût ?

Inria

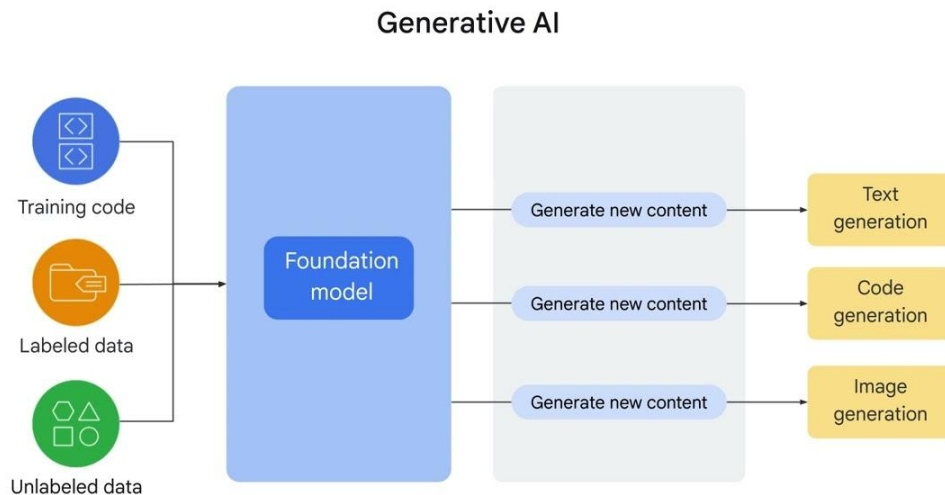
50
1973
2023
IRISA

Prologue

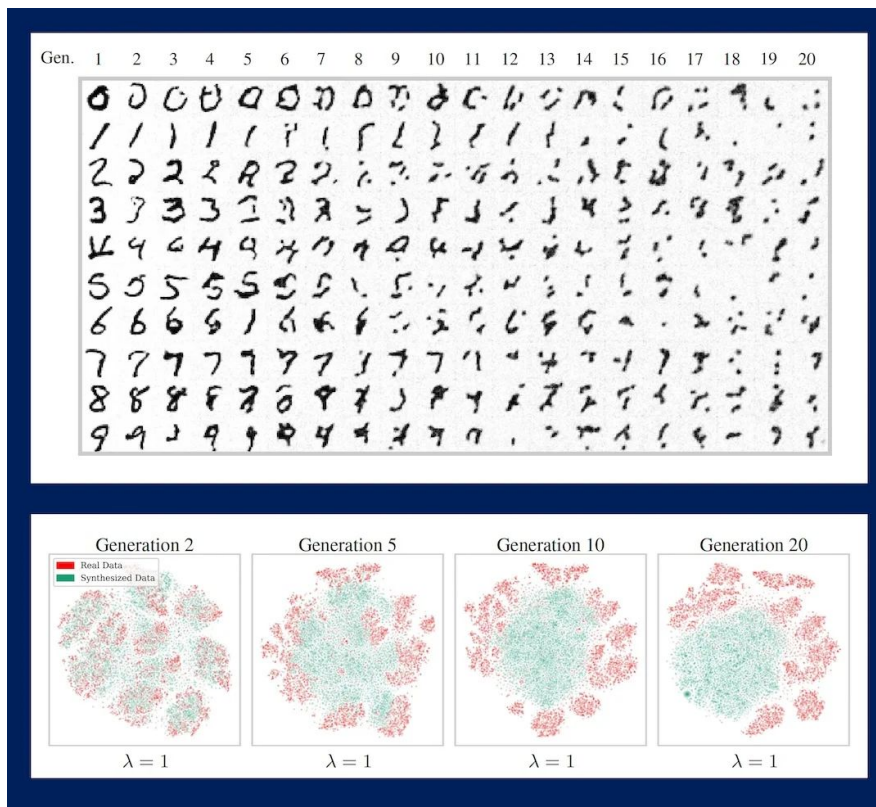
Large Language Model



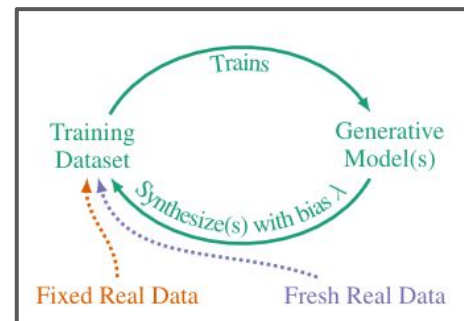
I.A. La dépendance au corpus



I.B. MAD(Model Autophagy Disorder)-ness



“We chose to work on visual AI models to better highlight the drawbacks of autophagous training, but the same MAD corruption issues occur with LLMs, as other groups have pointed out.”



I.C. Droits d'auteurice et protection des données

Privacy and Disinformation

"Approximately 11% of the information shared with ChatGPT by employees consists of sensitive data, including client information. [...] Companies such as Samsung, Amazon and JPMorgan have reportedly barred employees from uploading confidential information, including code, to LLMs."¹

Researchers Poke Holes in Safety Controls of ChatGPT and Other Chatbots

A new report indicates that the guardrails for widely used chatbots can be thwarted, leading to an increasingly unpredictable environment for the technology.

FORRES > INNOVATION > VENTURE CAPITAL **The Incoming Tidal Wave Of Data Pollution In AI**

Health IT - 2 Min Read

Researchers find AI can be used to generate volumes of misleading content on critical health topics, call for vigilance

¹ Source: Forbes, *10 Ways Cybercriminals Can Abuse Large Language Models*, M. Drollet (30 June 2023).

II.A. Le mythe de la productivité

TRIBUNE

Marion Beauvalet

Chercheuse à l'université Paris-Dauphine-PSL

Lucie Rondeau du Noyer

Chercheuse au Centre international de recherche sur l'environnement et le développement (Cired)

Intelligence artificielle : « Les gains de productivité ne se traduisent pas forcément par une diminution des horaires ou de l'intensité du travail »

Avec l'IA générative, le travail évolue pour un grand nombre de salariés, chargés désormais de contrôler des tâches qu'ils accomplissaient auparavant, d'où une perte d'autonomie et de savoir-faire, constatent les deux chercheuses Marion Beauvalet et Lucie Rondeau du Noyer, dans une tribune au « Monde ».

Publié le 18 février 2025 à 11h30 | 🕒 Lecture 3 min.

II.B. Financements et dépendance aux modèles



II.C. Travailleuses des Suds

Open letter to President Biden from tech workers in Kenya

22 May 2024

Dear President Biden,

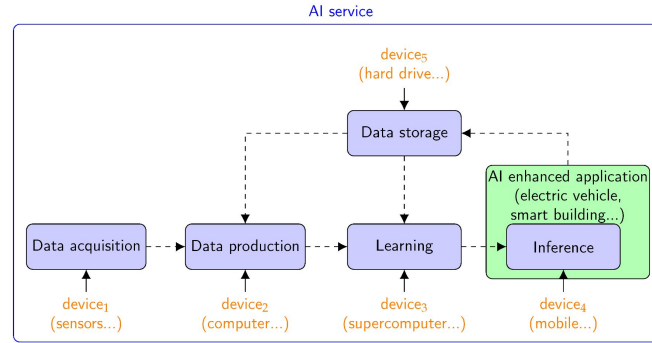
Cc: Ambassador Katherine Tai, US Trade Representative,

We are 97 data labellers, content moderators and Artificial Intelligence (AI) workers in Nairobi, Kenya. We work for American companies like Facebook, ScaleAI, OpenAI via their outsourcing companies in Kenya.

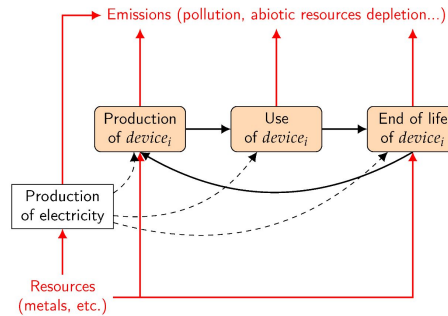
We understand you will meet Kenya's President William Ruto on his official state visit, to "*mark the 60th anniversary of US – Kenyan diplomatic relations and will celebrate a partnership that is delivering for the people of the United States and Kenya.*" We write because we understand you will discuss, "*trade, investment and technological innovation*" – issues in which our workforce has a direct and personal stake.

US Big Tech companies are systemically abusing and exploiting African workers. In Kenya, these US companies are undermining the local labor laws, the country's justice system and violating international labor standards. Our working conditions amount to modern day slavery. Any trade-related discussions between the US and Kenya must take into account these abuses and ensure that the rights of all workers are protected.

III.A. Cycle de vie

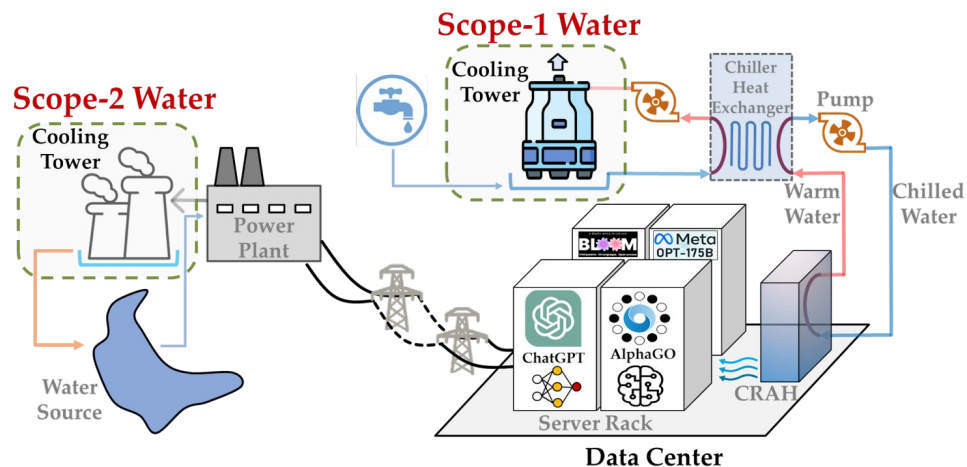


(a) Different tasks involved in an AI service



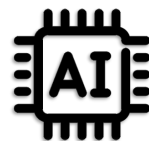
(b) Life cycle phases of each device _{i} used by the service

III.B. Empreinte écologique (1)



Global AI's Scope 1 & 2 Water Withdrawal in 2027

Est. 4.2~6.6 Billion Cubic Meters

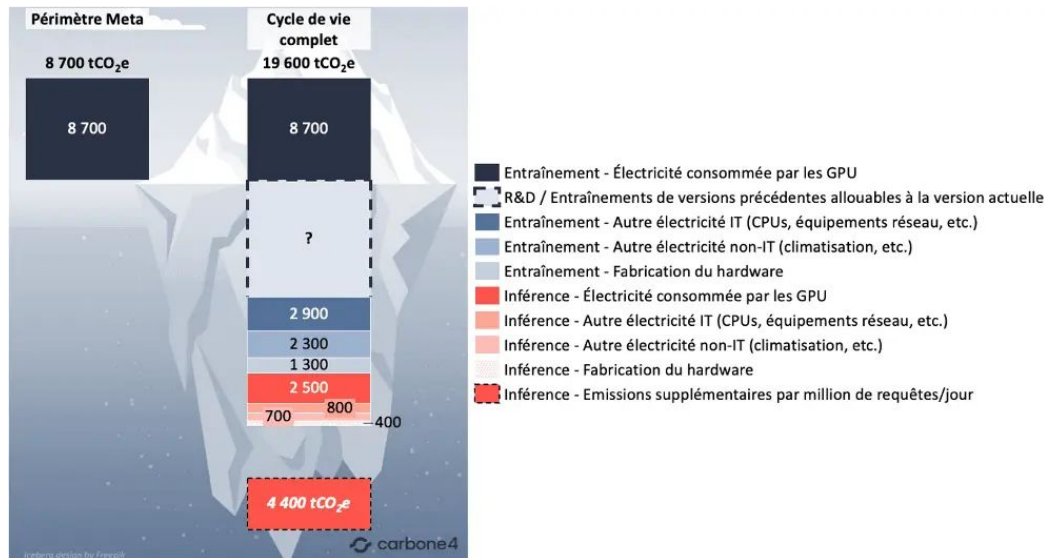


≈



4~6x Annual Water Withdrawal of Denmark

III.B. Empreinte écologique (2)



Empreinte carbone d'un grand modèle tel que Llama 3-405B (Meta), avec et sans prise en compte des postes hors électricité des GPU durant l'entraînement et l'inférence. Cette empreinte se veut représentative d'un modèle de 405 milliards de paramètres utilisé pendant 1 an, traitant chaque jour 1 million de requêtes générant 200 tokens. **À noter qu'une plus forte utilisation du modèle augmenterait significativement la part de l'inférence dans ce calcul.**

III.B. Empreinte écologique (3)

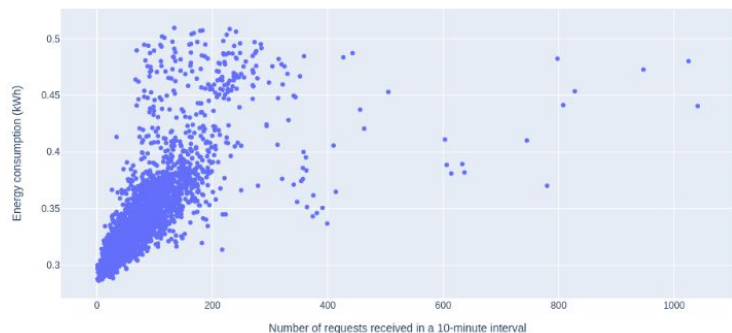
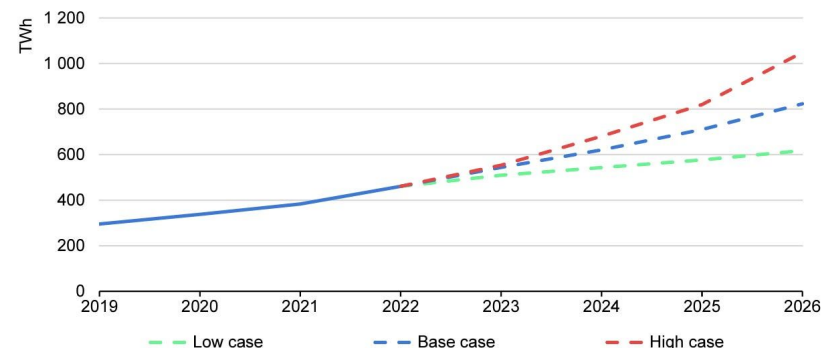


Figure 3: The quantity of energy used by the GCP instance (on the y axis) versus the number of requests received by the instance in a 10 minute interval (on the x axis). It can be seen that even when zero requests are received by the instance in this time span (bottom left of the graph), the energy consumption remains at approximately 0.28 kWh.

Global electricity demand from data centres, AI, and cryptocurrencies, 2019-2026

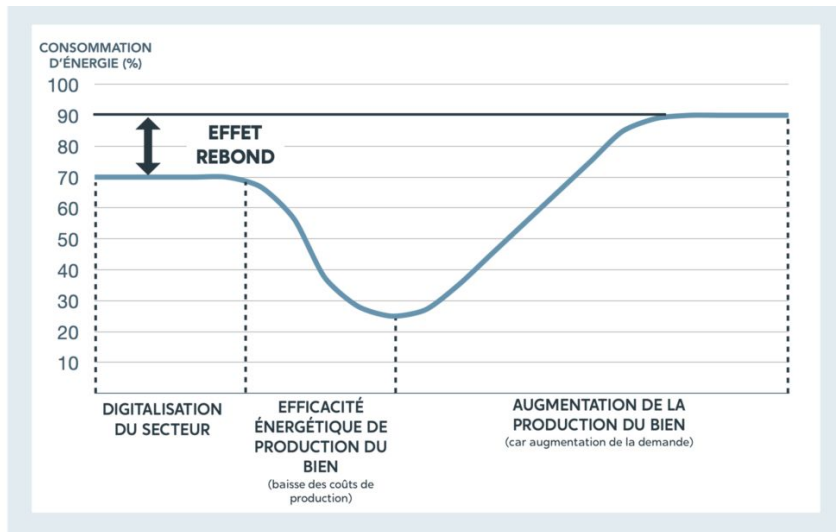


IEA. CC BY 4.0.

Notes: Includes traditional data centres, dedicated AI data centres, and cryptocurrency consumption; excludes demand from data transmission networks. The base case scenario has been used in the overall forecast in this report. Low and high case scenarios reflect the uncertainties in the pace of deployment and efficiency gains amid future technological developments.

Sources: Joule (2023), [de Vries, The growing energy footprint of AI](#); [CCRI Indices \(carbon-ratings.com\)](#); The Guardian, [Use of AI to reduce data centre energy use](#); [Motors in data centres](#); The Royal Society, [The future of computing beyond Moore's Law](#); Ireland Central Statistics Office, [Data Centres electricity consumption 2022](#); and Danish Energy Agency, [Denmark's energy and climate outlook 2018](#).

III.C. Coûts cachés et futurs



Intelligence artificielle : « Le piège de l'effet rebond »

Le rapport environnemental de Microsoft révèle que ses émissions de dioxyde de carbone sont en forte augmentation du fait de ses investissements dans les centres de données. De la difficulté à concilier technologie et sobriété, constate Philippe Escande, éditorialiste économique au « Monde ».

Publié le 17 mai 2024 à 11h29, modifié le 17 mai 2024 à 11h41 | 🕒 Lecture 2 min.

Conclusions



Sources

<https://livescu.ucla.edu/model-autophagy-disorder/>
<https://arxiv.org/abs/2307.01850>
<https://link.springer.com/content/pdf/10.1007/s43681-021-00043-6.pdf>
<https://news.rice.edu/news/2024/breaking-mad-generative-ai-could-break-internet>
<https://www.carbone4.com/ia-generative-du-changement-climatique>
https://orbi.uliege.be/bitstream/2268/319760/1/Conf_ISSEP_Neysen.pdf
<https://www.nature.com/articles/s41599-024-03520-5.pdf>
https://www.sciencedirect.com/science/article/pii/S2212827124001173?ref=pdf_download&fr=RR-2&rr=929615dbe9cc6ef7
<https://ecu.au.libguides.com/generative-ai/environmental-risk>
<https://www.sciencedirect.com/science/article/pii/S2095809924002315>
https://orbi.uliege.be/bitstream/2268/319760/1/Conf_ISSEP_Neysen.pdf
<https://boavizta.org/en/blog/empreinte-de-la-fabrication-d-un-serveur>
<https://www.springerprofessional.de/en/carbon-footprint-evaluation-of-code-generation-through-llm-as-a-27273018>
<https://www.mdpi.com/2071-1050/14/9/5172>
https://enseigner.u-bordeaux.fr/application/files/9716/9960/6020/Kit_IAG_-_Avantages_et_limites_de_IIA_dans_enseignement_superieur.pdf
<https://orsys-lemag.com/ia-les-generateurs-de-code-une-revolution-pour-les-developpeurs/>
<https://www.inria.fr/fr/position-paper-intelligence-artificielle-environnement>
<https://www.polytechnique-insights.com/en/columns/energy/generative-ai-energy-consumption-soars/>
<https://time.com/6247678/openai-chatgpt-kenya-workers/>
<https://www.noemamag.com/the-exploited-labor-behind-artificial-intelligence/>
<https://www.foxglove.org.uk/open-letter-to-president-biden-from-tech-workers-in-kenya/>

<https://doi.org/10.48550/arXiv.2304.03271>
<https://github.blog/news-insights/research/research-quantifying-github-copilots-impact-on-developer-productivity-and-happiness/>
<https://kinsta.com/blog/github-statistics/>
<https://academia.hypotheses.org/60133>
<https://politicsrights.com/fr/deconstruire-battage-ia-impact-reseaux-sociaux/>
<https://oecd.ai/en/wonk/how-much-water-does-ai-consume>
<https://academia.hypotheses.org/60133>
<https://reporterre.net/L-insoutenable-cout-ecologique-du-boom-de-l-IA>
<https://reporterre.net/Ruee-sur-l-intelligence-artificielle-une-dangereuse-illusion-au-service-de-la-Big-Tech>
<http://chatonsky.net/ima-fsn/>
<https://voxeurop.eu/en/artificial-intelligence-exploit-workers/>
<https://news.csu.edu.au/opinion/ai-is-a-multi-billion-dollar-industry-its-underpinned-by-an-invisible-and-exploited-workforce>
<https://voxeurop.eu/en/artificial-intelligence-exploit-workers/>
<https://politicsrights.com/fr/deconstruire-battage-ia-impact-reseaux-sociaux/>
<https://www.polytechnique-insights.com/en/columns/energy/generative-ai-energy-consumption-soars/>
<https://arxiv.org/abs/2211.02001>
<https://www.cnil.fr/reglement-europeen-protection-donnees/chapitre2#Article9>
<https://www.cnil.fr/reglement-europeen-protection-donnees/chapitre3#Article22>
<https://www.usine-digitale.fr/article/sommet-ia-109-milliards-d-euros-d-investissements-prevus-dans-l-intelligence-artificielle-en-france.N2227192>
<https://www.sustainabilitybynumbers.com/p/ai-energy-demand>
<https://www.ilo.org/resource/article/artificial-intelligence-illusion-how-invisible-worker-s-fuel-automated>
https://www.cjr.org/tow_center/qa-uncovering-the-labor-exploitation-that-powers-ai.php
<https://intelligence-artificielle.developpez.com/actu/355826/Des-dependances-imaginaires-aux-consequences-reelles-l-IA-invente-des-noms-de-logiciels-et-les-devs-les-telechargeant-des-dependances-logicielles-fictives-ont-ete-integrees-dans-des-projets-reels/>
<https://www.jeuvinavocat.com/publication/les-droits-dauteur-et-le-copyright-sont-ils-menaces-par-lintelligence-artificielle>