

Open Source and AI: Freedom in AI Systems

MOURA HARTERY Nicole,¹ SAAD Saif²

Abstract

The exponential growth of Artificial Intelligence has challenged traditional open source concepts, leading to widespread "Openwashing" where systems are marketed as open without providing true access. This presentation defines genuine Open Source AI (OSAI) based on the Open Source AI Definition (OSAID), which mandates transparency in code, data, and parameters. It explores the benefits of true OSAI, including accelerated innovation, community collaboration, and cost advantages. However, it also critically examines the real world barriers of high infrastructure costs, significant safety and misuse risks, and inconsistent project support. The analysis concludes by emphasizing the need for clear criteria to identify genuine open systems, arguing that this discernment is essential for fostering a transparent, accountable, and publicly beneficial AI ecosystem.

Keywords: Open Source AI, Openwashing, Artificial Intelligence, AI Systems.

Abstract

La croissance exponentielle de l'intelligence artificielle a remis en question les concepts traditionnels de l'open source, conduisant à un "Openwashing" généralisé où les systèmes sont commercialisés comme ouverts sans en fournir un accès réel. Cette présentation définit la véritable IA Open Source (OSAI) en s'appuyant sur la Définition de l'IA Open Source (OSAID), qui exige la transparence du code, des données et des paramètres. Elle explore les avantages profonds d'une véritable OSAI, notamment l'innovation accélérée, la collaboration communautaire et des avantages économiques significatifs. Cependant, elle examine aussi de manière critique les obstacles concrets tels que les coûts d'infrastructure élevés, les risques importants en matière de sécurité et d'utilisation abusive, et le support de projet inconstant. L'analyse conclut en soulignant la nécessité de critères clairs pour identifier les systèmes réellement ouverts, affirmant que ce discernement est essentiel pour promouvoir un écosystème d'IA transparent, responsable et bénéfique pour le public.

Mots-clés: IA Open Source, Openwashing, Intelligence Artificielle, Système d'IA.

1 Introduction

In recent years, the conception of Open Source in relation to newly developed Artificial Intelligence (AI) systems has been a challenge. Given the significant differences between AI systems and traditional software, there are a range of entities that seek to implement guidelines for the development, use and modification of AI.³

While AI systems have been around for over a decade, there is an unprecedented rise of these tools as of late, with platforms like OpenAI's ChatGPT reaching 700 million weekly active users and companies like NVIDIA valued at trillions. Having the ability to build and maintain AI models became not only a technological challenge but also a political and economical one, as nations like the United States and China invest billions of dollars into building AI research and infrastructure to have the best model.^{4,5}

1. Nicole Moura Hartery, Polytech Grenoble, harterynicole@gmail.com

2. Saif Saad, Polytech Grenoble, saif.saad@etu.univ-grenoble-alpes.fr

3. Open Source Initiative, "The Open Source AI Affiliates," <https://opensource.org/affiliates>.

4. Nick Turley, "ChatGPT hits 700 million weekly active users," <https://x.com/nickaturley/status/1952385556664520875>.

5. CNBC, "Nvidia becomes first company to reach 5 trillion evaluation," <https://www.cnbc.com/2025/10/29/nvidia-on-track-to-hit-historic-5-trillion-valuation-amid-ai-rally.html>.

The exponential development in AI capabilities raises the debate about transparency, biases, and compliance within the models. Most of the world's leading technology companies offer some form of "Open Sourceness" when it comes to their tools, but not enough to conform to Open Source Initiatives' (OSI) Open Source Artificial Intelligence Definition (OSAID).⁶

Given this context, grasping what constitutes Open Source AI is essential to recognising its potential while identifying where current practices fall short.

2 Understanding Open Source AI

To understand what Open Source AI entails, it is imperative to know the four freedoms to software as defined by The GNU Manifesto. First, the freedom to run the program as wanted and for any purpose. Second, the freedom to study how the program works and modify it. Third, the freedom to redistribute copies. And lastly, the freedom to distribute copies of the modified version.⁷

However, applying those freedom principles to AI systems is not as simple as traditional software. The intrinsics of models, parameters, training data and even infrastructure go beyond solely offering access to the source code, creating ambiguity about what truly constitutes Open Source in the AI context.

The OSAID offers the most comprehensive definition to date and it states that, as well as guaranteeing software freedom, Open Source AI must make available not only the code, but the data information and parameters for the models. Thus, the term "Openwashing" comes in, conceptualizing systems that are so-called Open Source, but in truth don't actually disclose the inner mechanics of their work.⁸

3 The Case for Open Source AI

The rise of AI systems in everyday applications, from customer service to medical diagnosis, has made transparency and accountability critical concerns. Regulators and policymakers worldwide are grappling with how to govern AI development responsibly, as demonstrated by The European Union's AI Act.⁹

The innovation potential of Open Source AI mirrors the success of traditional open source software, like Linux and Apache, that became foundational infrastructure for the internet. Similarly, open AI models can serve as building blocks for specialized applications as developers can customize them for specific areas without the costs of training from scratch.

Community collaboration accelerates progress in ways closed development cannot match. Thousands of researchers and engineers worldwide contribute improvements, identify vulnerabilities, and adapt models for diverse use cases. This distributed effort has produced models like Meta's Llama 3 and Mistral's offerings that rival alternatives in performance while remaining freely accessible.

For businesses, companies gain flexibility to deploy models on their own infrastructure, eliminating costs while maintaining control over sensitive data. For example, Llama 3 70B can be up to 50 times cheaper and 10 times faster than GPT-4 when used through cloud API providers.¹⁰

6. Open Source Initiative, "The Open Source AI Definition 1.0," <https://opensource.org/ai/open-source-ai-definition>.

7. GNU Operating System, "The GNU Manifesto," <https://www.gnu.org/gnu/manifesto.html>.

8. Radboud University, "'Open-washing' generative AI: how Meta, Google and others feign openness," <https://www.ru.nl/en/research/research-news/open-washing-generative-ai-how-meta-google-and-others-feign-openness>.

9. EU Artificial Intelligence Act, "EU Artificial Intelligence Act," <https://artificialintelligenceact.eu/#>.

10. Anita Kirskovka, "Llama 3 70B vs GPT-4: Comparison Analysis," https://www.vellum.ai/blog/llama-3-70b-vs-gpt-4-comparison-analysis?utm_source=google&utm_medium=organic.

4 Addressing Concerns

4.1 Quality

A persistent misconception holds that open source AI systems lag behind proprietary alternatives in quality and performance. As mentioned, models Mistral AI’s demonstrate that open source can match or exceed closed alternatives across benchmarks. The rapid iteration enabled by community contributions means open source models evolve quickly.¹¹

The open source heavyweights in AI include not just these foundation models but the entire infrastructure supporting modern AI development. PyTorch and TensorFlow, both open source frameworks, power the majority of AI research and production systems. Hugging Face’s open ecosystem hosts thousands of models and has become the standard for model sharing and collaboration.¹²

4.2 Infrastructure

AI resource requirements present a significant barrier in Open Source AI, considering training large language models demands computational infrastructure costing millions of dollars and consuming a lot of energy, which makes the open source ideals of accessibility harder.¹³

4.3 Safety

Moreover, safety considerations deserve serious attention. Open models can be customized for harmful purposes, and unlike API-based services, there are no content filters or usage controls once a model is downloaded. This reality necessitates thoughtful approaches to model release, and potential limitations for the most powerful systems.¹⁴

4.4 Support

Finally, documentation and usability often lag in open source AI projects. While the code and weights may be available, comprehensive documentation, user friendly interfaces, and good support channels require sustained effort that volunteer communities may struggle to provide.¹⁵

5 Openwashing in Practice

The phenomenon of openwashing manifests in various forms across the AI industry. Some companies release model weights but withhold training data, making true replication impossible. Others provide limited documentation that obscures key architectural decisions or training procedures. API access is sometimes marketed as open despite offering no ability to inspect or modify the underlying system.¹⁶

11. Kyle Wiggers, “Mistral claims its newest AI model delivers leading performance for the price,” <https://techcrunch.com/2025/05/07/mistral-claims-its-newest-ai-model-delivers-leading-performance-for-the-price/>.

12. Hugging Face, “Open-Source Text Generation LLM Ecosystem at Hugging Face,” <https://huggingface.co/blog/os-llms>.

13. SemiAnalysis, “The Inference Cost Of Search Disruption – Large Language Model Cost Analysis,” <https://www.semianalysis.com/p/the-inference-cost-of-search-disruption>.

14. Anthropic, “Core Views on AI Safety: When, Why, What, and How,” <https://www.anthropic.com/news/core-views-on-ai-safety>.

15. McKinsey Company, “The state of AI in 2023: Generative AI’s breakout year,” <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ais-breakout-year>.

16. Andrew C. Oliver, “Open-washing and the illusion of AI openness,” <https://www.infoworld.com/article/3615678/open-washing-and-the-illusion-of-ai-openness.html>.

The OSAID provides a framework for evaluation. It emphasizes that openness must be practical, not merely theoretical, and documentation must be sufficient for practitioners to replicate and modify the system. This standard exposes many open AI offerings as falling short.¹⁷

To identify a genuine open source project, one must look for several key indicators. First, a clear and recognized open source license, such as Apache 2.0 or MIT, must be applied to all components. Second, there must be full and practical access to all assets needed for modification and replication, encompassing the code, data, and parameters. Third, the project must provide sufficient documentation, detailed enough for a technically proficient individual to understand, replicate, and build upon. Finally, the license must be free of use based restrictions, as it cannot include clauses that restrict how or for what purpose the AI system can be used.

6 Making Informed Choices

For any organization, selecting an AI model is a strategic decision that goes beyond "open vs. closed". One must assess how the model performs on benchmarks relevant to the specific business task and determine if it is a base model that requires extensive, costly fine-tuning.

This leads directly to the issue of resource requirements. The computational costs must be calculated to see if the model can run on infrastructure or if it demands specialized hardware. Safety and alignment are similarly critical, as an organization must understand the model's known vulnerabilities, its inherent biases, and what tools are provided for alignment.

7 The Future of Open Source AI

The trajectory of Open Source AI will likely be shaped by several converging trends. Regulatory frameworks worldwide are beginning to distinguish between different levels of AI system transparency, potentially creating legal incentives for genuine openness. The European Union's AI Act, for instance, imposes stricter requirements on high risk AI systems, which could drive demand for auditable, transparent models.¹⁸

Technological advances may democratize access to the computational resources currently dominated by large technology companies. For example, cloud computing providers increasingly offer specialized AI infrastructure, lowering barriers to entry.

The competitive landscape continues to evolve as organizations recognize that openness can be a strategic advantage rather than merely a cost. Companies building on open foundations can focus resources on domain specific innovations rather than reinventing core technologies. This dynamic might create an ecosystem where open and closed approaches coexist, each serving different needs and use cases.

8 Conclusion

The exponential growth of artificial intelligence has challenged and redefined the traditional meaning of open source. There is now a critical period where a significant gap has emerged between Openwashed models, which offer only a semblance of access, and genuinely Open Source AI, which provides the transparency and freedom necessary for true innovation.

As established previously, true openness offers clear advantages in cost, flexibility, and community progress. However, Legitimate concerns regarding the immense resource requirements for training and the serious potential for misuse must be actively addressed by the community and through governance.

17. Open Source Initiative, "The Open Source AI License Review Process," <https://opensource.org/licenses/review-process>.

18. Mark Dingemans, Andreas Liesenfeld, "Rethinking open source generative AI: open-washing and the EU AI Act," *FACCT '24, June 03-06, 2024, Rio de Janeiro, Brazil ACM ISBN 979-8-4007-0450-5/24/06* <https://doi.org/10.1145/3630106.3659005>, 2024,

The path forward requires critical discernment. Developers, policymakers, and business leaders must look beyond marketing claims and use clear criteria, like the OSAID, to evaluate AI systems. Fostering a truly open AI ecosystem is an essential step toward building a future where AI is transparent, accountable, and developed for the public good.

References

- Andreas Liesenfeld, Mark Dingemans. “Rethinking open source generative AI: open-washing and the EU AI Act.” *FAccT '24, June 03–06, 2024, Rio de Janeiro, Brazil ACM ISBN 979-8-4007-0450-5/24/06* <https://doi.org/10.1145/3630106.3659005>, 2024.
- Andrew C. Oliver. “Open-washing and the illusion of AI openness.” <https://www.infoworld.com/article/3615678/open-washing-and-the-illusion-of-ai-openness.html>.
- Anita Kirskovka. “Llama 3 70B vs GPT-4: Comparison Analysis.” https://www.vellum.ai/blog/llama-3-70b-vs-gpt-4-comparison-analysis?utm_source=google&utm_medium=organic.
- Anthropic. “Core Views on AI Safety: When, Why, What, and How.” <https://www.anthropic.com/news/core-views-on-ai-safety>.
- CNBC. “Nvidia becomes first company to reach 5 trillion evaluation.” <https://www.cnbc.com/2025/10/29/nvidia-on-track-to-hit-historic-5-trillion-valuation-amid-ai-rally.html>.
- EU Artificial Intelligence Act. “EU Artificial Intelligence Act.” <https://artificialintelligenceact.eu/#>.
- GNU Operating System. “The GNU Manifesto.” <https://www.gnu.org/gnu/manifesto.html>.
- Hugging Face. “Open-Source Text Generation LLM Ecosystem at Hugging Face.” <https://huggingface.co/blog/os-llms>.
- Kyle Wiggers. “Mistral claims its newest AI model delivers leading performance for the price.” <https://techcrunch.com/2025/05/07/mistral-claims-its-newest-ai-model-delivers-leading-performance-for-the-price/>.
- McKinsey Company. “The state of AI in 2023: Generative AI’s breakout year.” <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ais-breakout-year>.
- Nick Turley. “ChatGPT hits 700 million weekly active users.” <https://x.com/nickaturley/status/1952385556664520875>.
- Open Source Initiative. “The Open Source AI Affiliates.” <https://opensource.org/affiliates>.
- . “The Open Source AI Definition 1.0.” <https://opensource.org/ai/open-source-ai-definition>.
- . “The Open Source AI License Review Process.” <https://opensource.org/licenses/review-process>.
- Radboud University. “‘Open-washing’ generative AI: how Meta, Google and others feign openness.” <https://www.ru.nl/en/research/research-news/open-washing-generative-ai-how-meta-google-and-others-feign-openness>.
- SemiAnalysis. “The Inference Cost Of Search Disruption – Large Language Model Cost Analysis.” <https://www.semianalysis.com/p/the-inference-cost-of-search-disruption>.