



Artificial Intelligence Index Report 2024



Stanford University
Human-Centered
Artificial Intelligence

Message From the Co-directors

A decade ago, the best AI systems in the world were unable to classify objects in images at a human level. AI struggled with language comprehension and could not solve math problems. Today, AI systems routinely exceed human performance on standard benchmarks.

Progress accelerated in 2023. New state-of-the-art systems like GPT-4, Gemini, and Claude 3 are impressively multimodal: They can generate fluent text in dozens of languages, process audio, and even explain memes. As AI has improved, it has increasingly forced its way into our lives. Companies are racing to build AI-based products, and AI is increasingly being used by the general public. But current AI technology still has significant problems. It cannot reliably deal with facts, perform complex reasoning, or explain its conclusions.

AI faces two interrelated futures. First, technology continues to improve and is increasingly used, having major consequences for productivity and employment. It can be put to both good and bad uses. In the second future, the adoption of AI is constrained by the limitations of the technology. Regardless of which future unfolds, governments are increasingly concerned. They are stepping in to encourage the upside, such as funding university R&D and incentivizing private investment. Governments are also aiming to manage the potential downsides, such as impacts on employment, privacy concerns, misinformation, and intellectual property rights.

As AI rapidly evolves, the AI Index aims to help the AI community, policymakers, business leaders, journalists, and the general public navigate this complex landscape. It provides ongoing, objective snapshots tracking several key areas: technical progress in AI capabilities, the community and investments driving AI development and deployment, public opinion on current and potential future impacts, and policy measures taken to stimulate AI innovation while managing its risks and challenges. By comprehensively monitoring the AI ecosystem, the Index serves as an important resource for understanding this transformative technological force.

On the technical front, this year's AI Index reports that the number of new large language models released worldwide in 2023 doubled over the previous year. Two-thirds were open-source, but the highest-performing models came from industry players with closed systems. Gemini Ultra became the first LLM to reach human-level performance on the Massive Multitask Language Understanding (MMLU) benchmark; performance on the benchmark has improved by 15 percentage points since last year. Additionally, GPT-4 achieved an impressive 0.96 mean win rate score on the comprehensive Holistic Evaluation of Language Models (HELM) benchmark, which includes MMLU among other evaluations.

Top 10 Takeaways (cont'd)

8. Scientific progress accelerates even further, thanks to AI. In 2022, AI began to advance scientific discovery. 2023, however, saw the launch of even more significant science-related AI applications—from AlphaDev, which makes algorithmic sorting more efficient, to GNoME, which facilitates the process of materials discovery.

9. The number of AI regulations in the United States sharply increases. The number of AI-related regulations in the U.S. has risen significantly in the past year and over the last five years. In 2023, there were 25 AI-related regulations, up from just one in 2016. Last year alone, the total number of AI-related regulations grew by 56.3%.

10. People across the globe are more cognizant of AI's potential impact—and more nervous. A survey from Ipsos shows that, over the last year, the proportion of those who think AI will dramatically affect their lives in the next three to five years has increased from 60% to 66%. Moreover, 52% express nervousness toward AI products and services, marking a 13 percentage point rise from 2022. In America, Pew data suggests that 52% of Americans report feeling more concerned than excited about AI, rising from 37% in 2022.