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Will ChatGPT Bring a Revolution to the AI Era? Postprint

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Abstract

[Objective] ChatGPT has sparked a wave across various industries. This article primarily investigates whether the emergence and application of ChatGPT can bring about substantive revolutionary breakthroughs.

[Method] This paper presents a discussion and analysis from five aspects: the birth, principles, impact, applications, and domesticization of ChatGPT, attempting to explain this unfolding transformation in artificial intelligence.

[Results] The birth of ChatGPT represents a major breakthrough in the development of artificial intelligence. Although it continues to require optimization, its impact on the entire industry is profound, and its application scenarios will be extensive.

[Conclusion] It is necessary to re-examine the development direction of China's AI technology, thereby promoting the domesticization of ChatGPT.

Full Text

Will ChatGPT Bring a Revolution to the AI Era?

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Abstract

[Objective] As ChatGPT has sparked a wave of excitement across industries, this paper investigates whether its emergence and application can bring substantive revolutionary breakthroughs. **[Method]** This article examines and analyzes five dimensions: the birth, principles, impact, applications, and domestic

development of ChatGPT, attempting to explain this unfolding AI transformation. **[Results]** The birth of ChatGPT represents a major breakthrough in AI development. Although it still requires continuous optimization, its impact on the entire industry is profound, and its application scenarios will be extensive. **[Conclusion]** It is necessary to re-examine the development direction of China's AI technology and thereby promote the domestication of ChatGPT.

Keywords: artificial intelligence; ChatGPT; conversational chatbot; machine learning model

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With technological updates developing at a breakneck pace, even as the meta-verse hype has yet to subside, ChatGPT has captured public attention. Is it a new round of AI revolution or a technological bubble? This article offers one perspective through brief analysis.

1. The Birth of ChatGPT

ChatGPT went viral on social media shortly after its launch, registering over 1 million users in just five days, and surpassing 100 million users within two months. Describing ChatGPT as an “overnight sensation” is hardly an exaggeration. Microsoft co-founder Bill Gates has stated that the significance of this technology's birth is no less than that of the internet or the personal computer. Consequently, many have labeled ChatGPT an AI revolution.

What exactly is ChatGPT? It is a general-purpose chatbot developed by AI lab OpenAI, capable of answering follow-up questions, admitting mistakes, challenging incorrect premises, and even rejecting unreasonable requests. User interactions with ChatGPT range from casual conversation and information consultation to poetry composition and code modification, with users continuously discovering new surprises through various tests. Microsoft is reportedly planning to integrate the latest GPT-4 version of ChatGPT into Bing search within weeks, directly challenging Google's search dominance.

According to *Fortune's* first disclosure of ChatGPT's origin story, key players, and deal details, the technology's impact on technology, business, and human life is profound. As a tech product, *Fortune* considers ChatGPT's status in AI comparable to Netscape and the iPhone in their respective eras. As a startup, ChatGPT attracted over 1 million users in just five days—a milestone that took Facebook 10 months to achieve.

In a deal with Microsoft, concerns have emerged that Microsoft's priorities might crowd out OpenAI's own objectives, risking OpenAI's broader mission and potentially undermining the sense of belonging among its scientists—its most

important asset. Controversies surrounding OpenAI have multiplied since it departed from its non-profit status, with safety being a major focus of criticism. Educators warn that students can easily use ChatGPT to cheat. Google's own powerful chatbot, LaMDA, remains unreleased due to concerns about potential misuse damaging the company's reputation. Now, Google plans to "reassess" its risk tolerance using ChatGPT as a benchmark.

Industry experts note that ChatGPT's greatest strength lies in its exceptional intent recognition and language comprehension capabilities, representing a leap forward in AI interaction. The core technology is large-scale AI language models, with the key challenges being how to equip AI models with logical reasoning abilities and how to enable them to learn from the entire internet. ChatGPT's rapid dominance has forced both giants and startups to accelerate R&D innovation, potentially marking the beginning of the most significant technological transformation in a decade.

2. The Principles of ChatGPT

ChatGPT's remarkable capabilities stem from massive datasets and can be described as an AI model in natural language processing (NLP). Large models form the foundation—trained on hundreds of millions of text or image corpora to produce models with billions of parameters. ChatGPT is an upgrade of OpenAI's GPT-3 model, which possesses 175 billion parameters, enabling unprecedented breakthroughs in answering questions across diverse topics drawn from web pages, books, news, and other sources.

The evolution of ChatGPT reveals a history of large model self-upgrades, during which OpenAI underwent at least three technical "self-revolutions." The 2022 releases marked a renewed emphasis on human-labeled data and reinforcement learning—specifically Reinforcement Learning from Human Feedback (RLHF). ChatGPT's superior performance can be summarized in three aspects: first, its machine learning model exhibits strong expressive power; second, it is trained on enormous data volumes; and third, its training methodology is advanced.

While the model itself hasn't changed significantly from GPT-3, the primary transformation lies in the training strategy through reinforcement learning, which resembles biological evolution. The model continuously adapts to its environment based on rewards and punishments. OpenAI uses a combination of supervised and reinforcement learning to fine-tune ChatGPT, with the RLHF component making it unique and minimizing distorted or biased outputs.

As a crucial component of AI, machine learning has long relied on data models requiring vast amounts of training data. Simply put, larger datasets provide more learning foundations, enabling greater precision and intelligence. However, data alone is insufficient, as costs for annotation, cleaning, and manual parameter tuning increase proportionally. Large models represent a milestone in machine learning deployment and the key to unlocking ChatGPT's potential.

3. What Does ChatGPT Bring?

As technological updates accelerate, public anxiety intensifies. ChatGPT has ordinary people worrying about being replaced by AI, with widespread warnings circulating: “Robots will replace these 10 professions—see if your industry is among them,” listing programmers, professors, playwrights, journalists, and other white-collar jobs. Some claim “Future entry-level positions will disappear, leaving tens of billions displaced.”

In reality, ChatGPT’s advancement isn’t about “suddenly becoming intelligent” but rather learning a language to communicate directly with humans. However, since it doesn’t truly understand what it says, it exhibits only “surface-level intelligence.” As *Nature* noted in December 2022, while tools like ChatGPT and AlphaCode can outperform over half of human programmers on certain limited coding tasks, they remain far from replacing real programmers. Another *Nature* piece emphasized that ChatGPT cannot perform critical thinking or reasoning, and when it draws upon incorrect information, its output becomes foolish.

The true value of ChatGPT lies not in what content it can generate—that’s merely a byproduct. Its real significance is transforming how people interact with information, addressing the contradiction between “too much information” and “too little attention.” Future solutions may involve a combination of “external brain” and “internal brain” approaches. Over-reliance on AI is dangerous; we should use it as a channel to expand information access and assist judgment, not as a substitute for human thinking and decision-making.

Professor Yingyi Qian’s observation that AI will obliterate China’s educational advantages serves as a mirror. If our educational strengths rely on rote memorization and excessive drilling, if university and postgraduate studies still treat “memorizing knowledge points” as a learning method, and if we consider “good memory” as the hallmark of a powerful mind, then ChatGPT is indeed frightening. While its learning ability is formidable, it remains trapped in the “big data, small task” passive learning paradigm. It shows no initiative, reflection, or judgment—merely completing tasks based on pre-programmed rules operating on massive databases. As Tim Cook noted: “I’m not worried about machines thinking like humans, but about humans thinking like machines.”

4. ChatGPT Applications

ChatGPT shows imminent applicability across industries. For the aging society, it represents a boon for the elderly as an ideal companion—available 24/7 for conversations about past romances, career triumphs, family life, successes and setbacks. It offers empathy and resonance, psychological comfort, and attentive service for a happier 晚年. More importantly, it helps bridge the digital divide created by new technologies, enabling seniors to adapt to online social life. It can also monitor and analyze elderly users’ health conditions through conversation, serving as a health and medical advisor.

In the media industry, at least three major application scenarios emerge: content production, content dissemination, and network governance. Regarding content production, while traditional models relied on PGC (Professionally Generated Content) and UGC (User Generated Content), AIGC (AI-Generated Content) will expand significantly. However, journalists' capacity for deep thinking remains irreplaceable; over-reliance on automatic generation may lead to homogenized content. The optimal strategy is using ChatGPT as an auxiliary tool.

For content dissemination, ChatGPT will be widely applied in intelligent gate-keeping, enabling machines to play a greater role in content review. While ethical risks like fake news warrant vigilance, ChatGPT can also combat misinformation. In network language governance, its RLHF training methodology can establish intelligent management models based on deep learning.

Professor Yu Guoming identifies two major challenges: superficial content and regulatory governance, suggesting the primary market in China lies in B2B applications. Government network public opinion management also presents significant opportunities. In the new media era of "everything connected, human-machine symbiosis," AI has gradually integrated into production and life. Algorithmic Python programs combined with social media apps have made online experiences more personalized and convenient.

The technology's maturity enables AI content creation to become a new industry-wide productivity tool, enhancing efficiency and richness. Some listed companies have announced increased investment in this area, attracting institutional investors. However, limitations remain—the model requires optimization, and profit models are still exploratory. High computing costs may hinder commercialization.

5. The Chinese Version of ChatGPT

Recent news indicates a Chinese version of ChatGPT will soon meet the public. In China, ChatGPT concept stocks remain hot, with search, gaming, and investment companies showing keen interest. However, while Microsoft and Google have articulated specific technical directions, domestic listed companies have only announced AI technology accumulation without many concrete commercial cases. Industry insiders note high technical barriers—if core technology breakthroughs prove difficult, progress will fall short of expectations.

Almost all interviewees emphasize that sustained investment in ChatGPT results from an innovative spirit and long-term commitment. Most Chinese industry insiders view ChatGPT as an exploration of AI paradigms rather than a search replacement. "In the short term, many may overestimate it; in the long term, many may underestimate it," observed one senior game AI developer. Hopefully, China's industry won't stagnate in this contradiction.

Not all AI companies need to develop ChatGPT—creating a Chinese version requires substantial capabilities. More enterprises should focus on applying

ChatGPT across various domains. China's policy environment continues optimizing, with strong demand for virtual humans and human-computer interaction scenarios, potentially accelerating AI deployment in finance, government, and healthcare. Overall, ChatGPT represents a milestone in AIGC progress and will likely inaugurate the next wave of AI development in China.

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Note: Figure translations are in progress. See original paper for figures.

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