

19. CHATGPT & DEEPSEEK: COMPARATIVE ANALYSIS AND FUTURE AI TRENDS

Egorov A.S.

*Belarusian State University of Informatics and Radioelectronics
Minsk, Republic of Belarus*

Subbotkina I.G. – Associate Professor

This paper reflects current trends and research perspectives in the field of AI and aims to provide a comprehensive comparison of two innovative technologies along with insights into future directions.

In recent years, artificial intelligence has witnessed rapid progress in natural language processing (NLP) and machine learning, driving the development of tools that extend beyond simple search functions to become fully interactive systems. ChatGPT, a conversational agent based on transformer architectures, and DeepSeek, a system specializing in semantic search, represent two distinct yet complementary approaches in AI development. This paper compares these technologies, highlighting their core differences and potential synergies while projecting the trajectory of future AI innovations.

ChatGPT is designed to interact with users through natural language, generating responses based on the context of the conversation. It is built using large transformer models and trained on a wide range of datasets. The model is effective at understanding context, keeping conversations flowing, and creating coherent responses. Its applications range from customer support and tutoring to creative writing and data summarization. However, while it excels at generating content, it sometimes struggles with factual accuracy and lacks deep knowledge in specialized areas.

DeepSeek represents a different paradigm, focusing on semantic search and retrieving deep knowledge. It uses neural networks to understand the meaning behind queries and documents, allowing it to find relevant information even without exact keyword matches. This approach improves the precision of search results by understanding context and intent at a deeper level. Nevertheless, while DeepSeek is mainly designed to provide precise information and short answers, it does not have the advanced conversational skills or creative text generation capabilities of ChatGPT.

Recent independent tests have provided concrete insights into how ChatGPT and DeepSeek perform under a variety of specific scenarios. Instead of a broad qualitative overview, several benchmark tests have been used to compare these systems on tasks covering areas such as reasoning, coding, knowledge retrieval, and complex problem-solving.

For instance, a comparative assessment by Business Insider tested both models using a series of seven real-world prompts. In one test, both systems were asked to calculate a monthly mortgage payment. Although the numerical estimates differed slightly due to varying assumptions in interest rates and additional fees, the methodologies used were nearly identical. ChatGPT tended to produce longer, more context-rich explanations, while DeepSeek delivered a concise, process-oriented answer with clearly itemized calculations [1].

In another test focusing on logical reasoning, DeepSeek's R1 model showed an impressive ability to break down complex puzzles, often producing a chain-of-thought reasoning process that closely mirrored human problem-solving.

User experience evaluations, such as those reported on Habr and other technical blogs, also reveal that while DeepSeek is exceptionally cost-effective and fast due to its optimized use of GPUs, it may lag in conversational fluency and creative language generation when compared to ChatGPT. For example, in tests involving creative prompts like designing futuristic cities, ChatGPT generated richer, more imaginative narratives, whereas DeepSeek's output was more factual and structured [2].

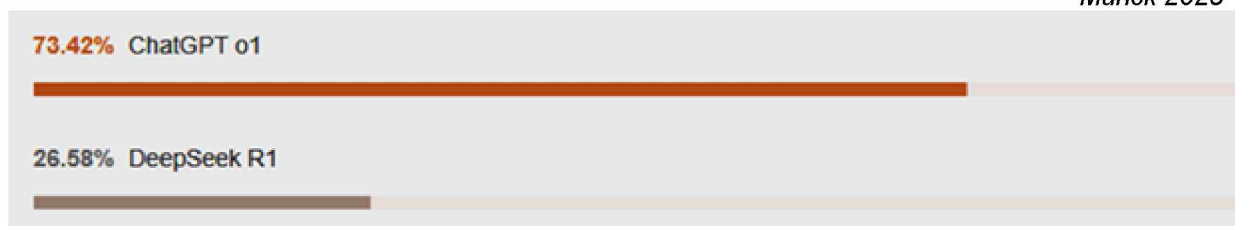


Figure 1 - Public Opinion on ChatGPT and DeepSeek Capabilities

Additional comparative tests on coding tasks have been conducted using online coding challenge benchmarks. In these tests, DeepSeek demonstrated a slightly higher success rate in generating correct Python code on the first attempt, whereas ChatGPT sometimes required multiple iterations. Notably, while both models achieved nearly identical scores on standard coding benchmarks (e.g., Codeforces), the efficiency of DeepSeek's approach came at the expense of less detailed inline commentary and fewer explanations for its output [3].

Further evaluations have explored the differences in translation accuracy and technical query handling. In translation tests, DeepSeek exhibited strong capabilities in translating factual and domain-specific content, often maintaining terminological consistency better than ChatGPT. However, ChatGPT excelled in translating more context-dependent texts, such as literary passages or idiomatic expressions, due to its advanced understanding of nuance and style.

While ChatGPT and DeepSeek dominate discussions on AI language models, other advanced AI systems are gaining prominence. Microsoft's Copilot is increasingly integrated into coding environments, assisting developers with real-time code suggestions and explanations. Similarly, POE (Platform for Open Exploration) offers access to multiple language models, enabling users to choose AI solutions tailored to specific needs. YandexGPT, developed by Yandex, is optimized for the Russian-speaking market, demonstrating strong contextual understanding and fluency in generating responses. These alternatives highlight the expanding AI ecosystem, where different models specialize in unique domains, reinforcing the trend toward diversified and application-specific AI solutions.

The future of AI will likely involve combining systems like ChatGPT and DeepSeek. Merging the natural language generation capabilities of conversational models with the powerful retrieval strengths of semantic search engines can lead to hybrid systems that offer both engaging dialogue and factual accuracy. This approach would be especially useful in areas like education, research, and customer service, where both clear communication and reliable information are important.

As AI continues to evolve, the demand for domain-specialized models will grow. Future technologies are expected to include mechanisms for rapid adaptation to specific fields such as medicine, law, finance, and engineering. These systems will improve their contextual understanding and response accuracy by being trained on specialized datasets. Developing modular AI architectures that integrate generative capabilities with retrieval components designed for industry-specific applications will be a key focus of research and development.

The ongoing evolution of AI technology requires a strong emphasis on ethical considerations and bias reduction. Future models will need to prioritize transparency, accountability, and effective error correction to strengthen user trust. Developers are expected to refine techniques that enhance the interpretability of AI decisions, help users understand the reasoning behind each response. This advancement will be crucial for balancing creativity and accuracy, especially as AI becomes more prevalent in sensitive fields.

The next generation of AI is poised to be more multi-modal, integrating not only text but also images, audio, and video to provide richer, context-aware interactions. Systems that can seamlessly transition between different forms of data will enhance user experiences and expand the range of applications. The convergence of multi-modal learning with advances in natural language processing is expected to facilitate more intuitive and effective human-computer interactions.

The comparison of ChatGPT and DeepSeek illustrates the growing specialization in AI language models, where different systems target to distinct use cases. ChatGPT offers highly engaging and creative text generation, making it ideal for dialogue-based applications, while DeepSeek excels in factual precision and efficient information retrieval. Various benchmark tests highlight their respective strengths, demonstrating that neither model is universally superior but rather optimized for different purposes.

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The broader AI landscape continues to expand with emerging models like Copilot, POE, and YandexGPT, each offering unique capabilities optimized for specific industries and user needs. This diversification suggests that the future of AI will not be defined by a single dominant model but by an ecosystem of specialized solutions. Looking ahead, the integration of generative AI with precise retrieval mechanisms, alongside advancements in multi-modal learning, will shape the next generation of intelligent systems, making them more adaptive, reliable, and capable of handling increasingly complex tasks.

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