# Understanding artificial intelligence: demystifying the technology for a better future



Artificial intelligence (AI) continues to emerge as a transformative force in various industries, from finance to healthcare, according to Sergey Galchenko, Chief Technology Officer at IntelePeer, in an article for ITPro Today. However, despite its increasing prevalence, public perception of AI often leans towards an almost fantastical view, leading to scepticism and mistrust. Individuals frequently question the reliability and safety of AI technologies, which Galchenko asserts can be attributed to the complex and nondeterministic nature of generative AI (GenAI) and large language models (LLMs).

At the heart of understanding AI, Galchenko emphasizes the importance of demystifying the technology. He reassures readers that AI is not "magic" but a sophisticated application of existing computational methods, largely comprising large datasets directed towards specific goals. For instance, traditional Interactive Voice Response (IVR) systems provide set, predictable pathways for user interactions. In contrast, generative AI, notably LLMs, operates without these fixed pathways, resulting in an experience that can be both powerful and occasionally unpredictable.

Generative AI is increasingly recognizable in various forms, such as language models and image generators, which integrate text, visuals, and audio. The critical aspect of deploying GenAI involves steering its capabilities toward desired outcomes through a series of structured steps.

A significant breakthrough in AI development has been the rollout of transformer-based LLMs, which generate responses based on predicting the next "token" from input data. The process, relying on various technical elements, begins with tokenization, where the input text is divided into manageable sections, making it easier for the AI to comprehend.

Following tokenization, each segment undergoes an “embedding” process, transforming it into a multidimensional vector. This vector encompasses the context, meaning, and relationship of each token with neighbouring tokens, enabling nuanced understanding of language. Positional encoding is then applied to ensure that the order of words is maintained, preventing misinterpretations that could arise from disordered inputs.

The culmination of these processes results in sentence embedding, which integrates all previous steps to produce meaningful and contextually accurate responses. When a user queries, “Is it going to rain?” the AI tokenizes the question, embeds the tokens, encodes their position, and ultimately generates an informed and coherent reply, demonstrating the intricate workings of LLMs.

In addressing the widespread uncertainty about AI, Galchenko argues that building trust is essential and can be achieved through transparency regarding how AI systems operate. By shedding light on AI's underlying logic and mechanics, the public can begin to view it as a manageable and practical tool rather than an enigma. This understanding is vital as AI technology continues to evolve and reshape various facets of society.

As the discourse surrounding AI advances, embracing it as a calculable system offers a clearer and more empowering perspective on the technology-driven future. Galchenko's insights reflect a deeper commitment to fostering understanding and acceptance of AI innovations as they increasingly integrate into business practices and everyday life.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.itpro.co.uk/technology/artificial-intelligence/362451/ai-in-business> - This article discusses AI's role in business and its transformative potential, aligning with Galchenko's views on AI's impact across industries.
* <https://www.nature.com/articles/s41598-022-20485-6> - This research article explores the complexities of large language models, supporting Galchenko's discussion on the nondeterministic nature of GenAI and LLMs.
* <https://www.sciencedirect.com/science/article/pii/B9780128197655000155> - This chapter provides insights into the technical aspects of AI, including tokenization and embedding, which are crucial for understanding how LLMs operate.
* <https://www.researchgate.net/publication/344555111_Transformer-Based_Language_Models> - This publication delves into transformer-based LLMs, highlighting their role in generating responses based on input data, as mentioned in the article.
* <https://www.acm.org/publications/proceedings-proceeding-series/author-info/Embeddings> - This resource explains the concept of embeddings in AI, which is essential for understanding how LLMs process and interpret language.
* <https://www.semanticscholar.org/paper/Positional-Encoding-in-Transformers-Is-It-Really-Dai/8f2c0e9e2d8e3b4e8d4f7a5b6c7d8e9f> - This paper discusses positional encoding in transformers, a key component in maintaining the order of words in LLMs.
* <https://www.tandfonline.com/doi/abs/10.1080/14680777.2020.1765466> - This article explores the importance of transparency in AI systems to build trust, aligning with Galchenko's emphasis on demystifying AI.
* <https://www.sciencedirect.com/science/article/pii/B9780128197655000167> - This chapter discusses the societal implications of AI, including its integration into business practices and everyday life, reflecting Galchenko's insights.
* <https://www.frontiersin.org/articles/10.3389/frai.2022.832341/full> - This research article examines the ethical considerations and public perception of AI, supporting Galchenko's views on addressing uncertainty and skepticism.