

## LARGE LANGUAGE MODELS: APPLICATION AND POTENTIAL FUTURE

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**Annotation.** This article shows the current spheres of application of artificial intelligence and large language models in particular and aims to show its potential future. At the beginning the definition of large language models is given. After that the text describes the main application of LLM for translating written texts. Then the article gives examples of several other fields of this artificial intelligence model's application. Further on it is spoken about the disadvantages and potential development in different aspects of large language models. At the end the significance of LLMs' performance is pointed out.

**Keywords:** large language models, artificial intelligence, GPT, virtual assistant, development

**Introduction.** Recent years marked an extreme breakthrough in the sphere of artificial intelligence. It became one of the mainstream priorities in the field of information technologies. Based on different criteria AI models now can be divided on several major branches. One of those is large language models, often abbreviated to LLM. Large language model is a type of an artificial intelligence capable of recognizing and generating text as one of its main functions [1]. The most known LLMs include GPT-4, Google Gemini, OpenAI, Cohere, LaMDa, etc.

In this article main aspects of the application of large language models in different spheres of modern life are analyzed and then its potential utilization in the future is discussed.

**Main part.** Most common practical application of large language models today is the translation of written texts. The AI models utilize build-in self-learning algorithms to automatically process and convert the text to a chosen language, adapting it in accordance with the grammatical aspects of the latter language. This makes AI technology much better than that of average translation systems like Google Translate. As an example, recently launched GPT-4 showed exceptionally great performance in translating European languages, although with lower accuracy in less common languages. However, despite the fact that in some cases large language models are accurate with translation, it is still hard to teach them several cultural and mental aspects of natural language such as idiomaticity. Thus, a highly-qualified human specialist is needed for executing constant control over mistakes an AI can make [2].

AI-powered virtual assistants are another example of large language models. This type of LLM is able to recognize the context of the request made by the user and generate an appropriate answer. Virtual assistants analyze the information given by the user and remember their preferences to provide more personalized content. LLMs in virtual assistants specialize in performing tasks, enhancing accessibility and providing required information along with human-like interaction [3]. The research shows that the number of companies using virtual assistants is rapidly increasing while the time they spend on performing tasks is reducing [2].

The famous ChatGPT (Figure 1) and its versions is probably the most used large language model at the time. Its applications go beyond just one purpose, as it allows the user to enter any prompt and can generate any respond. It can be used in variety of cases from solving a mathematics of physics problem to creating entertaining content such as a story. It is also be useful for content creators as it can generate full articles, blog posts, product descriptions and more [4].



Figure 1 – ChatGPT logo

Large language models' techniques are also often utilized in tandem with other artificial intelligence models. One of the most prominent such applications is the merge of LLM with graphical artificial intelligence models, which are utilized to create multimedia content, such as images or videos, based on the written prompt.

The most useful application of large language models for IT professionals is code development, reviewing and debugging. While AI models are not fully developed to create complex code, they are able to provide a simple code in different programming languages, including C++, Java, Python, Ruby, etc. Sometimes it is difficult to review a long code and this is exactly what the LLM can do. Large language models also allow to translate code between different programming languages. An example of such LLM is StarCoder (Figure 2) [3].



Figure 2 – StarCoder logo

Currently there are several limitations that large language models face. They include the ability to use LLMs for inappropriate purposes, lack of training, struggling with identifying context in ambiguous prompt and more. That's why the future of LLMs presupposes a major development of its bias mitigation, improvement of its training methods and information provision, further collaboration with other AI models, optimizing for deployment on edge devices and. This will ensure secure large language models' utilization [5].

People nowadays are arguing about the effect of artificial intelligence on our life. Many are concerned with the possibility of AI replacing humans on different jobs. In fact, LLM may greatly contribute to it. Such professions as translator, content creator, designer and other may be endangered by the large language models and their variations in the nearest future. However, since the LLMs are not yet greatly developed, its utilization is still limited.

**Conclusion.** The role of LLM in the humanity's future depends on its performance. The major disadvantage of LLM is its dependence on the information provided by its developer. If it's provided false information, it will not be able to work accurately and will make a lot of mistakes. In order to address the issue, further development is required.

The possible future of large language models in aspect of artificial intelligence development is vague, as it presents a dichotomy of both advantages and disadvantages. However, at this point, the probability of LLM manifesting itself in an unexpected way is relatively low. Hence, it has the potential to become one of the tools utilized in society's daily routine, replacing traditional methods of problem solving.

### References

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