

WHAT IS GENERATIVE AI?

Generative AI is a type of artificial intelligence that can **create some kind of new content** – text, images, audio, code or synthetic data. It does so by using different types of machine learning models trained on a vast amount of data.

What is so revolutionary about this type of AI that everyone talks about, is its ability to produce human-like outputs in a wide variety of fields very successfully. For instance, conversational AI (like Chat GPT) can talk to users and answer questions, in a manner that can be difficult to distinguish from a human.

How does generative AI work?

From the standpoint of a user, it all starts with **prompts**, which most commonly take the form of text, but can also be codes, images, sounds or any other inputs the AI system is capable of processing. The AI then generates an output it is trained for – text, image, code, video etc. But, how does it manage to generate content?

The essence of AI functioning is a specific type of algorithm called neural network, which is trained to recognize patterns in data and then uses these patterns to generate new content. **Training** presumes feeding AI with massive amounts of data – like code, various images or text in different forms like articles, posts, scientific papers etc. By being exposed to billions of samples, it learns to **recognize patterns** - like the shape or color of an object or the most common words used to describe a certain phenomenon.

The AI still does not comprehend or know what that object or phenomenon is, but can recognize it in a context it was trained on. In the next step, the AI uses the learned patterns to **generate new content** that fits the user's prompt. It is important to note that the AI does not merely copy the examples it saw in the training dataset, but can combine the acquired knowledge to come up with new outputs.

What are its limitations?

Even though one of its strongest features is the capability to train unsupervised on a massive amount of data, most of the popular generative AI tools require a certain level of moderation and targeted instructions to correct mistakes and mitigate risks.

Despite the groundbreaking features, generative AI tools still face a great deal of limitations, primarily due to the data it is trained on and the quality of the algorithm. Some of the most prominent constraints and corresponding risks in using these tools are the **lack of accuracy, bias, hallucinations** or **data privacy**.

What is generative AI used for?

Every type of AI has its own format niche, a predetermined format of prompt and output, depending on what it is trained on and for. Hence, there are different types of generative AI tools – text, code, image or audio generation tools. While traditional AI has the ability to recognize patterns in data and make predictions and decisions based on them, generative AI creates completely new content - similar to it, but non-existing in the dataset it was trained on. Hence, its application brings spearheading changes when compared to the traditional one, which predominantly performs specific tasks.

Language models can help in coding, creative or academic writing, translation or genetic sequencing, audio models can contribute to better and faster dubbing or transcription, while visual models can help with design, image editing or architectural rendering. AI models can **influence many industries and increase productivity in many fields** – i.e. in healthcare and scientific research it can be used for new drug discovery, faster diagnostics, fast and accurate MRI scans or X-rays analysis and similar.