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# Generative AI technology

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**Why is in news?** Generative artificial intelligence has become a buzzword this year, capturing the public's fancy and sparking a rush among Microsoft and Alphabet to launch products with the technology they believe will change the nature of work.

## **What is generative AI?**

Like other forms of artificial intelligence, generative AI learns how to take actions from past data.

It creates brand new content, a text, an image, even computer code based on that training, instead of simply categorizing or identifying data like other AI.

The most famous generative AI application is ChatGPT, a chatbot that Microsoft-backed OpenAI released late last year.

The AI powering it is known as a large language model because it takes in a text prompt and from that writes a human-like response.

GPT-4, a newer model that OpenAI announced this week, is "multimodal" because it can perceive not only text but images as well.

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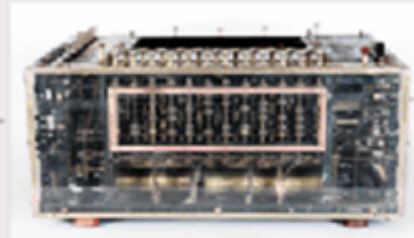
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# Generative AI's evolution

For an advanced technology that's considered relatively new, generative AI is deep-rooted in history and innovation.

**1932**

Georges Artsrouni invents a machine he reportedly called the "**mechanical brain**" to translate between languages on a mechanical computer encoded onto punch cards.



**1966**

MIT professor Joseph Weizenbaum creates the first chatbot, **Eliza**, which simulates conversations with a psychotherapist.

**1980**

Michael Toy and Glenn Wichman develop the Unix-based game **Rogue**, which uses procedural content generation to dynamically generate new game levels.



**1986**

Michael Irwin Jordan lays the foundation for the modern use of recurrent neural networks (RNNs) with the publication of "Serial order: a parallel distributed processing approach."



**2000**

University of Montreal researchers publish "A Neural Probabilistic Language Model," which suggests a method to model language using feed-forward neural networks.



**2011**

Apple releases **Siri**, a voice-powered personal assistant that can generate responses and take actions in response to voice requests.

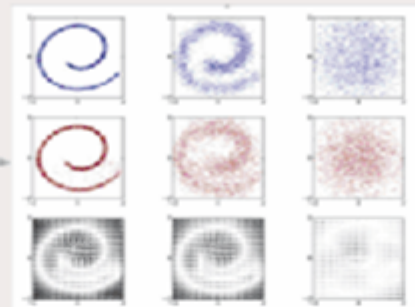


**2013**

Google researcher Tomas Mikolov and colleagues introduce word2vec to identify semantic relationships between words automatically.

**2015**

Stanford researchers publish work on diffusion models in the paper "**Deep Unsupervised Learning using Nonequilibrium Thermodynamics**." The technique provides a way to reverse-engineer the process of adding noise to a final image.



**2018**

**1957**

Linguist **Noam Chomsky** introduces **Syntactic Structures**, which outlines rules for parsing a language sentence.

**1968**

Computer scientist **Marvin Minsky** creates **SHRDLU**, a program that can manipulate blocks according to user instructions.

**1985**

Computer scientist **Judea Pearl** introduces **Bayesian networks**, which are graphical models that leads to methods for representing content in a specific domain.

**1989**

Yann LeCun, Yoshua Bengio, and Geoffrey Hinton demonstrate **convolutional neural networks** (CNNs) that can recognize images.

**2006**

Data scientist **Fei-Fei Li** creates the **ImageNet** database, which serves as a foundation for visual recognition research.

**2012**

Alex Krizhevsky, Ilya Sutskever, and Geoffrey Hinton demonstrate the **Deep Neural Network** architecture, which automatically takes advantage of large datasets.

**2014**

Research scientists introduce **Generative Adversarial Networks** (GANs), which pit two neural networks against each other to generate realistic content.

Diederik Kingma and Max Welling introduce **variational autoencoders** (VAEs) for generating images, videos and audio.

**2017**

Google researchers introduce **transformers** in the paper "Attention is all you need." This architecture is the basis for subsequent research in natural language processing, automatically parsing and generating large language models.

## **Significance of Generative AI**

### **Evolution of Generative AI**

The technology is helpful for creating a first draft of marketing copy, for instance, though it may require cleanup because it isn't perfect.

One example is from CarMax Inc, which has used a version of OpenAI's technology to summarize thousands of customer reviews and help shoppers decide what used car to buy.

Generative AI likewise can take notes during a virtual meeting. It can draft and personalize emails, and it can create slide presentations.

Microsoft Corp and Alphabet Inc's Google each demonstrated these features in product announcements this week.

### **Concerns with Generative AI**

School systems have fretted about students turning in AI-drafted essays, undermining the hard work required for them to learn.

Cybersecurity researchers have also expressed concern that generative AI could allow bad actors, even governments, to produce far more disinformation than before.

At the same time, the technology itself is prone to making mistakes.

Factual inaccuracies touted confidently by AI, called "hallucinations," and responses that seem erratic like professing love to a user are all reasons why companies have aimed to test the technology before making it widely available.