Artificial Intelligence is revolutionizing the way businesses operate  
AI tools help automate tasks improve efficiency and provide better customer experiences   
Machine Learning (ML), a subset of AI, enables systems to learn from data and make predictions.   
Digital marketing also benefits from AI by enhancing SEO, content creation, and customer engagement.

Artificial intelligence is the ability of a computer or computer-controlled robot to perform tasks that are commonly associated with the intellectual processes characteristic of humans, such as the ability to reason. Although there are as yet no AIs that match full human flexibility over wider domains or in tasks requiring much everyday knowledge, some AIs perform specific tasks as well as humans. Learn more.

Are artificial intelligence and machine learning the same?

No, artificial intelligence and machine learning are not the same, but they are closely related. Machine learning is the method to train a computer to learn from its inputs but without explicit programming for every circumstance. Machine learning helps a computer to achieve artificial intelligence.

artificial intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.

Deep learning is a subset of machine learning that uses multilayered neural networks, called deep neural networks, that more closely simulate the complex decision-making power of the human brain.

Deep neural networks include an input layer, at least three but usually hundreds of hidden layers, and an output layer, unlike neural networks used in classic machine learning models, which usually have only one or two hidden layers.

Generative AI, sometimes called "gen AI"*,*refers to deep learning models that can create complex original content such as long-form text, high-quality images, realistic video or audio and more in response to a user’s prompt or request.

At a high level, generative models encode a simplified representation of their training data, and then draw from that representation to create new work that’s similar, but not identical, to the original data.

Generative models have been used for years in statistics to analyze numerical data. But over the last decade, they evolved to analyze and generate more complex data types. This evolution coincided with the emergence of three sophisticated deep learning model types:

Machine learning is a subfield of artificial intelligence ([AI](https://www.coursera.org/articles/what-does-ai-stand-for)) that uses algorithms trained on data sets to create self-learning models capable of predicting outcomes and classifying information without human intervention. Machine learning is used today for a wide range of commercial purposes, including suggesting products to consumers based on their past purchases, predicting stock market fluctuations, and translating text from one language to another.

In common usage, the terms “machine learning” and “artificial intelligence” are often used interchangeably due to the prevalence of machine learning for AI purposes in the world today. But, the two terms are meaningfully distinct. While AI refers to the general attempt to create machines capable of human-like cognitive abilities, machine learning specifically refers to the use of machine learning algorithms and data sets to do so.

**Examples and use cases**

Machine learning is typically the most mainstream type of AI technology in use today. Some of the most common [examples of machine learning](https://www.coursera.org/articles/machine-learning-examples) that you may have interacted with in your day-to-day life include:

* Recommendation engines that suggest products, songs, or television shows to you, such as those found on Amazon, Spotify, or Netflix.
* Speech recognition software that allows you to convert voice memos into text.
* A bank’s fraud detection services automatically flag suspicious transactions.
* Self-driving cars and driver assistance features, such as blind-spot detection and automatic stopping, to improve overall vehicle safety.
* Machine learning is both simple and complex.
* At its core, the method simply uses algorithms – essentially lists of rules – adjusted and refined using past data sets to make predictions and categorizations when confronted with new data. For example, a [machine learning algorithm](https://www.coursera.org/articles/machine-learning-algorithms) may be “trained” on a data set consisting of thousands of images of flowers that are labeled with each of their different flower types so that it can then correctly identify a flower in a new photograph based on the differentiating characteristics it learned from other pictures.
* To ensure such algorithms work effectively, however, they must typically be refined many times until they accumulate a comprehensive list of instructions that allow them to function correctly. Algorithms that have been trained sufficiently eventually become “[machine learning models](https://www.coursera.org/articles/machine-learning-models),” which are essentially algorithms that have been trained to perform specific tasks like sorting images, predicting housing prices, or making chess moves. In some cases, algorithms are layered on top of each other to create complex networks that allow them to do increasingly complex, nuanced tasks like generating text and powering chatbots via a method known as “[deep learning](https://www.coursera.org/articles/what-is-deep-learning).”
* As a result, although the general principles underlying machine learning are relatively straightforward, the models that are produced at the end of the process can be very elaborate and complex.

## Types of machine learning

Several different types of machine learning power the many different digital goods and services we use every day. While each of these different types attempts to accomplish similar goals – to create machines and applications that can act without human intervention – the precise methods they use differ somewhat.

To help you get a better idea of how these types differ from one another, here’s an overview of the four different types of machine learning primarily in use today.

### 1. Supervised machine learning

In [supervised learning](https://www.coursera.org/articles/supervised-learning), algorithms are trained on*labeled* data sets that include tags describing each piece of data. In other words, the algorithms are fed data that includes an “answer key” describing how it should be interpreted. For example, an algorithm may be fed images of flowers that include tags for each flower type so that it will be able to identify the flower better again when fed a new photograph.

Supervised learning is often used to create machine learning models used for prediction and classification purposes.

### 2. Unsupervised machine learning

[Unsupervised learning](https://www.coursera.org/articles/unsupervised-learning) uses *unlabeled* data sets to train algorithms. In this process, the algorithm is fed data that doesn't include tags, which requires it to uncover patterns on its own without any outside guidance. For instance, an algorithm may be fed a large amount of unlabeled user data culled from a social media site in order to identify behavioral trends on the platform.

Unsupervised machine learning is often used by researchers and data scientists to identify patterns within large, unlabeled data sets quickly and efficiently.

### 3. Semi-supervised machine learning

Semi-supervised learning uses both unlabeled and labeled data sets to train algorithms. Generally, during semi-supervised learning, algorithms are first fed a small amount of labeled data to help direct their development and then fed much larger quantities of unlabeled data to complete the model. For example, an algorithm may be fed a smaller quantity of labeled speech data and then trained on a much larger set of unlabeled speech data in order to create a model capable of speech recognition.

Semi-supervised learning is often employed to train algorithms for classification and prediction purposes when large volumes of labeled data are unavailable.

### 4. Reinforcement learning

[Reinforcement learning](https://www.coursera.org/articles/reinforcement-learning) uses trial and error to train algorithms and create models. During the training process, algorithms operate in specific environments and then are provided with feedback following each outcome. Much like how a child learns, the algorithm slowly begins to acquire an understanding of its environment and begins to optimize actions to achieve particular outcomes. For instance, an algorithm may be optimized by playing successive games of chess, which allows it to learn from its past successes and failures playing each game.

Reinforcement learning is often used to create algorithms that must effectively make sequences of decisions or actions to achieve their aims, such as playing a game or summarizing an entire text.

**Machine learning benefits and risks**

Machine learning is already transforming much of our world for the better. Today, the method is used to construct models capable of identifying cancer growths in medical scans, detecting fraudulent transactions, and even helping people learn languages. But, as with any new society-transforming technology, there are also potential dangers to know about.

At a glance, here are some of the major benefits and potential drawbacks of machine learning: