ACTIVIDAD #3

Tipo actividad: Reading

Reading :

Machine Learning - Fundamentals

Machine learning is a common type of artificial intelligence. Learn more about this exciting technology, how it works, and the major types powering the services and applications we rely on every day.

Machine learning is a subfield of artificial intelligence that uses algorithms trained on data sets to create models that enable machines to perform tasks that would otherwise only be possible for humans, such as categorizing images, analyzing data, or predicting price fluctuations.

Today, machine learning is one of the most common forms of artificial intelligence and often powers many of the digital goods and services we use every day.

In this article, you'll learn more about what machine learning is, including how it works, different types of it, and how it's actually used in the real world. We'll take a look at the benefits and dangers that machine learning poses, and in the end, you'll find some cost-effective, flexible courses that can help you learn even more about machine learning.

Machine learning definition

Machine learning is a subfield of artificial intelligence (AI) that uses algorithms trained on data sets to create self-learning models that are 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 with one another 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 algorithms and data sets to do so.

Examples and use cases

Machine learning is typically the most mainstream type of AI technology in use around the world today. Some of the most common examples of machine learning 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, improve overall vehicle safety.

How does machine learning work?

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 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," 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."

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 oversight – 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 machine 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 the data 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 machine learning is often used to create machine learning models used for prediction and classification purposes.

2. Unsupervised machine learning

Unsupervised machine 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 machine learning uses both unlabeled and labeled data sets to train algorithms. Generally, during semi-supervised machine 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 machine learning model capable of speech recognition. Semi-supervised machine learning is often employed to train algorithms for classification and prediction purposes in the event that large volumes of labeled data is unavailable.

4. Reinforcement learning

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 allow it to learn from its past success 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.

Adapted from: https://www.coursera.org/articles/what-is-machine-learning

13. Fill in the blanks activity:

Fill in the blanks with the appropriate word or phrase according to the text:

1. Machine learning is a common type of _____.
2. Machine learning uses algorithms trained on _____ to create models.
3. Today, machine learning is one of the most common forms of _____.
4. In this article, you'll learn more about what machine learning is, including how it works, different types of it, and how it's actually used in the _____.
5. Machine learning is a subfield of artificial intelligence (AI) that uses _____ trained on data sets to create self-learning models.

6. 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 _____.

7. Recommendation engines suggest products, songs, or television shows, such as those found on _____, Spotify, or Netflix.

8. Machine learning algorithms may be "trained" on a data set consisting of thousands of images of _____ to identify a flower in a new photograph.

9. Supervised machine learning is often used to create machine learning models used for _____ purposes.

10. Reinforcement learning uses trial and error to train algorithms, allowing them to optimize actions to achieve particular outcomes, such as playing a _____.

11. Machine learning is a subfield of artificial intelligence that uses algorithms trained on _____ to create self-learning models.

12. Unsupervised machine learning uses unlabeled data sets to train algorithms, requiring them to uncover patterns on their own without any outside _____.

13. Semi-supervised machine learning uses both unlabeled and labeled data sets to train algorithms, where a smaller quantity of labeled data helps direct their development, followed by much larger quantities of unlabeled data to _____ the model.