About AI

Artificial Intelligence (AI) is rapidly transforming our world. Remarkable surges in AI capabilities have led to a wide range of innovations including autonomous vehicles and connected Internet of Things devices in our homes. AI is even contributing to the development of a brain-controlled robotic arm that can help a paralyzed person feel again through complex direct human-brain interfaces. These new AI-enabled systems are revolutionizing and benefitting nearly all aspects of our society and economy – everything from commerce and healthcare to transportation and cyber security. But the development and use of the new technologies it brings are not without technical challenges and risks. AI and Machine Learning (ML) is changing the way in which society addresses economic and national security challenges and opportunities. It is being used in genomics, image and video processing, materials, natural language processing, robotics, wireless spectrum monitoring and more. These technologies must be developed and used in a trustworthy and responsible manner.

Algorithm

An algorithm is a formula representing the relationship between certain variables. Think of algorithms as a simple set of instructions with a finite end designed to produce an output. An everyday example of an algorithm is a recipe. You have a set amount of inputs (ingredients) designed to produce a repeatable output — apple pie, for example. Machine learning programs in AI use algorithms to make predictions, and in the case of marketing, suggestions are based on algorithms that hope to target the user's specific preferences (if website visitor 'A' visits pages for kid's short sleeve shirts an algorithm will email them coupons for kid's short sleeve shirts).

Chatbots

A chatbot is a program that runs within websites and apps that interacts directly with users to help them with simple tasks. A "conversation" happens between the user and the computer program. These are often currently used for customer support, but the applications for chatbots are growing.

Cluster

Any group of people or things that share a common characteristic. Data is combed through by AI to uncover patterns and connections that humans might not readily see. Clusters can be used to identify target segments or audiences, creating marketing opportunities through commonalities.

Cognitive science

The broader form of study that includes AI in addition to philosophy, linguistics, psychology, neuroscience, and anthropology. All of these combine together to learn how the mind functions and, when applied to AI, how machines can simulate human thought and action.

Machine learning

With limited need for programming, machines can teach themselves. Combing through massive amounts of data allows AI to identify patterns and groupings. This could be used to determine target audiences, decide on optimal times to send emails, or segment out groupings for deeper engagement.

Deep learning

In this advanced version of machine learning, computers actually teach themselves with minimal programming by humans. Marketers can use deep learning to identify data and make predictions related to how consumers might behave.

Image recognition (or "computer vision")

One of the more complicated processes for machine learning, computers can be programmed to understand what is happening in an image. AI searches for patterns within images to quickly identify nuances that humans may not see.

Natural Language Processing (NLP)

This technology allows machines to determine what humans are saying, whether in text or by voice.

More sophisticated programs can decipher speech in various languages, understanding not only the actual vocabulary, but also pulling out context and more hidden meanings. Sarcasm and subtlety are still difficult for AI, but advanced technology is working on it.

Neural networks

Structured to be similar to the human brain, this AI model incorporates natural language processing and deep learning to identify faces in photos and analyze handwriting.

Semantic analysis

A more sophisticated form of Natural Language Processing, this concept is focused on the process of stringing words together as well as the way that language is understood through cultural context. This could function as a help to create eBooks and blog posts, with the potential to replace human writers or content marketers (!). Wait, what?

TensorFlow™ is an open source software library for numerical computation using data flow graphs. Nodes in the graph represent mathematical operations, while the graph edges represent the multidimensional data arrays (tensors) communicated between them. The flexible architecture allows you to deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device with a single API. TensorFlow was originally developed by researchers and engineers working on the Google Brain Team within Google's Machine Intelligence research organization for the purposes of conducting machine learning and deep neural networks research, but the system is general enough to be applicable in a wide variety of other domains as well.

PyTorch is an open source machine learning framework based on the Torch library, used for applications such as computer vision and natural language processing, primarily developed by Meta AI. It is free and open-source software released under the Modified BSD license. Although the Python interface is more polished and the primary focus of development, PyTorch also has a C++ interface.

MindSpore is the AI computing framework. Fully developed by Huawei from the ground up, it implements on-demand collaboration across the cloud-edge-device. It provides unified APIs and end-to-end AI capabilities for model development, execution, and deployment in all scenarios.

Using a distributed architecture, MindSpore leverages a native differentiable programming paradigm and new AI native execution modes to achieve better resource efficiency, security, and trustworthiness. Meanwhile, MindSpore makes full use of the computing power of Ascend AI processors and lowers the entry requirements of industry AI development, bringing inclusive AI faster to reality.

Supervised learning is an approach to creating artificial intelligence (AI), where a computer algorithm is trained on input data that has been labeled for a particular output. The model is trained until it can detect the underlying patterns and relationships between the input data and the output labels, enabling it to yield accurate labeling results when presented with never-before-seen data.

Supervised learning is good at classification and regression problems, such as determining what category a news article belongs to or predicting the volume of sales for a given future date. In supervised learning, the aim is to make sense of data within the context of a specific question.

Unsupervised Learning is a machine learning technique in which the users do not need to supervise the model. Instead, it allows the model to work on its own to discover patterns and information that was previously undetected. It mainly deals with the unlabelled data.

Unsupervised Learning Algorithms allow users to perform more complex processing tasks compared to supervised learning. Although, unsupervised learning can be more unpredictable compared with other natural learning methods. Unsupervised learning algorithms include clustering, anomaly detection, neural networks, etc.