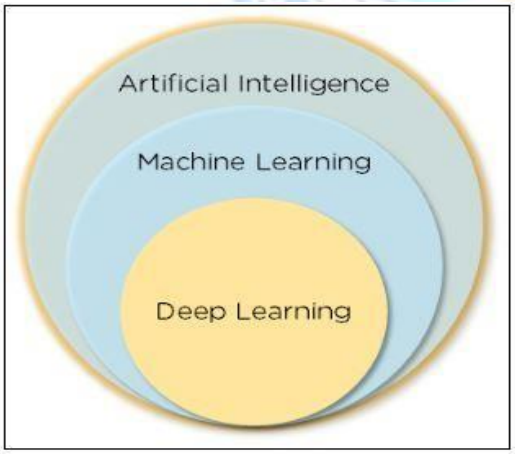
DEEP LEARNING NEURAL NETWORKS

Deep learning is a subfield of machine learning that deals with algorithms inspired by the structure and function of the brain. Deep learning is a subset of machine learning, which is a part of artificial intelligence (AI).



Artificial intelligence is the ability of a machine to imitate intelligent human behavior. Machine learning allows a system to learn and improve from experience automatically. Deep learning is an application of machine learning that uses complex

algorithms and deep neural nets to train a model

Importance of Deep Learning

- Machine learning works only with sets of structured and semi-structured data, while deep learning works with both structured and unstructured data
- Deep learning algorithms can perform complex operations efficiently, while machine learning algorithms cannot
- Machine learning algorithms use labeled sample data to extract patterns, while deep learning accepts large volumes of data as input and analyzes the input data to extract features out of an object
- The performance of machine learning algorithms decreases as the number of data increases; so to maintain the performance of the model, we need a deep learning

1. Virtual Assistants

Virtual Assistants are cloud-based applications that understand natural language voice commands and complete tasks for the user. Amazon Alexa, Cortana, Siri, and Google Assistant are typical examples of virtual assistants. They need internet-connected devices to work with their full capabilities. Each time a command is fed to the assistant, they tend to provide a better user experience based on past experiences using Deep Learning algorithms.

2. Healthcare

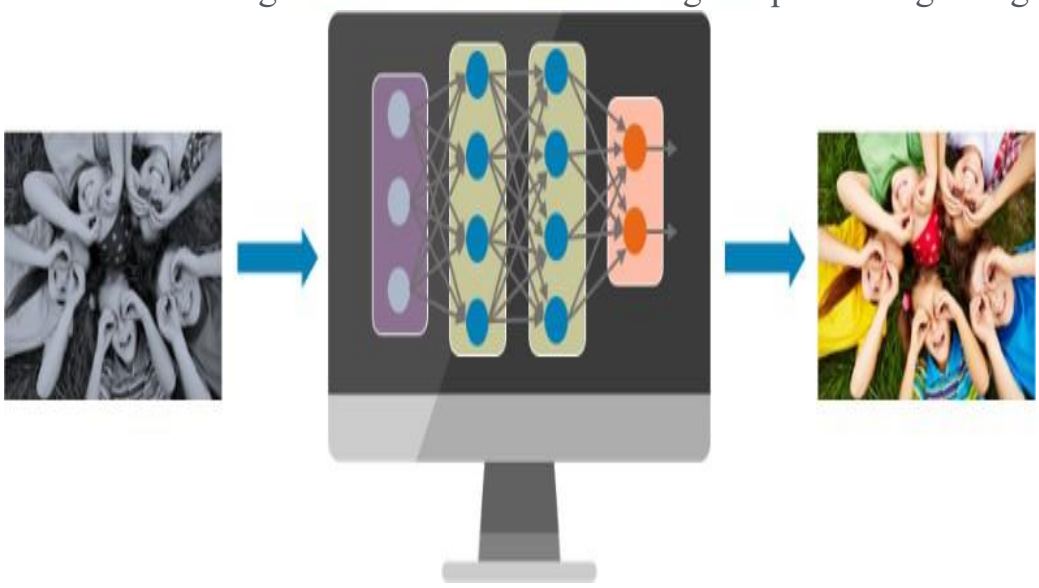
Deep Learning has found its application in the Healthcare sector. Computer-aided disease detection and computer-aided diagnosis have been possible using Deep Learning. It is widely used for medical research, drug discovery, and diagnosis of life-threatening diseases such as cancer and diabetic retinopathy through the process of medical imaging.

3. Entertainment

Companies such as Netflix, Amazon, YouTube, and Spotify give relevant movies, songs, and video recommendations to enhance their customer experience. This is all thanks to Deep Learning. Based on a person's browsing history, interest, and behavior, online streaming companies give suggestions to help them make product and service choices. Deep learning techniques are also used to add sound to silent movies and generate subtitles automatically.

4. Image Coloring

Image colorization has seen significant advancements using Deep Learning. Image



colorization is taking an input of a grayscale image and then producing an output of a colorized image. ChromaGAN is an example of a picture colorization model. A generative network is framed in an adversarial model that learns to colorize by incorporating a perceptual and semantic understanding of both class distributions and color.

5. Image Captioning

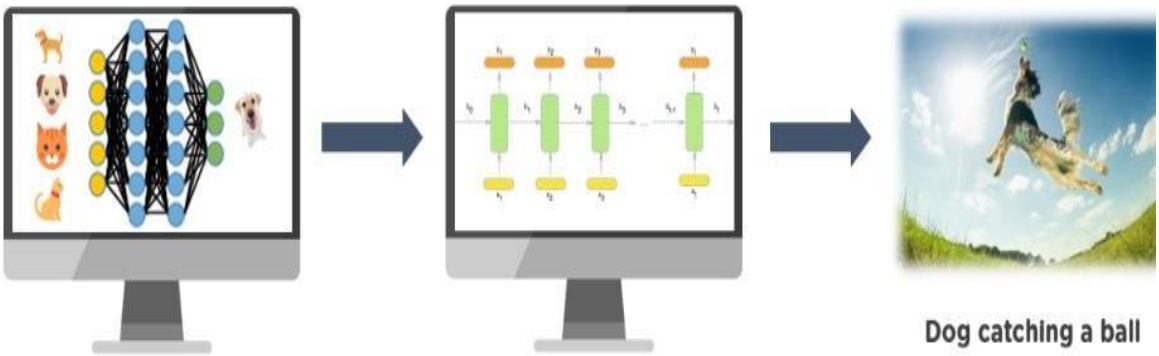


Image Captioning is the method of generating a textual description of an image. It uses computer vision to understand the image's content and a language model to turn the understanding of the image into words in the right order. A recurrent neural network such as an LSTM is used to turn the labels into a coherent sentence. Microsoft has built its caption bot where you can upload an image or the URL of any image, and it will display the textual description of the image. Another such application that suggests a perfect caption and best hashtags for a picture is Caption AI.