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DEEP LEARNING OF ARTIFICIAL INTELLIGENCE

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ABSTRACT –
The present research paper is focuses on the types of AI and also the uses of deep learners. The intelligent machines will replace or enhance human capabilities in many areas. Artificial intelligence is the intelligence exhibited by machines or software. It is the subfield of computer science and Engineering. Application areas of artificial intelligence is heaving a huge impact on various fields of life as expert system is widely used in these days to solve the complex problems in various areas as education, engineering, business, medicine, weather forecasting etc. Artificial intelligence includes game playing, expert systems, neural networks, natural language, and robotics. This paper examines features of artificial Intelligence, introduction, definitions of AI, growth and future achievements.
Keywords- Artificial Intelligence, Human Intelligence, Machine Learning

AI is a set of algorithms that enable machines to perform tasks that would otherwise require human intelligence. This includes things like recognizing objects, understanding natural language, and making decisions based on data. AI can be used for a variety of purposes, from helping doctors diagnose diseases to controlling robots in manufacturing plants.
AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

OBJECTIVES OF THE RESEARCH STUDY

The objectives of said research study are as follows -

1. To study the concept of Artificial Intelligence
2. To study the benefits over traditional machine learning.
3. To study the Types of Artificial Intelligence

RESEARCH METHODOLOGY

The said research paper is descriptive in nature. The collection of data for preparing the said research paper are based on secondary data. The Secondary Data is collected from various reference books related to Artificial Intelligence, Fundamentals of Computer Algorithm. For said research study secondary data is also collected from the

National and International Research Journals which are related to Artificial Intelligence, Mathematics etc. For the present research study the data pertaining to the above objectives was collected and reviewed the literature on the topic concerned. The literature was thus collected by visiting various libraries. The secondary data is also collected from various websites.

Types of Artificial Intelligence

Artificial intelligence can be divided into two different categories: weak and strong. Weak artificial intelligence embodies a system designed to carry out one particular job. Weak AI systems include video games such as the chess example from above and personal assistants such as Amazon's Alexa and Apple's Siri. You ask the assistant a question, and it answers it for you.

Strong artificial intelligence systems are systems that carry on the tasks considered to be human-like. These tend to be more complex and complicated systems. They are programmed to handle situations in which they may be required to problem solve without having a person intervene. These kinds of systems can be found in applications like self-driving cars or in hospital operating rooms.

Deep learning is a method in artificial intelligence (AI) that teaches computers to process data in a way that is inspired by the human brain. Deep learning models can recognize complex patterns in pictures, text, sounds, and other data to produce accurate insights and predictions. You can use deep learning methods to automate tasks that typically require human intelligence, such as describing images or transcribing a sound file into text.

Artificial intelligence (AI) attempts to train computers to think and learn as humans do. Deep learning technology drives many AI applications used in everyday products, such as the following:

1. Digital assistants
2. Voice-activated television remotes
3. Fraud detection
4. Automatic facial recognition

It is also a critical component of emerging technologies such as self-driving cars, virtual reality, and more.

Deep learning models are computer files that data scientists have trained to perform tasks using an algorithm or a predefined set of steps. Businesses use deep learning models to analyze data and make predictions in various applications.

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Uses of deep learning?

Deep learning has several use cases in automotive, aerospace, manufacturing, electronics, medical research, and other fields. These are some examples of deep learning:

1. Self-driving cars use deep learning models to automatically detect road signs and pedestrians.
2. Defense systems use deep learning to automatically flag areas of interest in satellite images.
3. Medical image analysis uses deep learning to automatically detect cancer cells for medical diagnosis.
4. Factories use deep learning applications to automatically detect when people or objects are within an unsafe distance of machines.

You can group these various use cases of deep learning into four broad categories—computer vision, speech recognition, natural language processing (NLP), and recommendation engines.

Computer vision

Computer vision is the computer's ability to extract information and insights from images and videos. Computers can use deep learning techniques to comprehend images in the same way that humans do. Computer vision has several applications, such as the following:

1. Content moderation to automatically remove unsafe or inappropriate content from image and video archives
2. Facial recognition to identify faces and recognize attributes like open eyes, glasses, and facial hair
3. Image classification to identify brand logos, clothing, safety gear, and other image details

Speech recognition

Deep learning models can analyze human speech despite varying speech patterns, pitch, tone, language, and accent. Virtual assistants such as Amazon Alexa and automatic transcription software use speech recognition to do the following tasks:

1. Assist call center agents and automatically classify calls.
2. Convert clinical conversations into documentation in real time.
3. Accurately subtitle videos and meeting recordings for a wider content reach.

Natural language processing

Computers use deep learning algorithms to gather insights and meaning from text data and documents. This ability to process natural, human-created text has several use cases, including in these functions:

1. Automated virtual agents and chatbots
2. Automatic summarization of documents or news articles

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3. Business intelligence analysis of long-form documents, such as emails and forms
4. Indexing of key phrases that indicate sentiment, such as positive and negative comments on social media

Recommendation engines

Applications can use deep learning methods to track user activity and develop personalized recommendations. They can analyze the behavior of various users and help them discover new products or services. For example, many media and entertainment companies, such as Netflix, Fox, and Peacock, use deep learning to give personalized video recommendations.

The components of a deep neural network are the following.

Input layer

An artificial neural network has several nodes that input data into it. These nodes make up the input layer of the system.

Hidden layer

The input layer processes and passes the data to layers further in the neural network. These hidden layers process information at different levels, adapting their behavior as they receive new information. Deep learning networks have hundreds of hidden layers that they can use to analyze a problem from several different angles.

For example, if you were given an image of an unknown animal that you had to classify, you would compare it with animals you already know. For example, you would look at the shape of its eyes and ears, its size, the number of legs, and its fur pattern. You would try to identify patterns, such as the following:

1. The animal has hooves, so it could be a cow or deer.
2. The animal has cat eyes, so it could be some type of wild cat.

The hidden layers in deep neural networks work in the same way. If a deep learning algorithm is trying to classify an animal image, each of its hidden layers processes a different feature of the animal and tries to accurately categorize it.

Output layer

The output layer consists of the nodes that output the data. Deep learning models that output "yes" or "no" answers have only two nodes in the output layer. On the other hand, those that output a wider range of answers have more nodes.

Deep learning is a subset of machine learning. Deep learning algorithms emerged in an attempt to make traditional machine learning techniques more efficient. Traditional machine learning methods require significant human effort to train the software. For example, in animal image recognition, you need to do the following:

1. Manually label hundreds of thousands of animal images.
2. Make the machine learning algorithms process those images.
3. Test those algorithms on a set of unknown images.

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4. Identify why some results are inaccurate.
5. Improve the dataset by labeling new images to improve result accuracy.

This process is called supervised learning. In supervised learning, result accuracy improves only when you have a broad and sufficiently varied dataset. For instance, the algorithm might accurately identify black cats but not white cats because the training dataset had more images of black cats. In that case, you would need to label more white cat images and train the machine learning models once again.

A deep learning network has the following benefits over traditional machine learning.

Efficient processing of unstructured data

Machine learning methods find unstructured data, such as text documents, challenging to process because the training dataset can have infinite variations. On the other hand, deep learning models can comprehend unstructured data and make general observations without manual feature extraction. For instance, a neural network can recognize that these two different input sentences have the same meaning:

- Can you tell me how to make the payment?
- How do I transfer money?

Hidden relationships and pattern discovery

A deep learning application can analyze large amounts of data more deeply and reveal new insights for which it might not have been trained. For example, consider a deep learning model that is trained to analyze consumer purchases. The model has data only for the items you have already purchased. However, the artificial neural network can suggest new items that you haven't bought by comparing your buying patterns to those of other similar customers.

Unsupervised learning

Deep learning models can learn and improve over time based on user behavior. They do not require large variations of labeled datasets. For example, consider a neural network that automatically corrects or suggests words by analyzing your typing behavior. Let's assume it was trained in the English language and can spell-check English words. However, if you frequently type non-English words, such as danke, the neural network automatically learns and autocorrects these words too.

Volatile data processing

Volatile datasets have large variations. One example is loan repayment amounts in a bank. A deep learning neural network can categorize and sort that data as well, such as by analyzing financial transactions and flagging some of them for fraud detection.

As deep learning is a relatively new technology, certain challenges come with its practical implementation.

Large quantities of high-quality data

Deep learning algorithms give better results when you train them on large amounts of high-quality data. Outliers or mistakes in your input dataset can significantly affect the

deep learning process. For instance, in our animal image example, the deep learning model might classify an airplane as a turtle if non-animal images were accidentally introduced in the dataset.

To avoid such inaccuracies, you must clean and process large amounts of data before you can train deep learning models. The input data preprocessing requires large amounts of data storage capacity.

Large processing power

Deep learning algorithms are compute-intensive and require infrastructure with sufficient compute capacity to properly function. Otherwise, they take a long time to process results.

Conclusion

The field of artificial intelligence gives the ability to the machines to think analytically, using concepts. Tremendous contribution to the various areas has been made by the Artificial Intelligence techniques from the last 2 decades. Artificial Intelligence will continue to play an increasingly important role in the various fields. This paper is based on the concept of artificial intelligence, scope of artificial intelligence in different areas with special to "the field of education". As all know artificial intelligence is intelligence behavior of machines which is given by the professional. As you all know artificial intelligence have simplified our life in every aspect it can be article writing or game playing or taking any important decision. In any machine many experts mind can be combined which is more powerful than a single expert mind. Many labors work can be done by a single machine and good thing of it is that it never tired. Now such types of robots are going to make which have emotions it will finish the loneliness of the person. But it has another aspect that is can be dangers for us. If we become completely dependent on that machines than it can ruin our life as we do not do any work ourselves and got lazy. And another is that it cannot give the feeling like human. So machines should be used only where there those are actually required.

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