DEEP LEARNING: A NEXT GENERATION OF LEARNING

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ABSTRACT

One of the fastest Growing part of Machine Learning is Deep Learning. A lot of research has been done in this area. Deep Learning algorithm helps us in many ways. Medical Field uses deep Learning Algorithm in its various domain. It gives fast and accurate results. Not only Medical Science but many other fields also know the power of Deep Learning. It covers almost every area and Nowwe can say none of the areas is untouched. This paper shows What exactly deep Learning is, Its various advantages and areas of Application. The paper also describes CNN which is its most fruitful method. Today Deep Learning can be thought of as an important part of human life.

Key Words: CNN, Supervised Learning, Unsupervised Learning.

I. INTRODUCTION

Today's world is a world of intelligence. when we work with intelligent programs we get their remarkable result. [1] Machine learning is a field of computer science Where We trained machines through the program so the machine can work with intelligence like a human. Machine learning relies on structured data and the decision of machine learning is always based on the experience of structured data. One function of machine learning is deep learning. It deeply analyses the working style of the human brain and makes similar patterns after analyzing these patterns for decision making. Deep learning works with artificial neural network layers. All processing here is done by layer. Nowadays Deep learning is popular field of research. Artificial intelligence is the superset of machine learning and machine learning is the superset of deep learning. Although a lot of work has already been done in the field of Deep learning, ismost popular choice for research. Computational power is the main factor of deep learning. As the power of computation increases day by day, deep learning becomes a center of attraction.

As the name implies, deep learning has many layers that make it a deeper network as it becomes deeper as the number of layers increases [2]. There is no separate step for feature extraction and classification in deep learning. Make Revolutionary advances in machine learning and AI [3]. This definition is based on traditional AI concepts. But various resources are available today, we can work on that number of data, and in this way, the accuracy of the result is increasing. according to Andrew, Now we have a sufficient amount of data as well as high-speed computers for the training purpose of neural networks[4].

If the number of data is high, the overall performance will also be higher. [5] A wide neural network can be thought of as deep learning. Deep Learning Algorithm Focuses on The Exploitation of unknown structure for better representation[6]. As name implies Deep Learning is although subset of AI , but it is not Simply AI. The various definitions of Deep Learning is available ,In the same row one definition is given in[7], They Focuses on Multilayer Approach.

II. BASIC ARCHITECTURE OF DEEP LEARNING

There are various architectures of Deep Learning. Here I am explaining only Convolution Neural Network (CNN).There are

two types of Learning Supervised and Un Supervised[8]

Convolutional Neural Networks (CNNs)[9]: Most researchers prefer the CNN algorithm for their research due to its various features such as accuracy, feature detection, etc. CNN is similar to ANN. It also provides input and output. But CNN is used more in the field of image processing due to its encoding feature.

In the architecture of CNN, different types of layers are available. Each layer performs a specific task. Layers of CNN are Convolutional Layers, Pooling Layers, and Fully Connected layers.

· There is a Convolutional layer then a polling layer, again a Convolutional layer and Polling layer and at last, there is one Hidden and one output layer which is connected. In this figure, two basic tasks done by the Layers are Feature Extraction and Classification

- The Convolution Layer is responsible for the result, Pooling is responsible for downsampling and finally, the connected Layers are responsible for producing scores.

· The role of the convolution layer is very important in architecture. it also reduces the complexity of the model.

· Separate attributes are used for separate layers in the configuration of CNN architecture like filter and stride size are basic attribute for convolution layer and pooling type is the basic attribute in Pooling layer whereas the main attribute of the connection layer is neurons.

1. **DIFFERENCE BETWEEN DEEP LEARNING AND MACHINE LEARNING**

There is a lot of differences between deep learning and machine learning. Machine learning performs well for small data set whereas Deep Learning performs better in a huge amount of data. Machine Learning understands the feature for data representation but Deep Learning does not need to understand the feature for Data representation. Deep Learning takes more time to execute than Machine Learning. We Should use deep learning when there is less number of algorithm available but Machine learning applied when many algorithms available[10][11] Machine Learning works with neural networks but Deep Learning is not.

III. DEEP LEARNING APPLICATIONS

Nowadays deep learning is being used in almost every field and its results are also coming very well. Here I am mentioning the names of some areas where deep learning is particularly used.

1. Fraud News Detection: There are various fake news is present by various media. A lot of existing articles are available to define the term Fake news in their own words. Today is the era, in which people having much curiosity with knowledge as well as awareness. Now, Fake news can be detected [12]very fast within 5 minutes of its spread. Deep Learning plays an important role in this area.

3.**Healthcare:** Deep learning has produced amazing results in healthcare. RL is very Popular in Healthcare. robotic-assisted surgery (RAS) is a good example of RL in Deep Learning. Researchers give their preference to Healthcare Area in Deep Learning.[13]

3.**Colorization of Black and White Images:** Traditionally Black and White images were Transformed into Colourful Images Manually. This Process was very Time-consuming. Mistakes were also more likely. It became very easy with the help of deep learning. It takes input as a black/white image and converts the image to a color format. The machine does all the work as human beings.[14]

4. **Natural Language Processing:** Every human being needs some communication mode to share his thoughts' modes may be text ,voice or symbol. In all modes The Key point is to explain the thoughts. NLP helps us with the use of Software in Language.[15]

Apart from this, deep learning is also used inmany more areas.

IV. CONCLUSION

Now We cannot imagine our life without Deep Learning. It covers almost all areas of our life. With the help of Deep Learning, We can get an accurate result of analysis in various areas. But there is some Challenging part also. It requires a lot of data for processing. CNN is the most popular method of Deep Learning among researchers. Deep learning already proved its role in medical science and shortly, it may be applied in many other areas also.

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