Application of Neural Networks

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Abstract- *Recently neural networks have won many contests in machine learning and pattern recognition. This paper will highlight applications of neural networks and its importance in digital era. Also we will highlight advantages and disadvantages along with various used of neural networks. The earlier survey have summarizes some relevant work regarding the application of neural networks and how its work. Artificial neural networks work like a human brain and it also take learning from set of examples set by different experiences to resolve the issues instant.. We need to understand artificial neural networks in depth to understand its application and why its trending and need of technological world. Artificial neural networks that is ANN became a choice of digital era to ease work and for more proficiently.*

Keywords- Artificial neural networks, Applications , Deep learners, Technological.

I. INTRODUCTION

In recent years, there has been lots of progress in information technologies especially in artificial intelligences, neural networks etc [1]. Artificial neural networks plays an important role for learning like human being as we learned in our childhood. For example- child learn from their parents or teachers, once they grow up they start doing self-learning or by doing lots of practice or experience throughout life to learn new things [2]. Same way ANN plays important role to learn like human for the following reasons-

- We can find the solutions of such difficult problems for which algorithm methods is required which may be expensive or may does not exist. In this with the help of neural networks we can find the solutions of such problems.
- We do not need to program neural networks in much extent as neural networks learn by examples which is self-sufficient in itself.
- Neural networks have the accurateness and notable very fast speed than conventional speed.

Artificial neural network develop the algorithm by processing the brain to solve the complex model pattern and do the predictions to solve the related problems on a ore smarter way and in a less time one can think of. ANN is just work like human brain to solve the problems as we do through our brain cells called neurons to process the information to get the desired output.And information which we got from external is received by dendrites of the neuron to processed it in the neural cell body so that the information can be converted as a output and passed through Axon to the next neuron. It is then next neuron will decide whether to pass or fail depending on the signal strength. For example- A customer wants loan from the bank, he went there and given all the information related to him and his financial status. Then the bank access the information received to check whether to approve the loan or not and then bank do prediction of the data, that the customer will default on the loan. It has data like financial status, current income level, past loan experience if any, his assets and etc. On the accessing everything very deeply bank will decide whether to pass or reject the loan. If everything is ok then they will pass the loan else reject. Same way ANN work on every information it receive and by studying to it deeply it decide whether to accept or reject. Artificial neural networks that is ANN also known as a branch of machine learning which use neural networks. It has unique ability to extract meaning from complex data to find the patters and deduct the problems to give desired output by using brain as human do and use many computer techniques. Neural networks provide convenience to many different sites and apps to work smoothly and easily and to provide better customer satisfaction like in Amazon, Flipkart , ridesharing apps etc [3-5].

II. NEURAL NETWORKS APPLICATIONS

1. **Speech Recognition**–Speech is most important for interaction among the humans. Therefore it is important for people to presume speech interfaces with computers. In the digital era, humans still looking for sophisticated languages to communicate with machines which is really difficult to learn and implement. To ease this communication problem, communication which is used for spoken is only possible for machine to understand. Many research has been done in this area and found a progress to but still systems are facing the issues of few vocabulary or grammar along with the issue of retraining of the system for different speakers in different situations. ANN plays here important role for speech recognition in the form of multilayer networks, multi networks with

recurrent connections and kohonen self-organizing feature map [3-6].

2. **Character Recognition**- Its falls under in the area of pattern recognition where many neural networks have been created for automatic recognition of handwritten characters, it may be digits as well as letters. ANN use the following for character recognition-

   - Use of Backpropagation neural networks in the multilayer neural networks which have several layers who are hidden and the pattern of connection is localized from one layer to the next layer.
   - Neocognitron is used which also have many hidden layers and its trained for use of application from layer to layer.Neural networks also recognize handwritten characters with the use of character recognition and devices which were used is Palm pilot, which is popular nowadays.

3. **Application for signature verification**- It is one of the most important application of ANN which is used to identify to authorize and authenticate the legality of a person for legal transaction. It's a non-vision technique. In this neural networks are trained for using an efficient algorithm of neural networks. And in the stage of verification, neural networkshelp in identify and check the authenticity of signatures for being genuine and correct.

4. **Human Face Recognition**- It is the biometric method by which one can identify the given face. Because of the characterization of non-face images, it became typical tasks. Neural network train in a such a way to identify both the images who have faces as well as image who do not have faces. All input images must be pre-processed to reduce the dimensionality of the image and then neural network use its train algorithm to process the image [7].

5. **Prediction of Stock Market-** Neural networks is used to predict stock prices on the information collected on daily basis. As day to day stock market prices is much complicated as its go up or down in any given day. As neural networks are able to examine many information quickly and sort everything. ANN helps in providing better stock prices predictions.

6. **Spell Checking-** Neural networks use system to detect misspelled words and the system is trained to observe the specific correction that a writer makes during typing. It has ability to check the spellings.

III. ADVANTAGES OF APPICATION OF ARTIFICAL NEURAL NETWORKS

ANN has many key advantages. Some of them are as following:

1. ANN has ability to solve the real life problems by learning non-linear model and complex relationships to identify the gaps.
2. ANN can predict data of any unseen information by concluding variable available to them and make the generalize data by the inputs it received to give desired outputs.
3. ANN does not execute on constraint on any input variable. It has ability to learn hidden data of both high volatility and non-constant change. It is important for forecasting in financial time series like stock prices.
4. ANN can store information of the entire network such as traditional programming not on a database.
5. ANN has ability to work with incomplete information to provide the data and the performance is depending on the missing information. ANN is train in such a way to provide best data. It can provide data on incomplete information too.
6. ANN learn from distributed examples which is done on the basis of different memories it has and also it teaches with all experience to the networks so that it gives desired output. The ANN success is directly proportional to the selected examples and if it does not go in this way it may produce false output.
7. The neural network does not corrode immediately once the network slow over the time or undergoes some relative degradation.
8. ANN has ability to train machine by commenting on similar events and make decisions based on self-learn events of different networks.
9. ANN can perform many job at one time. It has ability to process data and information of many networks at one time and give desired output to every networks.

IV. DISADVANTAGES OF APPLICATION ARTIFICIAL NEURAL NETWORKS

ANN has manydisadvantages too. Some of them are as following:

1. Artificial neural network is much depended on hardware as it requires parallel processor to process the problem through neural network. The understanding of the equipment is thus required.

2. ANN many times gives unexplained solutions to the problems as it does not give clue of hoe and why which make the ANN to reduce the trust on the networks.
3. ANN is worked on the experience of trial and error of the network structure as there is no specific rule of ANN structure.
4. ANN knows to work with numeric value thus every information of problem must have transmitted into numerical value so that it can access and find the solutions of the problems easily.
5. Artificial neural network has unknown duration for certain value which gives error to the sample that means it needs training and the results are not optimum results.

V. APPLICATION OF NEURAL NETWORKS TO DIFFERENT SECTORS

Neural network is used in many industries for forecast, customer research, data validation and management of risk [8-11]. Below are few examples of industries using application of neural networks and they are as follows-

1. Marketing- Market segmentation is done to know the target market which can be done by dividing market into different groups of customers with different behaviour of consumers. Neural network process everything in a marketing way to find out the segmentation on the basis of demographic, geographical, status and purchasing power. Trained neural network know how to segment the market and create boundaries for the customers for better marketing process.
2. Sales and Retail- Neural market has ability to consider various variables at same time such as market demand, customer income, population and product price. Projection of sales can be a great advantage.From this information retailer can connect with customers.
3. Banking and Finance- Neural networks is used to solve the problems of banking sector like pricing and hedging of derivative securities, forecasting of future prices, forecasting of exchange rate and performance of stock. Neural networks are the technologies used for decision making.
4. Medicine- Neural network is used in medicine as well as it works like human brain and helps in extensive application to biomedical systems to recognise the diseases for numerous scans.

VI. CONCLUSION

Application of Neural networks has given insights to solutions of many problems and helps to work like the human brain and process the environment simulation in same way. As human brain learn same way artificial neural networks learn from many examples sets on the different networks to give the solution of almost every problem. It has given new insights to technological world which can be used by almost every sector for instance solution and giving information on time. Its uses authenticated and given many instant solutions which obviously ease the work for the people rather than traditional approach of working in earlier days. It is a new tool which is in demand for the creative use and visual concepts to generalise work and give information and desired output. Overall, neural network has helped the computer systems more useful in the technological world by giving the change of its behaviour inclined towards to work more like humans. One must know and have installation of neural network applications for smooth functioning of system. With the help of artificial neural networks one can find instant solution of problems which have algorithm methods which are expensive and even doesn't exist. It doesn't need a program at such extent. It has faster speed of accuracy and use fast speed to access the information to give desired outputs.

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