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A View of Artificial Neural Network

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Abstract: **In this paper, An Artificial Neural Network or ANN, its various characteristics and business applications. In this paper also show that "what are neural networks" and "Why they are so important in today's Artificial intelligence?" Because various advances have been made in developing intelligent system, some inspired by biological neural networks. ANN provides a very exciting alternatives and other application which can play important role in today's computer science field. There are some Limitations also which are mentioned**

Keywords:-Artificial Neural Network, ANN, Feedback Network, Feed Forward Network, Artificial Neuron and Applications.

I. INTRODUCTION

The concept of ANN is basically introduced from the subject of biology where neural network plays an important and key role in human body. In human body work is done with the help of neural network. Neural Network is just a web of inter connected neurons which are millions and millions in number. With the help of these interconnected neurons all the parallel processing is done in human body and the human body is the best example of Parallel Processing

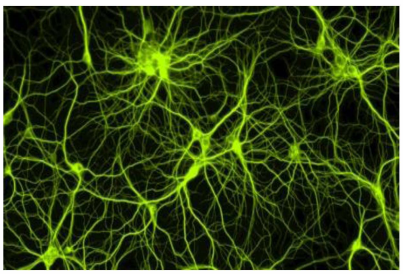

Fig 1 Neural Network in Human Body *[9]*

A neuron is a special biological cell that process information from one neuron to another neuron with the help of some electrical and chemical change. It is composed of a cell body or soma and two types of out reaching tree like branches: the axon and the dendrites. The cell body has a nucleus that contains information about hereditary traits and Plasma that holds the molecular equipments or producing material needed by the neurons *[4].* The whole process of receiving and sending signals is one in particular manner like a neuron receives signals from other neuron through dendrites. The Neuron send signals at spikes of electrical activity through a long thin stand known as an axon and an axon splits this signals through synapse and send it to the other neurons *[7].*

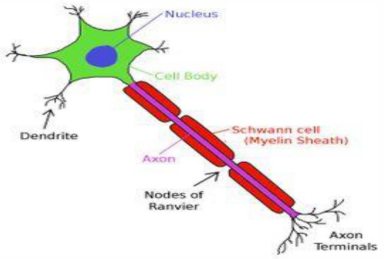

Fig 2 Human Neurons *[4]*

II. ARTIFICIAL NEURAL NETWORK

An Artificial Neuron is basically an engineering approach of biological neuron. It has device with many inputs and one output. ANN is consisting of large number of simple processing elements that are interconnected with each other and layered also. *[6, 7]*

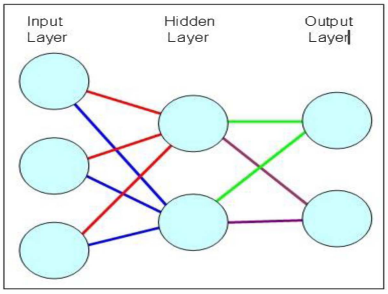

Fig 3 Artificial Neuron *[7]*

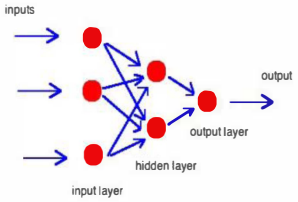

Fig 4 Multilayered ANN *[2]*

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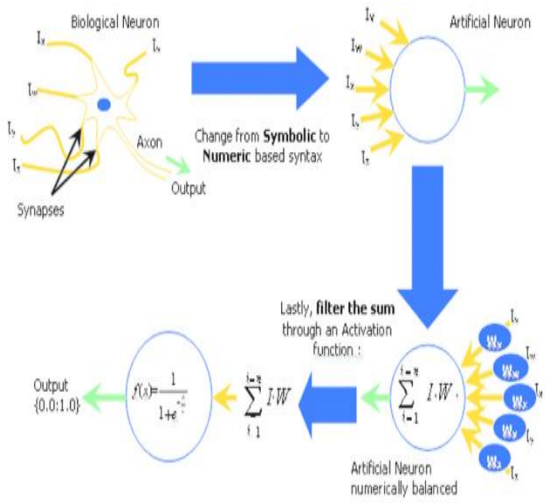

Fig 5 Functions of an Artificial Neuron *[6]*

III. DIFFERENCES

Modern Computers:-

1) Contain one or few Processors which are high speed but complex.
2) Having Localized Memory separate from processor.
3) Computing is done with stored programs in a sequential and centralized manner.
4) In terms of reliability it is very vulnerable.
5) The Operating Environment is well defined and well constrained. *[4]*

Biological Neural system:-

1) contains a large number of processor which have low speed but simple in structure.
2) Having Distributed Memory but integrated into processor.
3) Computing is done with self learning in a parallel and distributed manner.
4) In terms of reliability it is robust.
5) The operating environment is poorly defined and unconstrained. *[4]*

IV. APPLICATIONS

There are various business applications of artificial neural network. Every sector in this world wants a system which is it intelligent to solve any problem according to the inputs. In this paper we have discussed various Business Applications which are listed below *[4, 6, and 7]:*

1) Airline Security Control.
2) Investment Management and Risk Control.
3) Prediction of Thrift Failures.
4) Prediction of Stock Price Index.
5) OCR Systems.
6) Industrial Process Control.
7) Data Validation.
8) Risk Management.
9) Target Marketing.
10) Sales Forecasting.
11) Customer Research.

The above applications have ability to predict any type of problem by its own with the help Artificial Neural Network phenomenon with the help of various algorithms like Perception Learning Algorithm, Back Propagation Algorithm, SOM Learning Algorithm and ART1 Learning Algorithm. *[4, 6, 7]*

V. LIMITATIONS

In this technological era every has Merits and some Demerits in others words there is a Limitation with every system which makes this ANN technology weak in some points. The various Limitations of ANN are *[6]:*

1) ANN is not a daily life general purpose problem solver.
2) There is no structured methodology available in ANN.
3) There is no single standardized paradigm for ANN development.
4) The Output Quality of an ANN may be unpredictable.
5) Many ANN Systems does not describe how they solve problems.
6) Black box Nature
7) Greater computational burden.
8) Proneness to over fitting.
9) Empirical nature of model development.

VI. CONCLUSION AND FUTURE WORKS

By studying artificial Neural Network we had concluded that as per as technology is developing day by day the need of Artificial Intelligence is increasing because of only parallel processing. Parallel Processing is more needed in this present time because with the help of parallel processing only we can save more and more time and money in any work related to computers and robots. If we talk about the Future work we can only say that we have to develop much more algorithms and other problem solving techniques so that we can remove the limitations of the Artificial Neural Network. And if the Artificial Neural Network concepts combined with the Computational Automata and Fuzzy Logic we will definitely solve some limitations of this excellent technology.

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REFERENCES

[1] Herve Debar, Monique Becker and Didier Siboni "A Neural Network Component for an Intrusion Detection System", Les Ulis Cedex France, 1992.
[2] Ajith Abraham, "Artificial Neural Networks", Stillwater, OK, USA, 2005.
[3] Carlos Gershenson, "Artificial Neural Networks for Beginners", United Kingdom.
[4] Anil K Jain, Jianchang Mao and K.M Mohiuddin, "Artificial Neural Networks: A Tutorial", Michigan State University, 1996.
[5] Ugur HALICI, "Artificial Neural Networks", Chapter 1, ANKARA
[6] Eldon Y. Li, "Artificial Neural Networks and their Business Applications", Taiwan, 1994.
[7] Christos Stergiou and Dimitrios Siganos, "Neural Networks".
[8] Limitations and Disadvantages of Artificial Neural Network from website http://www.ncbi.nlm.nih.gov/pubmed/8892489
[9] Image of a Neuron form website http://transductions.net/ 2010/02/04/313/neurons/ [10] About Artificial Neural Network from website http:// en.wikipedia.org/wiki/Artificial_neural_network
[11] RC Chakraborty, "Fundamentals of Neural Networks", myreaders.info/html/artificial_intelligence.html, June 01, 2010.
[12] Prof. Leslie Smith, "An Introduction to Neural Networks", University of Stirling., 1996, 98, 2001, 2003.
[13] Prof. Dr. Eduardo Gasca A., "Artificial Neural Networks", Toluca
[14] Kishan Mehrotra, Chilukuri K Mohan and Sanjay Ranka "Elements of artificial neural network", 1996
[15]Weyiu Yi 339229, "Artificial Neural Networks", 2005.
[16]Vincent Cheung and Kevin Cannons, "An Introduction of Neural Networks", Manitoba, Canada, May 27, 2002.
[17]Howard Demuth and Mark Beale, "Neural Network Toolbox", with the help of metlab, user guide version 4.
[18]Girish Kumar Jha, "Artificial Neural Network and its Applications", IARI New Delhi.
[19] About Neural Network from website http://en.wikipedia.org / wiki/Neural_network.
[20] About Feed Back Network from website http://www.idsia.ch/ ~juergen/rnn.html.
[21] Sucharita Gopal, "Artificial Neural Networks for Spatial Data Analysis", Boston, 1988.

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