

Artificial Neural Networks in Human Life: Future Challenges and Its Applications

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Abstract- Artificial neural network is the combination of science and technology for making and using its best in future. It usually means using AI to understand human intelligence in the form of machine by the means of conceptual definition of Artificial intelligence, it is broadly characterized as the study of computations and machines which usually deals with reasoning, questioning, perception and its action. So basically this paper examines the brief introduction on ANN and history of ANN under AI, its existing application and its ideas with the implementation.

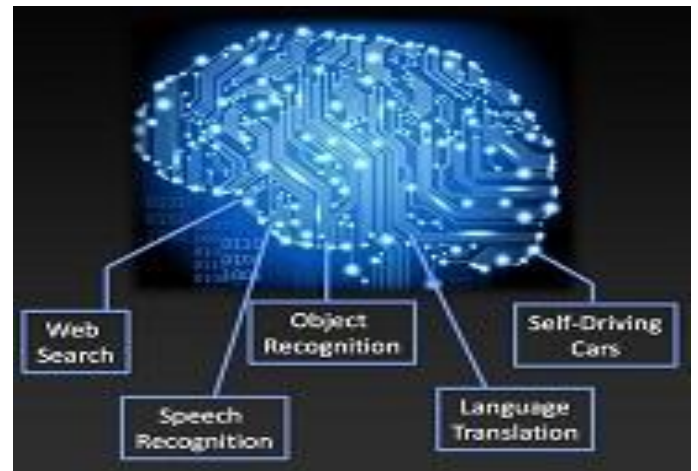
information processing system. It is composed of a large number of neurons working in together to solve special problem. ANNs are like people or Person they learn by experience. According to Michael Moser of the University of Colorado^a, The neural network is structured to perform non-linear Bayesian classification".

Introduction:

Eventually, intelligent agents will replace or intensify human capabilities in many areas. Artificial Neural Networks is a subordinate of artificial Intelligence which are also called intelligent agents in field of computer science.

Artificial Neural Networks are computing system influenced by the biological neural networks here it uses artificial neurons. Here we are going to discuss about the application of neural networks in Human life like medical, transportation, education etc. We here would give some of ideas about the neural networks where they are used or can be used. An ANN is formed from hundreds of single units, artificial neurons which can be described as processing elements, connected with coefficients commonly named as weights, which constitute the neural structure and are organized according to layers

Here we will talk about neural network, we should more properly say "artificial neural network" (ANN). Artificial neural networks are computers whose architecture is designed after the human or animal brain. They generally consist of many hundreds of simple processing units which are connected together in a complicated communication network. Every node is a interpretation model of area life neuron which sends a fresh signal if it receives a sufficiently strong input signal from the other nodes from which it is connected Artificial Neural Network is information processing model that is inspired by how animal or human nervous system such as the mind processes the information. Most important element of this is the design of the



History:

In 1943, Warren McCulloch and Walter Pitts produced design of the neuron and is still in use in field of artificial neural networking. This design is broken into two parts i.e. a summation over weight inputs and an output function of the sum.

Why and Where to Use Neural Networks?

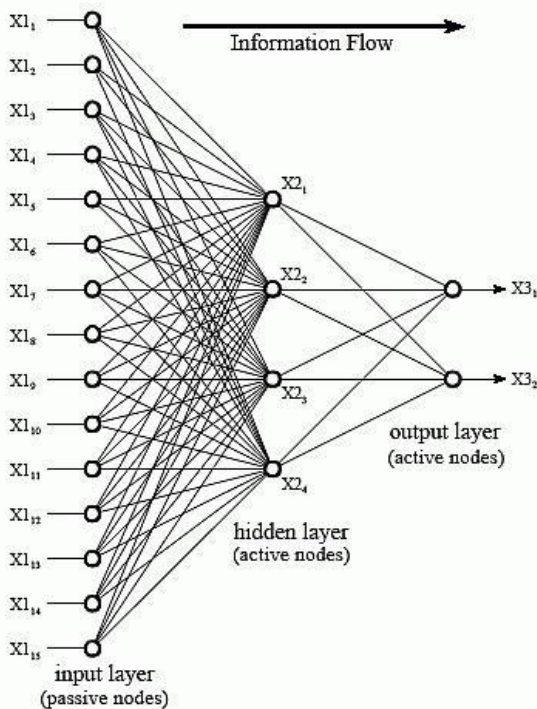
Neural Networks do have the ability to derive conclusions from typical and complicated data sets make them suitable for deriving patterns and directions that are very much complex to get noticed by human mind or by simple machines.

Architecture of Artificial Neural Networks:

Over a period of time, there have been different varieties of neural networks structures like as we know some are usually based on what normally people sees under the microscope and some what they usually observe by applying

mathematical algorithms and derivations. The frequently used structure is shown. This neural network is made by combing three layers, commonly known as the input layer, hidden layer, and output layer. Each of these layers consists of one or more than one nodes, represented by the diagram on the right by the circles. The lines depict how messages travel from one of the node to the next node. In this model of neural networks, the message flows from the inputs to the output i.e. from left to right. Other types of neural networks have more fancy connections, such as feedback path.

These nodes of input layer are unflappable, meaning that they do not affect or change the given information. They receive a single and unique value on their input, and duplicate the value to



Their multiple outputs. In correlation, the nodes of both hidden and output layer are functioning. This means that they modify the given data as depicted. The variables X1-15 hold the data to be processed.

Every value of the input layer is copied or replicated and then sent to the hidden layer. This is called fully attached structure. As depicted, the values that are entering the hidden node are multiplied with the given or stored weights, a set of pre-cogitated numbers are already stored in the system. The weighted number then form as a single number. This is shown in the picture Σ . Before withdrawing from the node, this resulted sum has to pass through a given non-linear mathematical function commonly known as sigmoid.

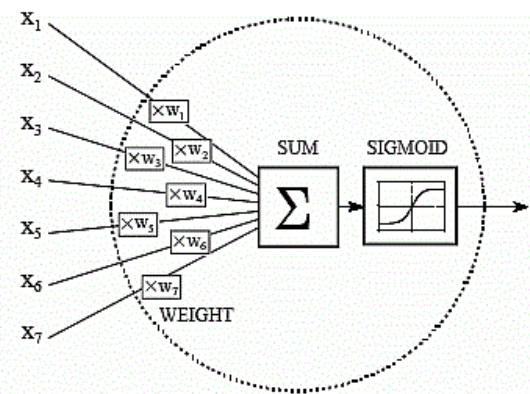
This is a 's' shaped flexure which is commonly used in system to bound the output of the resulting node i.e. value of the input to the sigmoid is between (-infinity) and (+infinity), its output values can only range and the output value is between zero and one (0 to 1).

Variables X21-24 are here used to depict its outputs of the hidden layer in the given flow diagram. As we saw before, each of these values are being duplicated and are the applied to the layer next to it. The activated nodes of the output layer combine together and modify the information to produce two output values of the network, X31 and 32.

Most of the application nowadays use this kind of three layered structure with a maximal of few hundreds of input nodes. In this Hidden layer is approximately about 16% as compared to the size of input layer. In the case of object detection, the output layer only requires only a single node. The output of the node is outset to provide positive or negative.

The outcome is that this kind of architecture is very easy and much generalized in nature. This particular flow diagram could be used by many problems, irrespective of their habits.

Within artificial neural network, the 100 samples are feed into the input layer, resulting in values coming out from the output layer. By selecting the appropriate weights, the output can be composed to report wide range of information. For instance, they might be the outputs for: Airplanes (True/False), birds (True/False), altitude bird (True/False) etc.



Applications:

In artificial neural networks, it is so vast that it has many different applications in different fields like as in computer science, biomedical engineering, aviation in electronic fields like PSS etc.

But nowadays ANN is more focussing in medical field especially in cancer and its treatment. There are many problems regarding this ANN. Earlier days, there were many problems which common people dealt in cancer treatments and its diagnostics, but ANN has reduced the burden of the cancer patients for their diagnosis of the Cancer mainly in mammographic cancer i.e. breast cancer.

(i) For mammographic diagnosis-

So now finally the day comes for the women who wouldn't be going for monthly check-ups and their exams for the diagnosis.

Through Machine Learning, it has introduced an ML-Algorithm in which the Algorithm is as follows like it will track the women's breast tissues temperature and it will analyse this data in the medical lab. Eventually, if it detects some change in pattern then technology will automatically going to alert the patient and thus the patient can make a schedule with her doctor. This technology is fully automated in cloud.

(ii) Diagnosing in Cardiovascular system-

By diagnosing the cardiovascular system through physiological measurements on the basis of daily routine from the patient. If this routine is carried out regularly, potential harmful medical conditions can be detected at an early stage and thus make the process of combating the disease much easier.

The main use of ANN is mainly focusing on the ability of sensing the fusion from several different sensors. ANN is so that advanced that it can detect the complex medical conditions.

Advantage-ANN in cardiovascular system that it can detect the heart disease quickly and painlessly and can detect the disease in early stage.

Of course, I am not saying that it will eliminate the need of doctors since a human expert is more reliable.

So, basically these are the main applications related to the medical diagnosis using ANN.

Now, there are also few and major applications of ANN in aviation and transportation.

Applications of Aviation and transportation.

Basically, as we all know that it is difficult to work without the use of expert system. So now the aviation department has also manage their work in the field of ANN.

We usually describes aviation in AI as AOD which is known as Air Operations Divisions.

The Application of AOD in the field of ANN are as follows:-

(I) The main application of AOD is that it is use for surrogate operators for combat and training simulators, mission management aids.

(ii) It is also used as support system for tactical decision making.

Ideas and its implementation

-In Aviation: Artificial Neural Network system can be fitted in with autopilot mode of airplanes which can be used to determine the altitude, air pressure, fuel consumption and many other factors these can be taken as the samples in input layer and can deduce the outcomes according to the previous outcomes which can reduce the load of pilot by switching of engines from time to time, by gaining altitude or reducing or it can alert the pilot of air pressure or storms.



-In Education: Artificial Neural Networks can be used to predict the future of student according to the performance report of the students. Artificial intelligence has played so much of important role that now in education field it is hard without AI to study and explore. The system of education is changing every day. Likewise every technology artificial intelligence in educated made a valuable contribution towards the world. So in schools, colleges or any other institutions, there should be first proper teaching on artificial intelligence so that children can learn the basic idea of that and thus can implement their newly brain for the upcoming future challenges.

In medical- As we know that time can heal everything, so did the medicines for the diseases. So ANN has played so important role that because of it there hardly would have been any growth in thus field. Artificial intelligence has discovered so many ways for those major diseases that was hardly to cure in ancient time. So, here in our paper our idea to contribute is that, now for curing every diseases there

should be a use of computational technology, again we are not saying human is not reliable but for the precision and accuracy of that curing of disease we should start implementing on AI more.

In Ballet Voting System-Countries like United States of America(U.S.A.) have a voting system which have different weights for different people known as popular voters or popular votes in this we can use ANN system to analyse the results and can help in future Elections. This can be done using a single ballet of an area and taking its voters as inputs and their popularity as weights.

Conclusion-

So from our review paper, we examined the importance of the artificial neural networks in the major field of Artificial intelligence .We all know that AI is the combination of science and engineering, it is basically the study of computational machines to analyse the perceptions, sensing, and the action of the human behaviour.

At the end, we concluded with the brief idea of AI how it is used and thus implemented for the future challenges. This is not the end of the ANN, many more challenges to come to face, perhaps who knows what AI can do for the better world and society.

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