Abstract

**Research Article** 

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# CAPABILITIES OF COMPUTER ALGORITHM LIKE HUMAN BRAIN UTILIZING ARTIFICIAL NEURAL NETWORKS: A TASK

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#### I. INTRODUCTION

Input and output appear to be how computer algorithms work. We take input and apply each step of the algorithms to it in order to get an output. The input leads to progress and questions that must be addressed in a timely manner. The output is the created result when each stage of the flowchart has been completed. The Central Processing Unit (CPU) is the computer's brain. A CPU accepts data, executes instructions, and interprets information, and we can conceive of it as a decisionmaker similar to the human brain. The context of real-world situations is interpreted in a way that computers cannot. Neural Networks are being developed to address the problem. They are a series of algorithms that have been designed to recognize patterns and are modeled after the human brain. They use machine perception, tagging, and raw data creation to interpret sensory neurons. ANN is the answer to making communications more human-like and allowing ANN to reason like humans. It was inspired by the evolution of the brain. A computer architecture in which many processors connect neurons in a human brain, allowing it to learn by processing one item in another until it succeeds. The brain's interconnected cells act similarly to computer-programmed Artificial Neural Networks.

The artificial neural network is a simple mathematical model that deals with nonlinear input-output interactions. It's a computer architecture in which many processors connect neurons in a human brain, allowing it to learn through trial and error. As a result, ANNs can handle a wide range of data and generalize to predict what will happen.

Artificial Neural Networks are utilized for a variety of activities, including classification. You can gather image datasets from several dog breeds, train a neural network on the image, then present a fresh photo of the dog and provide a statistical score on how closely the new concept matches the model? It will also tell you what breed of dog the photograph is. Neural Networks are also employed in self-driving cars, character recognition, image compression, stock market prediction, and a variety of other cutting-edge applications.

Artificial Neural Networks have existed since the 1940s, but they have never performed well. Because of the undefined result, no other model can come near to it. They become powerful and are one of the most popular machine learning models, and they become a part of artificial intelligence. The goal of this study is to explain what an artificial neural network is. Accept that the opportunities and challenges that we confront in 4IR are numerous and complicated. Some of the 4IR technologies include robotics and artificial intelligence. The foundations of Artificial Intelligence Are Artificial Neural Networks (AI).

#### **II. RELATED LITERATURE**

According to Wankar (2014), Artificial Neural Networks have properties such as the computer's system unit being connected to the input device, processor, and output device, in the same way that the input, hidden, and output layers are components of neural networks.

According to Kumar (2017) defines a neural network as a state that provides information or signal processing in conjunction with a mathematical model based on biological neural networks. Artificial neural networks are well-known for their use of iterative algorithms to build networks, feedbacks, and dendrites that can operate in both supervised and unsupervised modes in interconnected neurons, providing an interesting option for complicated problem solving and other uses. Researchers from various disciplines have created artificial neural networks to address difficulties such as pattern recognition, prediction, and optimization.

According to Sannaki (2016), the Artificial Neural Network is a crucial tool for modeling information processing capacities in the artificial nervous system, which is used in cognitive science. An artificial neural network (ANN) is a type of computer algorithm that can learn via practice. They are ideally suited for modeling complex and non-linear processes because of this property. They've progressed to the point where they can reason and act like humans.

## **III. RESEARCH METHODOLOGY**

### **Computer Architecture of Neural Networks.**

There are two sorts of methodologies that are employed in the implementation of Neural Networks. Simulation using standard computer software. In terms of time execution, this is a unique solution of hardware. Neural networks comprising processing units and weights will be simulated using traditional computer software. Voice recognition, image recognition, and so on are examples of such technologies.

High-performance Neural Networks hardware will become crucial and required for practical operations when Neural Networks Algorithms grow with 1000's of neurons and 10000's of synapses. A graphics processing unit, for example, is used in deep learning algorithms for object recognition, image categorization, and other tasks.

When a data piece travels across the edges of a Neural Network, the connection per second number measures the implementation's performance. The learning algorithm's performance in connection updates per second as measured by the learning algorithm (CUPS).

#### **IV. FINDINGS AND DISCUSSION**`

#### A. Result

Artificial neural networks are the most important machine learning tools. Artificial Neural Networks are brain-inspired systems that tend to learn in the same way as humans do. In the Artificial Neural Network, the input, hidden, and output layers are critical components that transform raw data into something that the output layer can use.



## **EXAMPLE OF A NEURAL NETWORK**

Artificial neural networks have the potential to learn, which makes them extremely strong and useful for a variety of applications. It is a component of a computing architecture that stimulates the human brain's ability to analyze and process information. It is the process through which a biological neuron functions by accumulating the values of the inputs it receives.

If it exceeds the threshold, it sends its signal to its output, where it is received by other neurons, and this is known as a feedforward network. Feedforward neural networks were created by ANN as the first and most basic type of network. The procedure only works in one way, from an input node to the output nodes, passing through hidden nodes. There are no feedback links or loops in the network in the example described. In a neural network, a cell is a node in the sensory input layer that receives sensory information.

To fully comprehend an Artificial Neural Network, one needs go beyond what it has done incorrectly and what it is doing correctly, which is referred to as feedback. It's how we figure out what went wrong and what went correctly, and it's also important for ANNs to understand. It's at this point that you'll notice parallels with the human brain.

If you want to learn volleyball, hit the ball hard enough and it will go outside the court, costing you points. However, if you hit it far enough over the net and onto the opposing side of the court, you can score a point. It's a classic form of feedback in which you either loose or gain points. And it is via this process that we learn what we are doing well or incorrectly. It's what a neural network must understand.

Backpropagation is a feedback technique used by neural networks to learn in the same way that the human brain does. It is, often known as training feedforward neural networks, is a frequently used method. It's a comparison of the output of the Networks to produce utilizing the difference in the number of neurons in the network, working backwards from the result in the artificial neural network, through the hidden neurons, to the input layer. Backpropagation is a method for calculating the gradient for each weight in a neural network model.

Artificial Neurons are a basic unit whose mathematical function models biological neurons and neural networks. It takes multiple inputs and combines them to create an output. Supervised Learning is a sort of artificial neural network that labels data in datasets. Through supervised learning, a supervisory signal has two inputs and the intended output value. Unsupervised learning is a technique for extracting inferences from datasets containing unlabeled input data. Because the world has so much unlabeled data, it makes sense if there is a lot of money in unsupervised learning/knowledge. Cluster analysis is the most frequent unsupervised learning method for determining the number of hidden neurons or groupings of data in exploratory data analysis.

Artificial Neural Networks are an alternative to traditional programmed computing that is based on the brain's activity. Their generalization capability, particularly the ability to handle unseen input, is most likely dependent on their generalization capability. This time, the ability of ANNs to generate output or make judgments is being compared to that of the human brain. We must also analyze the benefits and drawbacks of ANN.

## **Advantages of Artificial Neural Networks**

According to Mijwill, M.M., Information stored across the entire network is similar to that found in traditional programming. The network continues to function despite the absence of a few pieces of information in one location. When an ANN is trained, the data may produce outputs with partial information. The impact of the missing data on performance is determined by its importance.

- 1. Have a fault-tolerance attitude. The ANN will continue to generate output even if one or more cells are corrupted. This characteristic allows networks to be fault-tolerant.
- 2. Make use of a distributed memory system. In order for an ANN to learn, the example must be determined and the network must be taught according to the intended output by displaying it to the networks. The success of the network is directly proportional to the instances chosen, although it cannot exhibit to the networks in all respects, and the networks can provide erroneous output.

#### Gradual corruption:

1. Over time, the network slows down and degrades in quality. The problem with the network does not appear to be corroding right away.

- 2. Machine learning's capability. It can make decisions and learn events from Artificial Networks by looking at the same process.
- 3. Parallel processing capability. An artificial neural network has the computational power to do multiple tasks at once.

## **Disadvantages of Artificial Neural Networks**

According to Mijwil, Maad, the downside of the Artificial Neural Network, is that it is hardware dependent. Because of its nature, Artificial Neural Networks require processors that can process data in parallel. As a result, the equipment's realization is conditional.

**Unexplained behavior of the network.** It is ANN's most important problem. It won't give you any hints as to why. How? It solves the network's problems.

**Determination of network structure**. Network structure is determined. In determining the structures, there is no specific rule. The proper network structures are discovered by trial and error.

**Unknown duration of the network**. If the sample error is reduced to a particular error, the training is complete. This value does not get the best outcomes.

## B. Discussion

ANNs are fast developing in our daily lives and current circumstances, and they are constantly testing and evaluating their benefits and difficulties encountered during use. Never forget that the problems of ANN networks, which are still a new science field, are being eliminated one by one as their benefits grow by the day.

Artificial Neural Networks are a mathematical model that simulates the structure and functionality of biological neural networks. Artificial neural networks are a form of computer algorithm model in which a large number of non-linear processing elements are aligned in parallel networks.

Artificial neural networks, in other words, will become a necessary component of our daily life.

## V. CONCLUSION AND FURTHER RESEARCH

Artificial Neural Networks are computer algorithms that mimic the human brain for a non-spatial continuum that measures in terms of events that follow one another from past to present to future. Artificial Neural Networks, like humans, learn by doing They're well-suited for simulating complex and non-linear processes because of this property. In biological systems, learning affects synaptic connections between neurons. Artificial Neural Networks are a mathematical model that mimics the structure and functionality of biological neural networks.

Artificial neural networks (ANNs) have advanced to the point where they can compute and act like humans. Artificial neural networks are a form of computer algorithm model in which a large number of nonlinear processing elements are aligned in parallel networks. These are the foundations of current biological nervous system knowledge that have shown to be useful in pattern or sequence recognition difficulties in the current situation.

An artificial neural network (ANN) is a computer program that simulates how human brains make decisions. The key to ANN perfection will be continual evaluation and testing.

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