IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 10, October 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

9940 572 462 | 6381 907 438 | ijircce@gmail.com | www.ijircce.com

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 || A Monthly Peer Reviewed & Referred Journal |

|| Volume 11, Issue 10, October 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1110024 |

A New Method Analysis of Artificial Neural Network Techniques for Appreciation and Audible Warning

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ABSTRACT: An artificial neural network (ANN) is a computational model inspired by the brain. It is composed of a large number of interconnected processing nodes, or neurons, that work together to solve specific problems.ANNs are used to predict future events, recognize patterns, and make decisions. They are often used in tasks that are too difficult for traditional computer systems, such as image recognition and speech recognition. Compared to the brain, ANNs have a number of advantages.
They can process enormous amounts of data much faster than the brain, and they are not limited by Short-Term Memory. In addition, Artificial Neural Networks can be designed to be fault-tolerant, meaning that they can continue to function even if some of their neurons are damaged or destroyed.
Despite these advantages, ANNs still have a number of limitations. They can be difficult to design and train, and they often require a large amount of data to be effective. Additionally, ANNs can be biased by the data they are trained on, which can lead to inaccurate results.

KEYWORDS-artificial neural network, appreciation,audible,warning,analysis

I. INTRODUCTION

The artificial neural network (ANN) is a computational model of the brain that was first proposed in the early 1940s. This model was inspired by the work of neuroscientists who were studying how information is processed in the brain. The first ANN was created by Warren McCulloch and Walter Pitts, who published a paper titled "A Logical Calculus of the Ideas Immanent in Nervous Activity" in 1943.
In this paper, McCulloch and Pitts showed how a simple neural network could be used to perform Boolean logic operations. This work laid the foundation for future research on artificial neural networks.[1]
In the 1950s, pioneering work on artificial intelligence (AI) led to further progress on Artificial Neural Networks. One important contribution came from Marvin Minsky and Seymour Papert, who showed that certain types of neural networks could not be used to solve certain types of problems. Despite these limitations, however, neural networks continued to be developed for AI applications.
In the 1980s, research on neural networks experienced a resurgence, thanks to advances in computer technology that made it possible to train large networks with many hidden layers. Today, Artificial Neural Networks are used for a variety of tasks, including facial recognition, handwriting recognition, and machine translation.

Artificial neural networks (ANNs) are computational models inspired by the brain. They are used to recognize patterns, classify data, and make predictions. There are three main types of ANNs: supervised learning, unsupervised learning, and reinforcement learning.

- Supervised learning algorithms are trained using labeled data. They learn to map input data to output labels.
- Unsupervised learning algorithms are trained using unlabeled data. They learn to group together similar data points without any guidance.
- Reinforcement learning algorithms are trained using a reinforcement signal. They learn to take actions that maximize a reward. Artificial Neural Networks can be used for a variety of tasks, such as image classification, object detection, and natural language processing.

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Artificial Neural Networks, or ANNs, are computer systems that are designed to simulate the way that the human brain learns and processes information. Neural networks are composed of a series of interconnected processing nodes, or neurons, that can recognize patterns of input data. When an ANN is presented with a new piece of data, it will attempt to find similarities with existing patterns that have been stored in its memory.[2]
If a match is found, the ANN will output the associated actions or results. If no match is found, the ANN will modify its internal connections in an attempt to learn from the new data and improve its ability to recognize similar patterns in the future.
This process of learning through trial and error is known as training the network. Once an Artificial Neural Network (ANN) has been trained, it can be used to make predictions or decisions based on new inputs. For example, an ANN could be used to identify objects in digital images or control a robotic arm.

Artificial neural networks, commonly referred to as ANNs, are a type of artificial intelligence that is modeled after the biological neural networks found in the brain. ANNs are capable of learning and making predictions based on data, which makes them well-suited for tasks such as image recognition, pattern recognition, and classification.

- Some of the key advantages of ANNs include their ability to learn from data, their ability to make predictions based on data, and their flexibility.
- As compared to other types of A.I., such as rule-based systems, Artificial Neural Networks are able to learn from past existing data and make the right predictions without being explicitly programmed to do so.
- This allows them to be more flexible and adaptable to changes in data.
- Additionally, because they are able to learn from data, ANNs can be trained on smaller datasets than other types of artificial intelligence.
- This is important because it means that ANNs can be used in situations where there is limited data available.
- Lastly, because they are flexible and able to learn from data, Artificial Neural Networks (ANN) can be easily deployed in a variety of different environments.

Artificial Neural Networks (ANN) are computational models that are inspired by the brain and can be used for tasks such as classification, prediction, and optimization. In general, an ANN consists of a set of input nodes, a set of hidden nodes, and a set of output nodes. The nodes are connected by a set of weights, and each node produces an activation value that is fed into the next node. When training an ANN, the weights are adjusted so that the model can learn to map inputs to outputs.Once trained, an Artificial Neural Network (ANN) can be used for tasks such as pattern recognition and data classification. In recent years, ANNs have been applied to a wide range of tasks such as image recognition, natural language processing, and drug design. As research continues to improve the accuracy and efficiency of these models, it is likely that their applications will continue to grow.[3]

II. DISCUSSION

Artificial neural networks (ANNs) are computational models that are inspired by the structure and function of biological neural networks. These models are used to discern patterns in data, and they have been applied to a wide range of tasks such as image classification, language translation, and predictive modeling.In recent years, ANNs have seen a surge in popularity due to advances in computing power and data storage capabilities. As a result, ANNs are now being used for more complex tasks such as facial recognition and autonomous driving. Looking to the future, it is clear that ANNs will continue to play an important role in artificial intelligence applications.As data sets become larger and more complex, ANNs will become increasingly essential for extracting useful information. Furthermore, Artificial Neural networks will become more efficient as research continues to develop new ways to train these models. Ultimately, the future of ANNs is shrouded in potential, and it is safe to say that these computational models will continue to revolutionize the field of AI.

Artificial neural network is one of the most popular machine learning (ML) algorithms that is inspired by the structure and function of the brain. Like other machine learning algorithms, ANNs can be used to learn from data. And then make the ideal predictions about future events. However, there are several key ways in which ANNs differ from other types of algorithms.

- One key difference is that ANNs are designed to work with data that is unstructured or partially structured.[4]
- This makes them well-suited for tasks such as image recognition, where the data is not easily converted into a tabular format.

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- Additionally, Artificial Neural Networks are capable of learning complex non-linear relationships between input and output variables.
- This makes them more powerful than linear models, which can only learn simple linear relationships.
- Finally, ANNs are also much more scalable than other types of algorithms. This means that they can be used to train large models with billions of parameters without running into computational issues.

As a result, ANNs have become one of the most popular types of machine learning algorithms in recent years.

There are many real-world examples of artificial neural networks in use today. One common example is facial recognition technology, which uses ANNs to identify individuals from a database of images. Another example is Autonomous vehicles, which use Artificial Neural Networks to process data from sensors and make decisions about how to navigate their surroundings.ANNs are also used in weather forecasting, image processing, and fraud detection. As these examples show, artificial neural networks are capable of solving a wide variety of problems.As computing power and data storage continue to become cheaper and more accessible, it is likely that ANNs will be increasingly used in the future to solve complex problems.

An artificial neural network is a computational model that is inspired by the way the brain processes information. The key components of an artificial neural network are neurons, which are interconnected and can transmit information to each other. The strength of the connection between neurons is known as a weight, and these weights can be adjusted in order to learn new information.In order to function properly, an artificial neural network needs a large amount of data in order to learn from. This data is typically fed into the neural network in the form of training examples, and the neural network will adjust its weights in order to try to learn the correct output for each example.Once the neural network has been trained, it can be used to make predictions on new data. Artificial neural networks have been used for a variety of tasks, including image recognition and machine translation.[5]

Adaptive Resonance Theory, or ART, is a neural network model proposed by Dr. Stephen Grossberg in the 1980s. The theory is based on the idea that the brain uses a process called resonance to match incoming sensory information with stored memories. This process allows us to recognize patterns and make predictions about the future.The ART model consists of two layers of neurons: the input layer, which receives sensory information, and the output layer, which stores memories. The output layer is divided into two groups: the match neurons, which store memories that match the current input, and the mismatch neurons, which store memories that do not match the current input.When a new input is presented, the match neurons will fire if they contain a memory that matches the input. If no match is found, the mismatch neurons will fire instead. The mismatch neurons will then activate the search process, which will look for a match in the input layer.If a match is found, it will be stored in the output layer as a new memory. If no match is found, the original memory will be updated to include the new input. The ART model has been used to simulate a variety of cognitive processes, including pattern recognition, short-term memory, long-term memory, and decision-making.[6]

III. RESULT

Artificial neural networks are computational models inspired by the biological nervous systems. They are used to recognize patterns, learn from data, and make predictions. Neural networks are made from a number of different interconnected processing nodes, (also known as neurons). It can range in complexity from a single artificial neuron to a network of many layers.Neural networks can be supervised or unsupervised. Supervised neural networks learn from training data that has been labeled with the correct answers. In contrast, unsupervised neural networks learn from data that is not labeled. Unsupervised learning is more challenging than supervised learning because the neural network must discover the underlying structure of the data on its own.However, unsupervised learning can be more powerful because it can identify complex patterns that may be difficult to find using other methods. There are many different types of unsupervised neural networks, but they all share the same goal of finding hidden patterns in data.[7]

There are many different algorithms and techniques used in unsupervised artificial neural networks, each with its own strengths and weaknesses. Some of the most popular algorithms include support vector machines (SVMs), deep learning, and multilayer perceptron (MLP).Support vector machines are able to effectively find patterns in data, even when there is a lot of noise. Deep learning is well suited for discovering complex patterns but requires a large amount of data to be effective. Multilayer perceptron is fast and can learn non-linear relationships, but is limited in the depth of the patterns it can detect.Each of these algorithms has its own pros and cons; it is necessary to select the right one for

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your work. Ultimately, the best algorithm for Artificial Neural Networks is the one that can find the desired patterns in the data while being computationally efficient.

Artificial Neural Networks are composed of a large number of interconnected processing nodes, and can be used to model complex nonlinear relationships. The structure and weights of the connections between nodes are determined by a learning algorithm that is "trained" on data. Artificial Neural Networks (ANN) have been successfully used in many different applications, including pattern recognition, prediction, control systems, and identification. In general, ANNs perform better than traditional linear models for tasks such as these because they can capture more information about the problem domain.[8]

Artificial neural networks (ANNs) consist of input, hidden, and output layers with connected neurons (nodes) to simulate the human brain. The existing nodes process and transmit input signals to the next nodes [1]. ANNs are nonlinear models to classify complicated relationships. Recently, ANNs have become the focus of attention for many researchers in various fields, due to the development of data (i.e., big data and cloud computing). The use of ANN aids in improving the traditional methods of finding the optimal solutions, as well as utilization of the BP-ANN to predict efficient solutions with the lowest costs and to avoid potential problems. This work has highlighted using ANN and BP-ANN in different applications in the engineering field. Also, it focused on the benefits of ANNs, which allows it to be used to solve various problems in different fields in the future. ANN is a biological activity-based network which is suitable for classifying biomedical signals. There are several advantages to using ANN-based ML algorithms, such as their self-adaptive nature, they are fast, accurate, and handle nonlinearities. ANN is also scalable and robust against noisy data. ANN is applicable to the ECG signal due to its main advantages being (1) the ECG signal is nonlinear by nature and ANN handles nonlinearities using different activation functions; (2) ECG signals have lower frequencies and ANN have an adaptive model for lower frequencies; and (3) the ECG signal has time varying and nonlinear noises and the ANN removes these noises.[9]

However, the ANN has several issues regarding its implementation like (1) ANN requires a sufficient set of data for training and validation purposes; (2) ANN may not provide a global optimal solution for the 12-lead ECG classification; and (3) the classification results using ANN depend on the selection of number of neurons.
There have been many algorithms proposed based on ANN for the ECG signal classification. In [10], a block-based ANN is proposed for the ECG signal classification. A robust and generic ANN-based algorithm for classifying the ECG signal has been proposed in [16]. The Recurrent Neural Network (RNN) is combined with an Eigen vector-based method in [17]. In these, the Physiobank database is analyzed for classifying four types of ECG beats. The two classifiers-based RNN is proposed in [18] for the detection of heartbeats.

Recently, deep neural networks (DNN)-based classification has been used by many researchers. In [19], DNN-based active classification of ECG signals was proposed using learning and interaction phases. A deep convolutional neural network (CNN)-based nine-layer model was proposed in [9,10] for identifying five categories of heartbeats present in ECG signals. A DNN model architecture was proposed in [8,9] using a CNN and recurrent network. The device's independent and interpatient ECG arrhythmia classification method was developed.

A 1D-convolutional ANN model was proposed in [7,8] for the cardiac arrhythmia detection of ECG signals. Deep CNN-based arrhythmia detection technique was used in [6,7]. A CNN algorithm is proposed in [5,6] for detection of myocardial infarction (MI) from the ECG signals. They achieved 93.53% accuracy with noise present in the signal. RNN is used in [4,5] to find the beat from the ECG. The global and updatable ECG beat classification is obtained from the RNN which is based on morphological and temporal information.

IV. CONCLUSION

Perceiving a person's feeling has consistently been an intriguing task for everyone. These feelings can be expressed through facial expressions, speech, actions, and so forth. The most widely used form of communication is through speech. Speech is an elaborated form of communication constituting various details. These details provide several information such as the abstract of the message, tone of the speaker, language used, background noise, any form of musical sound, emotions, etc. The significance of speech emotion recognition technology is getting mainstream with the advancement of "Voice User Interface" technology.[3,4] This technology makes it possible for computers to interact with humans by applying speech analysis to understand the instructions given by a person and perform the

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required tasks and commands. There is always an emotion attached to a piece of speech while communicating but recognizing this emotion is a complex job in the research field.[2,3] This is mainly because the way emotions are perceived from an audio differs from person to person. I have created two models for speech emotion recognition. I have used Mel Frequency Cepstral Coefficient (MFCC) for feature extraction from the audio files. The first model has been created using Multi-Layer Perceptron (MLP) classifier which gave an accuracy 57.29 percent. The second model was created Long Short-Term Memory (LSTM) and gave a good accuracy of 92.88. I have made use of RAVDESS dataset for classification purpose.[1,2]

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Impact Factor: 8.379

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