

Neural networks term paper examples

[Technology](#), [Internet](#)



Introduction

Neural Network, or most commonly known as “ Artificial Neural Network” is an information processing pattern which are comprised of multiple processors and influenced by how the nervous system processes information. The processors or units, as many researchers would call them, are linked by communication channels and carry numeric data that are acquired by our brain and senses in many different ways. The units function only with the local data acquired and with the information that they have from the connection. It is said that a Neural Network (ANN) learns via examples, just like humans and is capable of handling processes precisely. A Neural Network needs a learning process, something that they can be good at, like classifying data, recognizing models, reading texts and many more. The idea of Neural Network was formed from the hopes of producing artificial systems that would be competent and smart enough to compute, think and behave like a human brain and probably to give us a better understanding of the human brain. Sufficient training is required to determine the weight of connections depending on the foundation of data. Basically, a Neural Network may showcase a qualification for stereotyping data without referring to the ‘ training’ data used, so therefore, the NN can produce new and accurate results after the ‘ training’ period is said to be done.

A lot of NN books have never been accurate about the definition of Neural Network, but here are some that may enlighten anyone and give an idea about what Neural Network is.

A neural network is a system composed of many simple processing elements operating in parallel dimensions whose functional quality is determined by

network structure, connection strengths, and the processing performed at computing elements or nodes (DARPA Neural Network Study, 1988). Artificial neural systems, or neural networks, are physically cellular systems, which can acquire, store, and utilize experiential knowledge (Zurada, 1992). A neural network is a massively parallel distributed processor that has a natural propensity for strong experiential knowledge and making it available for use. It resembles the brain in two ways: 1. Knowledge is acquired by a network through a learning process. 2. Interneuron connection strengths known as synaptic weights are used to store knowledge (Haykin, 1994). Neural Networks employs a different computing paradigm: von Neumann machines are based on the processing or memory abstraction of human information processing and neural networks are based on the parallel architecture of animal brains. Neural networks are multiprocessor systems that can process elements, has a high level of interconnection, basic scalar messages, adaptive interaction between elements. A neuron in our body may handle over ten thousand various inputs and could send outputs to a lot more of neurons. Basically, neurons are connected in a three dimensional model. Real brains are more complex than any artificial neural network so far considered, and thus cannot be compared side by side with any advanced neural networks, at least at this point (Leslie Smith, 1996).

Computational Intelligence

Neural networks can compute basically almost anything that can be computed and can perform as well as a normal computer can. NNs use overseen learning, and with this, one must provide a legit training data with an input and your desired output or results. But in order for the training to be

complete and successful, one must invest a lot of training data and a lot of time. NNs are practically used for classification and approximation problems, which can be easily learned but has hard rules and are therefore not easily actionable. While standard computers compute and solve problems by following instructions or an algorithmic approach, a neural network computes and solves in a way similar to how a human brain does. Standard computers have the tendency to not solve a problem when the distinct steps that are needed to solve it are not encoded properly in its system. This problem limits the computers' capability of solving a problem, and thus, will stick to solving problems that humans already know how figure out. On the other hand, neural networks cannot be programmed to accomplish and solve a specific problem. NNs learn by example and the connected neurons work together to solve a case. The only thing that is different about NNs is that it can compute and solve problems and computations by itself but the operation or the procedural steps on how NNs solved the case will remain unread.

Average computers and neural networks correlate each other. Choosing to use either a conventional computing device such as a computer or a more advanced neural network depends on the tasks or problems at hand.

Why would we use neural networks?

Neural networks can be used to educe patterns and determine sophisticated trends that would be too intricate for a human brain or a standard computer to notice. The NNs eccentric ability to understand complicated data would make it easier for the humans to decipher a problem. If a neural network has been trained well, it can be considered to be an expert in its field of information and could be used to afford answers to ' what if' questions and

also, to figure out new scenes or problems. Neural networks operate and learn via adaptive learning and may function well like a human brain, provided it has been given enough and precise training. It organizes the data that it gets during training on its own, and so the user would not have a problem arranging it by itself anymore. NN's computations could be carried out in a parallel manner via the hardware devices that are being designed and produced. The decimation of a network can lead to deterioration of rendition and performance but some of the network credentials can still be of use and preserved even with major network damage. Overall, neural networks work like the brain and it functions better than an algorithmic computer.

How do we use neural networks?

With the definition of neural networks, we can basically use it to cover up real world problems. We can use its capability of distinguishing trends. Therefore, they are better used for prediction essentials like target marketing, sales forecasting, data validation, customer research, risk management, etc. Neural networks have also been used to diagnose hepatitis, recover data from a defective software, interpretation of Chinese words that seem to have a lot of meanings, undersea mine unearthing, texture analysis, hand-written word recognition and facial recognition. Neural networks can also be used in the field of medicine, which would make process of conducting research easier. It is basically used for identifying diseases from varied scans such as CAT scans, ultrasonic scans, etc. and for modeling parts of the human body. It is also used to store a massive number of medical records with the information on symptoms, treatment and

diagnosis based on a specific case.

It can also be used in the field of business specifically in the area of accounting, resource allocation, and scheduling and financial breakdown.

Neural networks can also be practiced for database mining, to search for patterns potential within the definitive accumulated data in the database. In some ways, NNs can also be developed and applied into the field of marketing. Neural networks would have to be unified with AMT, also known as Airline Marketing Tactician, a computer system composed of different intelligent engineering expert systems, to be able to support the marketing constrain of airline seat allocations. The said application has escalated quickly and has been regularly updated since it was first developed.

Nowadays, it is being used to monitor and recommend booking advice for each departure. Such information can have a direct impact on the profitability of an airline and can provide a technological advantage for users of the system (Hutchison and Stephens, 1987).

Basically, a lot of research has been going on about neural networks worldwide. From essential research to a more productive and effectual literacy algorithms to networks that can react to chronological deviations of patterns to finding out new techniques on how to develop neural network chips. Unfortunately, producing a learning chip would make this technology face a whole set of new problems where the value of a standard computer and its software could not be justified. Neural networks can recognize a handwriting done on a tablet and translate it into an inputted text. It can also be used as speech and vision acknowledgment systems and it is now

actually being incorporated in toys, washing machines, televisions and a lot more of new technologies.

Conclusion

In summary, neural networks behave, work, and organize information much like how the human brain does. It has the ability to learn from experiences, from examples, and apply those learned skills into a prescribed task or exercise. It can be trained to execute a desired task in a more efficient and cost-productive way, which is actually the main rationale why computers were developed. It throws conventional computers which rely on sophisticated learning languages in order to operate out of the water, performance and cost-effectiveness wise. However, the problem with NNs is that they are still on their early stages of development and so enterprises that carry vital and confidential information cannot really rely on them just yet. For this reason, conventional computers, even though they still rely on computer programs and do not possess the ability to learn through examples and past experiences, still remain the mainstream choice not only by multinational enterprises that rely on computer assist for majority of their business operations but also for individuals who need light to moderate computing tasks. Additionally, the price to function ration is still too high to consider switching to a NN-based computer system. However, as more information about NNs become available and accessible to the developers and to the market, these problems would eventually go away. For now, all that Neural Networks or Artificial Neural Networks could offer is a promise that it would take the world of computing to a whole new level, a level much

higher than where the conventional computers brought humans in the information technology age.

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