



NEURAL NETWORKS THEORY, TECHNOLOGY, AND APPLICATIONS

PATRICK K SIMPSON

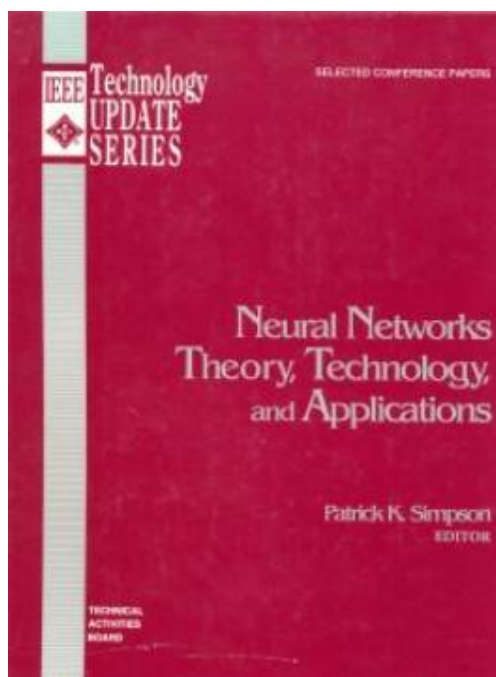


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A neural network is a network or circuit of neurons, or in a modern sense, an artificial neural network, composed of artificial neurons or nodes. Thus a neural network is either a biological neural network, made up of real biological neurons, or an artificial neural network, for solving artificial intelligence (AI) problems. The connections of the biological neuron are modeled as weights. A positive weight reflects an excitatory connection, while negative values mean inhibitory connections. All inputs

What is Artificial Neural Network Architecture, Applications and algorithms to perform Pattern Recognition, Fraud Detection and Deep Learning.

When Neural Networks are used with a fewer number of processing units and weights, software simulation is performed on the computer directly. E.g. , voice recognition, etc. When Neural Network Algorithms developed to the point where useful things can be done with 1000s of neurons and 10000s of synapses, high-performance Neural Networks hardware will become essential for practical operation. E.g., GPU (Graphical processing unit) in the case of Deep Learning algorithms in the event of object recognition, image classification, etc.

3 Neural Networks and Non-Gaussian Processes with Effective Field Theory. 4 Minimal Non-Gaussian Process Likelihoods with Wilsonian Renormalization. 5 Conclusions.

The relationship between asymptotic neural networks and Gaussian processes provides a strong hint towards a theoretical understanding of deep learning. Rather than considering a neural network to be determined by draws from a parameter space distribution, this perspective considers neural networks themselves as draws from a function space distribution. Now neural networks engineering is almost completely based on heuristics, almost no theory about network architecture choices. You can read about engineering method more in a works by prof. Billy Koen, especially "Discussion of the Method. Conducti..."

As to contemporary approaches to neural network theory promising is evolutionary physics -- you can dive in it starting with links from here: Why does Deep Learning work? But it is too early to have a definite formula for an answer about optimal numbers for optimal structures in a neural network architect. Continue Reading.

Now neural networks engineering is almost completely based on heuristics, almost no theory about network architecture choices. Applications of Neural Networks - Before studying the fields where ANN has been used extensively, we need to understand why ANN would be the preferred choice of application. It suggests that ANN has an interdisciplinary approach in its development and applications. Speech Recognition. Speech occupies a prominent role in human-human interaction. Therefore, it is natural for people to expect speech interfaces with computers. In the present era, for communication with machines, humans still need sophisticated languages which are difficult to learn and use. To ease this communication barrier, a simple solution could be, communication in a spoken language that is possible for the machine to understand.