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Neural Network & Applications- An Overview

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ABSTRACT
Models of the brain and nervous system for Highly parallel to the Process information much more like the brain than a serial computer like Learning and simple principles with complex behaviour as well Applications are powerful problem solvers and also used in biological models.

KEYWORDS: *Human brain, Behaviours, Nerv cells, Neuron*

Introduction: The human brain contains about 10 billion nerve cells (neurons), Each neuron is connected to the others through 10000 synapses and Properties of the brain. It can learn, reorganize itself from experience and it adapts to the environment.

It is robust and fault tolerant, A mathematical model to solve engineering problems. Group of highly connected neurons to realize compositions of non linear functions as in Tasks, Classification, Discrimination/Recognition, Prediction/Estimation with 2 types of networks like Feed forward Neural Networks and Recurrent Neural Networks.

Neural Networks: Feed Forward Neural Networks- The information is propagated from the inputs to the outputs and Computations of N_o non linear functions from n input variables by compositions of N_c algebraic functions with Time has no role (NO cycle between outputs and inputs).

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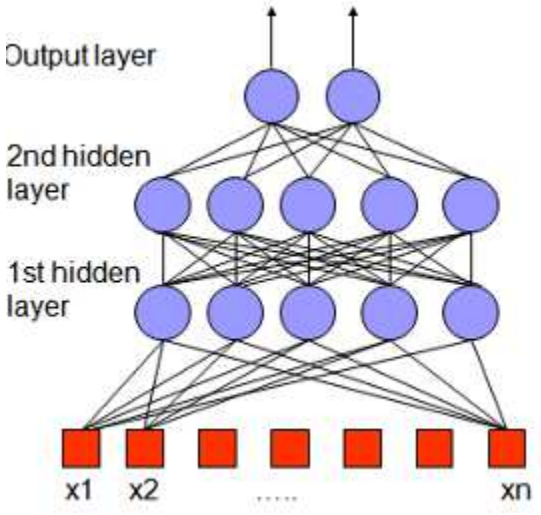

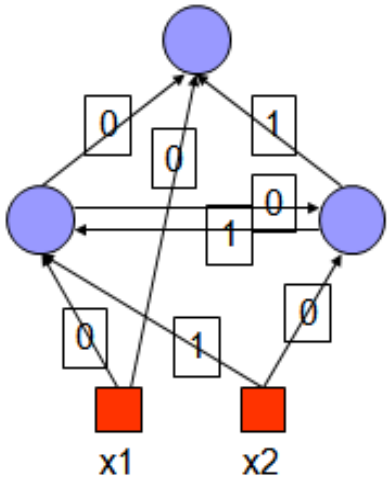

Recurrent Neural Networks- Can have arbitrary topologies and model systems with internal states (dynamic ones). Delays are associated to a specific weight and Training is more difficult. Performance may be problematic for Stable Outputs may be more difficult to evaluate and unexpected behavior (oscillation, chaos etc).

Classification: Class objects in defined categories with Rough decision OR Estimation of the probability for a certain object to belong to a specific class in used Data mining and Applications such as Economy, speech and patterns recognition, sociology, etc.

Classical neural architectures: Perceptron with Multi-Layer Perceptron and Radial Basis Function (RBF) Kohonen Features maps used in other other architectures such as Neural Networks (Applications). Face recognition, Time series prediction, Process identification, Process control, Optical character recognition and Adaptive filtering.

Supervised learning and task

The desired response of the neural network in function of particular inputs is well known. One may provide examples and teach the neural network how to fulfill a certain task.

Unsupervised learning

Idea for group typical input data on the basis of similarity and data clustering. No need of a professor for the network finds itself the correlations between the data for examples of such networks like Kohonen feature maps.

Conclusions:

Supervised networks are universal approximators (Non recurrent networks) and any limited function can be approximated by a neural network with a finite number of hidden neurons to an arbitrary precision. These are Linear approximators: for a given precision, the number of parameters grows exponentially with the number of variables (polynomials) and Non-linear approximators, the number of parameters grows linearly with the number of variables. Neural networks are utilized as statistical tools such as Adjust non linear functions to fulfill a task and Need of multiple and representative examples but fewer than in other methods with Neural networks enable to model complex static phenomena as well as dynamic ones. Representations of data have to be formulated as Training vectors must be statistically representative of the entire input space with Unsupervised techniques can help the use of The use of Neural Networks needs a good comprehension of the problem.

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