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Biomedical Seminar I
Artificial Neural Networks

Artificial Neural Networks is a powerful data modeling tool that is used to represent complex input/output relationships. The motivation for this new technology was to create an artificial system that is analogous to the brain in the sense that it could perform "intelligent" tasks.

Artificial Neural Networks mimic the brain in two respects:

1. Knowledge is acquired through a learning process called trial and error.
2. It's an interneuron connection strength known as synaptic weights are used to store the knowledge.
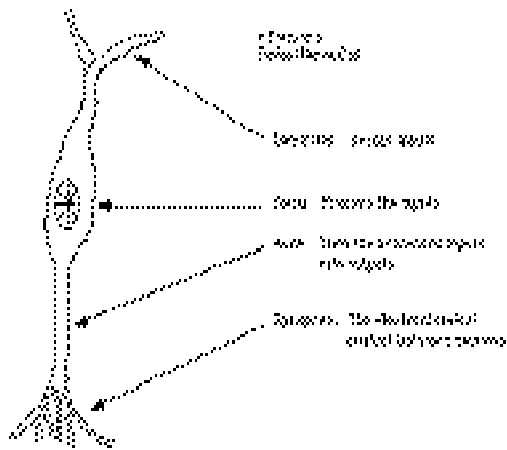
The human brain has 100 billion neurons in it. Inputs are accepted through the Dendrites and processed in the Soma. The Axon will process these inputs to outputs and the Synapses will send the outputs out of the neuron to other neurons that is connected too.

The basic structure of an Artificial Neural Network is:
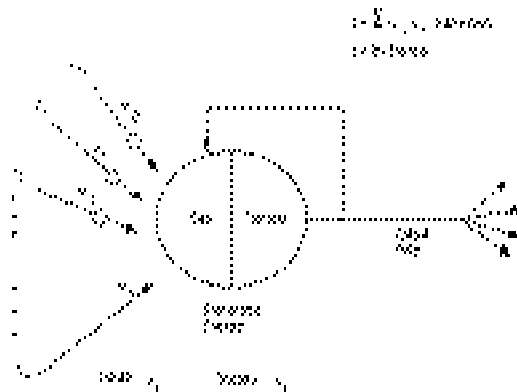
Here we have a set of inputs multiplied by a set of weights and those weights are then summed together and fed into a transfer function which will produce a desired output.

The transfer function is normally a sigmoid function, other common functions is the unit step and a linear function.

The weights that are multiplied by the inputs are what get adjusted when the network is getting trained to perform some task. The training requires many different input output models to feed into the neural network. This is accomplished by using a computer simulation program.

Sources:

*   http://www.dacs.dtic.mil/techs/neural/neural_ToC.html
*   http://www.neurosolutions.com/products/ns/whatisNN.html
*   http://www-cse.stanford.edu/classes/sophomore-college/projects-00/neural-networks/Files/neural_network_presentation.swf
*   http://www.doc.ic.ac.uk/~nd/surprise_96/journal/vol4/cs11/report.html#What%20is%20a%20Neural%20Network