

Artificial Neural Networks

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Artificial neural network is an attempt to duplicate many aspects of human creativity to produce newer systems self organized to form their own rules about what they experience. It is believed that all brain functions including creativity is originated from a collective of neurons. The artificial systems consist of a palette of neurobiological analog. The raw essential ingredients are artificial neurons (processing units) and synapses (connection weights) in addition to the elementary mix NOISE. Neural Networks require inputs to function that is a given network may represent a mathematical mapping between some set of inputs and a corresponding set of outputs. The inputs get vectored and then passed onto a cascaded system of neural network to activate a complex chain of associations. If a random disturbance or noise is introduced to the network through the connection weights, the network visits and compare a previously experienced occasions. If nothing is found in the network it will produce a new experience. The previous process is called virtual input effect. For instance, in the process of automobile body design the network will give dozens of late models. A low magnitude disturbance in the network allows the synapse to connect, which we see as a progression of body shapes the network has never before seen. As the number of disturbance increase, the network will produce a nonsensical shape. This network can be trained to map automobile performance characteristics to the

required design specifications. Training is a straight forward technique which requires exposing the network to examples of performance input as corresponding design outputs. Then the network will self organize to capture all the implicit rules of automobile design. The main advantage of the neural networks is their ability to recognize patterns in data. The network ability to generalize relationships from input patterns make them less sensitive to noisy data than other approaches. Their ability to present nonlinear relationships from patterns makes them well suited for a large variety of applications such as some industrial control system or financial forecasting.

