



The Role of Artificial Neural Network (ANN) in Artificial Intelligence (AI)

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An artificial neural network is a massively parallel distributed, adaptive system; having a natural property of storing experiential knowledge and making it available for use. Artificial Neural networks resemble the brain in two aspects:

- Knowledge is acquired by the network through its learning process
- Interneuron connection strengths are known as synaptic weights are used to store the knowledge.

The benefits of ANN includes nonlinearity, evidential response, adaptivity, robustness, massive parallelism, fault tolerance, input-output mapping, optimality, and so on. The architecture of it comprises connectivity, characteristics, and activities between the nodes. In general, we design a model with a specific architecture and learning algorithm with the consideration of problem definition. The example of various architecture are single-layer feedforward networks (e.g., Perceptron), multilayer feedforward networks (e.g., Multilayer Perceptron), recurrent networks (e.g., Hopfield network), lattice structures (e.g., Kohonen network), and permutation of above. The taxonomy of learning processes comprises of supervised, unsupervised, and reinforcement learning with the essence of various learning algorithms, such as error-correction, Boltzmann, Hebbian, and competitive learning.

Subsequently, ANN is a system of deep learning, which is a kind of machine learning, and machine learning is a subfield of AI. It refers to more data, bigger models with fast computation.

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