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According to the inventor of the first neurocomputer, Dr. Robert Hecht-Nielsen, Neural Network is “ a computing system made up of a number of simple, highly interconnected processing elements”. Those elements, similarly to 86 billion nerve cells in human brain called *neurons*, process the information (in a way similar to *axons)* by their dynamic state response to external inputs. The Artificial Neural Networks consists of multiple nodes, that utilize the inserted data to perform simple operations and pass their results to other neurons. Although the original goal of the approach was to solve the problems in a way inspired by human brain communication with the nervous system, over time it gave a way to performing specific tasks unrelated with very biology. The fields where NN are applied include medicine (e.g. cancer cells analysis), telecommunication (automated information services and image compression), software (i.e. pattern recognition in facial recognition) and military (e.g. target tracking and signal identification).

ANN were divided into three fundamentally different classes: recurrent (feedback) networks, as well as single and multilayer feedforward networks, which are the most common type of neural networks. Single layer network consists of two layers – input and output, which receive corresponding signals and activate the synaptic links, that in turn are responsible for carrying the weights between input and output neurons (one way only). Contrary to SLN, Multi-layered Feedback Networks implement hidden layers, which aim to perform the intermediary computation before heading to input or output layer. The input layer units (neurons) are linked to hidden layer neuron and transported weights are referred to as “input hidden layer weights”. However, if the problem requires mutual communication between I/O layers, the best solution is a recurrent network, which has the ability of (long-term) remembering the information in the hidden states. In the opposite to the above-mentioned topologies, RN possess their own internal memory, which is used to process the sequences of input. Unfortunately, using their potential requires years of experience in the AI field, as training the system may turn out to be exceptionally complicated. Moreover, feedback networks cannot be trained for large number of neurons and may face some scaling problems.