



FINTECH > AUTOMATED INVESTING

Neural Network

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What Is a Neural Network?

A neural network is a series of algorithms that endeavors to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. In this sense, neural networks refer to systems of neurons, either organic or artificial in nature.

Neural networks can adapt to changing input; so the network generates the best possible result without needing to redesign the output criteria. The concept of neural networks, which has its roots in [artificial intelligence](#), is swiftly gaining popularity in the development of [trading systems](#).

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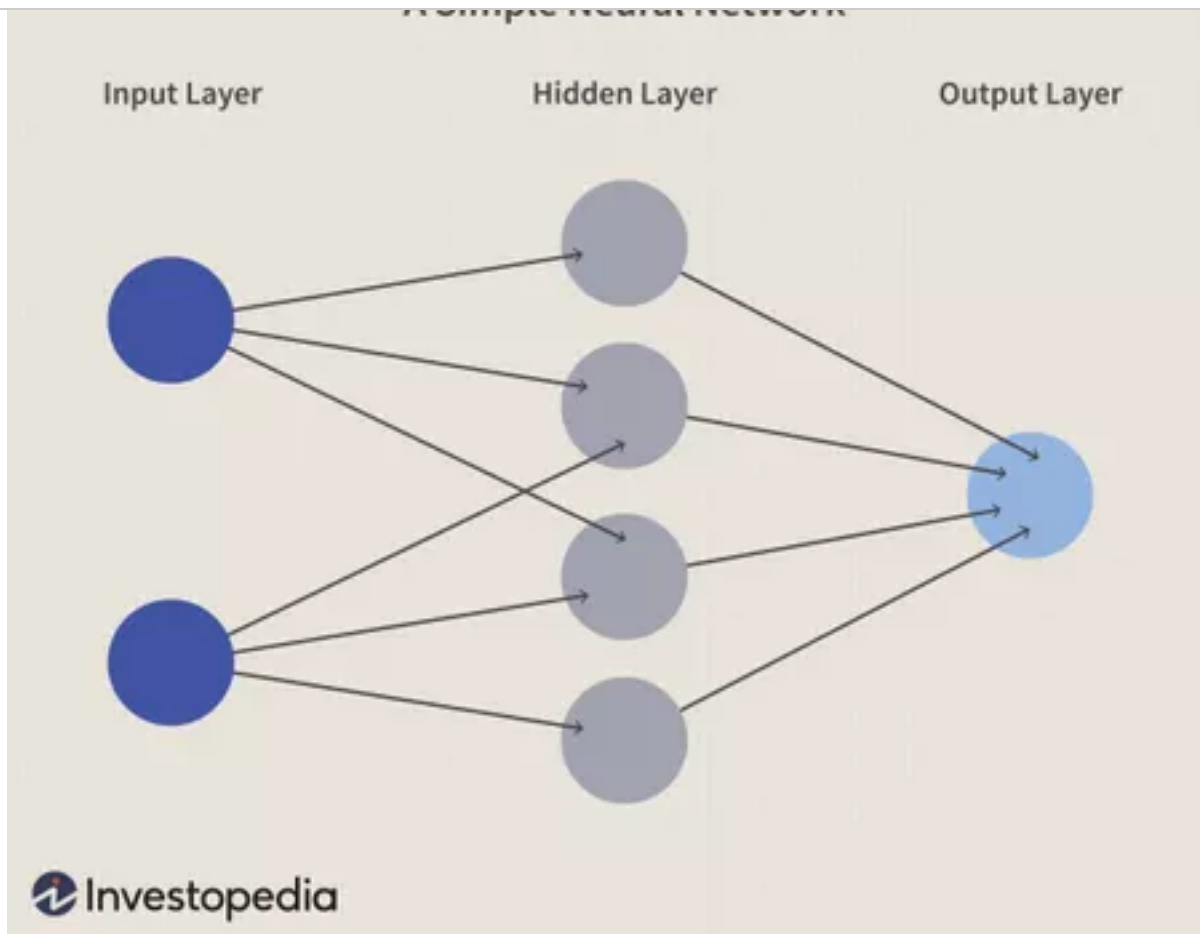


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KEY TAKEAWAYS

- Neural networks are a series of algorithms that mimic the operations of an animal brain to recognize relationships between vast amounts of data.
- As such, they tend to resemble the connections of neurons and synapses found in the brain.
- They are used in a variety of applications in financial services, from forecasting and marketing research to fraud detection and risk assessment.
- Neural networks with several process layers are known as "deep" networks and are used for deep learning algorithms
- The success of neural networks for stock market price prediction

Basics of Neural Networks

Neural networks, in the world of finance, assist in the development of such processes as time-series forecasting, [algorithmic trading](#), securities classification, credit risk modeling, and constructing proprietary indicators and price [derivatives](#).

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A neural network works similarly to the human brain's neural network. A “neuron” in a neural network is a mathematical function that collects and classifies information according to a specific architecture. The network bears a strong resemblance to statistical methods such as curve fitting and regression analysis.

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known as perceptron and is similar to a [multiple linear regression](#). The perceptron feeds the signal produced by a multiple linear regression into an activation function that may be nonlinear.

Multi-Layered Perceptron

In a multi-layered perceptron (MLP), perceptrons are arranged in interconnected layers. The input layer collects input patterns. The output layer has classifications or output signals to which input patterns may map. For instance, the patterns may comprise a list of quantities for [technical indicators](#) about a security; potential outputs could be “buy,” “hold” or “sell.”

Hidden layers fine-tune the input weightings until the neural network’s margin of error is minimal. It is hypothesized that hidden layers extrapolate salient features in the input data that have predictive power regarding the outputs. This describes feature extraction, which accomplishes a utility similar to statistical techniques such as principal component analysis.

Application of Neural Networks

Neural networks are broadly used, with applications for financial operations, enterprise planning, trading, business analytics, and product maintenance. Neural networks have also gained widespread adoption in business applications such as forecasting and marketing research solutions, fraud detection, and [risk assessment](#).

A neural network evaluates price data and unearths opportunities for making trade decisions based on the data analysis. The networks can distinguish subtle nonlinear interdependencies and patterns other methods of [technical analysis](#) cannot. According to research, the accuracy of neural networks in making price predictions for stocks differs. Some models predict the correct stock prices 50 to 60 percent of the time, while others are accurate in 70 percent of all instances. Some have posited that a 10 percent improvement in efficiency is all an investor can ask for from a neural network. ^[1]

better analyzed by using previously developed algorithms. It is not so much the [algorithm](#) that matters; it is the well-prepared input data on the targeted indicator that ultimately determines the level of success of a neural network.

What Are the Components of a Neural Network?

There are three main components: an input layer, a processing layer, and an output layer. The inputs may be weighted based on various criteria. Within the processing layer, which is hidden from view, there are nodes and connections between these nodes, meant to be analogous to the neurons and synapses in an animal brain.

What Is a Convolutional Neural Network?

A convolutional neural network is one adapted for analyzing and identifying visual data such as digital images or photographs.

What Is a Recurrent Neural Network?

A recurrent neural network is one adapted for analyzing time series data, event history, or temporal ordering.



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Autoregressive Integrated Moving Average (ARIMA)

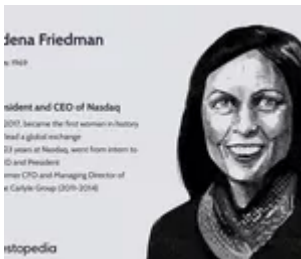
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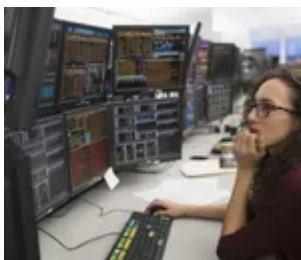
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