Multilayer Perceptrons (MLPs)

Multilayer Perceptrons (MLPs) are a type of artificial neural network that are commonly used for supervised learning tasks, such as classification and regression. They are called "multilayer" because they consist of multiple layers of neurons, with each layer performing a specific function.

The basic building block of an MLP is the neuron, which is modeled after the structure of a biological neuron in the brain. Each neuron takes in one or more inputs, applies a mathematical function to them, and produces an output.

The input to each neuron in an MLP is a vector of features, such as pixel values in an image or numerical data in a dataset. The first layer of neurons in an MLP is called the input layer, and each neuron in this layer corresponds to a single feature in the input vector.

The output of each neuron in an MLP is passed through an activation function, which introduces nonlinearity into the model. Common activation functions include sigmoid, tanh, and ReLU.

The output of each neuron in one layer is used as input to the neurons in the next layer, and so on, until the final layer of neurons produces the output of the model. This final layer is called the output layer, and the number of neurons in this layer depends on the specific task being performed.

MLPs are useful in a variety of real-life applications, including image and speech recognition, natural language processing, and financial forecasting. They are particularly effective when dealing with complex data that cannot be easily modeled using traditional statistical methods.

In summary, MLPs are a powerful type of neural network that are commonly used for supervised learning tasks. They consist of multiple layers of neurons, each of which

performs a specific function, and are particularly effective when dealing with complex data.