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*Filter*

Convolutional neural networks contain layers that uniquely look for specific features in a dataset. Each layer is a detection filter for the features and every subsequent layer is an increasingly specialized filter. A filter can detect a feature anywhere in an image, for example, through manipulation (whether it’s color, size, rotation, transformation, or etc.) and is applied many times and to all areas. Every filter is considered by the final layer that makes a decision based on the dataset.

*Feature*

Features are involved in the input layer of a convolutional neural network – they are the elements used to make a classification of the dataset. For example, a neural network whose intended purpose is to decide whether an animal is a cat or dog would take into account each animal’s features (height, length, shape, weight, ratios, etc.). Features can vary from simple to complex and can also rely on postprocessing of the input dataset.

*Feature Map*

A feature map is the output of a filter on a layer. For each layer, the filter is moved to every position in the dataset and the feature map collects every position’s output (the number of filters is equal to the number of feature maps). So, in a convolutional neural network, hidden layers are divided into feature maps that are the result of a single filter being applied to different positions of the input dataset.

*Pooling*

Max pooling is one of the most common functions utilized in convolutional neural networks. Its basis is that a feature’s relative location to other features is most important and does away with the extraneous information involved with their specific locations. This layer accomplishes reduction in computation and representation size. The input dataset is divided into rectangles by the pooling layer and then the layer displays the maximum value for a set of four of the rectangles.