DL Glossary

http://www.wildml.com/deep-learning-glossary/

Activation Function

To allow Neural Networks to learn complex decision boundaries, we apply a nonlinear activation function to some of its layers.

Commonly used functions include sigmoid, tanh,
ReLU (Rectified Linear Unit) and variants of these.

Backpropagation

Backpropagation is an algorithm to efficiently calculate the gradients in a Neural Network, or more generally, a feedforward computational graph.

It boils down to applying the chain rule of differentiation starting from the network output and propagating the gradients backward.

Data Augmentation

Data augmentation is a strategy that enables practitioners to significantly increase the diversity of data available for training models, without actually collecting new data.

Data augmentation techniques such as cropping, padding, and horizontal flipping are commonly used to train large neural networks.

Convolutional Neural Network (CNN, ConvNet)

A CNN uses convolutions to extract features from local regions of an input.

Most CNNs contain a combination of convolutional, pooling and affine layers.

CNNs have gained popularity particularly through their excellent performance on visual recognition tasks, where they have been setting the state of the art for several years.

Dropout

Dropout is a regularization technique for Neural Networks that prevents overfitting.

It prevents neurons from co-adapting by randomly setting a fraction of them to 0 at each training iteration.

Dropout can be interpreted in various ways, such as randomly sampling from an exponential number of different networks.

Dropout layers first gained popularity through their use in CNNs, but have since been applied to other layers, including input embeddings or recurrent networks.

Keras

Keras is a Python-based Deep Learning library that includes many high-level building blocks for deep Neural Networks.

It can run on top of either TensorFlow, Theano, or CNTK.

Max-Pooling

A pooling operation is typically used in Convolutional Neural Networks. A max-pooling layer selects the maximum value from a patch of features.

Just like a convolutional layer, pooling layers are parameterized by a window (patch) size and stride size. For example, we may slide a window of size 2×2 over a 10×10 feature matrix using stride size 2, selecting the max across all 4 values within each window, resulting in a new 5×5 feature matrix.

Pooling layers help to reduce the dimensionality of a representation by keeping only the most salient information, and in the case of image inputs, they provide basic invariance to translation (the same maximum values will be selected even if the image is shifted by a few pixels). Pooling layers are typically inserted between successive convolutional layers.

Multilayer Perceptron (MLP)

A Multilayer Perceptron is a Feedforward Neural Network with multiple fully-connected layers that use nonlinear activation functions to deal with data which is not linearly separable.

An MLP is the most basic form of a multilayer Neural Network, or a deep Neural Networks if it has more than 2 layers.

ReLU

Short for Rectified Linear Unit(s).

ReLUs are often used as activation functions in Deep Neural Networks.

They are defined by $f(x) = \max(0, x)$.

ReLUs are the most commonly used activation function in Convolutional Neural Networks.

TensorFlow

TensorFlow is an open source C++/Python software library for numerical computation using data flow graphs, particularly Deep Neural Networks.

It was created by Google.

In terms of design, it is most similar to Theano, and lower-level than Caffe or Keras.

VGG

VGG refers to convolutional neural network model that secured the first and second place in the 2014 ImageNet localization and classification tracks, respectively.

The VGG model consist of 16–19 weight layers and uses small convolutional filters of size 3×3 and 1×1.