Deep Learning Foundation and Algorithms



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Overview



Need of deep learning

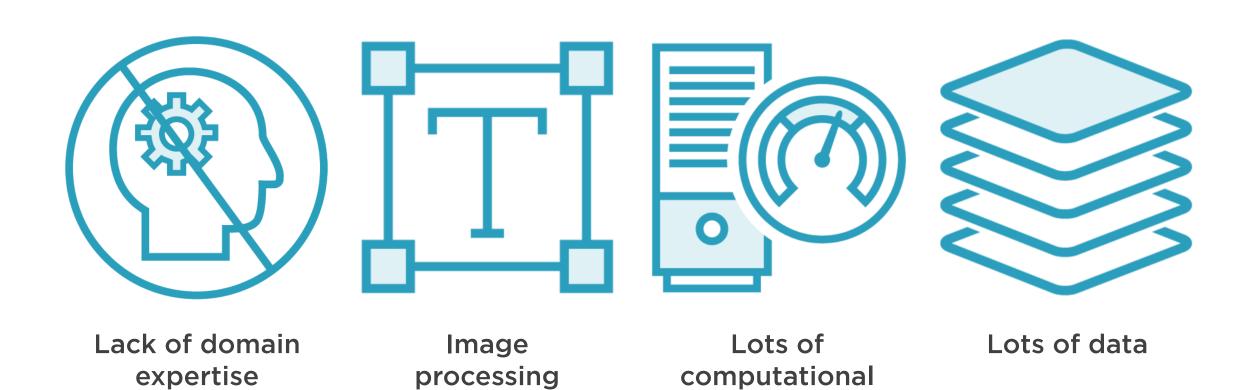
Concepts of artificial neural network

Types of deep learning

AWS deep learning algorithms

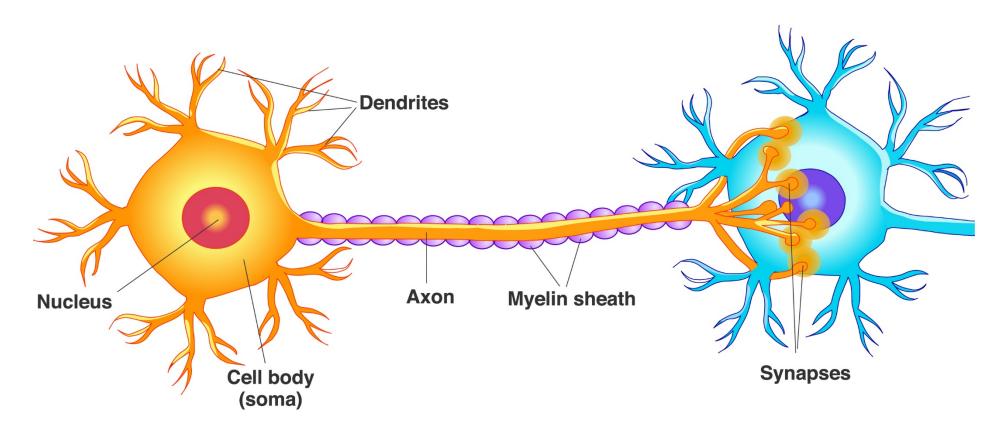


Deep Learning Drivers



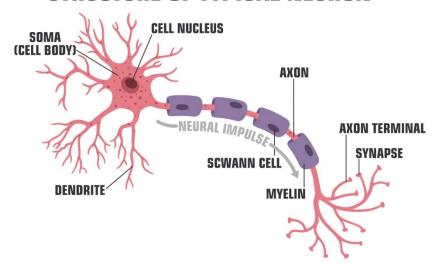
power

Neuron Communication

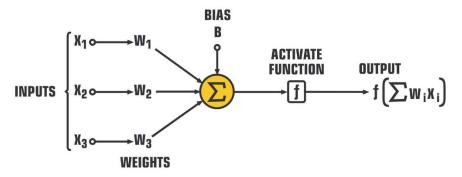


Perceptron

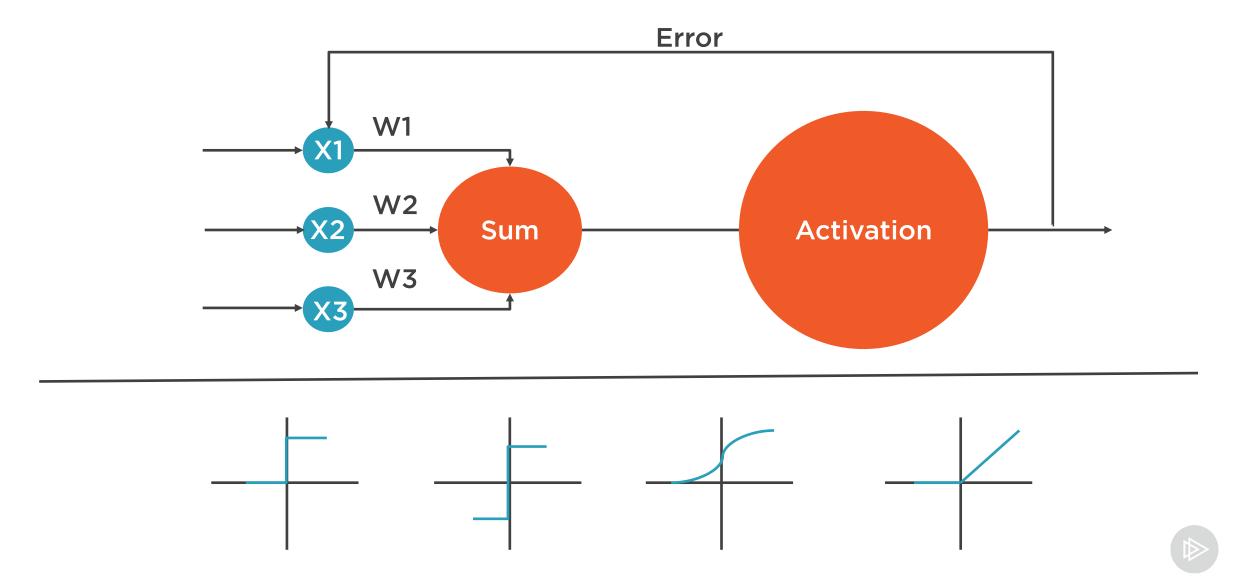
STRUCTURE OF TYPICAL NEURON



STRUCTURE OF ARTIFICIAL NEURON



Activation Function



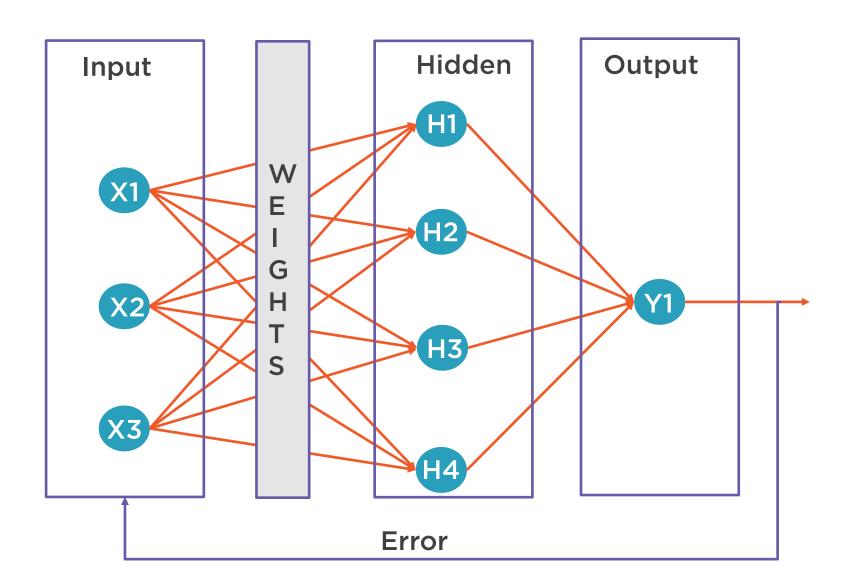
Types of Neural Network

Artificial Neural Network Convolution Neural Network Recurrent Neural Network

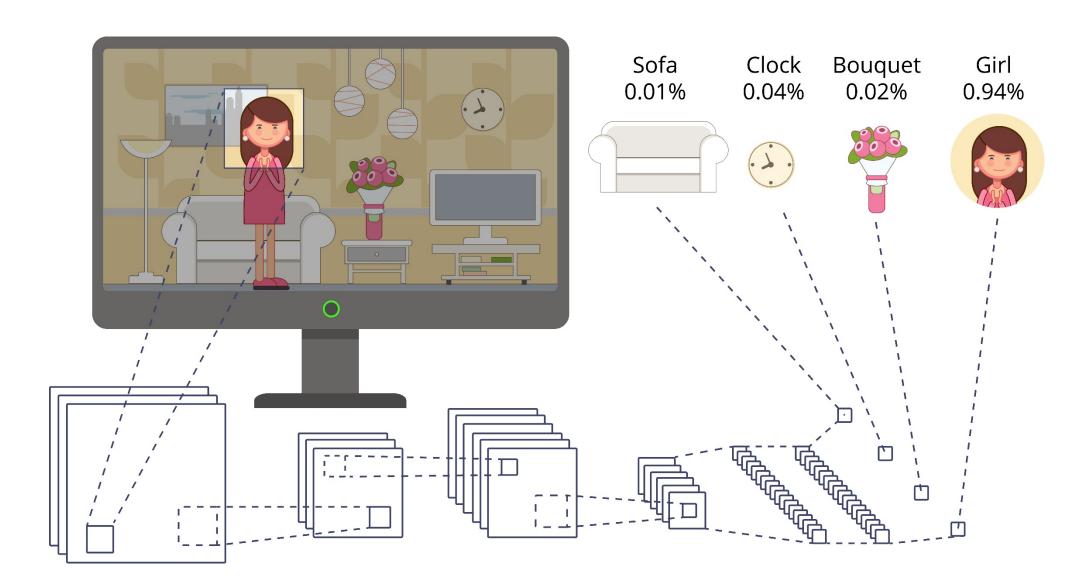
Deep Neural Network Deep Belief Network



Artificial Neural Network



Convolution Neural Network



Convolution Neural Network Layers

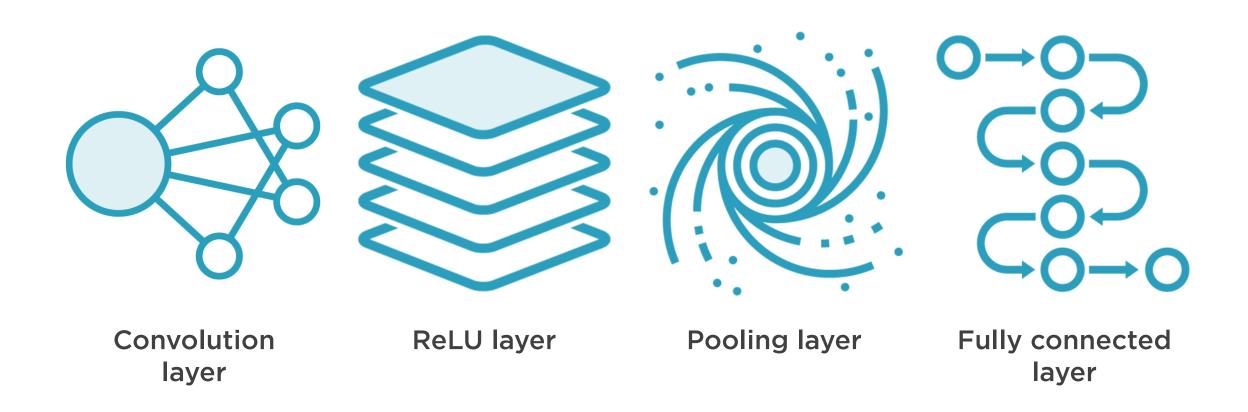




Image Classification

Supervised/classification Learning File type Instance GPU for training, CPU for inference type Metrics Required num_classes, num_training_samples

parameters



Object Detection

Learning Type Supervised/single DNN

File type

RecordIO, augmented manifest image

Instance type

GPU for training, CPU or GPU for inference

Metrics

Mean average precision

Required hyper parameters num_classes, num_training_samples



Semantic Segmentation

Learning

earning
Type

Supervised/classification

RecordIO, augmented manifest image

Instance type

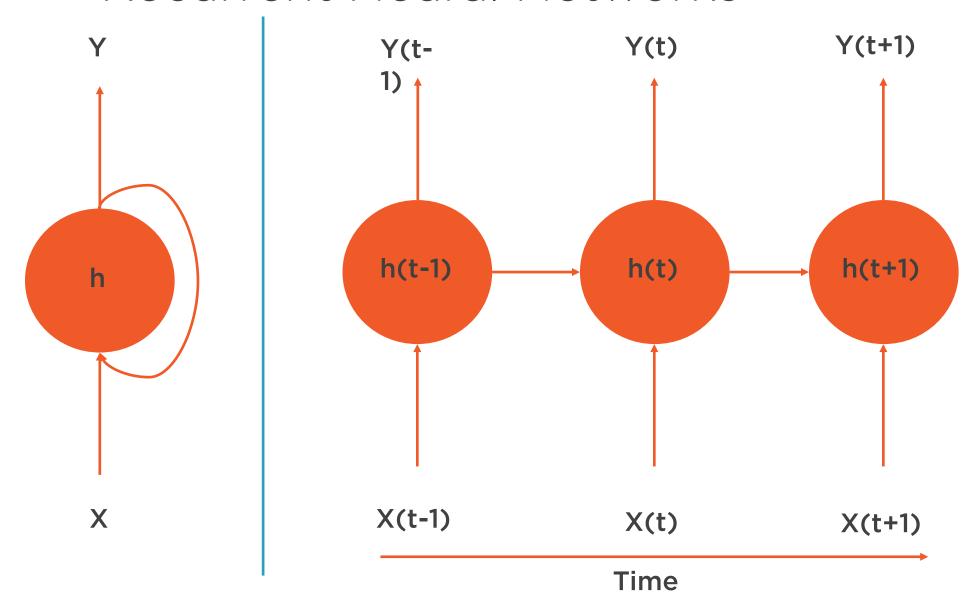
GPU for training, CPU or GPU for inference

Intersection over union also known as jaccard index

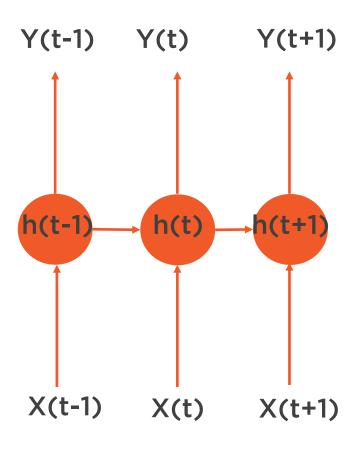
Required parameters num_classes, num_training_samples



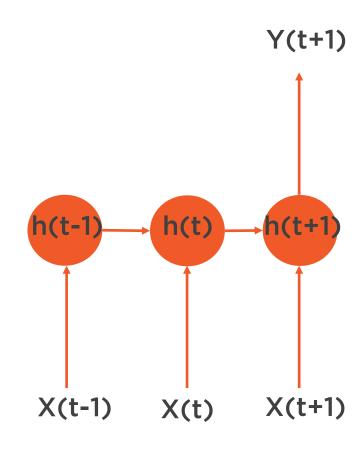
Recurrent Neural Networks



RNN Configurations



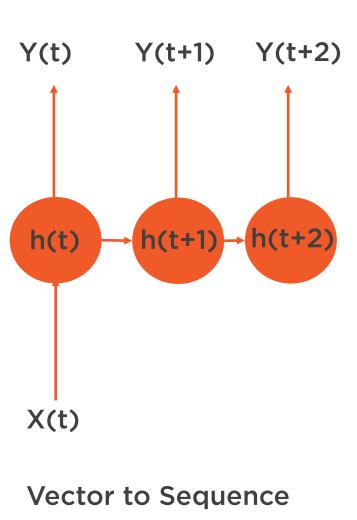
Sequence to Sequence



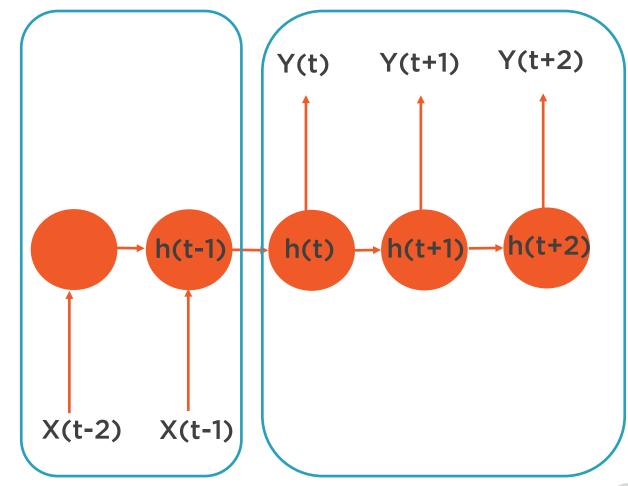
Sequence to Vector



RNN Configurations







Blazing Text

Learning
Type

Supervised File type CSV, text Instance type GPU, CPU mean_rho (word2vec) and accuracy (text classification) Required mode hyper parameters



Sequence to Sequence

Learning
Type

Supervised File type RecordIO, JSON Instance type

GPU

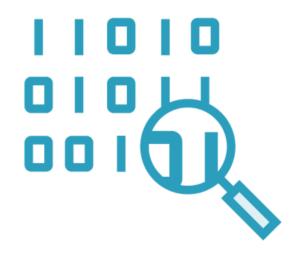
Required hyper parameters

Accuracy, bleu, perplexity metrics

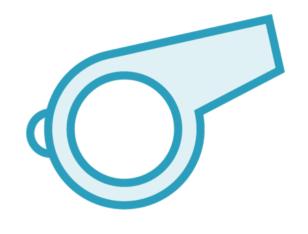
No required but many optional parameters available



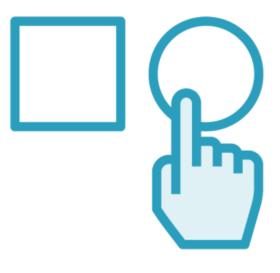
Object2Vec







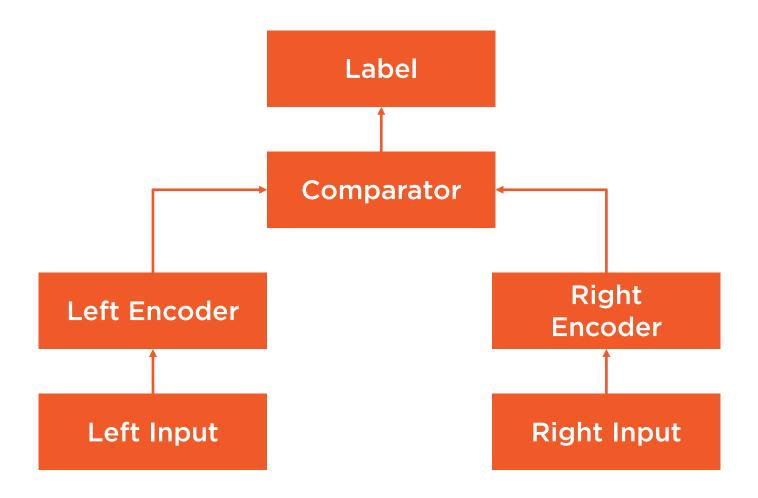
Train a model



Produce inferences



Object2Vec





Object2Vec

Learning Unsupervised File type Instance CPU or GPU (training), GPU (inference) type RMSE (regression), accuracy and cross-entropy (classification) Metrics Required encO_max_seq_len, encO_vocab_size parameters

