Deep Machine Learning libraries and frameworks

At the end of 2015, all eyes were on the year's accomplishments, as well as forecasting technology trends of 2016 and beyond. One particular field that has frequently been in the spotlight during the last year is deep learning, an increasingly popular branch of machine learning, which looks to continue to advance further and infiltrate into an increasing number of industries and sectors. Here are a list of Deep Learning libraries and frameworks that will gain momentum in 2016.

1. Theano is a python library for defining and evaluating mathematical expressions with numerical arrays. It makes it easy to write deep learning algorithms in python. On the top of the Theano many more libraries are built.

· Keras is a minimalist, highly modular neural network library in the spirit of Torch, written in Python, that uses Theano under the hood for optimized tensor manipulation on GPU and CPU.

· Pylearn2 is a library that wraps a lot of models and training algorithms such as Stochastic Gradient Descent that are commonly used in Deep Learning. Its functional libraries are built on top of Theano

· Lasagne is a lightweight library to build and train neural networks in Theano. It is governed by simplicity, transparency, modularity, pragmatism , focus and restraint principles.

· Blocks a framework that helps you build neural network models on top of Theano.

2. Caffe is a deep learning framework made with expression, speed, and modularity in mind. It is developed by the Berkeley Vision and Learning Center (BVLC) and by community contributors. Google's DeepDream is based on Caffe Framework. This framework is a BSD-licensed C++ library with Python Interface.

4. Gensim is deep learning toolkit implemented in python programming language intended for handling large text collections, using efficient algorithms.

5. Chainer bridge the gap between algorithms and implementations of deep learning. Its powerful, flexible and intuitive and is considered as the flexible framework for Deep Learning.

6. deepnet is a GPU-based python implementation of deep learning algorithms like Feed-forward Neural Nets, Restricted Boltzmann Machines, Deep Belief Nets, Autoencoders, Deep Boltzmann Machines and Convolutional Neural Nets.

7. Hebel is a library for deep learning with neural networks in Python using GPU acceleration with CUDA through PyCUDA. It implements the most important types of neural network models and offers a variety of different activation functions and training methods such as momentum, Nesterov momentum, dropout, and early stopping.

8. CXXNET is fast, concise, distributed deep learning framework based on MShadow. It is a lightweight and easy extensible C++/CUDA neural network toolkit with friendly Python/Matlab interface for training and prediction.

9. DeepPy is a Pythonic deep learning framework built on top of NumPy.

10. DeepLearning is deep learning library, developed with C++ and python.

11. Neon is Nervana's Python based Deep Learning framework.

12. ConvNet Convolutional neural net is a type of deep learning classification algorithms, that can learn useful features from raw data by themselves and is performed by tuning its weighs.

13. DeepLearnToolBox is a matlab/octave toolbox for deep learning and includes Deep Belief Nets, Stacked Autoencoders, convolutional neural nets.

14. cuda-convnet is a fast C++/CUDA implementation of convolutional (or more generally, feed-forward) neural networks. It can model arbitrary layer connectivity and network depth. Any directed acyclic graph of layers will do. Training is done using the backpropagation algorithm.

15. MatConvNet is a MATLAB toolbox implementing Convolutional Neural

16. eblearn is an open-source C++ library of machine learning by New York University's machine learning lab, led by Yann LeCun. In particular, implementations of convolutional neural networks with energy-based models along with a GUI, demos and tutorials.

17. SINGA is designed to be general to implement the distributed training algorithms of existing systems. It is supported by Apache Software Foundation.

18. NVIDIA DIGITS is a new system for developing, training and visualizing deep neural networks. It puts the power of deep learning into an intuitive browser-based interface, so that data scientists and researchers can quickly design the best DNN for their data using real-time network behavior visualization.

19. Intel® Deep Learning Framework provides a unified framework for Intel® platforms accelerating Deep Convolutional Neural Networks.

20. N-Dimensional Arrays for Java (ND4J)is scientific computing libraries for the JVM. They are meant to be used in production environments, which means routines are designed to run fast with minimum RAM requirements.

21. Deeplearning4j is the first commercial-grade, open-source, distributed deep-learning library written for Java and Scala. It is designed to be used in business environments, rather than as a research tool.

22. Encog is an advanced machine learning framework which supports Support Vector Machines,Artificial Neural Networks, Genetic Programming, Bayesian Networks, Hidden Markov Models, Genetic Programming and Genetic Algorithms are supported.

23. Convnet.js is a Javascript library for training Deep Learning models (mainly Neural Networks) entirely in a browser. No software requirements, no compilers, no installations, no GPUs, no sweat.

24. Torch is a scientific computing framework with wide support for machine learning algorithms. It is easy to use and efficient, fast scripting language, LuaJIT, and an underlying C/CUDA implementation. Torch is based on Lua programming language.

25. Mocha is a Deep Learning framework for Julia, inspired by the C++ framework Caffe. Efficient implementations of general stochastic gradient solvers and common layers in Mocha could be used to train deep / shallow (convolutional) neural networks, with (optional) unsupervised pre-training

26. Lush(Lisp Universal Shell) is an object-oriented programming language designed for researchers, experimenters, and engineers interested in large-scale numerical and graphic applications. It comes with rich set of deep learning libraries as a part of machine learning libraries.

27. DNNGraph is a deep neural network model generation DSL in Haskell.

28. Accord.NET is a .NET machine learning framework combined with audio and image processing libraries completely written in C#. It is a complete framework for building production-grade computer vision, computer audition, signal processing and statistics applications

29. darch package can be used for generating neural networks with many layers (deep architectures). Training methods includes a pre training with the contrastive divergence method and a fine tuning with common known training algorithms like backpropagation or conjugate gradient.

30. deepnet implements some deep learning architectures and neural network algorithms, including BP,RBM,DBN,Deep autoencoder and so on.

Upcoming Deep Learning events in 2016:

- Deep Learning Summit, San Francisco, 28–29 January
- Virtual Assistant Summit, San Francisco, 28–29 January
- Women in Machine Intelligence Dinner, London, 17 February
- Deep Learning in Healthcare Summit, London, 7–8 April
- Deep Learning Summit, Boston, 12–13 May
- Machine Intelligence Summit, Berlin, 29–30 June
- Deep Learning Summit, London, 22–23 September
- IoT Meets AI Dinner, London, 15 September
- Deep Learning Summit, Singapore, 20–21 October