AI & Robotics

Extra - Machine Learning Frameworks

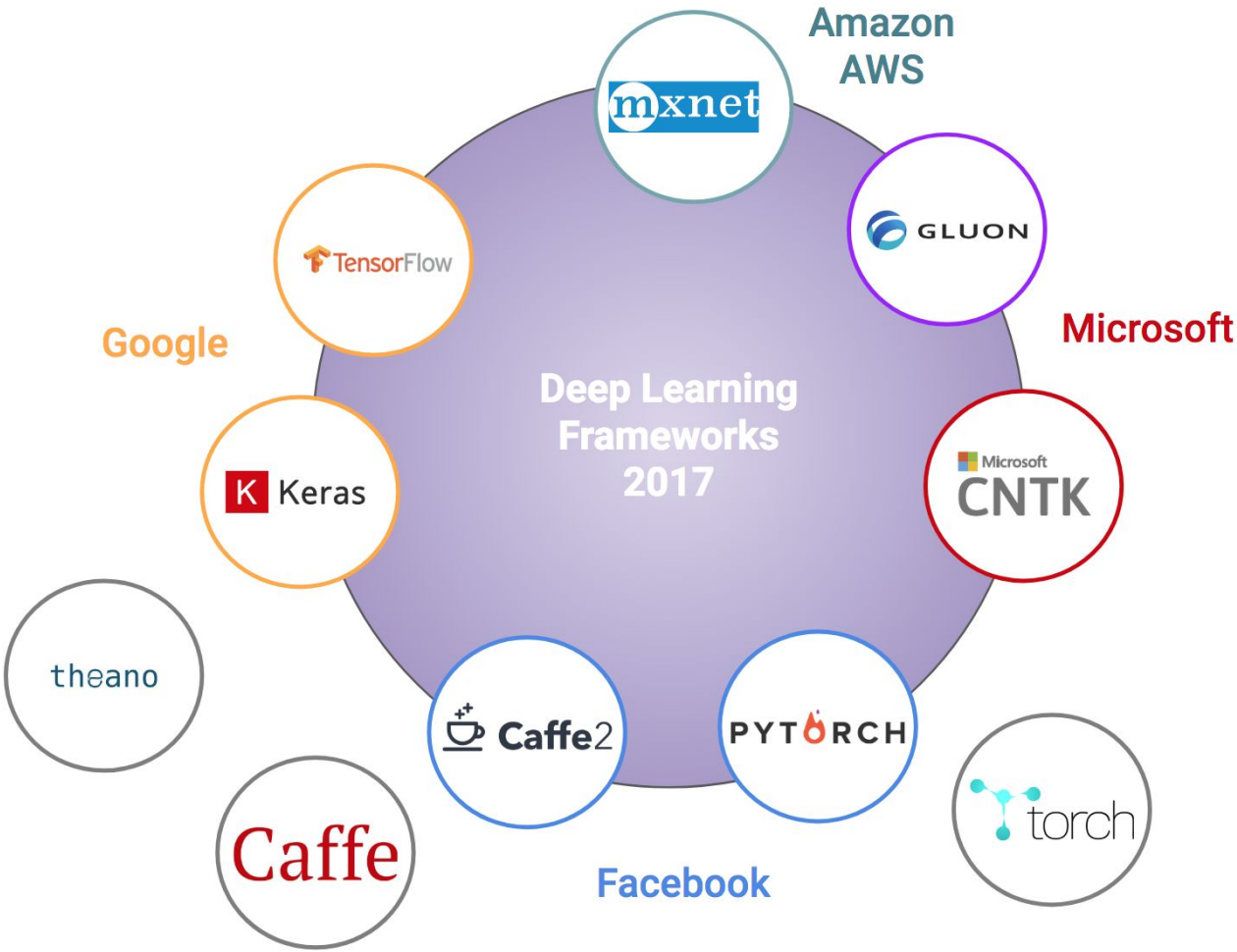
PXL AI & ROBOTICS LAB

Goals

The **junior-colleague**

- has an understanding of the different frameworks used in Machine and Deep Learning

ONNX


Amazon
AWS
mxnet
GLUON
Microsoft
Microsoft
CNTK
Google
TensorFlow
Keras
Deep Learning
Frameworks
2017
theano
Caffe
Caffe2
PYTORCH
torch
Facebook

Scikit-learn

- Written in Python, C and C++
- Supports most of the classical supervised and unsupervised learning algorithms:
  - Random forests
  - SVM
  - Naive Bayes
  - Gradient boosting
  - Clustering
- Designed to interoperate with the numerical and scientific libraries NumPy and SciPy
- Shipped with Anaconda

Advantages	Disadvantages
Great classical machine learning support	Very limited support for Neural Networks
Easy to use and excellent for beginners	No Deep Learning support

https://scikit-learn.org/stable/

https://github.com/scikit-learn/scikit-learn

PyTorch

- Written in Python, C++, CUDA
- Created by Facebook
- Tensor computation (like NumPy) with strong GPU acceleration
- Deep neural networks built on a tape-based autodiff system

Advantages	Disadvantages
Machine Learning and Deep Learning support	
allows customization	

https://pytorch.org/

https://github.com/pytorch/pytorch

Fast.AI

- Written in Python
- Built on top of Scikit-learn and PyTorch
- Aim is to make Machine and Deep Learning as accessible as possible
- Contains a lot of functions to make data processing easier

Advantages	Disadvantages
Great all round support	API changes quite often
Integrates new techniques and methods rapidly	Less market usage
Great for learning concepts easily	

https://www.fast.ai/

https://github.com/fastai/fastai

TensorFlow

- Python
- Created by Google
- Tensor computation (like NumPy) with strong GPU acceleration
- Stateful dataflow graphs
- Tensor Processing Unit (TPU) => dedicated hardware support

Advantages	Disadvantages
Fast	Not so easy to use
Neural networks and Deep Learning support	

https://www.tensorflow.org/

https://github.com/tensorflow/tensorflow

Keras

- Capable of running on top of TensorFlow, Microsoft Cognitive Toolkit, Theano, or PlaidML

https://www.tensorflow.org/

https://github.com/tensorflow/tensorflow

To be continued...