# TensorFlow – machine learning frameworks

## Summary

A neural network framework that make it easy for user to train as it will handle the mathematic component of training (require data to be provided – usually from minst) and run in python environment. After training, it can be used to predict result based on input.

Other frameworks:

* PyTorch
* CNTK
* Apache MXNet

“TensorFlow is an **open-source machine learning library** for research and production. TensorFlow offers APIs for beginners and experts to develop for desktop, mobile, web, and cloud.” (TensorFlow, 2019)

“TensorFlow can **train and run deep neural networks** for **handwritten digit classification**, **image recognition**, **word embeddings**, **recurrent neural networks**, **sequence-to-sequence models for machine translation**, **natural language processing**, and **PDE (partial differential equation) based simulations**. Best of all, TensorFlow **supports production prediction at scale**, with the same models used for training.” (Yegulalp, S., 2018)

“TensorFlow allows developers to create dataflow graphs—structures that **describe how data moves through a graph**, or a series of processing nodes. Each **node** in the graph **represents a mathematical operation**, and each **connection** or edge between nodes **is a multidimensional data array**, or **tensor**.”

Tensorflow is “written as high-performance C++ binaries. Python just directs traffic between the pieces, and provides high-level programming abstractions to hook them together.”

Able to “run on most any target that’s convenient: a local machine, a cluster in the cloud, iOS and Android devices, CPUs or GPUs” and “deployed on most any device where they will be **used to serve predictions**”

Instruction to install tensorflow: (<https://www.tensorflow.org/install/>)

## Resources

<https://www.tensorflow.org/>

<https://www.infoworld.com/article/3278008/tensorflow/what-is-tensorflow-the-machine-learning-library-explained.html>