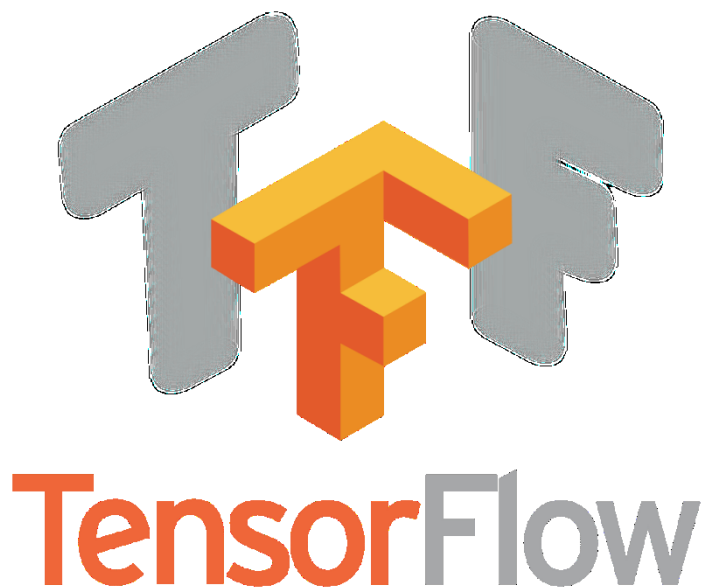Electrical and Computer Engineering Department
Tarbiat Modares University

Supplementary material-1
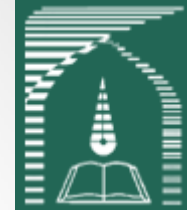
Foad Ghaderi, PhD

Deep Learning Tools

Why TensorFlow

❑ TensorFlow™ is an open source software library for numerical computation using data flow graphs.

❑ TensorFlow was originally developed by researchers and engineers working on the Google Brain Team within Google's Machine Intelligence research organization.

❑ The flexible architecture allows you to deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device with a single API.

❑ Scalable, flexible and Popular (= big community)

TensorFlow programming stack
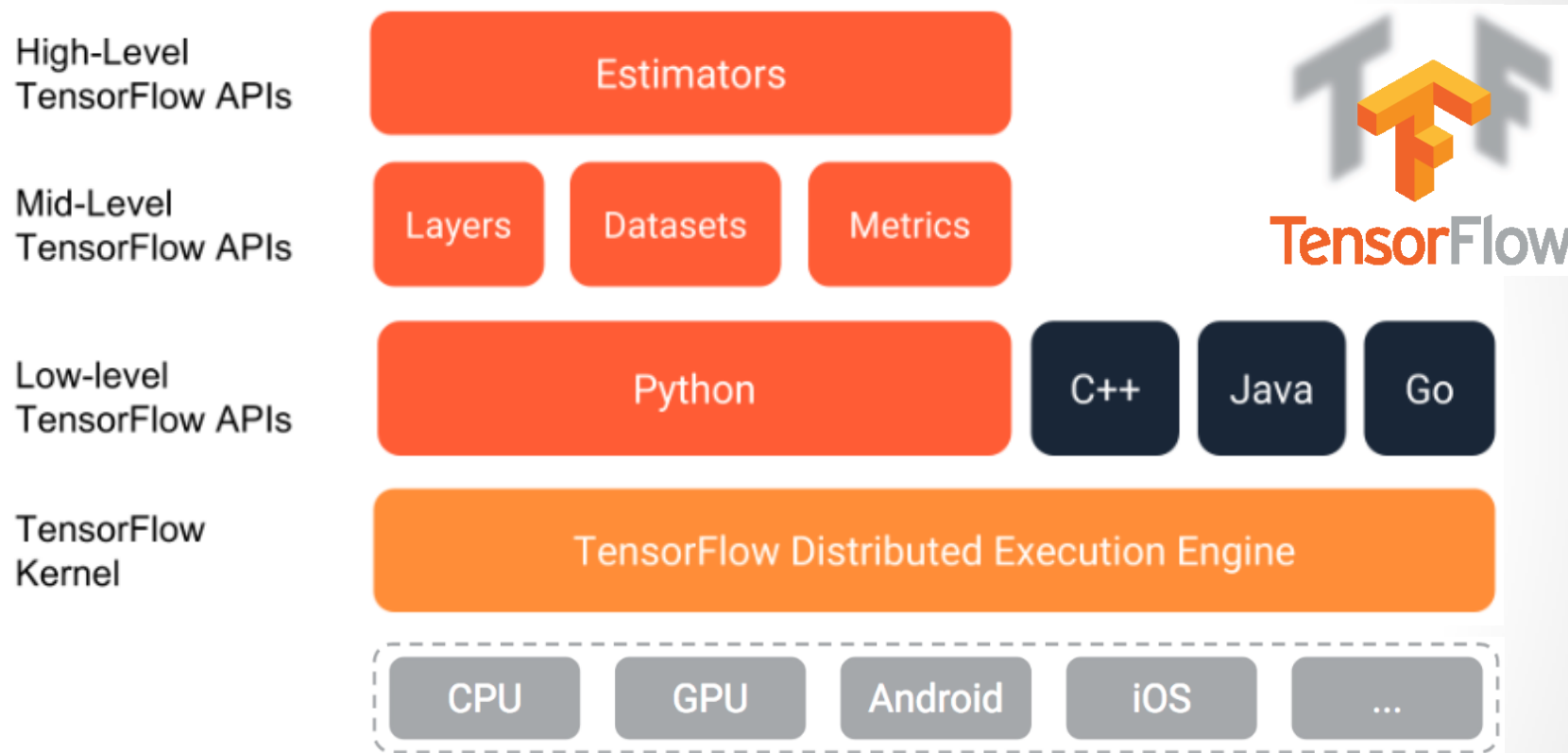
Estimators, represent a complete model. The Estimator API provides methods to train the model, to judge the model's accuracy, and to generate predictions.

Datasets for Estimators, build a data input pipeline. The Dataset API has methods to load and manipulate data, and feed it into your model.

Why Keras

K Keras

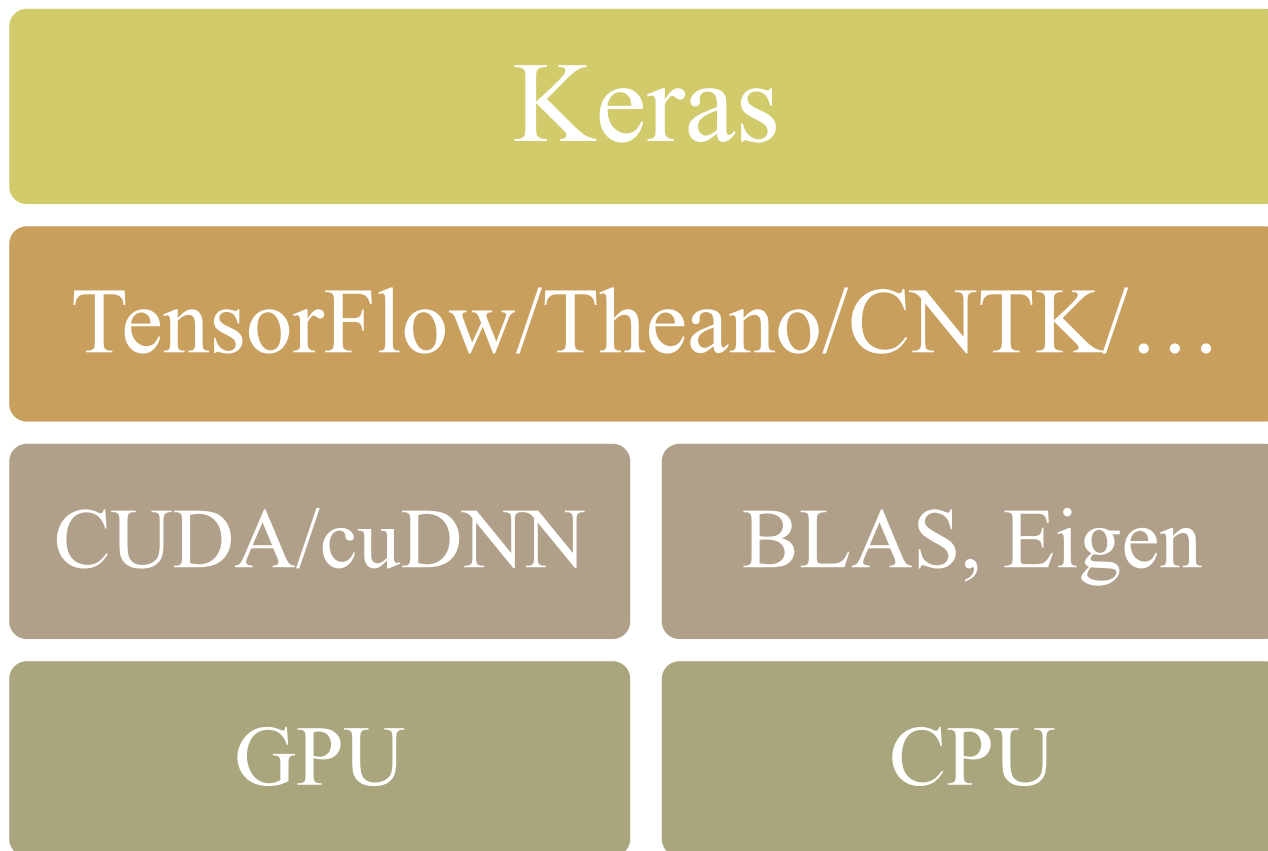A high-level API to build and train deep learning models.

It is used for

- ❑ Fast prototyping
- ❑ Advanced research
- ❑ Production

Three key advantages:

- ➢ *User friendly*
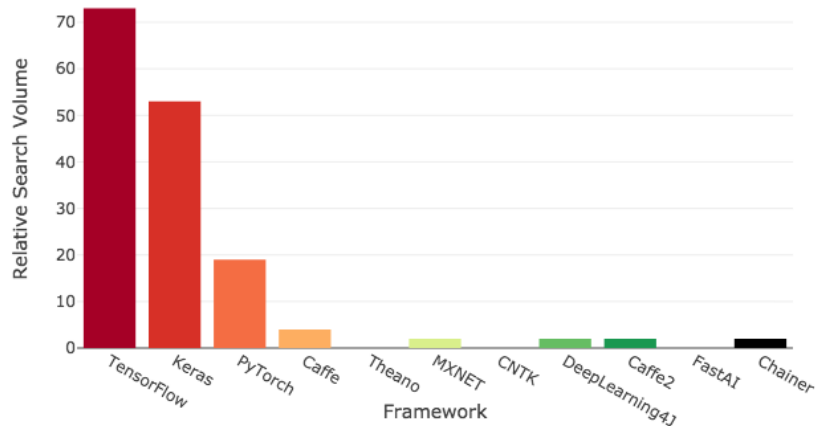- ➢ *Modular and composable*
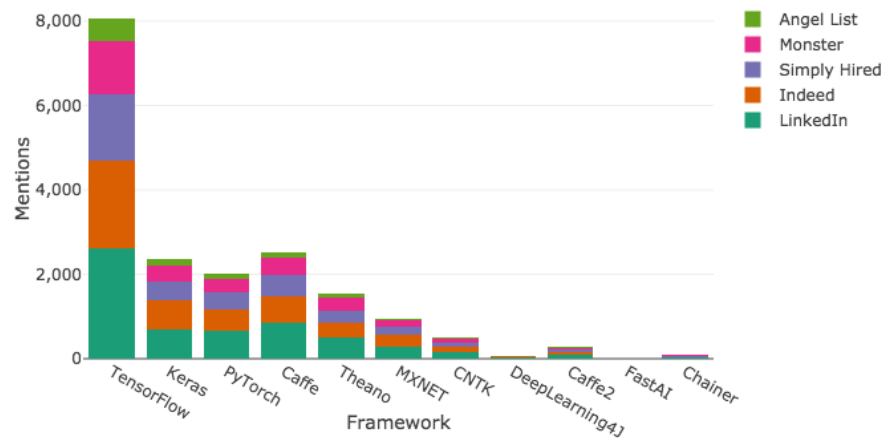- ➢ *Easy to extend*

Keras programming stack

| Keras |
| TensorFlow/Theano/CNTK/… |

| CUDA/cuDNN | BLAS, Eigen |
| GPU | CPU |

Why TensorFlow/Keras

Source:
Jeff Hale, (2019, June 17) "Deep Learning Framework Power Scores 2018", Retrieved from https://towardsdatascience.com
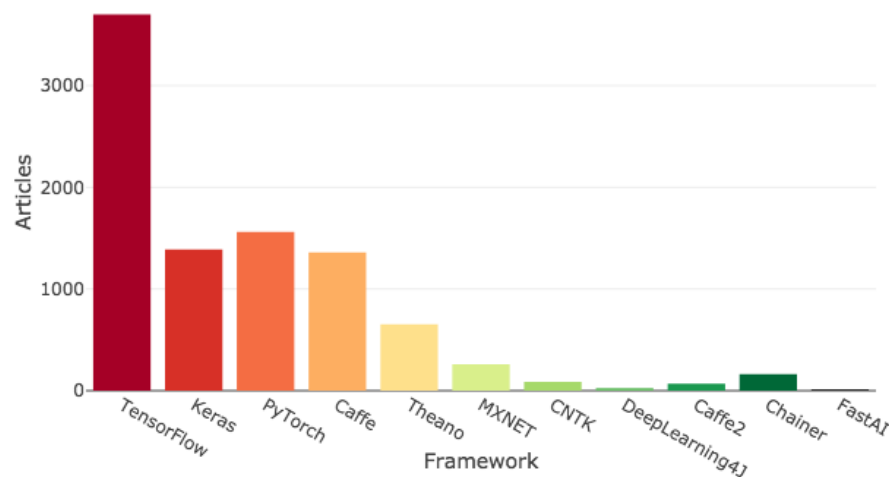
Why TensorFlow/Keras

Amazon Books
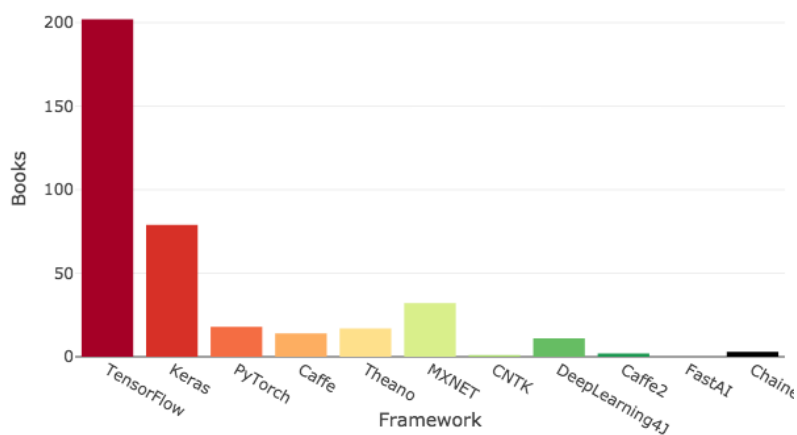
ArXiv Articles

Source:
Jeff Hale, (2019, June 17) "Deep Learning Framework Power Scores 2018", Retrieved from https://towardsdatascience.com

Why TensorFlow/Keras

Deep Learning Framework Power Scores 2018

Source:
Jeff Hale, (2019, June 17) "Deep Learning Framework Power Scores 2018", Retrieved from https://towardsdatascience.com