Introduction to 

Fast Campus
Start Deep Learning with Tensorflow

TensorFlow

A multidimensional array.

TensorFlow

A graph of operations.

What is TensorFlow?

- Open source software library for numerical computation using data flow graphs
- Originally developed by Google Brain Team to conduct machine learning and deep neural networks research
- General enough to be applicable in a wide variety of other domains as well

TensorFlow provides an extensive suite of functions and classes that allow users to build various models from scratch.

Deep Learning Framework

- https://en.wikipedia.org/wiki/Comparison_of_deep_learning_software
- For a framework to be useful in production, it needs to be efficient, scalable, and maintainable.
- For research, the framework needs to have flexible operations that can be combined in novel ways.
- Alternative frameworks are either flexible enough for research but less scalable, such as Chainer and PyTorch, or scalable but less flexible, such as Caffe and MXNet. TensorFlow are both flexible and scalable, allowing users to streamline from research into production.

Why TensorFlow

- Python API
- Portability: deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device with a single API
- Flexibility: from Raspberry Pi, Android, Windows, iOS, Linux to server farms
- Visualization (TensorBoard is da bomb)
- Checkpoints (for managing experiments)
- Auto-differentiation autodiff (no more taking derivatives by hand. Yay)
- Large community (> 10,000 commits and > 3000 TF-related repos in one year)
- Awesome projects already using TensorFlow

TensorFlow in Open-Source Community

Positive Reviews

67,000+
GitHub Stars

17,000+
GitHub repositories with 'TensorFlow' in the title

Rapid Development

1,000+
Contributors

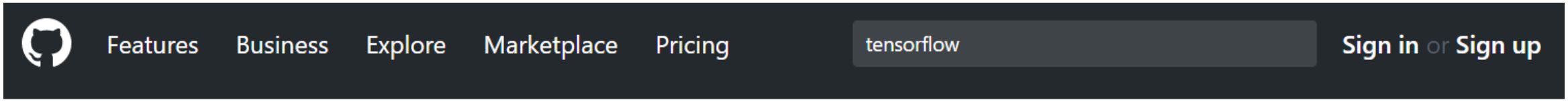
21,000+
Commits in 21 months

Direct Engagement

8,000+
Stack Overflow questions answered

100+
Community-submitted GitHub issues responded to weekly

Search Results on Github



Repositories 25K
Code
Commits 297K
Issues 49K
Wikis 2K
Users 344

Languages

Python	13,651
Jupyter Notebook	5,065
HTML	553
C++	468

TensorFlow

Tensorflow

TensorFlow is an open source software library for numerical computation.

See topic

25,323 repository results

Sort: Best match

tensorflow/*tensorflow*

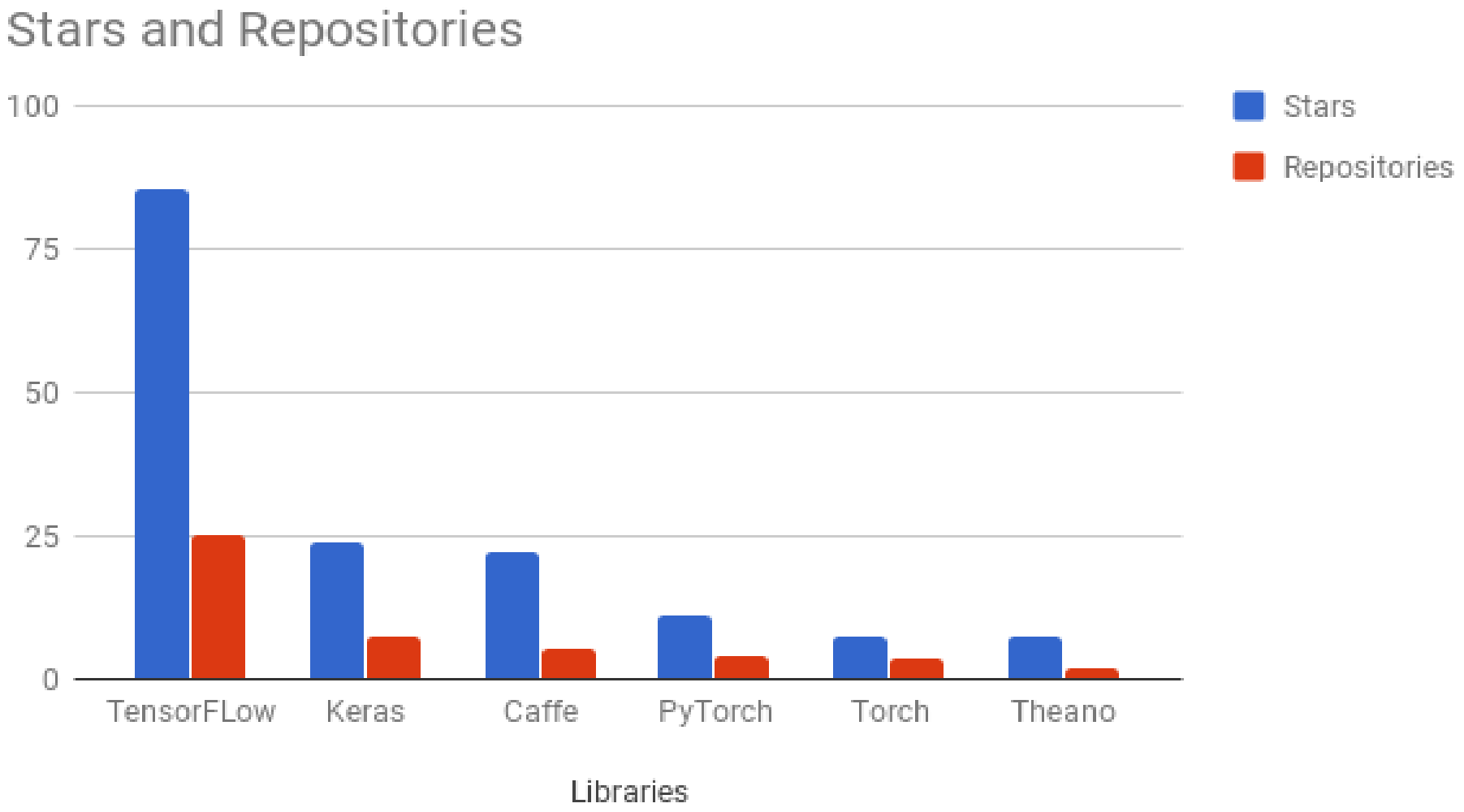
C++ ★ 85.5k

Computation using data flow graphs for scalable machine learning

tensorflow python machine-learning

Apache-2.0 license Updated 29 minutes ago

Stars and Repositories



Companies Using Tensorflow

- Google
- OpenAI
- DeepMind
- Snapchat
- Uber
- Airbus
- eBay
- Dropbox
- A bunch of startups

Fancy Projects Using TensorFlow

- WaveNet: A Generative Model for Raw Audio (DeepMind, 2016)
- Dermatologist-level classification of skin cancer with deep neural networks (Esteva, Kuprel, et al., Nature 2017)
- Magenta (Google)

TensorFlow Basics

- import tensorflow as tf

- The first thing we need to understand about TensorFlow is its computation graph approach. Any TensorFlow program consists of two phases:
  - Phase 1: assemble a graph
  - Phase 2: use a session to execute operations in the graph.

- Note that this might change in the future with TensorFlow's eager mode, currently experimental.