Deep Learning Framework Workshop

CE-40550
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Outline

1. What is a deep learning framework?
2. Why we need a framework?
3. Tensorflow vs. Pytorch
4. Computation graph
5. Pytorch basics
6. Built-in datasets
7. Custom dataset
8. Transforms
9. Simple MLP classifier
10. Simple CNN classifier

What is a deep learning framework?

An interface, library or a tool which allows us to build deep learning models more easily and quickly, without getting into the details of underlying algorithms.

1. Optimized for performance
2. Easy to understand and code
3. Good community support
4. Parallelize the processes to reduce computations
5. Automatically compute gradients

Why we need a framework?

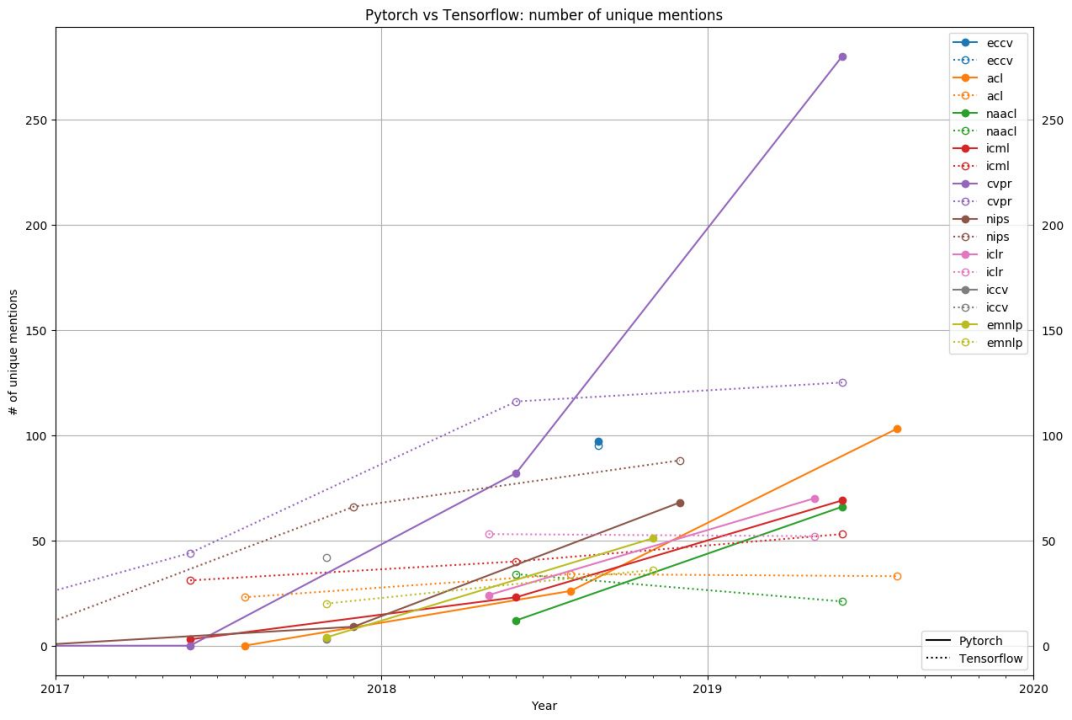
Due to,

- Computational complexity of forward and backward pass in a network
- Need to use hardware efficiently

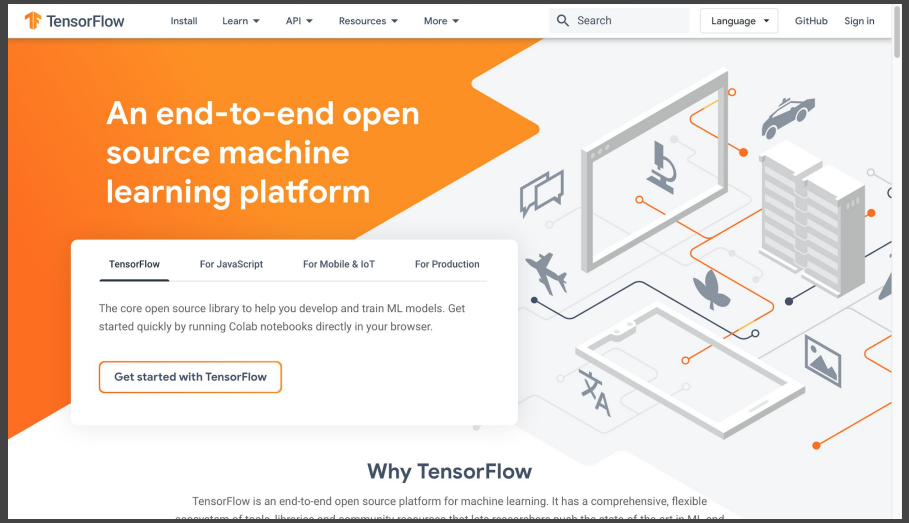
without frameworks,

- Having really deep networks would be impossible!
- No place for complex architectures and new ideas
- Minimum effect on science and technology
- No standard way of implementation

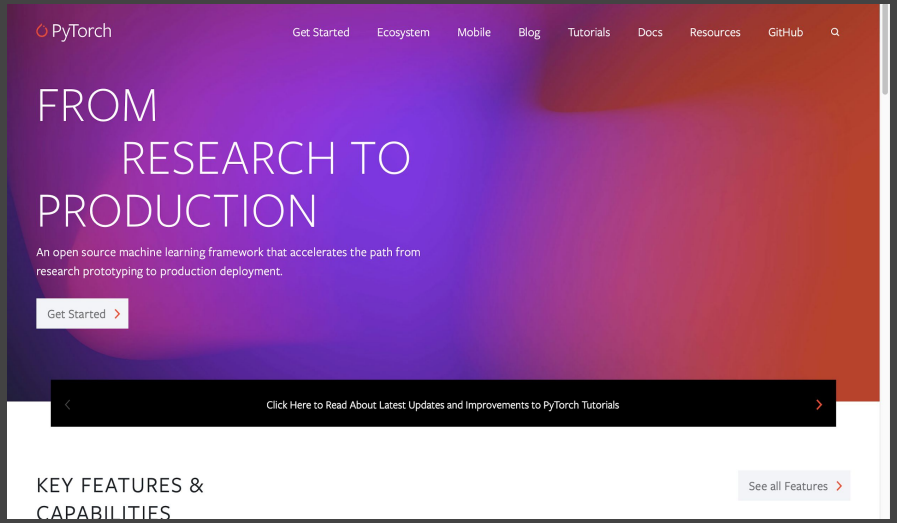
Tensorflow vs. Pytorch



Tensorflow vs. Pytorch



Tensorflow



Pytorch

Tensorflow vs. Pytorch

1. Tensorflow is based on Theano and has been developed by Google.
   PyTorch is based on Torch and has been developed by Facebook.

2. Tensorflow creates a static graph.
   PyTorch believes in a dynamic graph.

3. Learning pytorch seems to be easier than tensorflow due to its structure.

4. Tensorflow is older than pytorch so it has a much bigger community behind it than PyTorch.

5. Tensorflow is better for production models and scalability.
   PyTorch is relatively better for passion projects and building rapid prototypes.

Computation graph