



Getting started with PyTorch

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Slack Channel for Tutorial:

<https://pytorchtutorial.slack.com>

Invite Link: <http://bit.ly/pytorchtutorialslack>

Tutorial Github Repo.:

<http://bit.ly/aiconfny19pytorch>

Introductions & Networking

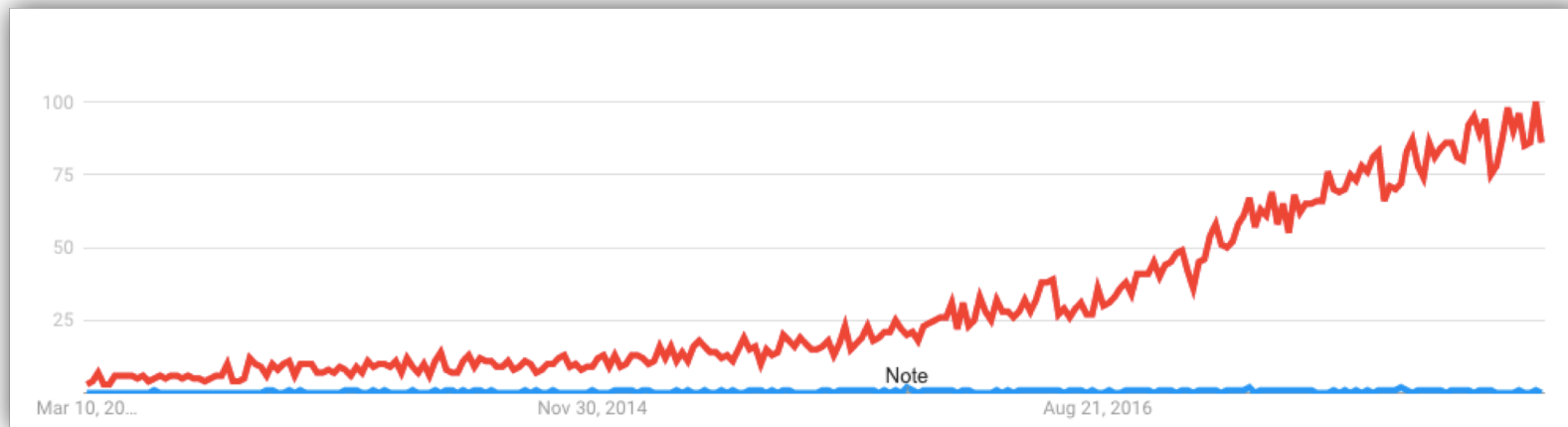
Agenda

- PyTorch Overview
- PyTorch Basics
- Linear Modeling
- Working with Data
- Break
- Image Classification
- Transfer Learning
- Text Classification
- Models in Production
- Discussion: Q & A

PyTorch Overview

PyTorch Origins

- Torch – Lua
- Chainer
- HIPS Autograd
- Need for Dynamic execution library
- Popularity of Python in Machine Learning Community



Google Trends Last Five Years

Terms: **Lua** Machine Learning **Python** Machine Learning

Tell me more about you:

<http://etc.ch/URSP>

Interactive Learning

Google Colab Environment

- Log in to your Google Account
- Go to: <https://colab.research.google.com>
- Go to File -> Open Notebook
- Go to GitHub tab and search for datadynamo
- From the dropdown select aiconf_ny_2019_pytorch
- Open the 01-Basics.ipynb notebook

Break

Transfer Learning

Why Transfer Learning?

Deep
Learning
Challenges

Not enough
data

Not enough
labeled data

Not enough
hardware

Training
time too
long

Transfer Learning

Domain to Domain Learning

- Learn Features, Weights, Biases in one domain
- Find domain with similar data characteristics and distribution
- Apply model in new domain

Retraining

- **Freeze layers** in a "good" model up to tunable depth of feature extraction but before final prediction layer
- Remove final layer(s)
- Relearn final and classification layers using your own data

Bonus: Combine Domain to Domain and Retraining

Deploying PyTorch Models

Deploying PyTorch Models: ONNX

- ONNX: Open Neural Network eXchange
 - Framework fragmentation: Project goal to allow researchers and developers to port models from one framework to another allowing interoperability
 - Currently supports some of Caffe2, PyTorch, Microsoft Cognitive Toolkit, Apache MXNet
- Currently PyTorch only supports model export not import
- Resources:
 - ONNX: <https://onnx.ai/> & <https://github.com/onnx/tutorials>
 - PyTorch: <http://pytorch.org/docs/master/onnx.html>

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Discussion