Module 0 - About this course

0.1 Overview

Outline

- What's PyTorch
- PyTorch compared to Other Deep learning Frameworks
  - TensorFlow
  - Keras
- Who's this course for

WHAT IS PYTORCH?

- A replacement for NumPy to use the power of GPUs
- A deep learning research platform

Imperative programing

- Imperative programing defines computation as you type it
- Feels more like Python:

```
import torch
a=torch.tensor(1.0)
b=torch.tensor(1.0)
c=a+b
print('c:',c)
```

```
c: tensor(2.)
```

总结:

Symbolic Programing

- Define the computation
- Execute the computation

```
import tensorflow as tf

a = tf.constant(1.0,name="a")
b = tf.constant(1.0,name="b")
c = a+b
print(c)
```

```
<tf.Tensor 'add_2:0' shape=() dtype=float32>
```

```
sess = tf.Session()
output = sess.run(c)
print("Value of c after running graph:",output)
```

```
c: tensor(2.)
```

Imperative programing

- Each and every level of computation can be accessed
- Regular Python tools are easier to use in PyTorch like debugging tools
- Can integrate many standard Programming operations like control flow stamens
- As a result you can quickly gain insight in your model

TensorFlow	PyTorch
TensorFlow is usually in large scale production	PyTorch is used for researchers to test out ideas quickly.

The Battle: TensorFlow vs. Pytorch by Eitan Rosenzvaig

Keras	PyTorch
Keras is simpler to experiment with for standard layers	Lower-level environment allows you to experiment, with new ideas

Keras or PyTorch as your first deep learning framework: by Piotr Migdal and Rafał Jakubanis

Who should take this Course

Anyone can build new better neural networks

You should have :

1. Basic knowledge of Calculus and Linear Algebra
2. Knowledge of Machine Learning
3. Knowledge of Neural Networks
4. Basic Knowledge of Deep learning

总结:

0.2 About this course

0.2.1 General Information

Prerequisites and recommended skills

PyTorch is a machine learning and deep learning library for Python. As such, to make use of the PyTorch you will need to have at least basic hands-on programing skills in Python.

- Python programming
- Recommended: Linear Algebra and Calculus

0.2.2 Learning Objectives

In this course you will learn about:

- Tensors , Gradients and Datasets
- Fundamentals of PyTorch with Linear Regression
- Logistic and Softmax Regression
- Feedforward Neural Network
- Deep Networks
- Intro to Convolution

总结:

0.2.3 Syllabus

Module 1 - Tensors and Gradients

- Tensors
- Derivatives
- Dataset Class

Module 2 - Fundamentals of PyTroch with Linear Regression

- Prediction 1D Regression
- Training 1D Regression
- Stochastic and Batch Gradient Descent
- PyTorch Way
- Model Validation
- Higher Dimensional Linear Regression

Module 3 - Logistic and Softmax Regression

- Logistic Regression Prediction
- Training Logistic Regression
- Softmax Regression

Module 4 - Feedforward Neural Network

- Neural Networks
- Back Propagation
- Activation Functions
- Building Deep Networks In Pytroch

Module 5 - Deep Networks

- Dropout
- Initialization

Module 6 - Intro to Convolution

- What's Convolution?
- Multiple Channel Convolution
- Activation Max Pooling
- Convolutional Neural Network

总结:

0.2.4 Grading Scheme

GRADING SCHEME

1. The minimum passing mark for the **course** is 70% with the following weights:
   - 50% - All Review Questions
   - 50% - The Final Exam
2. Though Review Questions and the Final Exam have a passing mark of 60% respectively, the only grade that matters is the overall grade for the **course**.
3. Review Questions have no time limit. You are encouraged to review the course material to find the answers. Please remember that the Review Questions are worth 50% of your final mark.
4. The final exam has a 1 hour time limit.
5. Attempts are per **question** in both, the Review Questions and the Final Exam:
   - One attempt - For True/False questions
   - Two attempts - For any question other than True/False
6. There are no penalties for incorrect attempts.
7. Clicking the "**Final Check**" button when it appears, means your submission is **FINAL**. You will **NOT** be able to resubmit your answer for that question ever again.
8. Check your grades in the course at any time by clicking on the "**Progress**" tab.

总结:

0.2.5 Copyrights and Trademarks

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总结：