TensorFlow Examples

TensorFlow例子
本教程的目的是通过示例轻松地进入到TensorFlow。为了便于阅读，它包括了笔记本和解释的源代码。
它适合初学者，他们想要找到清晰和简明的关于TensorFlow的例子。除了传统的“原始”TensorFlow实现之外，您还可以找到最新的TensorFlow API实践(比如层、估计器、数据集……)。
更新(03/18/2018):TensorFlow的热切API示例可用!(TF v1.5 +推荐)。
如果您使用的是旧的TensorFlow版本(0.11及以下)，请查看 这里.*

教程索引

0 - Prerequisite

- 介绍机器学习。.
- 介绍MNIST数据集。.

1 - Introduction

- **Hello World** (notebook) (code). 非常简单的例子，学习如何使用TensorFlow打印“hello world”。
- **Basic Operations** (notebook) (code). A simple example that cover TensorFlow basic operations.
- **TensorFlow Eager API basics** (notebook) (code). Get started with TensorFlow's Eager API.

2 - Basic Models

- **Linear Regression** (notebook) (code). Implement a Linear Regression with TensorFlow.
- **Linear Regression (eager api)** (notebook) (code). Implement a Linear Regression using TensorFlow's Eager API.
- **Logistic Regression** (notebook) (code). Implement a Logistic Regression with TensorFlow.
- **Logistic Regression (eager api)** (notebook) (code). Implement a Logistic Regression using TensorFlow's Eager API.
- **Nearest Neighbor** (notebook) (code). Implement Nearest Neighbor algorithm with TensorFlow.
- **K-Means** (notebook) (code). Build a K-Means classifier with TensorFlow.
- **Random Forest** (notebook) (code). Build a Random Forest classifier with TensorFlow.

3 - Neural Networks

Supervised

- **Simple Neural Network** (notebook) (code). Build a simple neural network (a.k.a Multi-layer Perceptron) to classify MNIST digits dataset. Raw TensorFlow implementation.
- **Simple Neural Network (tf.layers/estimator api)** (notebook) (code). Use TensorFlow 'layers' and 'estimator' API to build a simple neural network (a.k.a Multi-layer Perceptron) to classify MNIST digits dataset.
- **Simple Neural Network (eager api)** (notebook) (code). Use TensorFlow Eager API to build a simple neural network (a.k.a Multi-layer Perceptron) to classify MNIST digits dataset.
- **Convolutional Neural Network** (notebook) (code). Build a convolutional neural network to classify MNIST digits dataset. Raw TensorFlow implementation.
- **Convolutional Neural Network (tf.layers/estimator api)** (notebook) (code). Use TensorFlow 'layers' and 'estimator' API to build a convolutional neural network to classify MNIST digits dataset.
- **Recurrent Neural Network (LSTM)** (notebook) (code). Build a recurrent neural network (LSTM) to classify MNIST digits dataset.
- **Bi-directional Recurrent Neural Network (LSTM)** (notebook) (code). Build a bi-directional recurrent neural network (LSTM) to classify MNIST digits dataset.
- **Dynamic Recurrent Neural Network (LSTM)** (notebook) (code). Build a recurrent neural network (LSTM) that performs dynamic calculation to classify sequences of different length.

Unsupervised

- **Auto-Encoder** (notebook) (code). Build an auto-encoder to encode an image to a lower dimension and re-construct it.
- **Variational Auto-Encoder** (notebook) (code). Build a variational auto-encoder (VAE), to encode and generate images from noise.
- **GAN (Generative Adversarial Networks)** (notebook) (code). Build a Generative Adversarial Network (GAN) to generate images from noise.

- **DCGAN (Deep Convolutional Generative Adversarial Networks)** (notebook) (code). Build a Deep Convolutional Generative Adversarial Network (DCGAN) to generate images from noise.

4 - Utilities

- **Save and Restore a model** (notebook) (code). Save and Restore a model with TensorFlow.
- **Tensorboard - Graph and loss visualization** (notebook) (code). Use Tensorboard to visualize the computation Graph and plot the loss.
- **Tensorboard - Advanced visualization** (notebook) (code). Going deeper into Tensorboard; visualize the variables, gradients, and more...

5 - Data Management

- **Build an image dataset** (notebook) (code). Build your own images dataset with TensorFlow data queues, from image folders or a dataset file.
- **TensorFlow Dataset API** (notebook) (code). Introducing TensorFlow Dataset API for optimizing the input data pipeline.

6 - Multi GPU

- **Basic Operations on multi-GPU** (notebook) (code). A simple example to introduce multi-GPU in TensorFlow.
- **Train a Neural Network on multi-GPU** (notebook) (code). A clear and simple TensorFlow implementation to train a convolutional neural network on multiple GPUs.

Dataset

Some examples require MNIST dataset for training and testing. Don't worry, this dataset will automatically be downloaded when running examples. MNIST is a database of handwritten digits, for a quick description of that dataset, you can check this notebook.

Official Website: http://yann.lecun.com/exdb/mnist/

Installation

To download all the examples, simply clone this repository:

```
git clone https://github.com/aymericdamien/TensorFlow-Examples
```

To run them, you also need the latest version of TensorFlow. To install it:

```
pip install tensorflow
```

or (if you want GPU support):

```
pip install tensorflow_gpu
```

For more details about TensorFlow installation, you can check TensorFlow Installation Guide

More Examples

The following examples are coming from TFLearn, a library that provides a simplified interface for TensorFlow. You can have a look, there are many examples and pre-built operations and layers.

Tutorials

- TFLearn Quickstart. Learn the basics of TFLearn through a concrete machine learning task. Build and train a deep neural network classifier.

Examples

- TFLearn Examples. A large collection of examples using TFLearn.