



TensorFlow for .NET

train neural networks with TensorFlow in C#

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TensorFlow for .NET by Lost Tech allows you to create, train, and use machine learning models with the full power of TensorFlow API on C#, F# or any other .NET language.

```
var input = tf.placeholder(tf.float32, new TensorShape(null, 1), name: "x");
var output = tf.placeholder(tf.float32, new TensorShape(null, 1), name: "y");

var hiddenLayer = tf.layers.dense(input, hiddenSize,
    activation: tf.sigmoid_fn,
    kernel_initializer: new ones_initializer(),
    bias_initializer: new random_uniform_initializer(minval: -x1, maxval: -x0),
    name: "hidden");

var model = tf.layers.dense(hiddenLayer, units: 1, name: "output");

var cost = tf.losses.mean_squared_error(output, model);

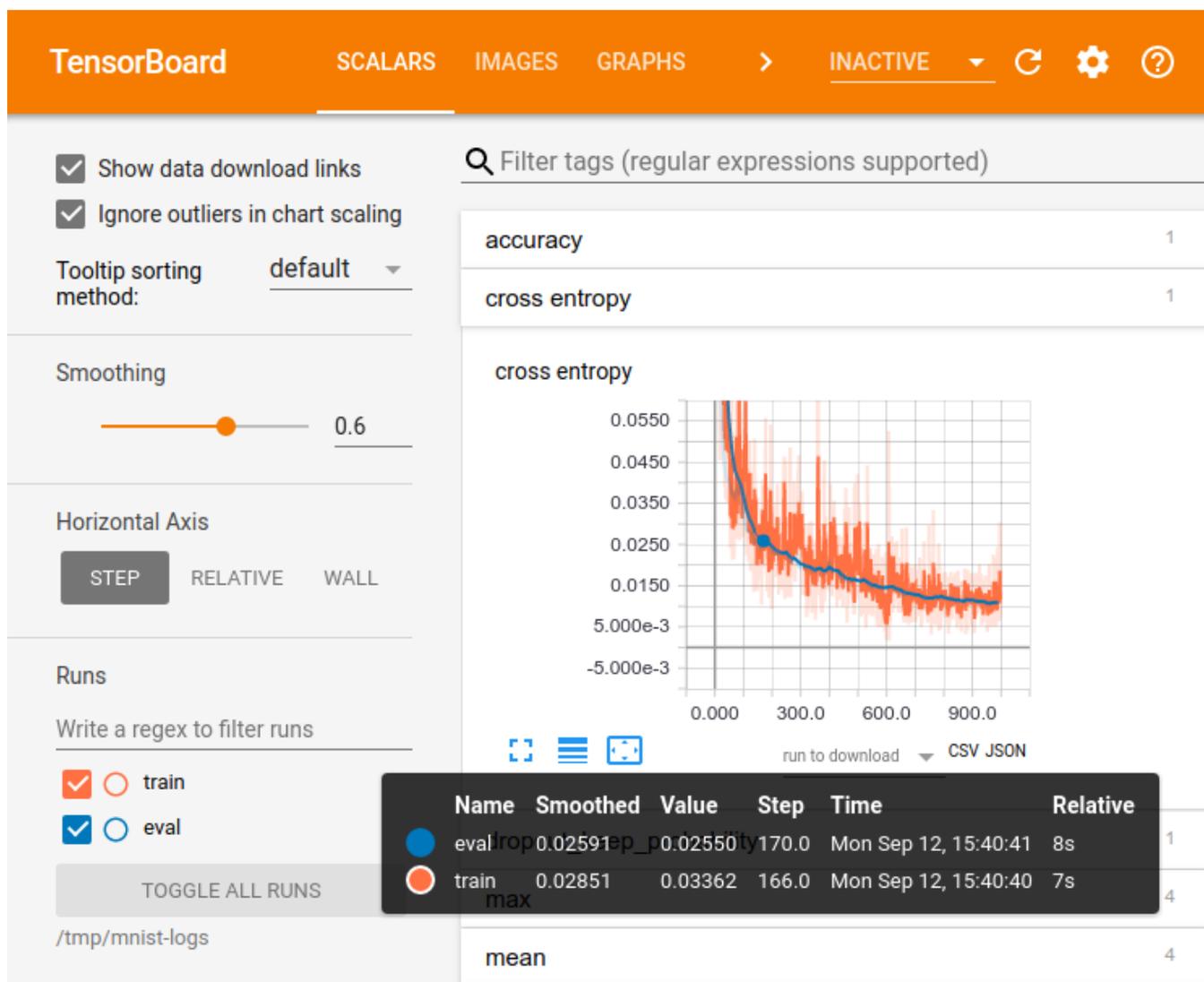
var training = new GradientDescentOptimizer(learning_rate: learningRate).minimize(cost);
```

Code sample.

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Features

- **Access the full set of TensorFlow APIs**
 - Build computation graphs, and run them in sessions
 - Use Keras-style [high-level APIs](#)
 - Build fast data pipelines, keep logs and model checkpoints
 - Use estimators and the full power of tf.contrib
 - Use eager mode to transform data interactively
 - Many more
- **Train and run models on any hardware platform: CPUs, GPUs, TPUs**
- **Use distributed training features**
- **Track your training progress with TensorBoard**



- **Easily port numerous existing TensorFlow examples**

from simple numerical computation samples to state-of-art models like [AlphaZero](#) - the new world's Go champion by DeepMind

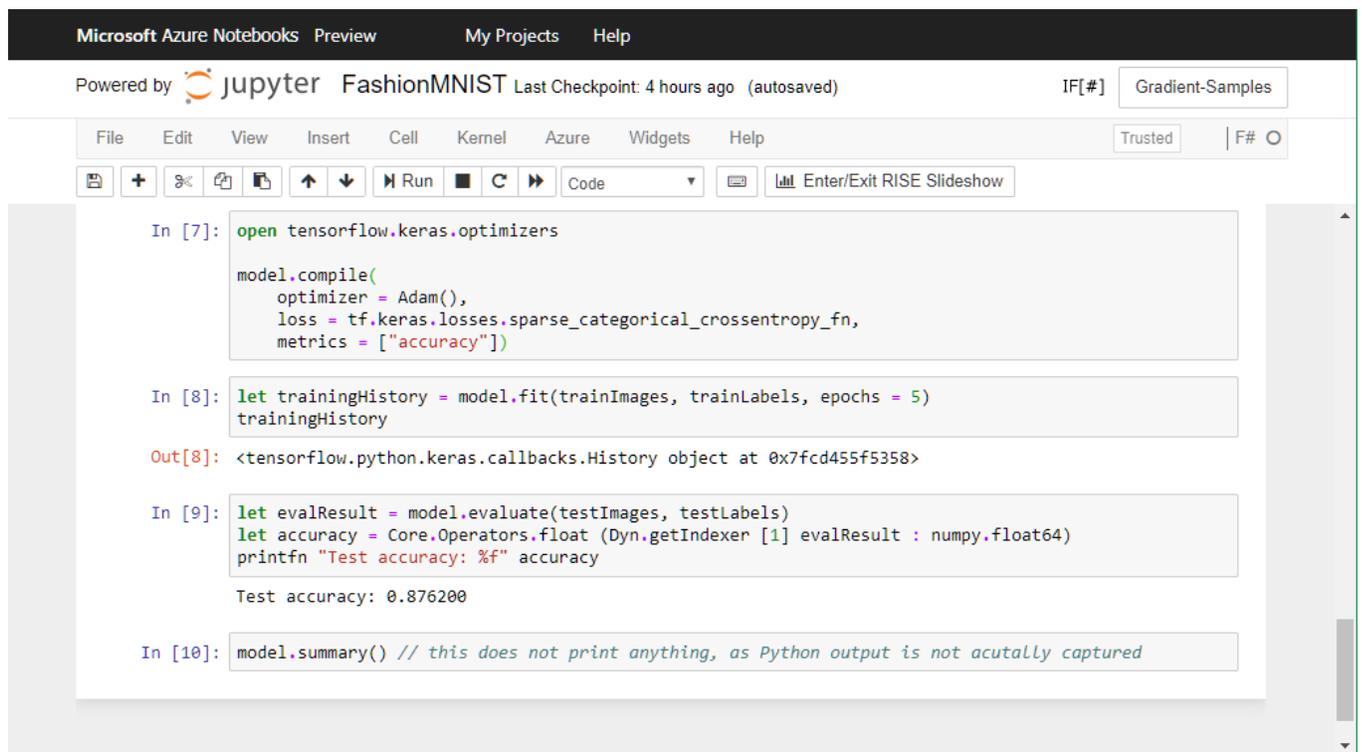
- **Get started quickly with a collection of [samples](#)**

- **Seek help with the [growing community](#)**

- **Use C# for machine learning**

- Static typing when possible, fallback to dynamic in corner cases
- IDE support: code completion, documentation hints for classes, functions, and parameters
- Experimental support for upcoming C# 8.0 features, such as ranges
- Can be used from C# interactive, and C# [kernel for Jupyter](#)

- **Use [F# Jupyter notebook](#) to train deep learning models (provided by Azure for free)**



Comparison with [TensorFlowSharp](#)

	TensorFlowSharp	Our TensorFlow
Load TensorFlow models	✓	✓
Train existing models		

	✓	✓
Create new models with low-level API	✓	✓
Create new models with high-level API	✗	✓
Dependencies	TF	TF + Python
TensorBoard integration	✗	✓
Estimators	✗	✓
Dataset manipulation via tf.data	✗	✓
tf.contrib	✗	✓
Commercial support	✗	✓

Documentation & Tutorials

- [Our Machine Learning Blog](#): cool samples, LostTech.TensorFlow news, etc
- See [What's New](#) in the latest version
- [Getting started](#)
- [Reinforcement learning](#) with Unity ML Agents
- [Writing billion songs with C# and Deep Learning + Demo](#)
- [C# or NOT](#): train deep convolutional network to classify programming language from a code fragment
- [.NET, TensorFlow, and the windmills of Kaggle](#)

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