

1 Basic Usage

Tensorflow is a programming system in which you represent computation as graphs.

Nodes in the graph are called 'ops'.

An op takes zero or more tensors. A tensor is a typed multidimensional array.

A graph must be launched in a Session. A session places methods to execute them (Cpu, Gpu).

These methods return tensors produced by ops as numpy ndarray objects in python.

1.1 Tensors

Tensorflow use a tensor data structure to represent all data- only tensors are passed between operations in the computation graph. A tensor has static type a rank and a shape.

A Tensor rank is not the same as matrix rank. Tensor rank is the number of dimensions of the tensor. Rank 0 means Scalar, Rank 1 means vector and rank 2 = matrix rank 3 = 3-Tensor (cube of numbers)

1.2 Variables

variables represent the state in computation graph and it won't be executed/performed until the session run method.

1.3 Fetches

to fetch the output of operations execute the graph with a run() call on the Session object and pass in the tensors to retrieve.

1.4 Feeds

Feeds is a mechanism for patching a tensor directly into any operation in the graph. A feed temporarily replace the output of an operation with a tensor value. When call run(), you need to give its value as run([output1,output2],holdername1 : value1, holdername2 : value2)

2 Problem Records

2.1 logloss in theano does not work on the tensorflow

logloss $\frac{1}{N} \sum_N \sum_j target * \log predict + (1 - target) * \log(1 - predict)$ use log, when the predict close to 1 or close to 0 the result will really large and return nan. Use other loss, like build-in log loss, but seem this loss can not give the a clear reconstruction. The reconstruction picture looks not very clear.

(In my understanding, this log loss is the feature-wise loss, calculate the difference on each features the reduce to mean.)