

TensorFlow Julia API

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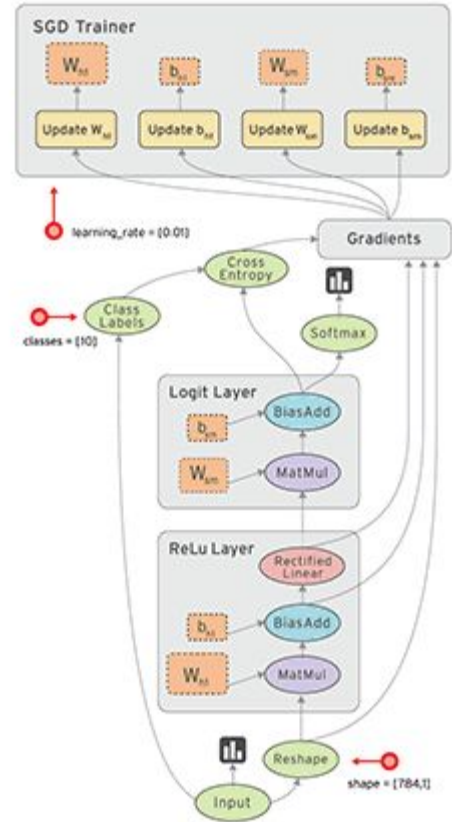
TensorFlow

- Developed by the Google Brain Team within Google's Machine Intelligence research organization
- Designed as a framework to facilitate research in machine learning
- Scalable for from research prototype to production system
- Open Source

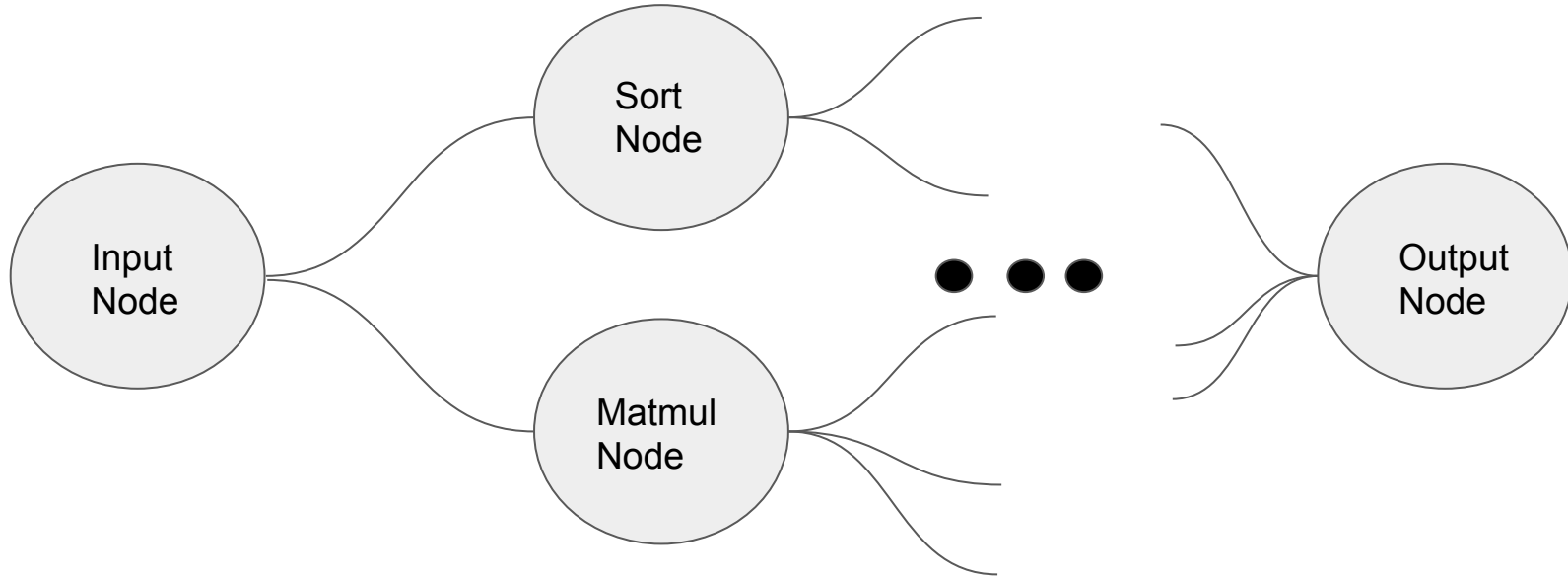


Dataflow Graph

- Represents computations
- Nodes represent operations (ops)
- Edges represent tensors (multidimensional arrays)
- Entire dataflow graph is a complete description of computations which occur in a session
- Sessions are executed on devices (CPU and/or GPU)

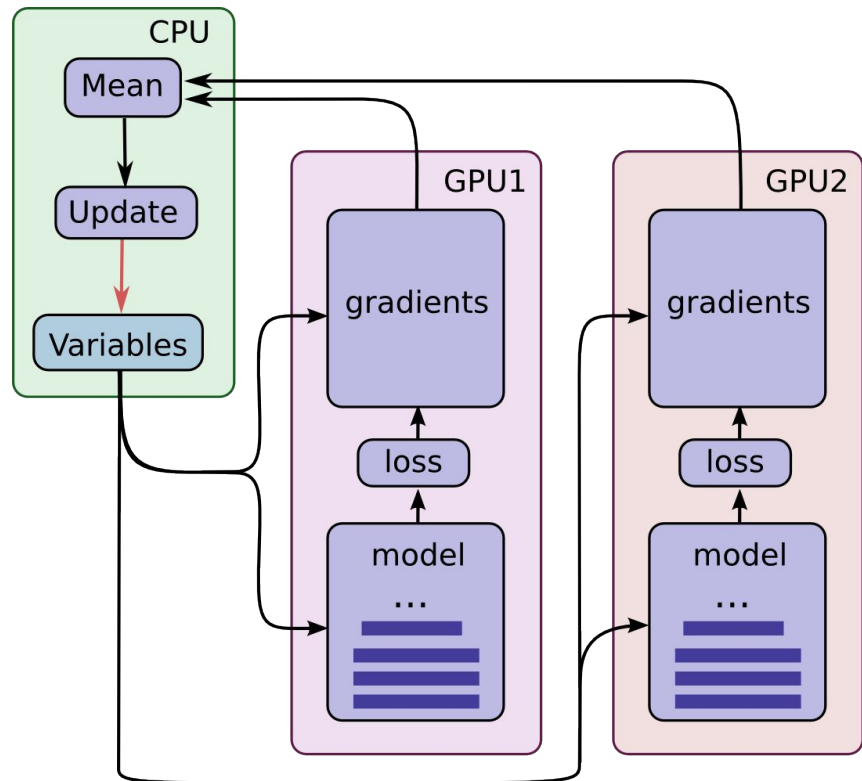


Dataflow



Parallel Training

- Asynchronous is fast but a model may be using stale parameters
- Synchronous has good training but is as slow as the slowest replica
- Each node runs its own replica model on a subset of the data
- Ensemble learning



Python API

- Building Graphs
- Constants, Sequences, and Random Values
- Variables
- Tensor Transformations
- Math
- Control Flow
- Images
- Sparse Tensors
- Inputs and Readers
- Data IO
- Neural Network
- Running Graphs
- Training

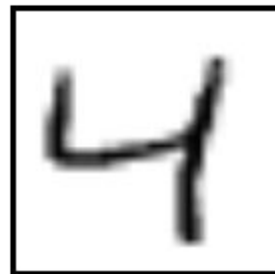
C++ API

- Env
- Session
- Status
- Tensor
- Thread

Julia API

- Building Graphs
- Constants, Sequences, and Random Values
- Variables
- Tensor Transformations
- Math
- Control Flow
- Neural Network

MNIST



- Training time for classifier to get to 95% accuracy
- 60,000 data points of training data
- 10,000 data points of test data

Performance

