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Google Tensor Flow

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Abstract

The purpose of this paper is to know what TensorFlow is and what it does, concepts to understand the content and parts function of it's composition. TensorFlow is an interface for expressing machine learning algorithms, and an implementation for executing such algorithms.This paper describes whats is the TensorFlow.

Categories and Subject Descriptors (according to ACM CCS): 500 [Computing methodologies]: Information extraction—

1. Introduction

Deep Learning is a specific area of Machine Learning that is taking great relevance within the world of Artificial Intelligence and that is behind some of the most surprising technological developments of recent years, and there is where the job of TensorFlow is.

2. What is TensorFlow?

TensorFlow is an open-source software library for for numerical computation using dataflow programming, across a range of tasks, It's develope for Google Brain Team for them system building needs of neural networks for detect and decode paterns and relations, at same time learning and reasoning like humans. TensorFlow Serving is a flexible, high-performance serving system for machine learning models, designed for production environments.

2.1. Data Structure

TenorFlow works with nodes, which one represents mathematical operations, while the graph edges represent the multidimensional data arrays that flow between them, that is what it's called tensor. It's a flexible architecture with the power of deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device.
TensorFlow uses a unified dataflow graph to represent both the computation in an algorithm and the state on which the algorithm operates

2.2. API

TensorFlow Serving provides out-of-the-box integration with TensorFlow models, but can be easily extended to serve other types of models and data.

2.3. Architecture

2.3.1. Key Concepts

Servables are the central abstraction in TensorFlow Serving. The size and granularity of a Servable is flexible. A single Servable might include anything from a single shard of a lookup table to a single model to a tuple of inference models.
Loaders manage a servable's life cycle. The Loader API enables common infrastructure independent from specific learning algorithms, data or product use-cases involved.
Sources are plugin modules that find and provide servables. Each Source provides zero or more servable streams. For each servable stream, a Source supplies one Loader instance for each version it makes available to be loaded
Managers handle the full lifecycle of Servables; including loading Servables, serving Servables and unloading Servables.
Serving Core manages the lifecycle and metrics.

2.4. Tensor processing unit

In May 2016 an ASIC built specifically for machine learning and tailored for TensorFlow. It's a programmable AI accelerator designed to provide high throughput of low-precision arithmetic, and oriented toward using or running models rather than training them. In May 2017 Google announced the second-generation, as well as the availability of the TPUs in Google Compute Engine

2.5. TensorFlow as a gift

TensorFlow makes it much easier for the company's engineers to translate new approaches to artificial intelligence into practical code packages. This improves the accuracy of services such as searches and voice recognition. Time after, Google start to offer it free.

2.6. Impact

The impact that Google has achieved by releasing this technology is spectacular and the community has responded. As of May 2017, there are more than 11,000 code repositories where TensorFlow is referenced.
One of the aspects that makes TensorFlow more interesting is that Google decided to release it as free software under Apache 2 license at the end of 2015. Since then, the impact of TensorFlow in the community has been enormous, becoming the cornerstone of a multitude of new Innovative products that rely on this Google technology at no additional cost.

2.7. Large-Scale Machine Learning

Several Google services use TensorFlow in production, we have released it as an open-source project, and it has become widely used for machine learning research.

2.8. Projection

Google's tool is also taking root in the next generation of artificial intelligence researchers and entrepreneurs.

2.9. Applications

Now days it been used more and more with different applications, used from any place and an easily sending of data to the cloud. It makes Google to take the third place in infrastructures hosted in the cloud, just under Amazon and Microsoft. TensorFlow is used from predicting costly road accidents to mail manage.
Another case is that of images and texts that can be related to each other quickly thanks to the association capacity of the neural network system. In the program, all the tests and experiments that were carried out for the development of programs and applications are stored.

2.10. How to use it?

TensorFlow is implemented in C ++ and Python, and the most convenient and easiest way to use it is through the API offered in Python.
Once we have the data prepared, we are able to build our neuron network and train it to learn from the training data.
Once we have our trained classifier model we can test it by giving it the data and the model will respond indicating what class it classifies.

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