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Paper Review Week 2
PyTorch: An imperative style, high-performance deep
learning library

CS 8803

1 Paper Overview

"PyTorch: AnImperativeStyle,High-Performance DeepLearningLibrary", written by Adam Paszke, Sam Gross, et al. is a joint efforts of multiple institues, including Google and Facebook, is published in NeurIPS'19. The desires to construct flexible machine learning system with user friendly Python interfaces while maintaining the efficiency are the main driving forces for a new machining learning system, which leads to PyTorch. The design principles and software architectures, along with implementation, are introduced in this paper, with new architecture to support flexible model declaration and module replacement. With simplifying interface while persevering performance, PyTorch gives users and developers the flexibility to experimenting system schemes [2]. The overall architectures, execution model, and extensibility study for PyTorch are discussed in this paper. Also, since it has been some time that PyTorch was proposed, the influence of this machine learning platform and its increasing popularity in research are demonstrated in this paper. Moreover, a benchmark comparison with present popular system, i.e. TensorFlow and MXNet, is included to show the efficiency of PyTorch. In general, the contributions of this paper is summarized as follows:

1. A flexible machine learning system with its implementation philosophy is introduced in this paper, including details about the system design and performance evaluation.

2. The increasing influence and comparison for the proposed machine learning system demonstrate its wide usage and acceptance.

1.1 Problem Summary

Previous machine learning system has disability and hardness to deploy and experiment with new machine learning models. It is hard to define the training model and the architectures of present machine models are hard to extend. Also, the open source platform for machine learning is not user friendly, with heavy user interfaces.

1.2 Related Works

- Tensorflow: A system for large-scale machine learning [1]
- Chainer: a next-generation open source framework for deep learning [4].
- Theano: A Python framework for fast computation of mathematical expressions [3].

2 Paper Strengths

The details coverage and comparison structure of this paper are the highlights of this system paper, although it looks like a summary or retrospect for this already proposed system. Instead of merely covering the system design details, the comparison with present systems to illustrate the goodness of the proposed system make it easy to follow. By introducing the architectures and design consideration, it gives clear introduction path. The influence study in research for this machine learning system is another highlights of this paper. Instead of merely focusing on the performance evaluation, the wide acceptance gives enough credits for its good usability. Also, there are some engineering concerns about the model evolving issues and abstraction, which is insightful to read.

1. The design details and comparison with present systems are well illustrated.

2. The background and the influence study of this paper gives enough credibility for the strength of this open source machine learning system.

3 Paper Weaknesses

As for the introduction paper for a system that is open source, the overall structures and details of this paper is enough. However, it is greater to see some examples from production environments, instead of merely focusing on research.

References

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