Title: Deep learning frameworks in high performance computing environments

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INTRODUCTION:

No recent research study has attempted to create a unified artificial intelligence theory of everything with practical use of comprehensive machine learning and deep learning frameworks as a recommendation machinery and data science field guide to the enterprises to establish a center of excellence. Some reviews of deep learning frameworks have been conducted in isolation, but lack the integrated insights across the platforms to make a recommendation. A bevy of deep learning machinery, hardware, programming languages, and tools are purpose-built to address particular problems in the enterprise. However, these applications are still in a nascent stage.

AIM:

The paper increases the visibility of deep learning and machine learning frameworks and programming languages to the enterprises to avoid one-size fits all approach and addresses the particular problem statement of the enterprise. This paper reviews the machine intelligence frameworks to break the data science open and recommend the ensemble of best practices and features available in the frameworks.

MATERIALS AND METHODS:

Due to the absence of significant literature about technological singularity, this paper performs quantitative methodology to create a new body of knowledge for organizations to use when identifying the right computing machinery for machine learning and deep learning implementations in their organizations. The traditional data analytics crunching big data are unable to provide insights into data-processing power. The rise of the artificial intelligence in the recent decade has shown the potential for tapping into deep learning and machine learning platforms with the right processes and optimized hardware. Organizations need the ability to process large-scale big data in heterogeneous distributed systems for data processing in data centers with GPU accelerators. Several deep learning frameworks offer a variety of features and abilities to process imperative and declarative programming languages. However, there is no integrated research that offers insights into the deep learning frameworks that crunch the big data at scale. There are limitations and advantages of each framework with which organizations can move to the next level from classical statistics to the next generation advanced machine intelligence and artificial intelligence.

RESULTS:

The critical factors of success for enterprises delving into deep learning and machine learning frameworks depend on leveraging the algorithms to support the decision-making framework. This deep learning framework aids as a business meme for organizations to take

their existing data analytics to the next level from Gartner's peak of inflated expectations to the road of technological singularity by embedding machine learning in every application in the organization by unleashing the potential of machine learning and deep learning algorithms without having to build multi-rule-based programming applications.

The tsunami of large-scale big data is exponentially growing complex with connected IoT and Industrial IoT applications. The data scientists, machine learning and deep learning practitioners require insights into the deluge of data by building and training machine learning models. Deep learning performs extraordinarily well for natural language processing, autonomous vehicles, genomics, bioinformatics, and healthcare industries. The present discussion was intended to bolster the enterprises providing recommendations of hardware, optimized algorithms, and libraries for scientific computing and provide the ability to manage complex and large-scale data.

CONCLUSIONS:

Many enterprises invest into deep learning and machine learning frameworks to have competitive advantage in various industries. The tools and frameworks surrounding deep learning and machine learning are getting built at a faster pace and many open-source contributions lead to new releases. It is important for the enterprises, deep learning and machine-learning practitioners to leverage the optimized and fully tuned platforms based on the hardware criteria and the requirements for scientific computing with mathematics. This aids the enterprises to run the existing frameworks that are already fully optimized instead of investing time and resources into deep learning and machine learning tools and avoid to start tuning these frameworks from the ground up. This paper has reviewed the evolution of machine intelligence tests, machine learning and deep learning algorithms with a new lens. This paper broke the data science open by dissecting the anatomy of machine learning and deep learning algorithms making recommendations on deep learning frameworks in high-performance computing environment handling multiple devices beyond CPUs such as GPUs, mobile devices, and FPGAs.

KEYWORDS:

Artificial intelligence, machine learning, deep learning, algorithms, big data, data science, programming, IoT, analytics, data scientists, Robotics

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