Secure Cloud Management System for Machine Learning

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Abstract

Nowadays cloud computing system is our friend to resolve our resource constraint problem. It is possible to access the latest generation of fast, high performance and efficient computing hardware at low cost. Further, cloud computing makes our data available, reliable, portable as well as secure. It provides us various services and products such as compute, storage, databases, analytics, networking, mobile, developer tools, management tools, machine learning, IoT, and security[1].

Goal In this internship project, the main goal will be to securely execute a machine learning (ML) algorithm of *ITPower Solutions GmbH*[2], and synchronize local computer into one of the cloud computing systems, e.g. AWS, Microsoft Azure, and google cloud platform(GCP) and measure the business cost for the proposed system.

Problem Description *ITPower Solutions GmbH* is working on a project called the *DeepTest* research project includes extensive experiments with deep neural networks(DNN) to perform. Both different network architectures and their hyperparameters are based on them check suitability, analyze and expand test inputs and outputs of embedded systems. These experiments require small to medium storage space for the learning data, model backups, and high-performance processors with GPU (graphics processors) support. However, the organization needs to understand that in the future, how much business cost will require to purchase a high-performance GPU or to use a cloud computing system.

Task Short demonstration of a standard ML algorithm (DNN) with few training data, in any cloud environments. Further, an easy and secure solution shall be created to make synchronization of cloud computing environments with the local computer. Finally, an overview shall be described concerning business costs and advantages and disadvantages of the respective neural network(NN) execution time.

Requirement The following options must need to know for this project.

- Cloud computing services (e.g. AWS, Azure, GCP)
- Python working environment with the libraries (required)
- Tensorflow > 2.0, scikit, Jupyter Notebook
- Matplot
- tennsorflow-probability

References

[1] AWS. Cloud products. `https://aws.amazon.com/products/`.

[2] Dr. Sadegh Sadeghipour. ITPower Solutions GmbH, Kolonnenstraße 26 10829 Berlin Germany, 2000. `https://itpower.de/en/company/about-us/`.