Research engineer position: Power consumption analysis of AI data centers

Context

Increasing use of AI and deep learning raise the issue of its environmental cost, both at the global scale of a data center and at the scale of algorithm choices. This topic has not been completely investigated by the community. In practice, under optimised softwares and bad practices generate significant wasted joules. The first step to improve this situation is to accurately measure of the carbon footprint at the global scale of a data center, and the finer scale of daily job runs. These measures would enable to answer questions such as : "*which architecture is optimal for my experiment* ?" or "*What are the different compromises between power consumption and performance accuracy ?*"

Project description

This position is part of the CoCa4AI project funded by the French DIM RFSI network, and which aims at building multi-scale carbon footprint models on data centers. These models will be realised on the Lab-IA cluster, managed by the LISN laboratory and which includes 12 server dedicated to IA and shared among 5 laboratories from Paris Region (LTCI, LISN, SAMOVAR, L2S, SATIE) in order to investigate deep learning algorithms such as convolutional networks and transformers. Consumption measures will be acquired from external and accurate powermeters, internal counters installed on each machine, and recordings related to the building such as PUE measures. The goal will be to establish the carbon footprint of a data center at multiple scale (instruction, program, node, building) and correlates this foorprint with deep learning applications and user behaviors. Overall this dataset will enable to identify opportunities relevant to other data centers, for instance in the context of the BigScience project and the large Jean Zay data center.

Mission

The successful candidate will carry out the following tasks :

- Installation of measuring equipment
- Design and implementation of tools to harvest data comping from powermeters, internal counters.
- Analyse the harvested data in the context of the carbon footpring evaluation of the data center and its user behaviors.

Skills

- At least a Master degree in computer science or related field
- Experience in system administration and if possible grid computing
- Knowledge in machine learning.

- Knowledge in energy consumption measurements
- Good human skills and team oriented attitude.

General information

The position is opened by the LISN laboratory
Location : Orsay, in the region of Paris
Contract duration : 12 months
Starting date as soon as possible
To apply, send resume references and covering letter at:

anne-laure.ligozat@lisn.upsaclay.fr

or paul.gay@univ-pau.fr