

Model parallelism for Online Deep Learning

Stage au sein de l'entreprise LumenAI

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Context This project is based on recent advances Deep Learning. The aim is to develop a new architecture of neural network able to treat in real time a stream of multivariate time series for supervised machine learning (classification or regression). The candidate will be inspired by our existing algorithms that use MCMC optimizers in online learning context.

LumenAI presentation LumenAI is a french startup founded at the heart of a laboratory in 2015. Based on recent advances in online learning theory, LumenAI designs new Machine Learning algorithms for industry.

LumenAI develops technologies for security (anomaly detection, community detection) as well as industry (predictive maintenance) and health. This internship is a part of our LumenAI Embedded Native Algorithms (LENA project) which aims at integrating algorithms in small board with few memory and calculus.

Location and team LumenAI combines high skills in mathematics (phd, professor, post-doc, data scientist) and software engineers in order to translate rapidly theoretical results into practical and industrial code. We double the team every year and are now composed of 12 people.

This internship will be based in Pau, Pyrenees Atlantiques, at the heart of the R&D team.

Applicant and remuneration We are looking for a passionate candidate with a strong background in both maths (linear algebra, optimization, probability and information theory) and computer science. The candidate will be able to understand mathematical modeling, algorithms and classical framework used in Machine Learning in order to produce clean code and efficient new algorithms. Paiement for this intership is 577,50 euros/month, with ticket restaurant and possible cash bonus and the end of work.

References

- Cesa-Bianchi, N., Lugosi, G. (2006). *Prediction, learning, and games*. Cambridge university press.
- Darmaillac, Y. et Loustau, S. *MCMC Louvain for Online Community Detection*. arXiv preprint arXiv:1612.01489, 2016.
- LI, L., Guedj, B. and Loustau, S. *A quasi-Bayesian perspective to Online Clustering*. Electron. J. Statist. Volume 12, Number 2 (2018), 3071-3113.
- Oyallon E. *Analyzing and introducing structures in deep convolutional neural networks*. These de Doctorat de l'Ecole Normale Superieure.