

Title:

Application of deep learning to LST1 real data

Internship supervisor

Name of supervisor	Thomas Vuillaume	Experiment	CTA
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Subject / activities

LAPP and LISTIC laboratories propose an internship in collaboration under the GammaLearn project. The project develops innovative analysis methods based on artificial intelligence applied to the data from the Cherenkov Telescope Array (CTA), an international collaboration <https://www.cta-observatory.org/>

Mission :

The intern will be part of the H.E.S.S./CTA team to work on evaluating the performances of the neural networks applied to the real data from the LST1 which is the first telescope of the Cherenkov Telescope Array built on site at La Palma.

Work environment

The GammaLearn project started in 2017 as a collaboration between the LAPP (CNRS), the LISTIC (USMB) and Orobix and develops innovative analysis methods based on artificial intelligence applied to the data from CTA. A specific neural network has already been developed in this context and its performances have been demonstrated on simulated data.

Summary of the work

With the acquisition of the first data from LST1, the performances of the network in real conditions must now be evaluated. After this step of evaluation, the intern will work on improving the performances of the network on real data based on transfer learning methods or by developing semi-supervised learning methods. The developed methods will be used to analyze several astrophysics sources observed by the LST1 and compared with the standard analysis used in the collaboration.

Skills

- Python
- Knowledge in data analysis
- Knowledge in machine learning
- Knowledge of deep learning framework ([PyTorch](#), [Tensorflow](#)) would be a plus
- Being able to present its technical work and scientific results
- Good written and spoken english
- Creativity
- Being able to work in a team and in a multidisciplinary environment

Opening of a PhD position

This internship will potentially continue with a PhD position, on the same or a similar subject.

Members of the team

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