INTERNSHIP:


NAME, first name of the person offering the internship:
Auguste Genovesio  
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Adresse électronique : auguste.genovesio@biologie.ens.fr  

Company/Membership Unit : Institut de Biologie de l'Ecole Normale Supérieure  
Area of expertise of the laboratory: Biological research  
Name of the host team or department: Team « Computational bioimaging and bioinformatics »

Name, first name, status and specialty of the trainee supervisor:
Tiphaine Champetier – PhD student – bio-informatique imagerie  
Numéro(s) de téléphone où l'on peut la joindre : 01.44.32.23.58  
Adresse électronique : tiphaine.champetier@ens.fr


keywords : Deep learning, machine learning, bio-imaging

Description:

Context:
The high-content screening, used in fundamental research and for therapeutic molecules discovery, makes it possible to automatically visualize the effect of a large number of parallel perturbations on a cellular model. This process, which uses automated microscopy, generates large amounts of images. Our laboratory uses and develops deep learning approaches to classify these disturbances automatically and to allow the inference of morphological modifications induced by them.

Goals:
The general goal of this project is to improve the understanding of a cellular model with deep learning.

Expected work:
After a quick upgrade of the candidate on the practical aspects of the application of deep learning methods to large image datasets, the internship project will focus on studying the capacity of networks, pre-trained on natural image classification, to transfer their expertise to biological domain images, and this for classification and clustering problems. We wish to create a transferable system allowing the explanation of biological visual phenotypes. In a second step, it will be possible to train a network with a special loss function in order to obtain a similarity metrics, allowing better clustering results.
Technical skills and education:

This M2 internship may be suitable for people in engineering or computer sciences. It may also be suitable for students in physics or statistics. Knowledge in Applied Mathematics or Statistical Learning is welcome but not absolutely necessary. Applicants will need to have programming basics, ideally in Python and if possible comfortable with linux environment.

All applications will be studied.

This subject constitutes a first step toward a PhD work: No
Start date and estimated duration of the internship: mid-January to March 4 to 6 month
Compensation: ~500€ / mois
Date of internship proposal and application deadline: 30/11/2018 – 01/03/2019