

M2 Internship Proposal – 6 months, funded

Mentors:

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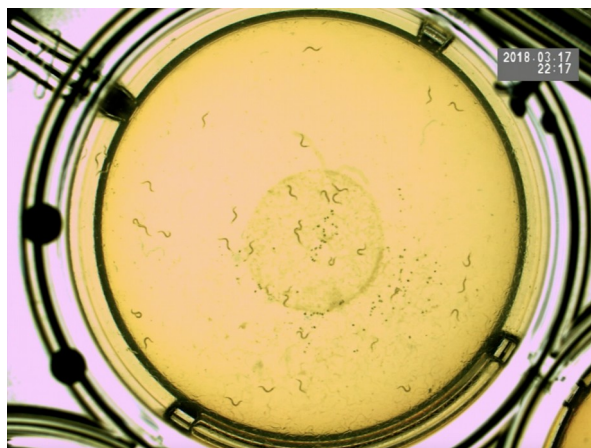
Title: Machine learning methods for image-based studies of experimental immunology

Expected profile: Knowledge of machine learning techniques and image processing methods, interest in biology

Subject: We study host-pathogen interactions using the worm *C. elegans*. Our principal model is a fungal pathogen that kills worms over a few days. We often need to assay the virulence of different fungal strains. We have a system that acquires time series images automatically, but so far our attempts to analyse them computationally have not been sufficiently accurate, and we were left to perform manual counts.

We are therefore looking for a way to make this pipeline entirely automatic by developing image processing and data analysis methods that would detect the liveliness of worms in movies. We are planning to rely on state-of-the-art methodologies in machine learning such as deep learning and LSTM architectures.

We show below an example of the images that we are acquiring, the plate and medium are shown in yellow, while the worms are visualized in grey within the plate.



If successful the project could lead to a software or a library that would be used routinely in Jonathan Ewbank's lab to perform screens over various fungal strains.

The expected programming language is python.