Internship proposal - Master 2 Bioinformatics

Specialisation Software Development and Data Analysis

Internship period: Jan-Jun 2024

Internship title	Subcellular image analysis with CellDetective
Internship supervisor(s)	Limozin Laurent
Laboratory acronym(s)	LAI
Laboratory city(ies)	Marseille
Web site(s)	https://labadhesioninflammation.org/
Team(s)	https://labadhesioninflammation.org/laurent-limozin/
E-mail(s)	Laurent.limozin@inserm.fr
Internship description	We are designing in LAI functional in-vitro immune assays based on multimodal microscopy for diagnostic and therapeutic purposes. In this context, we have developed CellDetective, a python-based open-source software for cell dynamics and interactions image analysis on large data sets. It integrates state-of-the-art AI-based segmentation and tracking algorithms as well as customised time signal processing and graphical representations. The GUI features complete interactive visualisation, annotation and training capabilities. We aim now at adapting this framework from cell scale analysis to subcellular scale. It will encompass single particle tracking as well as substructures quantifications and dynamic analysis on nanopatterned surfaces.
Expected skill	The candidate will need excellent skills in Python (Qt, numpy, matplotlib). Notions of signal analysis and/or machine learning would be highly appreciated.
Confidential (yes/no)	No
Informatics resources	Existing code to extend. Collaboration with main developer Rémy Torro during 3 months.
Potential PhD project (yes/no)	Yes, possible.
References (2 and 3)	Github access on demand