

Engineer position:

Microscopy Image Analysis with deep learning



As part of the AMIDEX SEMENDO-BASE research project, Aix-Marseille University is recruiting a biological image analysis engineer. The aim is to implement methods and tools for managing and analyzing images generated by scanning electron microscopy. The project is co-developed by LIS (computer sciences laboratory) and IHU Méditerranée Infection – APHM, La Timone Hospital.

Project Summary

Infective endocarditis (IE) is a severe disease with difficult diagnosis and high morbidity and mortality. It is characterized by a bacterial or fungal infection of the endocardium causing the destruction of a heart valve and the formation of vegetation due to the development of an inflammatory and infected fibrino-platelet deposit. We have recently developed an innovative approach to analyze vegetations. Scanning electron microscopy provides nanoscale images of the valve tissue to observe major vegetation components that differ in abundance depending on the bacterial species. The current analysis process is manual and operator dependent. Aims of the project is to perform the analysis of the images by deep learning approaches. They should allow to detect and to quantify automatically each component of the vegetations to better understand their development and structure in order to propose adapted therapeutics. The main objective of this mission is to set up the main pipeline from data collection to image processing.

Job description / Main Missions

The activities will be dedicated to:

- Use scanning electron microscopy (SEM) for acquiring test images and increment database.
- Set the model of the data and define a procedure to facilitate the transfer from the microscope to the dedicated database.
- Annotate the images regarding the class of microbes detected in current image corpus.
- Set-up deep learning models.
- Perform needed deep-learning experiments.
- Participate in writing deliverables.

Job information

New position on a fixed-term contract for a renewable period of 1 year. May be suitable for a first position.

Remuneration according to profile and experience based on Aix-Marseille University salary scales.

The project will take place mainly at the IHU Méditerranée Infection on the Timone campus in Marseille.

Candidate profile

The candidate will set up IT tools for image management and image processing.

Required education and skills :

- Master or engineer degree (Bac +5) or PhD in biology, image processing or bioinformatics.
- Proficiency in microscopy images analysis tools.
- Proficiency in Python and/or Java for software development.
- Knowledge in microscopy.
- Knowledge of database management.
- Ability to work independently and collaborate effectively within a multidisciplinary team.
- Proficiency in professional English.
- Knowledge/previous expertise of deep learning for biological microscopy images is a plus.

Application guidelines

The application must include a resume specifying the last diplomas obtained and the elements of professional experience, and a letter of motivation.

Examination of application will begin on December 1st, 2023.

Expected start date: Early 2024.

Please submit application materials to:

- Dr. Marc-Emmanuel Bellemare : marc-emmanuel.bellemare@univ-amu.fr
- Dr. Jean-Pierre Baudoin : jpbaudoin@live.fr
- Pr. Laurence Camoin Jau : Laurence.CAMOIN@ap-hm.fr

