

Post Doctoral position at University Paris Saclay/ Gustave Roussy Deep Learning on histopathological images to identify biomarkers of response to immunotherapy.

Context: A postdoctoral position is available to work on the ARC Signi't project entitled « Artificial intelligence-driven integration of Radiomics, Pathomics & Genomics to predict outcome of immunotherapy». This project is in collaboration of CentraleSupélec, Gustave Roussy and the startup TheraPanacea and it aims to identify biomarkers for prediction of response to immunotherapy.

Topic: Recent advances in artificial intelligence have provided promising directions to assist physicians in diagnosis, prognosis, treatment decision, and assessment of outcomes. Radiomics driven signatures (Sun et al. Lancet Oncology 2018) have been proposed and have shown correlations with the response to anti-PD-(L)1 immunotherapy for various cancer locations and types paving the way to precision medicine. In this project, we aim to adopt an integrative/evidence-driven complex system approach for disease understanding through global reasoning on interrelated health variables such as genomics, radiomics and pathomics. The aim of ARC Signi't project is to determine automatically the best combination of features towards optimal outcome predictions.

Main duties and responsibilities: We are seeking to appoint a Postdoc candidate to join the project working on the digital pathology part. In particular, the candidate will conduct research on the topics of deep learning and medical imaging focusing on supervised and semi-supervised methods. The goal of the research will be the discovery of robust representations from Whole Slide pathological Imaging (WSI) that can serve as powerful biomarkers for response to immunotherapy. Moreover, the candidate will be involved on MSc and PhD students supervision.

We are looking for a highly motivated computing scientist with a strong academic and scientific background in Deep Learning, Medical Imaging and a real interest in medicine and oncology.

Skills requested:

- A PhD degree in Computer Science, Applied Mathematics or Electrical Engineering with an emphasis on Machine Learning and Deep Learning
- At least 3 years project experience in AI/ML/DL/MI (including PhD)
- Good coding skills
- Good publication record
- Excellent oral and written communication skills

Work environment: The candidate will be affiliated with CentraleSupélec a French Grande Ecole d'Ingénieurs, and the coordinating institution of the Graduate School of Engineering and System Sciences, at the University of Paris-Saclay, a new university created from the cluster of several top historical academic institutions in the South of Paris region. Moreover, the candidate will be

integrated in a multidisciplinary team in Gustave Roussy composed of physicists, physicians and engineers. Gustave Roussy is one of the first cancer center in Europe and treats about 12,000 new patients per year. For a few years, Gustave Roussy has been working on different projects in collaboration with CentraleSupélec and TheraPanacea, a startup stemming from CentraleSupélec's research laboratories, which is specialized in the design of intelligent software solutions in oncology and radiotherapy.

Conditions of employment: the position is offered for 16 months, starting as soon as possible.

Salary: depending on experience

Apply: applicants should send a cover letter summarizing past experience and research interests, a CV including a list of publications, and contact information for two references to Pr Eric Deutsch, chair of the radiation oncology department Gustave Roussy cancer campus and INSERM U1030 unit eric.deustch@gustaveroussy.fr and Maria Vakalopoulou, Associate Professor at CentraleSupélec maria.vakalopoulou@centralesupelec.fr