Phd in computational oncology at Institut Curie, Paris: machine learning for fighting cancer

Keywords : Computational biology / Machine learning / spatial omics / multimodal data integration

Description

Institut Curie is one of the largest European institutions for cancer research and treatment with strong and old interdisciplinary traditions. It is located in the centre of Paris in a both cultural and scientific rich environment (http://curie.fr). The "Computational Oncology" Unit (U900 INSERM, Mines ParisTech, InstitutCurie) involves about 100 researchers and students and is a very active and growing interdisciplinary team of biologists, physicians, mathematicians, statisticians, physicists, and computer scientists (u900.curie.fr).

Our research group Computational Systems Biology of Cancer focuses on deciphering determinants of tumorigenesis and tumor progression and proposing new strategies to combat cancer using machine learning and network modeling applied to high dimensional data (sysbio.curie.fr). Two members of the group hold chairs at Paris of Artificial Intelligence Research Institute (prairie-institute.fr).

Recent progresses in cancer research are based on the systematic characterization of tumors by omics data (from high-throughput tumor sequencing), now performed at the single cell level, and collected together with the information of spatial localization (so-called spatial omics). Combined with tumor imaging (eg pathological slides), this offers an extremely rich information which holds the potential of better understanding of tumor progression mechanism and of response to treatment. This opens new avenues of research to choose an optimal patient treatment and predict and explain the response.

The proposed project aims at developing new analytical concepts and tools for analyzing multi-modal omics and spatial omics data of cancer patients to achieve this goal.

Required skills

- Master degree in statistics, computer science, bioinformatics, or mathematics
- Proficiency in programming (Python, R)
- Deep knowledge of statistics
- strong background in machine learning both conceptual and practical
- Experience in working with large datasets
- Strong will to interact with scientists from different disciplines and physicians
- Excellent communication and collaboration skills
- ability to work independently and creative thinking
- Knowledge in molecular biology and in oncology is a plus, but not required

Send CV, recommendation letter and three references to emmanuel.barillot@curie.fr with reference PHDA2023 before September 30th, 2023. Applications will be considered immediately.