PhD position: Improving cancer treatment from multi-modal data

Marie Skłodowska-Curie Initial Training Network on Machine Learning Frontiers in Precision Medicine

Research topic:
The goal of this PhD thesis will be to develop and apply novel machine learning techniques to predict cancer outcome (for example, recurrence or survival) from multi-modal patient data (which may include images, medical notes in natural languages, the outcome of various lab analyses, and multiple genomic data modalities, such as copy number variation, gene expression or epigenetic data). The PhD candidate will investigate mathematical and computational framework to represent and learn from such heterogenous data, and apply them on real data available through collaborations with cancer hospitals.

Environment:
This PhD position will be funded by the European Research Council as part of the Machine Learning Frontiers in Precision Medicine (MLFPM) Initial Training Network. The funding is for three years. The PhD student will enroll in Fall 2019.

According to the mobility rules governing the ITN, **only candidates who have not carried their main activity (work or studies) in France for more than 12 months over the last 3 years are eligible.**

Two visits of three months each to other nodes of the network are planned: one at the Max Planck Institute for Psychiatry in Munich (Germany), under the supervision of Bertram Müller-Myhsok, working on improving depression treatment from multi-modal data, and the other at IBM R&D in Haifa (Israel), under the supervision of Chen Yanover working on inferring causal relations from health data. In addition, participation in yearly ITN meetings will be an opportunity to meet and discuss with all other members of the network.

The project will take place in the Centre for Computational Biology (CBIO — http://cbio.ensmp.fr) of ARMINES/Mines ParisTech, one of the most prominent French engineering schools. CBIO has a long-standing partnership with Institut Curie, a major hospital and research facility

dedicated to cancer. CBIO benefits from an exceptional scientific environment with immediate access to experts and collaborators in biology and medicine, enabling a stimulating interdisciplinary exchange. The laboratory is located in the centre of Paris, both in Mines ParisTech and in the nearby Institut Curie.

The thesis will be supervised by Chloé-Agathe Azencott (http://cazencott.info).

Prerequisites:
A MSc in computer science, applied mathematics or equivalent is required. We are looking for candidates with solid notions in machine learning and statistics, proficiency in at least one programming language, and a strong motivation to work on health applications. Prior experience with health data is not required but strongly welcomed.

Candidates must not have carried their main activity (work or studies) in France for more than 12 months over the last 3 years.

How to apply:
Candidates must apply on the online platform at https://h2020mlfpm.glowbase.com/ **before January 15, 2019** and select ESR11. For more information regarding the thesis, please contact Chloé-Agathe Azencott at chloe-agathe.azencott@mines-paristech.fr. This proposal is part of a global call: https://euraxess.ec.europa.eu/jobs/363030.