24 months Post Doc position in artificial intelligence applied to cancerology research to work in the project AI4Elderly

Project motivation

The lengthening of life expectancy in developed countries is accompanied by an increase in the number of cancers in the elderly. Age is one of the main risk factors for cancer, with an incidence 10 times higher in patients over 65 years old. Currently, patients over the age of 70 represent a third of newly diagnosed cancer cases and projections estimate that they will represent half by 2050. Today, in France, the incidence of cancer is increasing steadily over the course of the life. Cancers in people aged 65 and over thus represent 62.4% of estimated cancers of all ages combined in 2017. For people aged 85 and over, 45,993 new cases of cancer are estimated. ("Epidemiology of cancers in patients aged 65 and over - Oncogeriatrics" n.d.).

The elderly has specific physiological, thymic, psychological and social characteristics that can influence their response to treatment (Overcash, 1969). Unfortunately, clinical studies specific to elderly patients very few and elderly subjects are often excluded from clinical studies due to comorbidities or frailty criteria. Thus, oncologists often have to make their decision by extrapolating the results of studies carried out in a younger population, which can entail risks for elderly patients of not benefiting from the suitable treatment adapted to their fragilities and comorbidities.

Nowadays it is increasingly common to use AI techniques such as Machine Learning and Deep Learning to improve early detection, diagnosis and prediction of disease progression in oncology.

Project objectives

We will use Machine Learning and Deep Learning methods applied to clinical data and healthcare reimbursement data from the INCA Cancer Data Platform, PDC. The objective is to create patients' temporal profiles using different criteria such as their clinical characteristics, the treatments received, their comorbidities and their consumption of care. We will focus on patients over the age of 70 cared for at the Institut Paoli-Calmette in Marseille and our analysis will cover a period of one year before diagnosis and up to five years after.

Once the medical pathways have been obtained, we will be able to set up predictive algorithms for the patients' response to the cancerological treatment, using supervised machine learning and Deep Learning methods.

The results of this project may also lead to significant improvements in the medical care of elderly cancer patients. In addition, the data processing methods resulting from this study will be valuable for cancer research and could pave the way for new discoveries and advances in cancer treatment in France using healthcare reimbursement data from the SNDS. The results may be extrapolated to other diseases.

Research team

This project will be carried out in collaboration between the Sesstim researchers and the oncologist at Marseille's Cancer Hospital, IPC. The Sesstim is a multidisciplinary team including data scientists, medical doctors and statisticians.

The post doc will be directly supervised by PhD Raquel Urena, associate professor in AI applied to health data at the Aix Marseille Université, PhD AD Bouhnik, biostatistician at the INSERM, Dr Louis Tassy, Medical oncologist at the IPC and PhD Sandrine de Montgolfier, associate professor at AMU.

The post doc will be located at the Faculty of Medicine of Marseille.

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Skills

- PhD in Artificial intelligence or computer Science
- MS degree in computer science or related discipline
- Good publication record in artificial intelligence and machine learning
- Good programming skills in Python and R
- Knowledge of Machine learning and deep learning methodologies
- Solid knowledge of SQL databases.

Contrat

Starting date : May or June depending on the candidate availabilities
Duration : 24 months
Salary : Post doc statutory salary fixed by Aix Marseille University.

Application:
Please send an email with a CV and a motivation letter to Raquel.urena@univ-amu.fr

Deadline for applying: 30 Mars 2023