The LBBE will hire a lecturer in "Biostatistic modelling –Artificial Intelligence"

The LBBE benefits from the opening of a position of Master/Mistress of Conferences in 2022. We are looking for a profile of Biostatistician with expertise in modeling survival, excess mortality and high-dimensional data to strengthen the Biostatistics Health Team of the Department of Statistics and Modeling for Health Sciences.
More details below.
Do not hesitate to contact us.

Published on 12 February 2022

Bio-statistics modelling and artificial intelligence

TEACHING

The candidate will be strongly involved in the first and second year teaching, in particular in the Health Sciences License, and in the new Artificial Intelligence courses developed within the framework of the tripartite partnership between UCBL, the Ecole Centrale de Lyon and the Hospices Civils de Lyon (doctors-engineer double curriculim).

- **Licence Sciences pour la Santé**: This program has been open for one year (L1) and is a key element of the interface between Science and Health within UCBL. With the opening of the L2 this year and the L3 in 2021, the additional demand for interventions for the Biostatistics courses of this license is 135 hours annually.

- **Biostatistics-Artificial Intelligence in Medicine**: The candidate recruited will be involved in the AI courses taught in the first year (PASS) and in the third year (Quantitative Bio-Medicine) of the medical curriculum.

- **Master's degree**: Teaching in first (M1) and second (M2) year of the Biostatistics, Biomathematics, Bioinformatics and Health (B3S) specialisation of the Master of Public Health, the candidate will intervene in different existing Teaching Units (generalized linear models, survival models) and in the new teaching units on applications and performance evaluation of learning models in Medicine.

- **University hospital training**: Specialized training (national) in bioinformatics, training sessions of the Artificial Intelligence Commission of the University Hospital.

- **Planned developments (prospective teaching)**: Mutualized UCBL training in Modeling and Artificial Intelligence attached to the DigitBiomed SFRI, national M2 project in Artificial Intelligence in Health (collaboration between national masters).

Teaching contacts:

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RESEARCH

With University degree (Master and PhD in Biostatistics), or an engineer degree with a PhD in Biostatistics, the candidate has developed extensive skills in fine survival modeling, and developed « diagnostic », « prognostic » or « therapeutic response » models based on the fitting of penalized flexible functions (splines, tensors) which have led to publications and software development related to these research areas.

The candidate will develop collaborative research and training activities at national and international levels. A strong involvement in collaborative work, in the supervision of researchers, as well as an ability to integrate research work in multidisciplinary research networks are required.

2.1. Modelling of mortality determinants (survival models) and excess mortality (Research Area 1 of the Biostatistics and Health Team)

New models of excess mortality hazard will be developed to estimate the combined effects of covariates. More or less complex relationships between the studied covariates, time and the variable of interest will be modeled using flexible mathematical functions, with penalization methods to avoid over-fitting of the models leading to an optimism bias.

Specific developments are required to model complex interactions using specific functions (splines, tensors) and to estimate the predictive properties of the models. The application domains are cancerology in collaboration with the

French network of cancer registries FRANCIM and Santé Publique France, Multiple Sclerosis with the French Observatory of Multiple Sclerosis (35,000 patients) in the framework of the SURVIMUS 2 and IN-EXCESS-MS projects, and potentially other chronic diseases with high mortality.

2.2. Biostatistics - Large scale data - Artificial Intelligence (Research Axis 4 of the Biostatistics and Health Team)

The teacher-researcher recruited will be called upon to implement, adapt, evaluate and validate the contextualized clinical performance (utility analysis) of « diagnostic », « prognostic » or « therapeutic response » models. This modeling will integrate classical statistical approaches (machine learning) and deep learning methods (neural networks) focused on statistical inference and prediction issues. This research work will be integrated into the framework of work on the evaluation of contextualized performance of models and algorithms developed by the Biostatistics-Health Team, work on AI applications developed at the Hospices Civils de Lyon (Artificial Intelligence Commission), and transverse modeling work developed for the One-Health research axis of the LBBE.

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