

## Internship

### Using machine learning to predict antibiotics resistance from patients clinical data

#### Advisors

- **Stanislas Rebaudet** (Infectiologist at Hôpital Européen Marseille and researcher at SESSTIM laboratory) ;
- **Raquel Urena** (Associate professor at Aix-Marseille Univ (AMU) and researcher at SESSTIM, specialist in machine learning applied to health data).

#### Context

In clinical practice, initial antibiotics treatment is often prescribed empirically until microbiological results of clinical samples (i.e bacterial cultures and antibiograms) are obtained. This is a challenging gamble based on probabilistic reasoning, which can get complex, even for experienced clinicians.

#### Objectives

The objective of this stage is to pursue the development, deployment and evaluation of machine learning algorithms aiming to predict the probability of a patient being infected by a bacteria sensitive to a given antibiotic, given specified features.

The work carried out in this intership will be part of a current research project in collaboration between the Hôpital Européen Marseille and the SESSTIM. The intern/trainee will take active part in research meetings between data scientists, clinical practitioners and public health specialists.

#### Scientific program

The scientific program of this project will be organized into two main tasks:

- 1) Implementation and comparison of artificial intelligence/machine-learning models (Deep learning, Random Forest, AdaBoost, GradientBoosting...) with a new set of data with additional features, and from additional hospitals.
- 2) Implementation of the best model in a responsive web application to adapt it to clinical practice.

#### Additional information

- Skills: Master-level in computer science, python programming, deep learning, web programming ; interest for health research ; rigor and tenacity.
- Location: the internship will take place in the SESSTIM laboratory at the Faculty of Medicine, Aix-Marseille University.
- Dates: Spring-summer 2022, duration 5-6 months.
- traineeship grant: around 600 euros per month (Statutory remuneration fixed by the university).

#### Contact details

To apply please send a mail with your CV and a motivation letter to [raquel.urena@univ-amu.fr](mailto:raquel.urena@univ-amu.fr).