METMALE

Methods of machine learning

Module

Objectives

The goal of this training module is to provide an understanding and mastering the main methods of machine learning used to analyse health data.

Knowledge to be acquired

- Know the main methods of machine learning, from their fundamental concepts to their contextualised use to analyse health data.

Skills to be acquired

- Being able to perform and interpret an analysis using machine learning methods.

Program

- General theoretical framework for machine learning;
- k-means;
- Support vector machines;
- Tree-based methods, bagging, random forests, boosting;
- Neural networks.

Prerequisites

- Knowledge in probabilities, in descriptive and inferential statistics, in mathematic;
- Basic knowledge of programming (Python and/or R).

Coordinators* & Instructors

Louis Visonneau*, Quentin Marcou,

Bibliographic resources

- Hastie, T., Tibshirani, R., & Friedman, J. (2009). The Elements of Statistical Learning: Data Mining, Inference, and Prediction (2nd ed.). Springer Series in Statistics. New York: Springer. https://doi.org/10.1007/978-0-387-84858-7
- MacQueen, J. (1967). Some methods for classification and analysis of multivariate observations. In L. M. Le Cam & J. Neyman (Eds.), Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability, Volume 1: Statistics (pp. 281-297). Berkeley: University of California Press. https://projecteuclid.org/euclid.bsmsp/1200512992
- He, K., Zhang, X., Ren, S., & Sun, J. (2016). Deep residual learning for image recognition. In 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR) (pp. 770-778). Las Vegas, NV: IEEE. https://doi.org/10.1109/CVPR.2016.90

Practical informations

Course organisation

21 hours of lecture and practical exercises.

Module organisation

Live and online.

Module fees

- Individually: 350 €;
- Institutionally: 1 050 €.