ADVANCED STATISTICAL MACHINE LEARNING

ECTS
5 credits

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

Code: N9EN19

Presentation

Objectives

By the end of this module, the student will have understood and be able to explain (main concepts) how to use deep learning methods for high dimensional classification and / or linear and nonlinear statistical methods

At the end of this module, the student should be able to:

- Adapt learning methods for the classification and regression of large data such as media or images
- optimize different models to compare them and finally select the most efficient method on the available data.
- Implement high dimensional deep learning methods on real data sets with Python libraries.

Description

The main topic of the course is learning methods, including statistical learning and deep neural networks, for processing large-dimensional media, such as images. Depending on the options open, the following topics will be covered:

- statistical learning, regression and classification - Linear models - GAM - Decision trees - Model aggregation methods (Bagging, Random forests, Boosting) - Vector-based machines

- Neural networks and introduction to deep learning: definition of neural networks, activation functions, multilayer perceptron, backpropagation algorithms, optimization algorithms, regularization

- Convolutional neural networks (applications to image classification, object detection), recurrent neural networks (sequence modeling, backpropagation in time), neural networks for 3D processing

- Supervised and unsupervised learning

- Implementation on large real data with Python and / or R libraries.

Pre-requisites

- R & Python, Statistics

Useful info

Place

Toulouse