UE From Basic Machine Learning models to Advanced Kernel Learning

Level
Baccalaureate +5

ECTS
6 credits

Component
UFR IM2AG (informatique, mathématiques et mathématiques appliquées)

Semester
Automne

- **Teaching language(s):** English
- **Open to exchange students:** Yes
- **Code d'export Apogée:** GBX9AM76

Presentation

Description

Statistical learning is about the construction and study of systems that can automatically learn from data. With the emergence of massive datasets commonly encountered today, the need for powerful machine learning is of acute importance. Examples of successful applications include effective web search, anti-spam software, computer vision, robotics, practical speech recognition, and a deeper understanding of the human genome. This course gives an introduction to this exciting field. In the first part, we will introduce basic techniques such as logistic regression, multilayer perceptrons, nearest neighbor approaches, both from a theoretical and methodological point of views. In the second part, we will focus on more advanced techniques such as kernel methods, which is a versatile tool to represent data, in combination with (un)supervised learning techniques that are agnostic to the type of data that is learned from. The learning techniques that will be covered include regression, classification, clustering and dimension reduction. We will cover both the theoretical underpinnings of kernels, as well as a series of kernels that are important in practical applications. Finally we will touch upon topics of active research, such as large-scale kernel methods and the use of kernel methods to develop theoretical foundations of deep learning models.

Course parts

Lectures	Lectures (CM)	36h

Useful info

Contacts

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Campus

Grenoble - University campus