MACHINE LEARNING AND INTELLIGENT SYSTEM

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Technical Teaching
MALIS
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ABSTRACT

The objective of this course is to give students a solid background in Machine Learning (ML) techniques. ML techniques are used to build efficient models for problems for which an optimal solution is unknown. This course will introduce the basic theories of Machine Learning, together with the most common families of classifiers and predictors. It will identify the basic ideas underlying the mechanism of learning, and will specify the practical problems that are encountered when applying these techniques, optimization, overfitting, validation, together with possible solutions to manage those difficulties.

Teaching and Learning Methods : Lectures and Lab sessions (groups of 1 or 2 students)

Course Policies : Attendance to Lab sessions is mandatory

BIBLIOGRAPHY

- The Elements of Statistical Learning. J. Friedman, R. Tobshirani, T. Hastie
- Pattern recognition and Machine Learning. C. Bishop

REQUIREMENTS

Knowledge about programming

DESCRIPTION

- Introduction to learning
- Supervised learning:
  - Linear methods for regression
  - Linear methods for classification
  - Support vector machines
  - Decision trees
  - Ensemble learning
  - Neural networks
- Learning theory, validation, overfitting and regularization
- Unsupervised learning:
  - Clustering, K-means
  - Dimensionality reduction, PCA

Learning outcomes:

- Master the fundamentals of Machine Learning
- Understand the most common families of classifiers and predictors
- Be able to apply ML algorithms to practical problems

Nb hours: 42.00, including 4 Lab sessions (12 hours)

Nb hours per week:3.00

Grading Policy : Lab reports (10%), Final Project (30%), Final Exam (60%)