Introduction to Machine Learning, 4 ECTS UJM Semestre 2

Course instructors: Marc Sebban (UJM, Saint- Etienne)

Language of instruction: English

Learning outcomes:
This course gives a general introduction to Machine Learning, from applications to theoretical aspects in Statistical Learning Theory.

Expected prior-knowledge: basic mathematics and statistics

Course outline:

- General Introduction to Machine Learning (learning settings, curse of dimensionality, overfitting/underfitting, etc.)
- Overview of Supervised Learning: True risk/Empirical risk, loss functions, regularization, sparsity, norms, bias/variance trade-off, generalization bounds, model selection.
- Ensemble methods (homogeneous/heterogeneous methods, Boosting/Adaboost, theoretical guarantees)
- Non-parametric Methods (K-NN)

Teaching methods:

- Lectures

Literature and study materials:
Basic textbooks:

- Statistical Learning Theory, V. Vapnik, 1989
- Machine Learning, Tom Mitchell, MacGraw Hill, 1997
- Pattern Recognition and Machine Learning, M. Bishop, 2013
- Convex Optimization, Stephen Boyd & Lieven Vandenberghe, Cambridge University Press, 2012.
- On-line Machine Learning courses: https://www.coursera.org/

Expected prior-knowledge:

- basic mathematics and statistics

Evaluation criteria

written exam (100%)