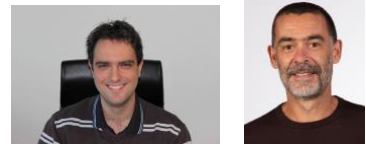Université
Jean Monnet
Saint-Étienne

Advanced Machine Learning

Course level: Master M2   **Track(s):** MLDM

ECTS Credits: 6

Course coordinators: Amaury Habrard and Marc Sebban

Education period: [3rd] semester   **Language of instruction:** English

Expected prior-knowledge: Machine Learning - Fundamentals and Algorithms; Optimization and Operational Research

Keywords: Statistical learning theory, Sparsity, Reinforcement learning, Metric learning, Transfer learning, on-line learning, SVM, PAC-Bayesian Theory

Syllabus:

- Sparsity-inducing norms in Machine Learning

- Advanced SVM and kernel methods

- Reinforcement learning and Bandits

- On-line learning: Regret bounds and main Algorithms

- Transfer learning

- Physics-informed Machine Learning

- Optimal Transport

Organisation and timetable: Lectures (16h), tutorials (14h) and lab sessions (10h).

Form(s) of Assessment: 1 theoretical exam (2h) 2/3, practical assignment 1/3.

Literature and study materials:

- Statistical Learning Theory, V. Vapnik, 1989
- Machine Learning, Tom Mitchell, MacGraw Hill, 1997
- Foundations of Machine Learning. M. Mohri and A. Rostamizadeh and A. Talwalkar, MIT Press, 2012.
- Pattern Recognition and Machine Learning, M. Bishop, 2013
- Understanding Machine Learning: From Theory to Algorithms, S. Shalev-Shwartz and S. Ben-David, Cambridge University Press, 2014.

Additional information/Contacts:

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