UCL Université catholique de Louvain

LELEC2870

2012-2013

Machine Learning : regression, dimensionality reduction and data visualization

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Verleysen Michel ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Main themes :	See description
Aims :	1. To understand and to be able to apply machine learning concepts for analyzing data and signals, in particular in the context of regression and prediction problems; 2. To understand and to be able to apply linear and nonlinear techniques for data visualization; 3. To be able to evaluate the performances of these methods through appropriate techniques; 4. To be able to choose between existing machine learning techniques, according to the nature of the data and signals to be analyzed. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Content :	" Linear regression " Nonlinear regression with Multi-Layer-Perceptrons " Clustering and vector quantization " Nonlinear regression with Radial-Basis Function Networks, Kernel regression " Probabilistic models for Regression " Ensemble models " Feature selection " Model selection " Principal Component Analysis " Nonlinear dimensionality reduction and data visualization " Independent Component Analysis
Other infos :	The course necessitates only a basic knowledge in linear algebra. In addition to the course itself there are exercise sessions organized on computers, and students must realize d a project aims at applying machine learning techniques in a specific application context. The exam is oral (if the number of students remains limited enough); the project report is evaluated too.
Cycle and year of study :	> Master [120] in Electro-mechanical Engineering > Master [120] in Biomedical Engineering > Master [120] in Computer Science and Engineering > Master [120] in Computer Science > Master [120] in Mathematical Engineering > Master [120] in Electrical Engineering > Certificat universitaire en statistique > Master [120] in Statistics: General
Faculty or entity in charge:	ELEC