Design of experiments and metamodels

ECTS
3 crédits

Hourly volume
64h

Introducing

Description

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

-The main methods of experimental design
-Metamodelling for optimization / uncertainty quantification of a black-box function
-At least the two main families of metamodels : chaos polynomials and Gaussian processes
-Kernel customization to account for external knowledge
-Design of computer experiments
-Global sensitivity analysis

The student should be able:

Experimental Design part.
-Plan an experiment in the framework of a linear model

Metamodels part.
-At a theoretical level, to do computations for:
-covariance kernels and Gaussian process
-ANOVA decomposition, Sobol indices
-At a practical level, to perform the complete methodology for analyzing a black-box function :
-design of experiments
-metamodel construction / evaluation
-application to optimization / uncertainty quantification

Necessary prerequisites

Linear model, Gaussian vectors.

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

Toulouse