Stochastic Processes: Time Series and Gaussian Processes

ECTS
4 crédits

Hourly volume
58h

Introducing

Objectives

At the end of this lecture, the student should have acquired the following skills, as well theoretically than practically with the R statistical Software and / or Python.

1) Time series
-Estimate or eliminate the trend and/or the seasonality of a time series
-Study the stationnarity of a time series
-Calculate and estimate the autocorrelogram and the autocorrelograms (total and partial) of a stationary process
-Study and/or adjust an ARMA (or ARIMA) model on a stationary time series
-Carry an optimal linear forecast of an ARMA process

2) Gaussian processes
-Know the fundamental properties of Gaussian processes
-Be able to characterize a Gaussian process through its covariance function
-Be able to use Gaussian Processes for modeling real life situations.

Necessary prerequisites

1) Time series
Probability and Statistics (MIC2) I2MIMT31
Statistics (MIC3) I3MIMT05
Probability and Inferential Statistics (I4MMMT21)

2) Gaussian processes
Advanced probabilities: martingales, stochastic algorithms and Montecarlo methods.
Markov chains.
Integration and probabilities.

Practical info

Location(s)

Toulouse