# Statistics

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

## In brief

- **plugin.odf-inp:PLUGINS_ODF_COURSE_NBHOURS_TXT:** 6 lectures of 1
- **Code ELP:** N6EM01B

# Presentation

## Objectives

Understand how to define a statistical model, to determine the main properties of estimators of the model parameters and finally to implement standard estimation methods (maximum likelihood, methods of moments, Bayesian estimators, confidence intervals)

Understand the concept of statistical test, how we can evaluate the performance of a test and how the Neyman Pearson theorem can be applied to binary hypothesis problems.

Understand the principles of goodness of fit tests (chi-square and Kolmogorov)

## Description

Estimation

- Statistical model and properties of estimators

- Cramér-Rao inequality

- Maximum likelihood



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- Method of Moments

- Bayesian estimation

- Confidence intervals

Binary hypothesis tests

- Probability of false alarm, of detection and receiver operational characteristics (ROCs)

- Neyman Pearson theorem

- Chi-square and Kolmogorov tests

## Pre-requisites

Bases of probability theory, computation of integrals and series, bases of optimization theory and of linear algebra

# Useful info



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