

Outline of the course

- 1 - Probabilities. Interpretation. Probability functions and distributions (1h)
- 2 - Hypotheses. Statistical Tests. Goodness of fit (2h)
- 3 - Parameter estimation. Maximum Likelihood Estimators. Bayesian parameter estimation. (1h)
- 4 - Uncertainty of parameter estimation. Confidence intervals and Limits. Credible intervals (3h)
- 5 - Model selection (frequentist and Bayesian) (1h)
- 6 - Introduction to sampling methods. Markov Chain Monte Carlo. Hybrid Monte Carlo (2h)

Main bibliography

- [1] Glen Cowan. "Statistical data analysis" (book) [lectures 1,2,3,4]
- [2] P. Gregory. "Bayesian Logical Analysis for Physical Sciences" (book) [lectures 1,3,4,5]
- [3] C. Bishop. "Pattern recognition for Machine Learning" (book) [lectures 5,6]
- [4] (article) Feldman and Cousins.
arXiv: 9711021 [lecture 4]
- [5] (article) R. Neal
arXiv: 1206.1901 [lecture 6]