

- Faculté des sciences
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Bayesian statistics (3ST2015)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en statistique	Cours: 2 ph	Voir ci-dessous	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante

Dr. Pierre-Yves Deléamont
Institut de statistique
Av. de Bellevaux 51 , CH-2000 NEUCHATEL

Contenu

This course will, if time permits, cover the following topics:

- I. Basic theory
 - The Bayesian choice
 - Foundations of Bayesian inference
 - Single-parameter models
 - Introduction to multi-parameter models
 - Hierarchical models
 - Model choice
- II. Introduction to Bayesian computation
 - Basics of Bayesian computation
 - Rejection sampling
 - Importance sampling
- III. Markov chain Monte Carlo methods
 - Motivation
 - Basics of Markov chains
 - Metropolis-Hastings algorithm
 - Gibbs sampling
- IV. Selected applications
 - Generalized linear models
 - Mixture models

Forme de l'évaluation

The final mark will be based on a 2 hour written examination.

Documentation

- Robert, C.P., The Bayesian Choice: from Decision-Theoretic Foundations to Computational Implementation (2nd edition). Springer, 2007.
- Gelman, A., Carlin, J., Stern, H., Dunson, D., Vehtari, A., and Rubin, D., Bayesian Data Analysis (3rd edition). Chapman and Hall, 2013.
- Albert, J., Bayesian Computation with R (2nd edition). Springer, 2009.
- Robert, C.P., and Casella, G., Introducing Monte Carlo Methods with R. Springer, 2010.

Pré-requis

Inferential statistics, Probability, R programming

Forme de l'enseignement

- 3 ECTS credits
- Spring semester

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