










Chapitre 3. Applications et thématiques avancées

1. Modèles Bayésiens hiérarchiques (Assurance / Biostats)
2. Bayesian Machine learning



- Gelman, A et al. (2013). *Bayesian Data Analysis, Third Edition*. Chapman and Hall/CRC. 
- Kruschke, J. K. (2010). *Doing Bayesian Data Analysis: A Tutorial with R, JAGS, and Stan*. Academic Press. 
- Robert, C. P., & Casella, G. (2004). *Monte Carlo Statistical Methods*. Springer. 
- Castillo, I (2017) *Introduction aux statistiques bayésiennes*, UPMC. 
- Vehtari, A. et al. (2021). *Rank-normalization, folding, and localization: An improved \hat{R} for assessing convergence of MCMC*. 
- Vets D. and Knudson C. (2020). *Revisiting the Gelman-Rubin Diagnostic*. 
- Betancourt, M. (2018). *A Conceptual Introduction to Hamiltonian Monte Carlo*. 
- Hoffman, M. D., & Gelman, A. (2014). *The No-U-Turn Sampler: Adaptively Setting Path Lengths in Hamiltonian Monte Carlo*. *Journal of Machine Learning Research*, 15(1), 1593-1623. 
- Gelman, A., & Rubin, D. B. (1992). *Inference from Iterative Simulation Using Multiple Sequences*. *Statistical Science*, 7(4), 457-472. 
- Hastings, W.K. (1970). *Monte Carlo Sampling Methods Using Markov Chains and Their Applications*. *Biometrika*, 57 (1): 97:109.
- Metropolis, N. et al. (1953). *Equation of State Calculations by Fast Computing Machines*. *The Journal of Chemical Physics*, 21(6), 1087-1092.



1. Pourquoi Monte-Carlo ? (Exemple de modèle hiérarchique)
2. Introduction à la méthode Monte-Carlo (historique, PRNG)
3. Algorithmes de simulation i.i.d (PRNG, transformation, rejet)
4. Méthodes MCMC (Gibbs, Metropolis)
5. Diagnostics de convergence MCMC
6. Méthodes MCMC avancées (Langevin, HMC, NUTS)

