Computational Statistics II (June - July 2019)

Alessia Pini

Outline

1. **Jacknife and Bootstrap**
   (a) The jacknife: bias estimation and reduction
   (b) Introduction to Bootstrap: empirical distributions, pulg-in principle, point estimate of the standard error
   (c) Bootstrap confidence intervals: percentiles method, Bootstrap t, BCa; coverage probability and consistency
   (d) The Edgeworth expansion and an Edgeworth view of the Bootstrap
2. **Introduction to EM**
   (a) The algorithm: construction and convergence
   (b) Examples

Tentative calendar

- Lesson 1 - 04/06/19 (3 hours). Introduction to Jacknife and Bootstrap
- Lesson 2 - 06/06/19 (3 hours). Bootstrap confidence intervals and Edgeworth expansion
- Lesson 3 - 11/06/19 (3 hours). Introduction to EM
- Lesson 4 - 13/06/19 (3 hours). Examples

References

Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. Journal of the royal statistical society. Series B (methodological), 1-38.

Efron, B., & Tibshirani, R. J. (1994). An introduction to the bootstrap. CRC press. Chapman & Hall/CRC Monographs on Statistics and Applied Probability.

Friedman, J., Hastie, T., & Tibshirani, R. (2001). The elements of statistical learning (Vol. 1, No. 10). Springer, New York. Springer series in statistics.

Hall, P. (1992). The bootstrap and Edgeworth expansion. Springer, New York. Springer series in statistics.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). An introduction to statistical learning (Vol. 112). New York: Springer.