ESTIMATION OF THE CORRELATION COEFFICIENT IN A BIVARIATE NORMAL DISTRIBUTION BASED ON INCOMPLETE DATA

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Abstract

In this paper, we consider the estimation of correlation coefficient ρ in a bivariate normal distribution with missing data. First, the asymptotic normal distribution of the MLE is derived, then the confidence intervals for ρ are constructed, and finally, simulation studies are carried out to investigate the performances of the proposed method.

Keywords and phrases: bivariate normal distribution, missing data, MLE, confidence interval.

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References

- [1] T. W. Anderson, Maximum likelihood estimates for a multivariate normal distribution when some observations are missing, J. Amer. Statist. Assoc. 52 (1957), 200-203.
- [2] T. W. Anderson, An Introduction to Multivariate Statistical Analysis, Wiley, New Jersey, 2003.
- [3] L. J. Bain and M. Engelhart, Introduction to Probability and Mathematical Statistics, Kent, MA: PWS, M, 1987.
- [4] R. C. Dahiya and R. M. Korwar, Maximum likelihood estimates for a bivariate normal distribution with missing data, Ann. Statist. 8 (1980), 687-692.
- [5] T. S. Fegurson, A Course in Large Sample Theory, Chapman & Hall, New York, 1996.
- [6] S. T. Garren, Maximum likelihood estimation of the correlation coefficient in a bivariate normal model with missing data, Statist. Probab. Lett. 38 (1998), 281-288.
- [7] K. Krishnamoorthy and Y. Xia, Inferences on correlation coefficients: one-sample, independent and correlated cases, J. Statist. Plann. Infer. 137 (2007), 2362-2379.
- [8] J. Sinsomboonthong, Estimation of the correlation coefficient for a bivariate normal distribution with missing data, Nat. Sci. 45 (2011), 736-742.