Multi-treatment regression designs in mixed models

Dário Ferreira¹, Sandra S. Ferreira¹, Célia Nunes¹ and João T. Mexia²

¹Department of Mathematics and Center of Mathematics and Applications, University of Beira Interior, Covilhã, Portugal ² Nova Math, Nova University of Lisbon, Caparica, Portugal

Abstract

We consider functions of mixed models, with the same variance-covariance matrix and mean vectors associated to a base design. We then study the action of the factors in that designs on the regression coefficients, thus having a multi-treatment regression design and carry out inference on the variance componentes and the estimable vectors.

Keywords

Linear mixed models; Inference; Regression coefficients.

Funding:

This work was partially supported by the Portuguese Foundation for Science and Technology through the projects UIDB/00212/2020 and UIDB/00297/2020.

References:

- Anderson, T.W. (1958). An Introduction to Multivariate Statistical Analysis. Wiley, New York.
- Brown, H. and R. Prescott (1999). *Applied Mixed Models in Medicine*. Wiley, New York.
- Demidenko, E. (2013). Mixed Models: Theory and Applications with R. Wiley, New York.
- Fonseca, M., J.T. Mexia and R. Zmyslony (2003). Estimators and tests for variance components in cross nested orthogonal models, *Discussiones Mathematicae -Probability and Statistics 23*, 175–201.
- Khuri, A.I., T. Matthew and B.K. Sinha (1998). Statistical Tests for Mixed Linear Models. Wiley, New York.
- Lehmann, E.L. and J.P. Romano (2005). *Testing Statistical Hypotheses*. Springer, New York.
- Mexia, J.T. (1987). Multi-treatment regression designs. Trabalhos de Investigação,
 1. Departamento de Matemática, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa.