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JOINT ESTIMATION FOR NORMAL ORTHOGONAL MIXED MODELS

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Abstract

Commutative Jordan algebras are used to express the structure of mixed orthogonal models and to derive complete sufficient statistics. From these statistics, UMVUE, (Uniformly Minimum Variance Unbiased Estimators), are derived for the relevant parameters, first of single models then of several such models. These models may correspond to experiments designed separately so our results may be seen as a contribution to this meta-analysis.

Keywords: normal orthogonal mixed models, commutative Jordan algebras, meta-analysis.

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REFERENCES

- [1] M. Fonseca, J.T. Mexia and R. Zmysłony, *Binary operations on Jordan algebras and orthogonal normal models*, Linear Algebra and its Applications **417** (2006), 75–86.
- [2] D.A.S. Frazer, *Nonparametric methods in statistics*, Jonh Wiley & Sons - New York 1957.
- [3] S.S. Ferreira, *Inference for orthogonal models with segregation*, PhD Thesis, UBI - Covilhã 2006.
- [4] J. Seely, *Quadratic subspaces and completeness*, The Annals of Mathematical Statistics **42** (2) (1971), 710–721.
- [5] J. Seely, *Minimal sufficient statistics and completeness for multivariate normal families*, Sankhya **39** (1977), 170–185.

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