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Abstracts of Short Communications and Posters

Section:

20. Special Activities of the ICM 1998

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Bolla, Marianna, Technical University of Budapest, Hungary
Compromise Factor Analysis

A method for compromise factor extraction from different covariance/correlation matrices corresponding to different stages of a sample is introduced. Compromise factors are independent and on this constraint they explain the largest possible part of the variables' variation at each stage.

The numerical solution is based on an algorithm finding the maximum of the sum of heterogeneous quadratic forms. As a result, the explained part of the variables and one factor at each stage is obtained that is a linear combination of the variables and the coefficients of the variables in it can be regarded like factor loadings. The number of investigated stages cannot exceed the number of variables.

Here the variables are supposed to be normally distributed. The algorithm can be extended to binary random variables with dependent components (taking values 0 or 1). k samples of them are given by the incidence matrices of k hypergraphs on n vertices ($k < n$). We are looking for so-called compromise Euclidean representation of the k hypergraphs where the representatives of the vertices in each sample can be regarded as factor-loadings. The two extreme cases are discussed separately and the corresponding algorithms are also proceeded in different frames.

Reference:

M. Bolla, Gy. Michaletzky, G. Tusnády, M. Ziermann, Extrema of Sums of Heterogeneous Quadratic Forms, *Linear Algebra and its Applications* 269 (1998), 331-365.