Lower Rank Approximation of Matrices by Least Squares with any Choice of Weights

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Abstract

Reduced rank approximation of matrices has hitherto been possible only by unweighted least squares. This paper presents iterative techniques for obtaining such approximations when weights are introduced. The techniques involve criss-cross regressions with careful initialization. Possible applications of the approximation are in modeling, biplotting, contingency table analysis, fitting of missing values, checking outliers, etc.

Keywords: REDUCED RANK APPROXIMATION
LEAST SQUARES
CRISS-CROSS REGRESSION
HOUSEHOLDER-YOUNG THEOREM
BIPLOT
CONTINGENCY TABLE
OUTLIERS