Multiway Multiblock Component and Covariates Regression Models.

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Summary

In this paper the general theory of multiway multiblock component and covariates regression models is explained. Unlike existing methods, such as multiblock-PLS and multiblock-PCA, in the new proposed method a different number of components can be selected for each block. Furthermore, the method can be generalized to incorporate multiway blocks, to which any multiway model can be applied. The method is a direct extension of principal covariates regression and therefore works in a simultaneous fashion in which a clearly defined objective criterion is minimized. It can be tuned to fulfill the requirements of the user. Algorithms to calculate the components will be presented. The method will be illustrated with two three-block examples and compared to existing approaches. The first example is with two-way data, and the second example is with a three-way array involved. It will be shown that predictions are as good as the existing methods, but because for most blocks fewer components are required, diagnostic properties of the method are improved.