

Covariate-adjusted matrix visualization via correlation decomposition

Chun-houh Chen

Academia Sinica, Institute of Statistical Science, Taipei, Taiwan

(gap.stat.sinica.edu.tw)

In this study, we extend the framework of matrix visualization (MV) by incorporating a covariate adjustment process through the estimation of conditional correlations. MV can explore the grouping and/or clustering structure of high-dimensional large-scale data sets effectively without dimension reduction. The benefit is in the exploration of conditional association structures among the subjects or variables that cannot be done with conventional MV. For adjustment of a discrete covariate, the conditional correlation is estimated by the within and between analysis. This procedure decomposes a correlation matrix into the within- and between-component matrices. When a covariate is of continuous nature, the conditional correlation is equivalent to the partial correlation under the assumption of a joint normal distribution. A simulation and some data sets are used to illustrate the proposed method.