Multidimensional scaling (MDS)

Reduced rank regression

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Key references

- AJ Izenman, “Modern Multivariate Statistical Techniques”, Ch 6, Springer, 2013.

Introduction

- Multivariate Regression has s variables $Y = (Y_1, \dots, Y_s)^T$ each of whose behaviour may be influenced by exactly the same set of inputs $X = (X_1, \dots, X_r)^T$. So components of X are correlated, components of Y are correlated and components of X are correlated with components of Y.
- Reduced-Rank Regression (RRR)
  - provides a unified approach to many classical multivariate statistical techniques;
  - analyzes a wide variety of problems involving dimension reduction and the search for structure in multivariate data;
  - is relatively simple to program since regression estimates depend only upon the covariance matrix of $(X^T, Y^T)^T$ and the eigendecoposition of a certain symmetric matrix that generalizes the multiple squared regression coefficient R^2 from multiple regression.