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Regression with Distance Matrices

Julian Faraway

(Submitted on 15 Mar 2013)

Data types that lie in metric spaces but not in vector spaces are difficult to use within the usual regression setting, either as the response and/or a predictor. We represent the information in these variables using distance matrices. A low-dimensional representation of such distance matrices can be obtained using methods such as multidimensional scaling. Once these variables have been represented as scores, an internal model linking the predictors and the response can be developed. Here we use partial least squares. Scoring is the transformation from a new observation to a score while backscoring is a method to represent a score as an observation in the data space. Both methods are essential for prediction and explanation. We illustrate the methodology for shape data, unregistered curve data and correlation matrices using motion capture data from an experiment to study the motion of children with cleft lip.

Submission history

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