COORDINATE DESCENT METHOD FOR SPARSE OPTIMAL SCORING

Linear discriminant analysis (LDA) is a popular tool for performing supervised classification in a high-dimensional setting. It seeks to reduce the dimension by projecting the data to a lower dimensional space using a set of optimal discriminant vectors to separate the classes. One formulation of LDA is optimal scoring which uses a sequence of scorings to turn the categorical variables into quantitative variables. In this way, optimal scoring creates a generalized linear regression problem from a classification problem. The sparse optimal scoring formulation of LDA uses an elastic-net penalty on the discriminant vectors to induce sparcity and perform feature selection. We propose a coordinate descent algorithm for finding optimal discriminant vectors in the sparse optimal scoring formulation of LDA.