Low Rank Linear Discriminant Analysis for Matrix Data

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Matrix-valued predictors are very common in image analysis, such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI). In this talk, we propose a simple least-squares-based linear discriminant analysis for matrix-valued predictors by penalizing the nuclear norm of the matrix coefficients. The new method can circumvent the singularity of the covariance matrix, enforce the low-rank structure and allow for better interpretation of the LDA coefficients. Simulations and an application to an EEG data will be presented.