

Robust linear discriminant analysis based on gamma-divergence

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Abstract: Linear discriminant analysis (LDA), a traditional method in linear classification, is widely used in pattern recognition and dimension reduction. In many practical cases, some data points are mislabeled, which may badly affect the LDA results. In this talk, we will first introduce gamma-divergence which is a more robust dispersion measure than the widely used Kullback-Leibler divergence. Based on minimum gamma-divergence, we proposed a more robust LDA type method. Instead of sample mean and sample covariance derived by minimum K-L divergence, weighted sample mean and weighted sample covariance from gamma-divergence can successfully reduce the effects of incorrect labels. We will analyze the robustness of our proposed method via its influence function. In the end, we will demonstrate the strength of our proposed method by simulation studies and applications on face data sets.