A Hold-out method to correct PCA variance inflation

In this paper we analyze the problem of variance inflation experienced by the PCA algorithm when working in an ill-posed scenario where the dimensionality of the training set is larger than its sample size. In an earlier article a correction method based on a Leave-One-Out (LOO) procedure was introduced. We propose a Hold-out procedure whose computational cost is lower and, unlike the LOO method, the number of SVD's does not scale with the sample size. We analyze its properties from a theoretical and empirical point of view. Finally we apply it to a real classification scenario.

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