

DIMENSION REDUCTION IN QUADRATIC CLASSIFICATION PROBLEMS

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For LDA, the standard dimension-reduction procedure is based on the directions that maximize the Fisher-Rao discriminant criterion. In contrast, there seems to be no universally accepted dimension-reduction method for QDA in the literature. The goal of this research project is to generalize adequately the ideas of class separation used in LDA. More precisely, the basic idea is to consider that, in a quadratic classification problem, the differences between classes have two components, location and dispersion, that should be treated separately. So far, results obtained have been published in

Velilla, S. (2008). A Method for Dimension Reduction in Quadratic Classification Problems, *Journal of Computational and Graphical Statistics*, **17**, 572-589.

Other works are currently in preparation. For example, [Velilla, S. (2009). On the structure of the quadratic subspace], in which the techniques of the 2008 paper are generalized. Possible applications of the procedures of Velilla (2008, 09) include an improvement of the classical leave-one-out error rate for Fisher's iris data set. Other well-known data sets are also under consideration.