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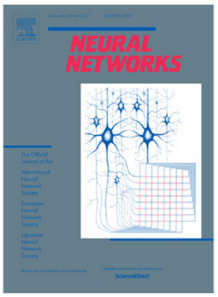

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Robust recursive absolute value inequalities discriminant analysis with sparseness

Chun-Na Li[a], Zeng-Rong Zheng[a], Ming-Zeng Liu[b], Yuan-Hai Shao[c,*], Wei-Jie Chen[a]

[a] *Zhijiang College, Zhejiang University of Technology, Hangzhou, 310024, P.R.China*
[b] *School of Mathematics and Physics Science, Dalian University of Technology at Panjin, Dalian, 124221, P.R.China*
[c] *School of Economics and Management, Hainan University, Haikou, 570228, P.R.China*

Abstract

In this paper, we propose a novel absolute value inequalities discriminant analysis (AVIDA) criterion for supervised dimensionality reduction. Compared with the conventional linear discriminant analysis (LDA), the main characteristics of our AVIDA are robustness and sparseness. By reformulating the generalized eigenvalue problem in LDA to a related SVM-type "concave-convex" problem based on absolute value inequalities loss, our AVIDA is not only more robust to outliers and noises, but also avoids the SSS problem. Moreover, the additional L1-norm regularization term in the objective makes sure sparse discriminant vectors are obtained. A successive linear algorithm is employed to solve the proposed optimization problem, where a series of linear programs are solved. The superiority of our AVIDA is supported by experimental results on artificial examples as well as benchmark image databases.

Keywords: linear discriminant analysis, feature extraction, absolute value, robust modeling, sparse projection

1. Introduction

Feature extraction plays an important role in pattern recognition. Extracting good features not only can identify the features that contribute

*Corresponding author.
Email address: shaoyuanhai21@163.com (Yuan-Hai Shao)