

LDA-SSS Package

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Abbreviations

LDA: Linear discriminant analysis

SSS: Small sample size

This package contains Matlab codes for several LDA-SSS algorithms. In many cases the data in original space is first projected to the range space of total scatter matrix [Huang et al. 2002]. The algorithms are listed as follows:

- 1) DLDA (Direct LDA) [Yu and Yang, 2001]
- 2) PILDA (Pseudoinverse LDA) [Tian et al. 1986]
- 3) FPILDA (Fast PILDA) [Liu et al., 2007]
- 4) PCAplusLDA (Fisherface or Principal Component Analysis + Linear Discriminant Analysis) [Swets and Weng, 1996; Belhumer et al., 1997]
- 5) NLDA (Null LDA) [Chen et al., 2000]
- 6) OLDA (Orthogonal LDA) [Ye 2005]
- 7) ULDA (Uncorrelated LDA) [Ye et al., 2004]
- 8) QRNLDA (QR based NLDA) [Chu and Thye, 2010]
- 9) FNLDA (Fast NLDA) [Sharma and Paliwal, 2012]
- 10) CLDA (Discriminant common vector LDA) [Cevikalp et al., 2005]
- 11) IPILDA (Improved PILDA) [Paliwal and Sharma, 2012]
- 12) ALDA (Approximate LDA) [Paliwal and Sharma, 2011]
- 13) EFR (Eigenfeature Regularization) [Jiang et al., 2008]
- 14) ELDA (Extrapolation LDA) [Sharma and Paliwal, 2010]
- 15) MLDA (Maximum Uncertainty LDA) [Li et al., 2003]
- 16) IDLDA (Improved DLDA) [Paliwal and Sharma, 2010]
- 17) TSLDA (Two-stage LDA) [Sharma and Paliwal, 2012a]
- 18) Range_Sw (Range space of within-class scatter matrix)
- 19) Null_Sw (Null space of within-class scatter matrix)
- 20) Range_Sb (Range space of between-class scatter matrix)
- 21) Null_Sb (Null space of between-class scatter matrix)

For details about each codes please type 'help <algorithm>' (where algorithm refers to the above mentioned codes). For references or other details please see the following paper:

Sharma and Paliwal, Linear discriminant analysis for the small sample size problem: an overview, Int. Jnr. Of Machine Learning and Cybernetics, 2013, DOI: 10.1007/s13042-013-0226-9

Please cite the above paper if you use the codes. If you are interested in adding more LDA-SSS algorithms then kindly send its Matlab code to us. We appreciate your support.

Test codes

In order to check if the downloaded codes are working properly, type 'Demo' in Matlab's command prompt.

If no errors are observed then the LDA-SSS package has been successfully loaded.

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