Package ‘SPCALDA’

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Type Package
Title A New Reduced-Rank Linear Discriminant Analysis Method
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Description A new reduced-rank LDA method which works for high dimensional multi-class data.
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R topics documented:

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A new reduced-rank LDA method which works for high dimensional multi-class data.
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A new reduced-rank LDA method which works for high dimensional multi-class data.

Usage

SPCALDA(X, Y, rho=exp(c(-2):6)), K=min(20, min(dim(X))), folds = NULL)

Arguments

X Input matrix, of dimension nobs x nvars; each row is an observation vector.
Y Response variable for class label, of dimension nobs x 1.
rho Tuning parameter.
K The total number of principal components considered.
folds Folds for cross-validation to select tuning parameter.

Value

ob lda rule with top PCs
tuneRotation Tuned rotation matrix
minerror Minimal training error
rho tuned value of the parameter rho
K tuned dimension, i.e., number of PCs
Author(s)
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Examples

```r
set.seed(2015)
n = 200; p = 500

X = matrix(rnorm(n*p),n,p)
mu = matrix(0,4,p)
mu[1,1:125] = 0.4; mu[2,126:250] = 0.4; mu[3,251:375] = 0.4; mu[4,376:500] = 0.4
Y = rep(1:4,50)

for (g in 1:4) {
  index = which(Y == g)
  n_g = length(index)
  X[index,] = X[index,] + matrix(mu[g,],n_g,p,byrow=TRUE)
}

xtr = X[1:100,]; ytr = Y[1:100] # training set
xte = X[101:200,]; yte = Y[101:200] # test set
folds = list(1:20,21:40,41:60,61:80,81:100)

spcaldaResult = SPCALDA(X=xtr, Y=ytr, rho=exp(c(-2:6)), K=20, folds = folds)
yhat = predict(spcaldaResult$ob, xte = %spcaldaResult$tuneRotation)$class
error = sum(yhat != yte)
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