

Package ‘funHDDC’

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Type Package

Title Model-based clustering in group-specific functional subspaces

Version 1.0

Date 2014-09-06

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Depends fda

Description The package provides the funHDDC algorithm (Bouveyron & Jacques, 2011) which allows to cluster functional data by modeling each group within a specific functional subspace.

License GPL-2

LazyLoad yes

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funHDDC-package	<i>Model-based clustering in group-specific functional subspaces with the funHDDC algorithm</i>
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Description

It provides the funHDDC algorithm (Bouveyron & Jacques, 2011) which allows to cluster functional data by modeling each group within a specific functional subspace.

Details

```

Package: funHDDC
Type: Package
Version: 1.0
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License: GPL-2

```

Author(s)

Charles Bouveyron & Julien Jacques Maintainer: Charles Bouveyron <charles.bouveyron@parisdescartes.fr>

References

C. Bouveyron & J. Jacques, Model-based Clustering of Time Series in Group-specific Functional Subspaces, *Advances in Data Analysis and Classification*, vol. 5 (4), pp. 281-300, 2011.

Examples

```

# Clustering the well-known "Canadian temperature" data (Ramsay & Silverman)
basis <- create.bspline.basis(c(0, 365), nbasis=21, norder=4)
fdobj <- smooth.basis(day.5, CanadianWeather$dailyAv[, "Temperature.C"], basis,
  fdnames=list("Day", "Station", "Deg C"))$fd
res = funHDDC(fdobj, 4, model='AkBQkDk', init='hclust', thd=0.001)

# Visualization of the partition and the group means
par(mfrow=c(1,2))
plot(fdobj, col=res$cls, lwd=2, lty=1)
fdmeans = fdobj; fdmeans$coefs = t(res$prms$m)
plot(fdmeans, col=1:max(res$cls), lwd=2)

## DO NOT RUN
# # Map of the results
# par(mfrow=c(1,12))
# library(maps)
# map("world", "canada")
# text(-CanadianWeather$coordinates[,2], CanadianWeather$coordinates[,1],
#   labels=rownames(CanadianWeather$coordinates), col=res$cls, cex=0.75)

```

funHDDC

Model-based clustering in group-specific functional subspaces

Description

It provides the funHDDC algorithm (Bouveyron & Jacques, 2011) which allows to cluster functional data by modeling each group within a specific functional subspace.

Usage

```
funHDDC(fd, K, init = "hclust", model = "AkBkQkDk", thd = 0.05, maxit = 50,
  eps = 1e-6, ...)
```

Arguments

fd	a functional data object produced by the fda package.
K	the number of clusters.
init	the initialization type ('random', 'kmeans' of 'hclust'). 'hclust' is the default.
model	the chosen model among 'AkjBkQkDk', 'AkjBQkDk', 'AkBkQkDk', 'AkBQkDk', 'ABkQkDk', 'ABQkDk'. See (Bouveyron & Jacques, 2011) for details.
thd	the threshold of the Cattell' scree-test used for selecting the group-specific intrinsic dimensions. See (Bouveyron & Jacques, 2011) for details.
maxit	the maximum number of iterations.
eps	the threshold of the convergence criterion.
...	additional options for internal functions.

Value

cls	the clustering partition
P	the posterior probabilities
prms	the model parameters
bic	the BIC value
aic	the AIC value
icl	the ICL value
loglik	vector of the log-likelihood values

Author(s)

Charles Bouveyron & Julien Jacques

References

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