

Package ‘EDOtrans’

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Type Package

Title Euclidean Distance-Optimized Data Transformation

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Description A data transformation method which takes into account the special property of scale non-invariance with a breakpoint at 1 of the Euclidean distance.

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Encoding UTF-8

LazyData true

Imports methods, stats, utils, ABCanalysis, opGMMassessment

Depends R (>= 3.5.0)

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R topics documented:

EDOtrans	2
FACSdata	3
GMMartificialData	3
Index	4

EDOtrans

Euclidean distance-optimized data transformation

Description

The package provides the necessary functions for performing the EDO data transformation.

Usage

```
EDOtrans(Data, Cls, PlotIt = FALSE, FitAlg = "normalmixEM", Criterion = "LR",
         MaxModes = 8, MaxCores = getOption("mc.cores", 2L), Seed)
```

Arguments

Data	the data as a vector.
Cls	the class information, if any, as a vector of similar length as instances in the data.
PlotIt	whether to plot the fit directly.
FitAlg	which fit algorithm to use: "ClusterRGMM" = GMM from ClusterR, "densityMclust" from mclust, "DO" from DistributionOptimization (slow), "MCMC" = NMixMCMC from mixAK, or "normalmixEM" from mixtools.
Criterion	which criterion should be used to establish the number of modes from the best GMM fit: "AIC", "BIC", "FM", "GAP", "LR" (likelihood ratio test), "NbClust" (from NbClust), "SI" (Silverman).
MaxModes	for automated GMM assessment: the maximum number of modes to be tried.
MaxCores	for automated GMM assessment: the maximum number of processor cores used under Unix.
Seed	seed parameter set internally.

Value

Returns a list of transformed data and class assignments.

DataEDO	the EDO transformed data.
EDOfactor	the factor by which each data value has been divided.
Cls	the class information for each data instance.

Author(s)

Jorn Lotsch and Alfred Ultsch

References

Lotsch, J., Ultsch, A. (2021): EDOtrans – an R Package for Euclidean distance-optimized data transformation.

Examples

```
## example 1
data(iris)
IrisED0data <- ED0trans(Data = as.vector(iris[,1]), Cls = as.integer(iris$Species))
```

FACSdata *Example data of hematologic marker expression.*

Description

Data set of 4 flow cytometry-based lymphoma makers from 1559 cells from healthy subjects (class 1) and 1441 cells from lymphoma patients (class 2).

Usage

```
data("FACSdata")
```

Details

Size 3000 x 4 , stored in FACSdata\$[FS, CDa, CDb, CDd] Original classes 2, stored in FACSdata\$Cls

Examples

```
data(FACSdata)
str(FACSdata)
```

GMMartificialData *Example data an artificial Gaussian mixture.*

Description

Dataset of 3000 instances with 3 variables that are Gaussian mixtures and belong to classes Cls = 1, 2, or 3, with different means and standard deviations and equal weights of 0.7, 0.3, and 0.1, respectively.

Usage

```
data("GMMartificialData")
```

Details

Size 3000 x 3, stored in GMMartificialData\$[Var1, Var2, Var3]
Classes 3, stored in GMMartificialData\$Cls

Examples

```
data(GMMartificialData)
str(GMMartificialData)
```

Index

* **EDOtrans**

EDOtrans, [2](#)

* **data transformation**

EDOtrans, [2](#)

EDOtrans, [2](#)

FACSdata, [3](#)

GMMartificialData, [3](#)