Package: clda (via r-universe)

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Title Convolution-Based Linear Discriminant Analysis

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Depends R (>= 3.1.0)

Description Contains a time series classification method that obtains a set of filters that maximize the between-class and minimize the within-class distances.

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Encoding UTF-8

LazyData true

RoxygenNote 7.1.0

Imports stats , MASS

NeedsCompilation no

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clda.classify *cLDA classify*

Description

Classify the time series and obtain the distances between the time series and the centroids of each class.

Usage

```
clda.classify(model, Data)
```

Arguments

model	An object returned by the function clda.model.
Data	Matrix of time series on the rows.

Value

A list containing the predicted labels of the time series and a matrix of distances between the time series and the centroids after applying the filters obtained by clda.model.

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See Also

clda.model

Examples

```
## Generating 200 time series of length 100 with label 1
time_series_signal_1 = sin(matrix(runif(200*100),nrow = 200,ncol = 100))
time_series_error_1 = matrix(rnorm(200*100),nrow = 200,ncol = 100)
time_series_w_label_1 = time_series_signal_1 + time_series_error_1
## Generating another 200 time series of length 100 with label 2
time_series_signal_2 = cos(matrix(runif(200*100),nrow = 200,ncol = 100))
time_series_error_2 = matrix(rnorm(200*100),nrow = 200,ncol = 100)
time_series_w_label_2 = time_series_signal_2 + time_series_error_2
## Join the time series data in one matrix
time_series_data = rbind(time_series_w_label_1,time_series_w_label_2)
label_time_series   = c(rep(1,200),rep(2,200))
clda_model <- clda.model(time_series_data,label_time_series)
## Create a test set
## data with label 1
Data_test_label_1 = sin(matrix(runif(50*100),nrow = 50,ncol = 100))
```

```
## data with label 2
Data_test_label_2 = cos(matrix(runif(50*100),nrow = 50,ncol = 100))
## join data into a single matrix
Data_test = rbind(Data_test_label_1,Data_test_label_2)
## obtain the labels and distances of each time series
clda.classify(clda_model,Data_test)
```

`clda.model` *cLDA Model*

Description

Obtains a set of filters for labeled time series data so that the between-class distances are maximized, and the within-class distances are minimized.

Usage

```
clda.model(Data, Labels)
```

Arguments

`Data`	Matrix of time series on the rows.
`Labels`	Label of each time series.

Value

A list containing the filters and their respective importance (g and eig_val), the class means (Means), the average of the class means (Mean), and the labels of each class mean (classes). The filters are the columns of the matrix g.

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Examples

```
## Generating 200 time series of length 100 with label 1
time_series_signal_1 = sin(matrix(runif(200*100),nrow = 200,ncol = 100))
time_series_error_1 = matrix(rnorm(200*100),nrow = 200,ncol = 100)
time_series_w_label_1 = time_series_signal_1 + time_series_error_1
## Generating another 200 time series of length 100 with label 2
time_series_signal_2 = cos(matrix(runif(200*100),nrow = 200,ncol = 100))
time_series_error_2 = matrix(rnorm(200*100),nrow = 200,ncol = 100)
time_series_w_label_2 = time_series_signal_2 + time_series_error_2
## Join the time series data in one matrix
time_series_data = rbind(time_series_w_label_1,time_series_w_label_2)
label_time_series   = c(rep(1,200),rep(2,200))
## obtain the model with the given data
clda.model(time_series_data,label_time_series)
```

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