Package 'funIHC'

October 20, 2026

Type Package

Title Functional Iterative Hierarchical Clustering

Version 0.1.1

Description Functional clustering aims to group curves exhibiting similar temporal behaviour and to obtain representative curves summarising the typical dynamics within each cluster. A key challenge in this setting is class imbalance, where some clusters contain substantially more curves than others, which can adversely affect clustering performance. While class imbalance has been extensively studied in supervised classification, it has received comparatively little attention in unsupervised clustering. This package implements functional iterative hierarchical clustering ('funIHC'), an adaptation of the iterative hierarchical clustering method originally developed for multivariate data, to the functional data setting. For further details, please see Higgins and Carey (2024) <doi:10.1007/s11634-024-00611-8>.

License MIT + file LICENSE

Encoding UTF-8

Depends R (>= 4.0.0)

Imports fda, stats, cluster, mclust

Suggests testthat (>= 3.0.0), knitr, rmarkdown, covr

RoxygenNote 7.3.3

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

Author Catherine Higgins [aut, cre],
Michelle Carey [aut]

Maintainer Catherine Higgins <catherine.higgins@mu.ie>

Repository CRAN

Date/Publication 2026-10-20 13:30:33 UTC

Contents

funIHC 2

Index **3**

funIHC *Functional Iterative Hierarchical Clustering*

Description

Performs Functional Iterative Hierarchical Clustering (funIHC) as described in the paper: Higgins, C., Carey, M. Addressing class imbalance in functional data clustering. Adv Data Anal Classif (2024). https://doi.org/10.1007/s11634-024-00611-8

Usage

```
funIHC(x, Data, type = 0)
```

Arguments

x	Numeric vector of time points.
Data	Numeric matrix with rows corresponding to time points and columns to individual curves.
type	Integer specifying representation: 0 = curves (default), 1 = first derivative, 2 = basis coefficients.

Value

A list containing:

label	Integer vector of cluster labels.
clusters	Clustered observations.
fd	Functional data object.
mean_clusters_mat	Cluster means.

Examples

```
## Load example data within the package
rds_path <- system.file("extdata", "U1505.rds", package = "funIHC")
example_data <- readRDS(rds_path)

## Extract curves
Data <- example_data$Data
Data <- t(Data)
x = 1:15 #number of time points

## Run functional iterative hierarchical clustering
res <- funIHC(x,Data)

## Inspect cluster assignments
table(res$label)
```

Index

funIHC, 2