Package ‘FPCA3D’

October 12, 2022

Type Package
Title Three Dimensional Functional Component Analysis
Version 1.0
Date 2018-07-09
Author Nan Lin, Momiao Xiong
Maintainer Nan Lin <edmondlinnan@gmail.com>
Description Run three dimensional functional principal component analysis and return the three dimensional functional principal component scores. The details of the method are explained in Lin et al.(2015) <doi:10.1371/journal.pone.0132945>.
License GPL-2 | GPL-3
Depends graphics, grDevices, stats, utils
NeedsCompilation no
Repository CRAN
Date/Publication 2018-07-10 15:20:09 UTC

R topics documented:

FPCA3D-package .................................................. 1
FFT2FS_3D .................................................... 3
FPCA_3D_score ............................................... 3

Index

FPCA3D-package Three Dimensional Functional Component Analysis

Description

Run three dimensional functional principal component analysis and return the three dimensional functional principal component scores. The details of the method are explained in Lin et al.(2015) <doi:10.1371/journal.pone.0132945>.
Details

The DESCRIPTION file:

Package: FPCA3D
Type: Package
Title: Three Dimensional Functional Component Analysis
Version: 1.0
Date: 2018-07-09
Author: Nan Lin, Momiao Xiong
Maintainer: Nan Lin <edmondlinnan@gmail.com>
Description: Run three dimensional functional principal component analysis and return the three dimensional functional principal component scores. The details of the method are explained in Lin et al. (2015) <doi:10.1371/journal.pone.0132945>.
License: GPL-2|GPL-3
Depends: graphics, grDevices, stats, utils

Index of help topics:

FFT2FS_3D Three dimensional Fourier Series
FPCA3D-package Three Dimensional Functional Component Analysis
FPCA_3D_score Three Dimensional Functional Component Analysis

data_in = array(runif(4000,0,1),dim=c(10,10,10,4)) test = FPCA_3D_score(data_in,0.8)

Author(s)

Nan Lin, Momiao Xiong
Maintainer: Nan Lin <edmondlinnan@gmail.com>

References


See Also

FFT2FS_3D, FPCA_3D_score

Examples

data_in = array(runif(4000,0,1),dim=c(10,10,10,4))
test = FPCA_3D_score(data_in,0.8)
Description

Calculate the three dimensional Fourier series coefficients of the input three dimensional array.

Usage

FFT2FS_3D(A)

Arguments

A A three dimensional numerical data array. For example, A can be the data array of an three dimensional image.

Details

Calculated the three dimensional numerical data array. The input A array can be any three dimensional data array. For image input data, the input should be data array only without any header information.

Value

A three dimensional Fourier series coefficients array of the input A data array.

References


Examples

test_data = array(runif(1000,0,1),dim = c(10,10,10))
rlt = FFT2FS_3D(test_data)

Description

Calculation of three dimensional functional principal component scores for a series of three dimensional array data.

Usage

FPCA_3D_score(X, prop)
FPCA_3D_score

Arguments

- **X**: The input data array. \( X \) is a four dimensional data array. The first three dimensional data represents the three dimensional data array for each observation. The fourth dimension represents the observations.

- **prop**: The prespecified proportion of variance the calculated functional principal component scores can explain in the functional domain.

Details

Calculate the three dimensional functional principal component scores for a series of three dimensional data.

Value

A two dimensional score matrix. The row of the score matrix represents each individual and the column of the score matrix represent each component score.

References


Examples

```r
data_in = array(runif(4000,0,1),dim=c(10,10,10,4))
test = FPCA_3D_score(data_in,0.8)
```
Index

* package
  FPCA3D-package, 1

FFT2FS_3D, 2, 3
FPCA3D (FPCA3D-package), 1
FPCA3D-package, 1
FPCA_3D_score, 2, 3