Package 'PWA'

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Type Package

Title Principal Wave Analysis (PWA) for high-dimensional structured
data.

Version 1.0

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Description R package for Principal Wave Analysis method in the paper: Zhang, Yuping (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

LazyData TRUE

Depends wavethresh

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RoxygenNote 7.1.1

R topics documented:

PWA–package *Principal Wave Analysis (PWA) for high-dimensional structured data.*

Description

R package for Principal Wave Analysis method in the paper: Zhang, Yuping (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

Details

The DESCRIPTION file: This package was not yet installed at build time.

Index: This package was not yet installed at build time.
~~ An overview of how to use ~~ ~~ the package, including the ~~ ~~ most important functions ~~

Author(s)

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References

Zhang, Yuping (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

PWA	*Principal Wave Analysis (PWA) for high-dimensional structured data.*

Description

Principal Wave Analysis method in the paper: Zhang, Yuping (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

Usage

```
PWA(x, niter = 6, sumabsa, sumabstheta, topfea.flag = TRUE, topfea, toptheta.flag = FALSE, toptheta,
```

Arguments

x	An N*P*T tensor. N is the number of subjects, P is the number of features. T is the number of points in a sequence (such as time points and genome loci).
niter	Number of iterations.
sumabsa	A value between 0 and 1.
sumabstheta	A value between 0 and 1.
topfea.flag	When topfea.flag is TRUE, the topfea argument is required. When topfea.flag is FALSE, the sumabsa argument is required.
topfea	The number of nonzero values in vector a.
toptheta.flag	When toptheta.flag is TRUE, the toptheta argument is required. When toptheta.flag is FALSE, the sumabstheta argument is required.
toptheta	The number of nonzero values in vector theta.
filter.number	This selects the smoothness of wavelet.
family	Specifies the family of wavelets. The options are "DaubExPhase" and "DaubLeAsymm".

Value

Output contains rank-one PWA decompostion, and the PWA estimated values as described in the paper: Zhang, Yuping (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

Author(s)

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References

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Examples

```
load("../y.RData")
out = PWA(y, topfea=60, sumabstheta=0.9)
```

PWA.BIC *Calculate the BIC type of model selection criterion.*

Description

Calculate the BIC type of model selection criterion as described in the paper: Zhang, Y. (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

Usage

```
PWA.BIC(x, obj)
```

Arguments

x	The input tensor for PWA function.
obj	The output object for PWA function.

Value

The calculated BIC type of model selection criterion.

Author(s)

Yuping Zhang

References

Zhang, Yuping (2022). Principal wave analysis for high-dimensional structured data with applications to epigenomics and neuroimaging studies. Statistics and Its Interface, 15(2), 225-236.

Examples

```
load("../y.RData")
out = PWA(y, topfea=60, sumabstheta=0.9)
bic = PWA.BIC(y, out)
```

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