Package 'OSIRCR'

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Type Package

Title Cosine Regression-Based Online Sliced Inverse Regression Algorithm

Version 0.2.9

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Description In high-dimensional streaming data analysis, extracting core periodic features under real-time constraints remains challenging. Traditional dimension reduction methods fail to adapt to incremental data and yield low accuracy due to irrelevant variables. This package provides the Online Sliced Inverse Regression framework for cosine regression with high-dimensional irrelevant variables. It integrates subspace extraction of sliced inverse regression and incremental learning of online algorithms to efficiently handle periodic streaming data. Cai, Z., Li, R., & Zhu, L. (2020) <doi:10.48550/arXiv.2002.02795>.

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Contents

BSIR *Batch SIR method. This method can estimate batch dimension reduction.*

Description

Batch SIR method. This method can estimate batch dimension reduction.

Usage

```
BSIR(data)

bsir_batch_data
```

Arguments

data	is a highly correlated data set

Format

A data frame

Value

Estimated central subspace

Functions

- `bsir_batch_data`: bsir_batch_data Example data for BSIR

Examples

```
BSIR(data=bsir_batch_data)
```

OPCA *Online PCA method. This method can estimate online eigen space.*

Description

Online PCA method. This method can estimate online eigen space.

Usage

```
OPCA(data, m = 3)

opca_online_data
```

Arguments

data	is a highly correlated data set
m	is the number of principal component

Format

A data frame

Value

Ahat, Dhat

Functions

- opca_online_data: opca_online_data Example data for OPCA

Examples

```
OPCA(data=opca_online_data,m=3)
```

OSIRgd *OSIR Gradient Descent method. This method can estimate online dimension reduction.*

Description

OSIR Gradient Descent method. This method can estimate online dimension reduction.

Usage

```
OSIRgd(data)

osir_gd_data
```

Arguments

data	is a highly correlated data set

Format

A data frame

Value

Estimated parameters and convergence result

Functions

- osir_gd_data: osir_gd_data Example data for OSIRgd

Examples

```
OSIRgd(data=osir_gd_data)
```

OSIRpd — *OSIR Perturbation method. This method can estimate online dimension reduction.*

Description

OSIR Perturbation method. This method can estimate online dimension reduction.

Usage

```
OSIRpd(data)

osir_pd_data
```

Arguments

data	is a highly correlated data set

Format

A data frame

Value

Estimated directions and error

Functions

- osir_pd_data: osir_pd_data Example data for OSIRpd

Examples

```
OSIRpd(data=osir_pd_data)
```

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