Package 'bahc'

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Type Package

Title Filter Covariance and Correlation Matrices with Bootstrapped-Averaged Hierarchical Ansatz

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Description A method to filter correlation and covariance matrices by averaging bootstrapped filtered hierarchical clustering and boosting. See Ch. Bongiorno and D. Challet, Covariance matrix filtering with bootstrapped hierarchies (2020) <doi:10.48550/arXiv.2003.05807> and Ch. Bongiorno and D. Challet, Reactive Global Minimum Variance Portfolios with k-BAHC covariance cleaning (2020) <doi:10.48550/arXiv.2005.08703>.

License GPL

Depends R (>= 3.5.0), fastcluster, matrixStats

Encoding UTF-8

LazyData true

RoxygenNote 7.1.0

NeedsCompilation no

Repository CRAN

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Contents

filterCorrelation *Compute the BAHC correlation matrix.*

Description

Compute the BAHC correlation matrix.

Usage

```
filterCorrelation(x, k = 1, Nboot = 100)
```

Arguments

x	A matrix: $x_{i,f}$ is feature f of object i
k	The order of filtering. $k = 1$ corresponds to BAHC.
Nboot	The number of bootstrap copies

Value

The BAHC-filtered correlation matrix of x.

Examples

```
r=matrix(rnorm(1000),nrow=20)   # 20 objects, 50 features each
Cor_bahc=filterCorrelation(r)
```

filterCovariance *Compute the BAHC covariance matrix.*

Description

Compute the BAHC covariance matrix.

Usage

```
filterCovariance(x, k = 1, Nboot = 100)
```

Arguments

x	A matrix: $x_{i,f}$ is feature f of object i
k	The order of filtering. $k = 1$ corresponds to BAHC.
Nboot	The number of bootstrap copies

Value

The BAHC-filtered correlation matrix of x.

Examples

```
r=matrix(rnorm(1000),nrow=20)   # 20 objects, 50 features each
sigma=exp(runif(20))
rs=t(sigma %*% r) %*% sigma
Cov_bahc=filterCovariance(rs)
```

Index