

Package: Vicus (via r-universe)

November 5, 2024

Type Package

Title Exploiting Local Structures to Improve Network-Based Analysis of Biological Data

Version 0.99.0

Depends R (>= 3.4.0)

Imports methods, utils, RANN, Matrix, RSpectra

Suggests scatterplot3d, knitr, rmarkdown, testthat

Description Compared with the similar graph embedding method such as Laplacian Eigenmaps, 'Vicus' can exploit more local structures of graph data. For the details of the methods, see the reference section of 'GitHub' README.md <<https://github.com/rikenbit/Vicus>>.

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URL <https://github.com/rikenbit/Vicus>

VignetteBuilder knitr

Repository <https://rikenbit.r-universe.dev>

RemoteUrl <https://github.com/rikenbit/vicus>

RemoteRef HEAD

RemoteSha 4be58d784ddf32d526fe4dd2bac40dda53d64efa

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Vicus-package	<i>Exploiting Local Structures to Improve Network-Based Analysis of Biological Data</i>
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Description

Compared with the similar graph embedding method such as Laplacian Eigenmaps, 'Vicus' can exploit more local structures of graph data. For the details of the methods, see the reference section of 'GitHub' README.md <<https://github.com/rikenbit/Vicus>>.

Details

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Author(s)

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References

Wang B, et al., (2017). Vicus: Exploiting local structures to improve network-based analysis of biological data. *PLOS Computational Biology*. 13(10), e1005621

See Also

[graphMatrix,embedding](#)

Examples

```
ls("package:Vicus")
```

embedding	<i>Graph Embedding</i>
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Description

Lower dimensions are estimated from the object returned from graphMatrix function.

Usage

```
embedding(obj)
```

Arguments

obj Object returned from graphMatrix function.

Value

A matrix (n times k)

Author(s)

Koki Tsuyuzaki

See Also

[graphMatrix](#)

Examples

```
X <- matrix(runif(10*20), nrow=10, ncol=20)
head(embedding(graphMatrix(X, K=2)))
```

graphMatrix

Graph Laplacian type matrix

Description

A symmetric matrix is returned.

Usage

```
graphMatrix(X, algorithm=c("Vicus", "LEM", "HLLE"),
            K=10, alpha=0.9, ndim=2)
```

Arguments

X A numeric matrix (n times p).

algorithm Algorithm to construct a graph matrix. Vicus matrix (Vicus), Graph Laplacian matrix (LEM), and Hessian Locally Linear Embedding matrix (HLLE) are available (Default: "Vicus").

K The number of neighborhoods to construct a graph matrix (Default: 10).

alpha An optional parameter for Vicus (Default: 0.9).

ndim The number of lower dimension to embed the graph (Default: 2).

Value

M: A symmetric matrix (n times n). This matrix can be applied to embedding function. algorithm: algorithm parameter specified by argument ndim: ndim parameter specified by argument

Author(s)

Koki Tsuyuzaki

See Also

[embedding](#)

Examples

```
X <- matrix(runif(10*20), nrow=10, ncol=20)
str(graphMatrix(X, K=2), 2)
```

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