

Package ‘Vicus’

July 21, 2025

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

NeedsCompilation no

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Repository CRAN

Date/Publication 2023-03-23 19:32:04 UTC

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

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Details

The DESCRIPTION file:

```
Package:      Vicus
Type:         Package
Title:        Exploiting Local Structures to Improve Network-Based Analysis of Biological Data
Version:      0.99.0
Authors@R:    c(person("Koki", "Tsuyuzaki", role = c("aut", "cre"), email = "k.t.the-answer@hotmail.co.jp"))
Depends:      R (>= 3.4.0)
Imports:      methods, utils, RANN, Matrix, RSpectra
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License:      MIT + file LICENSE
URL:          https://github.com/rikenbit/Vicus
VignetteBuilder: knitr
Author:       Koki Tsuyuzaki [aut, cre]
Maintainer:   Koki Tsuyuzaki <k.t.the-answer@hotmail.co.jp>
```

Index of help topics:

Vicus-package	Exploiting Local Structures to Improve Network-Based Analysis of Biological Data
embedding	Graph Embedding
graphMatrix	Graph Laplacian type matrix

Author(s)

NA

Maintainer: NA

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	<i>Graph Laplacian type matrix</i>
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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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