Package 'networkmeasures'

August 2, 2019

Type Package

Title Quantify Complexity of igraph networks

Version 0.1

Author Mark van der Loo, Edwin de Jonge, Benjamin Schwetz

Maintainer Mark van der Loo <mark.vanderloo@gmail.com>

Description Quantify Complexity of igraph networks

License GPL (>= 2)

Depends purrr (>= 0.3.1)

Imports igraph

Suggests tinytest, knitr

RoxygenNote 6.1.1

VignetteBuilder knitr

R topics documented:

`efficiency` *Efficiency of an undirected graph*

Description

The `efficiency`, according to Latora (2001), of an undirected network is calculated by summing the inverse distances for all node-node pairs of the graph and divide by the same metric for a fully connected network.

Usage

```
efficiency(g)
```

Arguments

g	a graph of type igraph

References

Latora, V., & Marchiori, M. (2001). Efficient behavior of small-world networks. Physical review letters, 87(19), 198701.

See Also

Other efficiency measure: local_efficiency

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information_content *Topological information content*

Description

Topological information content

Usage

```
information_content(g)
```

Arguments

g	a graph

Details

The topological information content is defined as the logarithm of the size of the automorphism group to the base of 2.

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local_efficiency *local efficiency of a graph*

Description

local_efficiency is a generalized form of the measure defined by Latora (2001). For each node the efficiency of the egonetwork without the central node is calculated. The Latora definition uses order = 1 (default).

Usage

```
local_efficiency(g, order = 1L)
```

Arguments

g	a graph
order	the order of the egonetwork. The default is taking only direct neighbors.

References

Latora, V., & Marchiori, M. (2001). Efficient behavior of small-world networks. Physical review letters, 87(19), 198701.

See Also

Other efficiency measure: `efficiency`

`vulnerability_edges` *Network vulnerability per edge*

Description

The `vulnerability`, according to Gol'dshtein (2004) and Latora et al (2005).

Usage

```
vulnerability_edges(g, efficiency = NULL)
```

Arguments

g	a graph
`efficiency`	A precomputed efficiency for g (optional)

References

Goldshtein, V., Koganov, G. A., & Surdutovich, G. I. (2004). Vulnerability and Hierarchy of Complex Networks. Cond-mat/0409298.

Latora, V., & Marchiori, M. (2005). Vulnerability and protection of infrastructure networks. Physical Review E, 71(1), 015103.

`vulnerability_nodes` *Network vulnerability per node*

Description

The `vulnerability`, according to Gol'dshtein (2004) and Latora et al (2005).

Usage

```
vulnerability_nodes(g, efficiency = NULL)
```

Arguments

g	a graph
`efficiency`	A precomputed efficiency for g (optional)

References

Goldshtein, V., Koganov, G. A., & Surdutovich, G. I. (2004). Vulnerability and Hierarchy of Complex Networks. Cond-mat/0409298.

Latora, V., & Marchiori, M. (2005). Vulnerability and protection of infrastructure networks. Physical Review E, 71(1), 015103.

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