

Package ‘networkmeasures’

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Type Package

Title Quantify Complexity of igraph networks

Version 0.1

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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

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efficiency	<i>Efficiency of an undirected graph</i>
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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](#)

<code>information_content</code>	<i>Topological information content</i>
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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.

<code>local_efficiency</code>	<i>local efficiency of a graph</i>
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Description

`local_efficiency` is a generalized form of the measure defined by Latora (2001). For each node the efficiency of the egonetnetwork 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 egonetnetwork. 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	<i>Network vulnerability per edge</i>
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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	<i>Network vulnerability per node</i>
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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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