

# Package ‘VertexSimilarity’

January 20, 2025

**Version** 0.1

**Title** Creates Vertex Similarity Matrix for an Undirected Graph

**Description** Creates Vertex Similarity matrix of an undirected graph based on the method stated by E. A. Leicht, Petter Holme, AND M. E. J. Newman in their paper <[DOI:10.1103/PhysRevE.73.026120](https://doi.org/10.1103/PhysRevE.73.026120)>.

**Imports** igraph

**License** GPL-2

**LazyData** true

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## Description

Returns Vertex Similarity matrix of undirected graph based on the method stated by E. A. Leicht, Petter Holme, AND M. E. J. Newman <[DOI:10.1103/PhysRevE.73.026120](https://doi.org/10.1103/PhysRevE.73.026120)>

## Usage

```
VertexSimilarity(m,alpha=0.97)
```

**Arguments**

m	Adjacency matrix of the graph
alpha	It tells the contribution of long paths relative to short ones. For, $0 < \alpha < 1$ , similarity measure considers vertices to be more similar if they have a greater than expected number of short paths between them, than if they have a greater than expected number of long ones.

**Details**

This method is based on the idea that a pair of vertices  $i,j$  are similar to each other if any pair  $u,v$  of their neighbours is similar. Using this method we can even find similarity values for the vertices that are not directly connected.

**Examples**

```
m <- matrix(c(1,0,0,0,0,1,1,1,1),ncol=3,nrow=3,byrow=TRUE)
SimilarityMatrix <- VertexSimilarity(m,alpha=0.85)
```

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