

# Package ‘alcyon’

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**Type** Package

**Title** Spatial Network Analysis

**Version** 0.8.1

**Description** Interface package for 'sala', the spatial network analysis library from the 'depthmapX' software application. The R parts of the code are based on the 'rdepthmap' package. Allows for the analysis of urban and building-scale networks and provides metrics and methods usually found within the Space Syntax domain. Methods in this package are described by K. Al-Sayed, A. Turner, B. Hillier, S. Iida and A. Penn (2014) ``Space Syntax methodology'', and also by A. Turner (2004) <https://discovery.ucl.ac.uk/id/eprint/2651> ``Depthmap 4: a researcher's handbook''.

**License** GPL-3

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**Author** Petros Koutsolampros [cre, aut] (ORCID:  
<https://orcid.org/0000-0003-2842-9899>), 'sala' library contributor  
 through 'depthmapX'),  
 Fani Kostourou [ctb] (ORCID: <https://orcid.org/0000-0002-6544-7693>),  
 Kimon Krenz [ctb] (ORCID: <https://orcid.org/0000-0001-6077-7282>),  
 Alasdair Turner [ctb] ('sala' library contributor through 'depthmapX'),  
 Tasos Varoudis [ctb] (ORCID: <https://orcid.org/0000-0001-7790-5623>),  
 'sala' library contributor through 'depthmapX'),  
 Christian Sailer [ctb] ('sala' library contributor through 'depthmapX'),  
 Eva Friedrich [ctb] ('sala' library contributor through 'depthmapX'),  
 University College London [fnd, cph] (2015 - 2020),  
 Spacelab UK [fnd] (2015 - 2020)

**Maintainer** Petros Koutsolampros <r-devel@pklampros.net>

**Repository** CRAN

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---

agentAnalysis

*Agent Analysis*


---

### Description

Runs Agent Analysis on the given PointMap

### Usage

```
agentAnalysis(
  pointMap,
  timesteps,
  releaseRate,
  agentLifeTimesteps,
  agentFov,
  agentStepsToDecision,
  agentLookMode,
  originX = vector(),
  originY = vector(),
  locationSeed = 0L,
  numberOfTrails = 0L,
  getGateCounts = FALSE,
  copyMap = TRUE,
  verbose = FALSE,
  progress = FALSE
)
```

### Arguments

pointMap	A PointMap, used as an exosomatic visual map for agents to take exploratory information
timesteps	Number of total system timesteps.
releaseRate	Agent release rate (likelihood of release per timestep).
agentLifeTimesteps	Agent total lifetime (in timesteps)
agentFov	Agent field-of-view (out of 32 bins = 360).
agentStepsToDecision	Agent steps before turn decision.
agentLookMode	The agent look mode. See <a href="#">AgentLookMode</a>
originX	Agent starting points (x coordinates).
originY	Agent starting point (y coordinates).
locationSeed	Agents to start at random locations with specific seed (0 to 10). Default is 0.
numberOfTrails	Record trails for this amount of agents (set to 0 to record all, with max possible currently = 50).

getGateCounts	Get values at gates
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.
progress	Optional. Show process progress.

## Value

Returns a list with:

- newAttributes: The new attributes that were created during the process
- trailMap: A ShapeMap with trails if numberOfTrails was set over 0

## Examples

```
miffFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(miffFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
agentAnalysis(
  pointMap,
  timesteps = 3000L,
  releaseRate = 0.1,
  agentStepsToDecision = 3L,
  agentFov = 11L,
  agentLife = 1000L,
  agentLookMode = AgentLookMode$Standard,
  originX = NA,
  originY = NA,
  locationSeed = 1L,
  numberOfTrails = 50L,
  getGateCounts = FALSE,
  verbose = FALSE
)
```

---

AgentLookMode	<i>Agent look modes.</i>
---------------	--------------------------

---

## Description

These are meant to be used to indicate what kind of look function the agents use to look around and decide where to go next. Possible values:

- AgentLookMode\$None
- AgentLookMode\$Standard
- AgentLookMode\$LineOfSightLength
- AgentLookMode\$OcclusionLength
- AgentLookMode\$OcclusionAny
- AgentLookMode\$OcclusionGroup45 (Occlusion group bins - 45 degrees)
- AgentLookMode\$OcclusionGroup60 (Occlusion group bins - 60 degrees)
- AgentLookMode\$OcclusionFurthest (Furthest occlusion per bin)
- AgentLookMode\$BinFarDistance (Per bin far distance weighted)
- AgentLookMode\$BinAngle (Per bin angle weighted)
- AgentLookMode\$BinFarDistanceAngle (Per bin far-distance and angle weighted)
- AgentLookMode\$BinMemory (Per bin memory)

## Usage

AgentLookMode

## Format

An object of class `list` of length 12.

## Value

A list of numbers representing each agent look mode

## Examples

```
AgentLookMode$Standard  
AgentLookMode$LineOfSightLength  
AgentLookMode$OcclusionAny
```

---

AllLineShapeGraph-class

*All-line Axial ShapeGraph*


---

### Description

A representation of sala's All-line ShapeGraph in R. Holds onto a sala All-line ShapeGraph pointer and operates on that

---

allToAllTraverse

*All-to-all traversal*


---

### Description

Runs all-to-all traversal on a map with a graph. This is applicable to:

- PointMaps (Visibility Graph Analysis)
- Axial ShapeGraphs (Axial analysis)
- Segment ShapeGraphs (Segment analysis)

### Usage

```
allToAllTraverse(
  map,
  traversalType,
  radii,
  radiusTraversalType,
  weightByAttribute = NULL,
  includeBetweenness = FALSE,
  quantizationWidth = NA,
  gatesOnly = FALSE,
  nthreads = 1L,
  copyMap = TRUE,
  verbose = FALSE,
  progress = FALSE
)
```

### Arguments

map	A PointMap, Axial ShapeGraph or Segment ShapeGraph
traversalType	The traversal type. See <a href="#">TraversalType</a>
radii	A list of radii
radiusTraversalType	The traversal type to keep track of whether the analysis is within the each radius limit. See <a href="#">TraversalType</a>

weightByAttribute	The attribute to weigh the analysis with
includeBetweenness	Set to TRUE to also calculate betweenness (known as Choice in the Space Syntax domain)
quantizationWidth	Set this to use chunks of this width instead of continuous values for the cost of traversal. This is equivalent to the "tulip bins" for depthmapX's tulip analysis (1024 tulip bins = $\pi/1024$ quantizationWidth). Only works for Segment ShapeGraphs
gatesOnly	Optional. Only calculate results at particular gate pixels. Only works for PointMaps
nthreads	Optional. Use more than one threads. 1 by default, set to 0 to use all available. Only available for PointMaps.
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.
progress	Optional. Enable progress display

**Value**

A new map with the results included

**Examples**

```
# Pointmap analysis (VGA)
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
allToAllTraverse(pointMap,
  traversalType = TraversalType$Angular,
  radii = -1L,
  radiusTraversalType = TraversalType$None
)

# Axial analysis
mifFile <- system.file(
```

```

    "extdata", "testdata", "barnsbury",
    "barnsbury_small_axial_original.mif",
    package = "alcyon"
  )
  sfMap <- st_read(mifFile,
    geometry_column = 1L, quiet = TRUE
  )
  shapeGraph <- as(sfMap, "AxialShapeGraph")
allToAllTraverse(
  shapeGraph,
  traversalType = TraversalType$Topological,
  radii = c("n", "3"),
  includeBetweenness = TRUE
)

# Segment analysis
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_segment_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "SegmentShapeGraph")
allToAllTraverse(
  shapeGraph,
  radii = c("n", "100"),
  radiusTraversalType = TraversalType$Metric,
  traversalType = TraversalType$Angular,
  weightByAttribute = "Segment Length",
  includeBetweenness = TRUE,
  quantizationWidth = pi / 1024L,
  verbose = FALSE,
  progress = FALSE
)

```

---

as *as("sf", "ShapeMap")*

---

### Description

This is a direct conversion, for ShapeMap -> Axial -> Segment see [axialToSegmentShapeGraph](#)

This is a direct conversion, for ShapeMap -> Axial -> Segment see [axialToSegmentShapeGraph](#)

### See Also

Other ShapeMap: [ShapeMap-class](#)

Other ShapeMap: [ShapeMap-class](#)

Other AxialShapeGraph: [AxialShapeGraph-class](#)

Other AxialShapeGraph: [AxialShapeGraph-class](#)

Other SegmentShapeGraph: [SegmentShapeGraph-class](#)

Other SegmentShapeGraph: [SegmentShapeGraph-class](#)

---

axialAnalysisLocal     *Axial analysis - local metrics*

---

## Description

Runs axial analysis to get the local metrics Control and Controllability

## Usage

```
axialAnalysisLocal(shapeGraph, copyMap = TRUE, verbose = FALSE)
```

## Arguments

shapeGraph	An Axial ShapeGraph
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

## Value

Returns a list with:

- completed: Whether the analysis completed
- newAttributes: The new attributes that were created during the process

## Examples

```
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
axialAnalysisLocal(shapeGraph)
```

---

AxialShapeGraph-class *Axial ShapeGraph*

---

### Description

A representation of sala's Axial ShapeGraph in R. Holds onto a sala Axial ShapeGraph pointer and operates on that

### See Also

Other AxialShapeGraph: [as\(\)](#)

---

AxialShapeGraph\_subset  
*Subset AxialShapeGraph objects*

---

### Description

Subsetting AxialShapeGraph objects essentially passes the data to [sf](#). See [sf](#)

### Usage

```
## S3 method for class 'AxialShapeGraph'  
x[...]  
  
## S3 replacement method for class 'AxialShapeGraph'  
x[...] <- value
```

### Arguments

x	object of class AxialShapeGraph passed to stars[]
...	other parameters passed to stars[] <-
value	value to be passed to sf[] <-

---

axialToSegmentShapeGraph  
*Axial to Segment ShapeGraph*

---

**Description**

Convert an Axial ShapeGraph to a Segment ShapeGraph

**Usage**

```
axialToSegmentShapeGraph(axialShapeGraph, stubRemoval = NULL)
```

**Arguments**

axialShapeGraph	An Axial ShapeGraph
stubRemoval	Remove stubs of axial lines shorter than this percentage (for example provide 0.4 for 40%)

**Value**

A new Segment ShapeGraph

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
axialToSegmentShapeGraph(shapeGraph, stubRemoval = 0.4)
```

---

blockLines                      *Block lines on a PointMap*

---

**Description**

Takes a PointMap and a ShapeMap with lines and blocks the cells on the PointMap where the lines pass.

**Usage**

```
blockLines(pointMap, lineStringMap, copyMap = TRUE, verbose = FALSE)
```

**Arguments**

pointMap	The input PointMap
lineStringMap	Map of lines, either a ShapeMap, or an sf lineString map
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

**Value**

A new PointMap with points as they have been blocked by the lines

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
lineStringMap <- as(sfMap, "sf")
mapRegion <- sf::st_bbox(lineStringMap)
pointMap <- createGrid(
  minX = mapRegion[["xmin"]],
  minY = mapRegion[["ymin"]],
  maxX = mapRegion[["xmax"]],
  maxY = mapRegion[["ymax"]],
  gridSize = 0.04
)
blockLines(
  pointMap = pointMap,
  lineStringMap = lineStringMap[vector()]
)
```

---

connections

*Get map connections*

---

**Description**

Get map connections

**Usage**

```
connections(map)
```

**Arguments**

map	A sala map
-----	------------

**Value**

A matrix with the connected refs

---

connections,AxialShapeGraph-method

*Get the Axial ShapeGraph connections*

---

**Description**

Get the Axial ShapeGraph connections

**Usage**

```
## S4 method for signature 'AxialShapeGraph'  
connections(map)
```

**Arguments**

map                    An Axial ShapeGraph

**Value**

A matrix with the connected refs

**Examples**

```
mifFile <- system.file(  
  "extdata", "testdata", "barnsbury",  
  "barnsbury_small_axial_original.mif",  
  package = "alcyon"  
)  
sfMap <- st_read(mifFile,  
  geometry_column = 1L, quiet = TRUE  
)  
shapeGraph <- as(sfMap, "AxialShapeGraph")  
connections(shapeGraph)
```

---

connections,PointMap-method

*Get the PointMap connections*

---

## Description

Get the PointMap connections

## Usage

```
## S4 method for signature 'PointMap'  
connections(map)
```

## Arguments

map                    A PointMap

## Value

A matrix with the connected refs

## Examples

```
mifFile <- system.file(  
  "extdata", "testdata", "gallery",  
  "gallery_lines.mif",  
  package = "alcyon"  
)  
sfMap <- st_read(mifFile,  
  geometry_column = 1L, quiet = TRUE  
)  
pointMap <- makeVGAPointMap(  
  sfMap,  
  gridSize = 0.04,  
  fillX = 3.01,  
  fillY = 6.7,  
  maxVisibility = NA,  
  boundaryGraph = FALSE,  
  verbose = FALSE  
)  
# plot the first 100 connections only  
head(connections(pointMap), 100)
```

---

connections, SegmentShapeGraph-method

*Get the Segment ShapeGraph connections*

---

### Description

Get the Segment ShapeGraph connections

### Usage

```
## S4 method for signature 'SegmentShapeGraph'  
connections(map)
```

### Arguments

map                    An Segment ShapeGraph

### Value

A matrix with the connected refs

### Examples

```
mifFile <- system.file(  
  "extdata", "testdata", "barnsbury",  
  "barnsbury_small_segment_original.mif",  
  package = "alcyon"  
)  
sfMap <- st_read(mifFile,  
  geometry_column = 1L, quiet = TRUE  
)  
shapeGraph <- as(sfMap, "SegmentShapeGraph")  
connections(shapeGraph)
```

---

createGrid

*Create a PointMap through a grid*

---

### Description

Create a PointMap through a grid

### Usage

```
createGrid(minX, minY, maxX, maxY, gridSize, verbose = FALSE)
```

**Arguments**

minX	Minimum X of the bounding region
minY	Minimum Y of the bounding region
maxX	Maximum X of the bounding region
maxY	Maximum Y of the bounding region
gridSize	Size of the cells
verbose	Optional. Show more information of the process.

**Value**

A new PointMap

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
lineStringMap <- as(sfMap, "sf")
mapRegion <- sf::st_bbox(lineStringMap)
createGrid(
  minX = mapRegion[["xmin"]],
  minY = mapRegion[["ymin"]],
  maxX = mapRegion[["xmax"]],
  maxY = mapRegion[["ymax"]],
  gridSize = 0.04
)
```

---

fillGrid

*Fill a PointMap's grid starting from one or more points*

---

**Description**

Fill a PointMap's grid starting from one or more points

**Usage**

```
fillGrid(pointMap, fillX, fillY, copyMap = TRUE, verbose = FALSE)
```

**Arguments**

pointMap	The input PointMap
fillX	X coordinate of the fill points
fillY	Y coordinate of the fill points
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

**Value**

A new PointMap with filled points

**Examples**

```

mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
lineStringMap <- as(sfMap, "sf")
mapRegion <- sf::st_bbox(lineStringMap)
pointMap <- createGrid(
  minX = mapRegion[["xmin"]],
  minY = mapRegion[["ymin"]],
  maxX = mapRegion[["xmax"]],
  maxY = mapRegion[["ymax"]],
  gridSize = 0.04
)
pointMap <- blockLines(
  pointMap = pointMap,
  lineStringMap = lineStringMap[vector()]
)
fillGrid(
  pointMap = pointMap,
  fillX = 3.01,
  fillY = 6.7
)

```

---

getTopFeatures

*Extract top x percent of features*


---

**Description**

Sorts features by a specific column and extracts the top x percent

**Usage**

```
getTopFeatures(lineStringMap, column, percent)
```

**Arguments**

lineStringMap    An sf lineString map  
 column            The column to use to extract the features from  
 percent          Percentage of features (to total) to extract

**Value**

The lineString map filtered and sorted

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
shapeGraph <- allToAllTraverse(
  shapeGraph,
  traversalType = TraversalType$Topological,
  radii = c("n", "3"),
  includeBetweenness = TRUE
)
getTopFeatures(shapeGraph, "Connectivity", 0.1)
```

---

 isovist

*Create isovists at point and direction angle*


---

**Description**

Create one or more isovists at particular points, given angle and field of view

**Usage**

```
isovist(boundaryMap, x, y, angle = NA, viewAngle = NA, verbose = FALSE)
```

**Arguments**

boundaryMap	A ShapeMap with lines designating the isovist boundaries
x	X coordinate of the origin points
y	Y coordinate of the origin points
angle	The angle (from the X axis) of the isovist look direction
viewAngle	The angle signifying the isovist's field of view
verbose	Optional. Show more information of the process.

**Value**

A ShapeMap with the isovist polygons

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
isovist(
  shapeMap,
  x = c(3.01, 1.3),
  y = c(6.70, 5.2),
  angle = 0.01,
  viewAngle = 3.14,
  FALSE
)
```

---

isovist2pts

---

*Create isovists using two points*


---

**Description**

Create one or more isovists at particular points, given another point for direction and an angle for field of view

**Usage**

```
isovist2pts(boundaryMap, x, y, toX, toY, viewAngle, verbose = FALSE)
```

**Arguments**

boundaryMap	A ShapeMap with lines designating the isovist boundaries
x	X coordinate of the origin points
y	Y coordinate of the origin points
toX	X coordinate of the target points
toY	Y coordinate of the target points
viewAngle	The angle signifying the isovist's field of view
verbose	Optional. Show more information of the process.

**Value**

A ShapeMap with the isovist polygons

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
isovist2pts(
  shapeMap,
  x = c(3.01, 1.3),
  y = c(6.70, 5.2),
  toX = c(3.40, 1.1),
  toY = c(6.50, 5.6),
  viewAngle = 3.14,
  FALSE
)
```

---

linkCoords

---

*Link map points/lines as if selecting them using points*


---

**Description**

Link map points/lines as if selecting them using points

**Usage**

```
linkCoords(map, fromX, fromY, toX, toY, copyMap = TRUE)
```

**Arguments**

map	A sala map
fromX	X coordinate of the origin point
fromY	Y coordinate of the origin point
toX	X coordinate of the target point
toY	Y coordinate of the target point
copyMap	Optional. Copy the internal sala map

**Value**

A new map with linked points/lines

---

linkCoords, AxialShapeGraph-method  
*Link two Axial Lines (coordinates)*

---

**Description**

Link two locations on an Axial ShapeGraph using the point coordinates

**Usage**

```
## S4 method for signature 'AxialShapeGraph'
linkCoords(map, fromX, fromY, toX, toY, copyMap = TRUE)
```

**Arguments**

map	An Axial ShapeGraph
fromX	X coordinate of the first link point
fromY	Y coordinate of the first link point
toX	X coordinate of the second link point
toY	Y coordinate of the second link point
copyMap	Optional. Copy the internal sala map

**Value**

A new Axial ShapeGraph with linked lines

**Examples**

```

mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
linkCoords(shapeGraph, 982.8, -1620.3, 1217.1, -1977.3)

```

---

linkCoords,PointMap-method

*Link two PointMap Cells (coordinates)*

---

**Description**

Link two cells on a PointMap using the point coordinates

**Usage**

```

## S4 method for signature 'PointMap'
linkCoords(map, fromX, fromY, toX, toY, copyMap = TRUE)

```

**Arguments**

map	A PointMap
fromX	X coordinate of the first link point
fromY	Y coordinate of the first link point
toX	X coordinate of the second link point
toY	Y coordinate of the second link point
copyMap	Optional. Copy the internal sala map

**Value**

A new PointMap with linked points

**Examples**

```

mifFile <- system.file(
  "extdata", "testdata", "gallery",
  "gallery_lines.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)

```

```

)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.04,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
linkCoords(pointMap, 1.74, 6.7, 5.05, 5.24)

```

---

linkRefs *Link map points/lines using their refs*

---

### Description

Link map points/lines using their refs

### Usage

```
linkRefs(map, fromRef, toRef, copyMap = TRUE)
```

### Arguments

map	A sala map
fromRef	The ref of the origin element
toRef	The ref of the target element
copyMap	Optional. Copy the internal sala map

### Value

A new map with linked points/lines

---

linkRefs,AxialShapeGraph-method  
*Link two Axial Lines (refs)*

---

### Description

Link two lines on an Axial ShapeGraph using their refs

### Usage

```
## S4 method for signature 'AxialShapeGraph'
linkRefs(map, fromRef, toRef, copyMap = TRUE)
```

**Arguments**

map	An Axial ShapeGraph
fromRef	Ref of the first link line
toRef	Ref of the second link line
copyMap	Optional. Copy the internal sala map

**Value**

A new Axial ShapeGraph with linked lines

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
linkRefs(shapeGraph, 0L, 9L)
```

---

linkRefs,PointMap-method

*Link two PointMap Cells (refs)*

---

**Description**

Link two cells on an PointMap using their refs

**Usage**

```
## S4 method for signature 'PointMap'
linkRefs(map, fromRef, toRef, copyMap = TRUE)
```

**Arguments**

map	A PointMap
fromRef	Ref of the first link line
toRef	Ref of the second link line
copyMap	Optional. Copy the internal sala map

**Value**

A new PointMap with linked points

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "gallery",
  "gallery_lines.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.04,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
pointMap <- linkRefs(pointMap, 1835056L, 7208971L)
```

---

links

*Get map links*

---

**Description**

Get map links

**Usage**

```
links(map)
```

**Arguments**

map            A sala map

**Value**

A matrix with the linked refs

---

`links,AxialShapeGraph-method`*Get the Axial ShapeGraph links*

---

**Description**

Get the Axial ShapeGraph links

**Usage**

```
## S4 method for signature 'AxialShapeGraph'  
links(map)
```

**Arguments**

`map`                    An Axial ShapeGraph

**Value**

A matrix with the linked refs

**Examples**

```
# links of an axial map  
mifFile <- system.file(  
  "extdata", "testdata", "barnsbury",  
  "barnsbury_small_axial_original.mif",  
  package = "alcyon"  
)  
sfMap <- st_read(mifFile,  
  geometry_column = 1L, quiet = TRUE  
)  
shapeGraph <- as(sfMap, "AxialShapeGraph")  
linkRefs(shapeGraph, 0L, 9L)  
unlinkCoords(shapeGraph, 530923.0, 184041.0, 530956.0, 183887.0)  
links(shapeGraph)
```

---

`links,PointMap-method` *Get the PointMap links*

---

**Description**

Get the PointMap links

**Usage**

```
## S4 method for signature 'PointMap'  
links(map)
```

**Arguments**

map                    A PointMap

**Value**

A matrix with the linked refs

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "gallery",
  "gallery_lines.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.04,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
linkRefs(pointMap, 1835056L, 7208971L)
links(pointMap)
```

---

makeAllLineMap                    *Create an All-line Map*

---

**Description**

Create an All-line Map

**Usage**

```
makeAllLineMap(boundsMap, seedX, seedY, verbose = FALSE)
```

**Arguments**

boundsMap            The boundary ShapeMap to create the all-line map in  
seedX                    X coordinate of the seed (the point that initiates the process)  
seedY                    Y coordinate of the seed (the point that initiates the process)  
verbose                Optional. Show more information of the process.

**Value**

An All-line Axial ShapeGraph

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
makeAllLineMap(
  shapeMap,
  seedX = 3.01,
  seedY = 6.7
)
```

---

makeColour

*Single Colour from depthmapX's Palettes*

---

**Description**

Create a single colour from depthmapX's palettes.

**Usage**

```
makeDepthmapClassicColour(value, rangeMin = 0, rangeMax = 1)
```

```
makeAxmanesqueColour(value, rangeMin = 0, rangeMax = 1)
```

```
makePurpleOrangeColour(value, rangeMin = 0, rangeMax = 1)
```

```
makeBlueRedColour(value, rangeMin = 0, rangeMax = 1)
```

```
makeGreyScaleColour(value, rangeMin = 0, rangeMax = 1)
```

```
makeNiceHSBColour(value, rangeMin = 0, rangeMax = 1)
```

**Arguments**

value	Value within the min/max range to take
rangeMin	The min value of the range
rangeMax	The max value of the range

**Value**

Returns a single colour.

**Examples**

```
makeDepthmapClassicColour(0.2, 0, 1)
makeAxmanesqueColour(0.2, 0, 1)
makePurpleOrangeColour(0.2, 0, 1)
makeBlueRedColour(0.2, 0, 1)
makeGreyScaleColour(0.2, 0, 1)
makeNiceHSBColour(0.2, 0, 1)
```

---

makeVGAGraph

*Create a graph between visible cells in the PointMap*

---

**Description**

Create a graph between visible cells in the PointMap

**Usage**

```
makeVGAGraph(
  pointMap,
  boundaryGraph = FALSE,
  maxVisibility = NA,
  copyMap = TRUE,
  verbose = FALSE
)
```

**Arguments**

pointMap	The input PointMap
boundaryGraph	Only create a graph on the boundary cells
maxVisibility	Limit how far two cells can be to be connected
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

**Value**

A new PointMap with a graph between points

**Examples**

```

miffFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(miffFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
lineStringMap <- as(sfMap, "sf")
mapRegion <- sf::st_bbox(lineStringMap)
pointMap <- createGrid(
  minX = mapRegion[["xmin"]],
  minY = mapRegion[["ymin"]],
  maxX = mapRegion[["xmax"]],
  maxY = mapRegion[["ymax"]],
  gridSize = 0.5
)
pointMap <- blockLines(
  pointMap = pointMap,
  lineStringMap = lineStringMap[vector()]
)
pointMap <- fillGrid(
  pointMap = pointMap,
  fillX = 3.01,
  fillY = 6.7
)
)
makeVGAGraph(
  pointMap = pointMap,
  boundaryGraph = FALSE,
  maxVisibility = NA
)

```

---

makeVGAPointMap

*Create a PointMap grid, fill it and make the graph*


---

**Description**

This is intended to be a single command to get from the lines to a PointMap ready for analysis

**Usage**

```

makeVGAPointMap(
  lineStringMap,
  gridSize,
  fillX,
  fillY,
  maxVisibility = NA,

```

```

    boundaryGraph = FALSE,
    verbose = FALSE
  )

```

### Arguments

lineStringMap	Map of lines, either a ShapeMap, or an sf lineString map
gridSize	Size of the cells
fillX	X coordinate of the fill points
fillY	Y coordinate of the fill points
maxVisibility	Limit how far two cells can be to be connected
boundaryGraph	Only create a graph on the boundary cells
verbose	Optional. Show more information of the process.

### Value

A new PointMap

### Examples

```

mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)

```

---

matchPointsToLines      *Match points to lines*

---

### Description

Match points to their closest line. Matches (spatial-join) points to lines. Finds the point closest to a line. One point is attached to one line, thus if fewer points than lines are given then some lines will have no point attached.

**Usage**

```
matchPointsToLines(points, lines, getIndex = FALSE)
```

**Arguments**

```
points      Points to attach.
lines       Lines to attach to.
getIndex    Get the index returned and not the data.
```

**Value**

If `getIndex` is `TRUE` then the index of the points as they relate to the matching lines are given. If not, then the data from the points dataframe is returned.

**Examples**

```
segmentsMif <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_segment_original.mif",
  package = "alcyon"
)
segmentsSf <- st_read(
  segmentsMif,
  geometry_column = 1L, quiet = TRUE
)
gateCountsMif <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_ped_gatecounts.mif",
  package = "alcyon"
)
gateCountsSf <- st_read(
  gateCountsMif,
  geometry_column = 1L, quiet = TRUE
)
matchPointsToLines(gateCountsSf, segmentsSf)
```

---

name	<i>Get map name</i>
------	---------------------

---

**Description**

Get map name

**Usage**

```
name(map)
```

**Arguments**

map                    A sala map

**Value**

The name of the object as a string

---

name,PointMap-method    *Get the PointMap name*

---

**Description**

Get the PointMap name

**Usage**

```
## S4 method for signature 'PointMap'  
name(map)
```

**Arguments**

map                    A PointMap

**Value**

The name of the PointMap as a string

**Examples**

```
mifFile <- system.file(  
  "extdata", "testdata", "gallery",  
  "gallery_lines.mif",  
  package = "alcyon"  
)  
sfMap <- st_read(mifFile,  
  geometry_column = 1L, quiet = TRUE  
)  
pointMap <- makeVGAPointMap(  
  sfMap,  
  gridSize = 0.04,  
  fillX = 3.01,  
  fillY = 6.7,  
  maxVisibility = NA,  
  boundaryGraph = FALSE,  
  verbose = FALSE  
)  
name(pointMap)
```

---

name,ShapeMap-method    *Get the ShapeMap name*

---

**Description**

Get the ShapeMap name

**Usage**

```
## S4 method for signature 'ShapeMap'  
name(map)
```

**Arguments**

map                    A ShapeMap

**Value**

The name of the ShapeMap as a string

**Examples**

```
mifFile <- system.file(  
  "extdata", "testdata", "simple",  
  "simple_interior.mif",  
  package = "alcyon"  
)  
sfMap <- st_read(mifFile,  
  geometry_column = 1L, quiet = TRUE  
)  
shapeMap <- as(sfMap[, vector()], "ShapeMap")  
name(shapeMap)
```

---

oneToAllTraverse        *One-to-all traversal*

---

**Description**

Runs one-to-all traversal on a map with a graph. This is applicable to:

- PointMaps (Visibility Graph Analysis)
- Axial ShapeGraphs (Axial analysis)
- Segment ShapeGraphs (Segment analysis)

**Usage**

```

oneToAllTraverse(
  map,
  traversalType,
  fromX,
  fromY,
  quantizationWidth = NA,
  copyMap = TRUE,
  verbose = FALSE
)

```

**Arguments**

map	A PointMap, Axial ShapeGraph or Segment ShapeGraph
traversalType	The traversal type. See <a href="#">TraversalType</a>
fromX	X coordinate of the point to start the traversal from
fromY	X coordinate of the point to start the traversal from
quantizationWidth	Set this to use chunks of this width instead of continuous values for the cost of traversal. This is equivalent to the "tulip bins" for depthmapX's tulip analysis (1024 tulip bins = $\pi/1024$ quantizationWidth). Only works for Segment ShapeGraphs
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

**Value**

Returns a list with:

- completed: Whether the analysis completed
- newAttributes: The new attributes that were created during the process

**Examples**

```

# Pointmap analysis (VGA)
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,

```

```

    maxVisibility = NA,
    boundaryGraph = FALSE,
    verbose = FALSE
  )
oneToAllTraverse(
  pointMap,
  traversalType = TraversalType$Metric,
  fromX = 3.01,
  fromY = 6.7
)

# Axial analysis
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
oneToAllTraverse(
  shapeGraph,
  traversalType = TraversalType$Topological,
  fromX = 1217.1,
  fromY = -1977.3
)

# Segment analysis
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_segment_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "SegmentShapeGraph")
oneToAllTraverse(
  shapeGraph,
  traversalType = TraversalType$Topological,
  fromX = 1217.1,
  fromY = -1977.3
)

```

---

oneToOneTraverse

*One-to-one traversal*


---

### Description

Runs one-to-one traversal on a map with a graph. This is applicable to:

- PointMaps (Visibility Graph Analysis)
- Segment ShapeGraphs (Segment analysis)

### Usage

```
oneToOneTraverse(
  map,
  traversalType,
  fromX,
  fromY,
  toX,
  toY,
  quantizationWidth = NA,
  copyMap = TRUE,
  verbose = FALSE
)
```

### Arguments

map	A PointMap or Segment ShapeGraph
traversalType	The traversal type. See <a href="#">TraversalType</a>
fromX	X coordinate of the point(s) to start the traversal from
fromY	X coordinate of the point(s) to start the traversal from
toX	X coordinate of the point(s) to start the traversal from
toY	X coordinate of the point(s) to start the traversal from
quantizationWidth	Set this to use chunks of this width instead of continuous values for the cost of traversal. This is equivalent to the "tulip bins" for depthmapX's tulip analysis (1024 tulip bins = $\pi/1024$ quantizationWidth). Only works for Segment ShapeGraphs
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

### Value

Returns a list with:

- completed: Whether the analysis completed
- newAttributes: The new attributes that were created during the process

### Examples

```
# Pointmap analysis (VGA)
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
```

```

)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
oneToOneTraverse(
  pointMap,
  traversalType = TraversalType$Metric,
  fromX = 7.52,
  fromY = 6.02,
  toX = 5.78,
  toY = 2.96
)

# Segment analysis
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_segment_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "SegmentShapeGraph")
oneToOneTraverse(
  shapeGraph,
  traversalType = TraversalType$Topological,
  fromX = 1217.1,
  fromY = -1977.3,
  toX = 1017.8,
  toY = -1699.3
)

```

---

palettes

*Colour Palettes from depthmapX*


---

### Description

Create n contiguous colours taken from depthmapX.

**Usage**

```

depthmap.classic.colour(n, rangeMin = 0, rangeMax = 1)

depthmap.axmanesque.colour(n, rangeMin = 0, rangeMax = 1)

depthmap.purpleorange.colour(n, rangeMin = 0, rangeMax = 1)

depthmap.bluered.colour(n, rangeMin = 0, rangeMax = 1)

depthmap.grayscale.colour(n, rangeMin = 0, rangeMax = 1)

depthmap.nicehsb.colour(n, rangeMin = 0, rangeMax = 1)

```

**Arguments**

n	Number of colours to generate
rangeMin	The min value of the range
rangeMax	The max value of the range

**Value**

Returns a vector of colours.

**Examples**

```

depthmap.classic.colour(100, 0, 1)
depthmap.axmanesque.colour(100, 0, 1)
depthmap.purpleorange.colour(100, 0, 1)
depthmap.bluered.colour(100, 0, 1)
depthmap.grayscale.colour(100, 0, 1)
depthmap.nicehsb.colour(100, 0, 1)

```

---

plot.PointMap

*plot a PointMap*


---

**Description**

Calls a standard plot.stars, but flips the first argument around the x axis

**Usage**

```

## S3 method for class 'PointMap'
plot(x, ...)

```

**Arguments**

x	object of class PointMap
...	other parameters passed to stars[]

---

PointMap-class	<i>PointMap</i>
----------------	-----------------

---

**Description**

A representation of sala's PointMap in R. Holds onto a sala PointMap pointer and operates on that

---

PointMap_subset	<i>Subset PointMap objects</i>
-----------------	--------------------------------

---

**Description**

Subsetting PointMap objects essentially passes the data to stars See [stars\\_subset](#)

**Usage**

```
## S3 method for class 'PointMap'
x[...]

## S3 replacement method for class 'PointMap'
x[...] <- value
```

**Arguments**

x	object of class PointMap passed to stars[]
...	other parameters passed to stars[] <-
value	value to be passed to stars[] <-

---

readMetaGraph	<i>Read MetaGraph</i>
---------------	-----------------------

---

**Description**

Reads a metagraph into a bunch of ShapeMaps/ShapeGraphs/PointMaps

**Usage**

```
readMetaGraph(fileName)
```

**Arguments**

fileName	The metagraph file
----------	--------------------

**Value**

A list of ShapeMaps, ShapeGraphs and PointMaps

**Examples**

```
fileName <- system.file(
  "extdata", "testdata", "barnsbury", "barnsburySmall.graph",
  package = "alcyon"
)
readMetaGraph(fileName)
```

---

reduceToFewest	<i>Reduce an All-line Map to two types of fewest-line maps</i>
----------------	--

---

**Description**

Reduce an All-line Map to two types of fewest-line maps

**Usage**

```
reduceToFewest(allLineMap)
```

**Arguments**

allLineMap      An AllLineShapeGraph

**Value**

A list with two fewest-line axial ShapeGraphs

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
allLineMap <- makeAllLineMap(
  shapeMap,
  seedX = 3.01,
  seedY = 6.7
)
reduceToFewest(allLineMap)
```

---

refIdToIndexAndBack    *Ref ID to index and vice-versa*

---

**Description**

Converts a depthmapX "Ref" ID to the indices (x, y) of a cell, or the reverse

**Usage**

```
refIDtoIndex(refID)
```

```
indexToRefID(i, j)
```

**Arguments**

refID	The Ref ID
i	The x-axis index of the cell
j	The y-axis index of the cell

**Value**

A pair of indices (x, y) or a Ref ID

**Examples**

```
idx <- refIDtoIndex(852645)
# outputs:
#   i   j
# 1 13 677
```

```
idx <- indexToRefID(13, 667)
# outputs:
# 852645
```

---

SegmentShapeGraph-class

*Segment ShapeGraph*

---

**Description**

A representation of sala's Segment ShapeGraph in R. Holds onto a sala Segment ShapeGraph pointer and operates on that

**See Also**

Other SegmentShapeGraph: [as\(\)](#)

---

SegmentShapeGraph\_subset

*Subset SegmentShapeGraph objects*


---

### Description

Subsetting SegmentShapeGraph objects essentially passes the data to sf. See [sf](#)

### Usage

```
## S3 method for class 'SegmentShapeGraph'
x[...]

## S3 replacement method for class 'SegmentShapeGraph'
x[...] <- value
```

### Arguments

x	object of class SegmentShapeGraph passed to stars[]
...	other parameters passed to stars[] <-
value	value to be passed to sf[] <-

---

shapegraphToGraphData *Conversion of shapegraph to graph data*


---

### Description

Creates data to be construct a graph, based on the connections and the x,y coordinates of the centroids of shapes in a shapegraph (axial, segment, convex). Specify weightColumn to assign weight to graph edges.

### Usage

```
shapegraphToGraphData(shapeGraph, weightColumn = NA)
```

### Arguments

shapeGraph	A ShapeGraph
weightColumn	Optional. The variable used to assign weight to graph edges

### Details

If weightColumn is provided, edge connections weight is calculated by taking the average of the variable of the connected nodes.

**Value**

Returns a list with edges and vertices for constructing a graph.

**Examples**

```
miffFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(miffFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
shapegraphToGraphData(shapeGraph)
```

---

ShapeMap-class	<i>ShapeMap class</i>
----------------	-----------------------

---

**Description**

A representation of sala's ShapeMap in R. Holds onto a sala ShapeMap pointer and operates on that

**See Also**

Other ShapeMap: [as\(\)](#)

---

shapeMapToPolygonSf	<i>ShapeMap to sf Polygon map</i>
---------------------	-----------------------------------

---

**Description**

Convert a ShapeMap to an sf Polygon map

**Usage**

```
shapeMapToPolygonSf(shapeMap)
```

**Arguments**

shapeMap      A ShapeMap

**Value**

A new sf Polygon map

## Examples

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
isovistMap <- isovist(
  shapeMap,
  x = c(3.01, 1.3),
  y = c(6.70, 5.2),
  angle = 0.01,
  viewAngle = 3.14,
  FALSE
)
shapeMapToPolygonSf(isovistMap)
```

---

ShapeMap\_subset

*Subset ShapeMap objects*

---

## Description

Subsetting ShapeMap objects essentially passes the data to sf. See [sf](#)

## Usage

```
## S3 method for class 'ShapeMap'
x[...]

## S3 replacement method for class 'ShapeMap'
x[...] <- value
```

## Arguments

x	object of class ShapeMap passed to sf[]
...	other parameters passed to sf[] <-
value	value to be passed to sf[] <-

---

TraversalType	<i>Traversal types</i>
---------------	------------------------

---

**Description**

These are meant to be used to indicate what kind of analysis is meant to be carried out.

**Usage**

TraversalType

**Format**

An object of class list of length 4.

**Value**

A list of numbers representing each particular analysis type

**Examples**

```
TraversalType$Angular
TraversalType$Topological
TraversalType$Metric
```

---

unlinkAtCrossPoint	<i>Unlink map lines at their crossing point</i>
--------------------	---

---

**Description**

Unlink map lines at their crossing point

**Usage**

```
unlinkAtCrossPoint(map, x, y, copyMap = TRUE)
```

**Arguments**

map	A sala map
x	X coordinate of the crossing point
y	Y coordinate of the crossing point
copyMap	Optional. Copy the internal sala map

**Value**

A new map with linked lines

---

unlinkAtCrossPoint, AxialShapeGraph-method  
*Unlink two Axial Lines (crosspoint)*

---

### Description

Unlink two crossing lines on an Axial ShapeGraph at the crossing point

### Usage

```
## S4 method for signature 'AxialShapeGraph'
unlinkAtCrossPoint(map, x, y, copyMap = TRUE)
```

### Arguments

map	An Axial ShapeGraph
x	X coordinate of the unlink crossing point
y	Y coordinate of the unlink crossing point
copyMap	Optional. Copy the internal sala map

### Value

A new Axial ShapeGraph with unlinked lines

### Examples

```
miffFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(miffFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
unlinkAtCrossPoint(shapeGraph, 530925.0, 184119.0)
```

---

unlinkCoords                      *Unlink map points/lines as if selecting them using points*

---

### Description

Unlink map points/lines as if selecting them using points

**Usage**

```
unlinkCoords(map, fromX, fromY, toX, toY, copyMap = TRUE)
```

**Arguments**

map	A sala map
fromX	X coordinate of the origin point
fromY	Y coordinate of the origin point
toX	X coordinate of the target point
toY	Y coordinate of the target point
copyMap	Optional. Copy the internal sala map

**Value**

A new map with unlinked points/lines

---

*unlinkCoords, AxialShapeGraph-method*  
*Unlink two Axial Lines (coordinates)*

---

**Description**

Unlink two locations on an Axial ShapeGraph using the point coordinates

**Usage**

```
## S4 method for signature 'AxialShapeGraph'
unlinkCoords(map, fromX, fromY, toX, toY, copyMap = TRUE)
```

**Arguments**

map	An Axial ShapeGraph
fromX	X coordinate of the first unlink point
fromY	Y coordinate of the first unlink point
toX	X coordinate of the second unlink point
toY	Y coordinate of the second unlink point
copyMap	Optional. Copy the internal sala map

**Value**

A new Axial ShapeGraph with unlinked lines

## Examples

```
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
unlinkCoords(shapeGraph, 982.8, -1620.3, 1080.4, -1873.5)
```

---

unlinkCoords,PointMap-method

*Unlink two PointMap Cells (coordinates)*

---

## Description

Unlink two cells on a PointMap using the point coordinates

## Usage

```
## S4 method for signature 'PointMap'
unlinkCoords(map, fromX, fromY, toX, toY, copyMap = TRUE)
```

## Arguments

map	A PointMap
fromX	X coordinate of the first unlink point
fromY	Y coordinate of the first unlink point
toX	X coordinate of the second unlink point
toY	Y coordinate of the second unlink point
copyMap	Optional. Copy the internal sala map

## Value

A new PointMap with unlinked points

## Examples

```
mifFile <- system.file(
  "extdata", "testdata", "gallery",
  "gallery_lines.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
```

```

)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.04,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
pointMap <- linkCoords(pointMap, 1.74, 6.7, 5.05, 5.24)
pointMap <- unlinkCoords(pointMap, 1.74, 6.7, 5.05, 5.24)

```

---

unlinkRefs

*Unlink map points/lines using their refs*


---

### Description

Unlink map points/lines using their refs

### Usage

```
unlinkRefs(map, fromRef, toRef, copyMap = TRUE)
```

### Arguments

map	A sala map
fromRef	The ref of the origin element
toRef	The ref of the target element
copyMap	Optional. Copy the internal sala map

### Value

A new map with unlinked points/lines

---

unlinkRefs, AxialShapeGraph-method

*Unlink two Axial Lines (refs)*


---

### Description

Unlink two lines on an Axial ShapeGraph using their refs

### Usage

```
## S4 method for signature 'AxialShapeGraph'
unlinkRefs(map, fromRef, toRef, copyMap = TRUE)
```

**Arguments**

map	An Axial ShapeGraph
fromRef	Ref of the first unlink line
toRef	Ref of the second unlink line
copyMap	Optional. Copy the internal sala map

**Value**

A new Axial ShapeGraph with unlinked lines

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "barnsbury",
  "barnsbury_small_axial_original.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeGraph <- as(sfMap, "AxialShapeGraph")
unlinkRefs(shapeGraph, 12L, 34L)
```

---

unlinkRefs,PointMap-method

*Unlink two PointMap Cells (refs)*

---

**Description**

Unlink two cells on an PointMap using their refs

**Usage**

```
## S4 method for signature 'PointMap'
unlinkRefs(map, fromRef, toRef, copyMap = TRUE)
```

**Arguments**

map	A PointMap
fromRef	Ref of the first unlink line
toRef	Ref of the second unlink line
copyMap	Optional. Copy the internal sala map

**Value**

A new PointMap with unlinked points

## Examples

```
mifFile <- system.file(
  "extdata", "testdata", "gallery",
  "gallery_lines.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.04,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
pointMap <- linkRefs(pointMap, 1835056L, 7208971L)
pointMap <- unlinkRefs(pointMap, 1835056L, 7208971L)
```

---

unmakeVGAGraph

*Unmake the graph in a PointMap*

---

## Description

Unmake the graph in a PointMap

## Usage

```
unmakeVGAGraph(pointMap, removeLinks = FALSE, copyMap = TRUE, verbose = FALSE)
```

## Arguments

pointMap	The input PointMap
removeLinks	Also remove the links
copyMap	Optional. Copy the internal sala map
verbose	Optional. Show more information of the process.

## Value

A new PointMap without the points graph

## Examples

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
shapeMap <- as(sfMap[, vector()], "ShapeMap")
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.01,
  fillY = 6.7,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
unmakeVGAGraph(
  pointMap = pointMap,
  removeLinks = FALSE
)
```

---

vgaIsovist

*Visibility Graph Analysis - isovist metrics*

---

## Description

Runs axial analysis to get the local metrics Control and Controllability

## Usage

```
vgaIsovist(pointMap, boundaryMap, copyMap = TRUE)
```

## Arguments

pointMap	A PointMap
boundaryMap	A ShapeMap of lines
copyMap	Optional. Copy the internal sala map

## Value

A new PointMap with the results included

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
boundaryMap <- as(sfMap[, c()], "ShapeMap")
vgaIsovist(pointMap, boundaryMap)
```

---

VGALocalAlgorithm      *VGA Local Analysis algorithms.*

---

**Description**

Different algorithms for calculating the VGA Local metrics (Control, Controllability, Clustering Coefficient).

- VGALocalAlgorithm\$None
- VGALocalAlgorithm\$Standard
- VGALocalAlgorithm\$AdjacencyMatrix

**Usage**

```
VGALocalAlgorithm
```

**Format**

An object of class list of length 3.

**Value**

A list of numbers representing each algorithm

**Examples**

```
VGALocalAlgorithm$Angular
VGALocalAlgorithm$Topological
VGALocalAlgorithm$Metric
```

---

vgaThroughVision	<i>Visibility Graph Analysis - Through Vision</i>
------------------	---

---

### Description

Runs Visibility Graph Analysis to get the Through Vision metric

### Usage

```
vgaThroughVision(pointMap, copyMap = TRUE)
```

### Arguments

pointMap	A PointMap
copyMap	Optional. Copy the internal sala map

### Value

A new PointMap with the results included

### Examples

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,
  maxVisibility = NA,
  boundaryGraph = FALSE,
  verbose = FALSE
)
vgaThroughVision(pointMap)
```

---

vgaVisualLocal      *Visibility Graph Analysis - Visual local metrics*


---

**Description**

Runs Visibility Graph Analysis to get visual local metrics

**Usage**

```
vgaVisualLocal(
  pointMap,
  nthreads = 1L,
  algorithm = VGALocalAlgorithm$Standard,
  copyMap = TRUE,
  gatesOnly = FALSE,
  progress = FALSE
)
```

**Arguments**

pointMap	A PointMap
nthreads	Optional. Number of threads to use (defaults to 1)
algorithm	Optional. The algorithm to use. See ?VGALocalAlgorithm
copyMap	Optional. Copy the internal sala map
gatesOnly	Optional. Only keep the values at specific gates
progress	Optional. Enable progress display

**Value**

A new PointMap with the results included

**Examples**

```
mifFile <- system.file(
  "extdata", "testdata", "simple",
  "simple_interior.mif",
  package = "alcyon"
)
sfMap <- st_read(mifFile,
  geometry_column = 1L, quiet = TRUE
)
pointMap <- makeVGAPointMap(
  sfMap,
  gridSize = 0.5,
  fillX = 3.0,
  fillY = 6.0,
  maxVisibility = NA,
```

```
        boundaryGraph = FALSE,  
        verbose = FALSE  
    )  
vgaVisualLocal(pointMap, FALSE)
```

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