

# Package ‘Rpolyhedra’

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**Title** Polyhedra Database

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**Maintainer** Alejandro Baranek <abaranek@dc.uba.ar>

**Description**

A polyhedra database scraped from various sources as R6 objects and 'rgl' visualizing capabilities.

**License** MIT + file LICENSE

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'public-lib.R' 'test-lib.R' 'zzz.R'

**BugReports** <https://github.com/ropensci/Rpolyhedra/issues>

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**Author** Alejandro Baranek [aut, com, cre, cph],  
Leonardo Belen [aut, com, cph],  
qbotics [cph],  
Barret Schloerke [rev],  
Lijia Yu [rev]

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Rpolyhedra-package      *Rpolyhedra: Polyhedra Database*

---

### Description

A polyhedra database scraped from various sources as R6 objects and 'rgl' visualizing capabilities.

### Details

A polyhedra database scraped from:

- <http://paulbourke.net/dataformats/phd/>: PHD files as R6 objects and 'rgl' visualizing capabilities. The PHD format was created to describe the geometric polyhedra definitions derived mathematically <<https://netlib.org/polyhedra/>> by Andrew Hume and by the Kaleido program of Zvi Har'El.
- <http://dmccoey.com/Polyhedra/>: Polyhedra text datafiles.

### Author(s)

**Maintainer:** Alejandro Baranek <[abarane@dc.uba.ar](mailto:abarane@dc.uba.ar)> [compiler, copyright holder]

Authors:

- Leonardo Belen <[leobelen@gmail.com](mailto:leobelen@gmail.com)> [compiler, copyright holder]

Other contributors:

- qbotics <qbotics6@gmail.com> [copyright holder]
- Barret Schloerke <schloerke@gmail.com> [reviewer]
- Lijia Yu <yu@lijiaju.net> [reviewer]

### See Also

Useful links:

- <https://docs.ropensci.org/Rpolyhedra/>
- <https://github.com/ropensci/Rpolyhedra>
- Report bugs at <https://github.com/ropensci/Rpolyhedra/issues>

---

genLogger

*genLogger*

---

### Description

Returns a configured logger with threshold according r6 object. This function is usually called in class constructors

### Usage

```
genLogger(r6.object)
```

### Arguments

r6.object      an r6.object

### Author(s)

ken4rab

---

getAvailablePolyhedra *Get available polyhedra*

---

### Description

Gets the list of names of available polyhedra and its status in the polyhedra database, which can be later called with getPolyhedron

### Usage

```
getAvailablePolyhedra(sources, search.string)
```

**Arguments**

`sources` A string vector containing the source, which can be obtained from `getAvailableSources()`.

`search.string` A search string

**Value**

polyhedra names vector

**See Also**

`getAvailableSources`

**Examples**

```
# gets all polyhedra in the database
available.polyhedra <- getAvailablePolyhedra()

# returns all polyhedra from a given source, in this case, netlib
available.netlib.polyhedra <- getAvailablePolyhedra(sources = "netlib")

# search within the polyhedron names

cube <- getAvailablePolyhedra(sources = "netlib", search.string = "cube")
cube
```

---

`getAvailableSources` *Get available sources*

---

**Description**

Gets the list of names of available sources in database to be used later as references to the package.

**Usage**

```
getAvailableSources()
```

**Value**

`sources` string vector, which can be obtained from `getAvailableSources()`

**See Also**

`getAvailablePolyhedra`, `getPolyhedron`

**Examples**

```
# gets all sources in the database
available.sources <- getAvailableSources()

# returns all polyhedra from all sources
available.polyhedra <- getAvailablePolyhedra(sources = available.sources)

# search within the polyhedron names from all sources
cubes <- getAvailablePolyhedra(
  sources = available.sources,
  search.string = "cube"
)
cubes
```

---

getLogger

*getLogger*

---

**Description**

Returns the configured lgr of an r6 object. If the object don't have a lgr or is not initialized returns an error

**Usage**

```
getLogger(r6.object)
```

**Arguments**

r6.object      an r6.object

**Author(s)**

ken4rab

---

getPolyhedraObject

*Get a polyhedra object*

---

**Description**

Return the polyhedra database handler.

**Usage**

```
getPolyhedraObject()
```

**Value**

.polyhedra

**See Also**

PolyhedraDatabase

---

getPolyhedron

*Get polyhedron*

---

**Description**

Gets a polyhedron from the database. It returns an R6 Class with all its characteristics and functions. The object returned, of type Polyhedron, allows to the user to get access to all the functionality provided.

**Usage**

```
getPolyhedron(source = "netlib", polyhedron.name)
```

**Arguments**

source                    string vector, which can be obtained from `getAvailableSources()`  
polyhedron.name           a valid name of a polyhedron in the database. Current names can be found with `getAvailablePolyhedra()`

**Value**

polyhedron R6 object

**See Also**

`getAvailablePolyhedra`, `getAvailableSources`

**Examples**

```
tetrahedron <- getPolyhedron(  
  source = "netlib",  
  polyhedron.name = "tetrahedron"  
)  
  
# returns name of polyhedra  
tetrahedron$getName()  
  
# polyhedron state  
tetrahedron.state <- tetrahedron$getState()
```

```

# Johnson symbol and Schlafli symbol
tetrahedron.state$getSymbol()

# vertex data.frame
tetrahedron.state$getVertices()

# List of faces of solid representation (3D)
tetrahedron.state$getSolid()

# List of faces of net representation (2D)
tetrahedron.state$getNet()

```

---

loggerSetupFile	<i>loggerSetupFile</i>
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---

### Description

loggerSetupFile

### Usage

```
loggerSetupFile(log.file, default.threshold = "info", append = TRUE)
```

### Arguments

log.file	log path for logging file
default.threshold	threshold for setting root. Default = "info"
append	if set to FALSE, cleanup all previous logs

### Author(s)

kenarab

---

PolyhedraDatabase	<i>Polyhedra database</i>
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---

### Description

Scrapes all polyhedra in data folder to save a representation which is accessible by the final users upon call to getPolyhedron().

**Public fields**

version version of database file  
 polyhedra.rds.file path of rds database file  
 sources.config Sources configuration for scraping different sources  
 ledger rr ledger of scraping process  
 logger class logger

**Methods****Public methods:**

- PolyhedraDatabase\$new()
- PolyhedraDatabase\$getVersion()
- PolyhedraDatabase\$configPolyhedraRDSPath()
- PolyhedraDatabase\$existsSource()
- PolyhedraDatabase\$addSourceConfig()
- PolyhedraDatabase\$existsPolyhedron()
- PolyhedraDatabase\$getPolyhedraSourceDir()
- PolyhedraDatabase\$getPolyhedronFilename()
- PolyhedraDatabase\$getPolyhedron()
- PolyhedraDatabase\$addPolyhedron()
- PolyhedraDatabase\$configPolyhedraSource()
- PolyhedraDatabase\$saveRDS()
- PolyhedraDatabase\$cover()
- PolyhedraDatabase\$scrape()
- PolyhedraDatabase\$testRR()
- PolyhedraDatabase\$generateTestTasks()
- PolyhedraDatabase\$schedulePolyhedraSources()
- PolyhedraDatabase\$getAvailableSources()
- PolyhedraDatabase\$getAvailablePolyhedra()
- PolyhedraDatabase\$clone()

**Method** new(): Create a new PolyhedraDatabase object.

*Usage:*

PolyhedraDatabase\$new()

*Returns:* A new 'PolyhedraDatabase' object.

**Method** getVersion(): get the version of the current object.

*Usage:*

PolyhedraDatabase\$getVersion()

*Returns:* Database version

**Method** configPolyhedraRDSPath(): sets the path of the RDS object



*Usage:*

PolyhedraDatabase\$configPolyhedraRDSPath()

*Returns:* Database version

**Method** existsSource(): Determines if the source exists on the database

*Usage:*

PolyhedraDatabase\$existsSource(source)

*Arguments:*

source source description

*Returns:* boolean value

**Method** addSourceConfig(): add source.config to the database

*Usage:*

PolyhedraDatabase\$addSourceConfig(source.config)

*Arguments:*

source.config SourceConfig object able to scrape source polyhedra definitions

*Returns:* PolyhedraDatabase object

**Method** existsPolyhedron(): Determines if the database includes a polyhedron which name matches the parameter value

*Usage:*

PolyhedraDatabase\$existsPolyhedron(source = "netlib", polyhedron.name)

*Arguments:*

source source description

polyhedron.name polyhedron description

*Returns:* boolean value

**Method** getPolyhedraSourceDir(): gets polyhedra sources folder

*Usage:*

PolyhedraDatabase\$getPolyhedraSourceDir(source, create.dir = TRUE)

*Arguments:*

source source description

create.dir if dir does not exists, create it

*Returns:* string with polyhedra sources path

**Method** getPolyhedronFilename(): gets the filename of the polyhedron matching parameter.

*Usage:*

PolyhedraDatabase\$getPolyhedronFilename(source, polyhedron.name, extension)

*Arguments:*

source source description

polyhedron.name polyhedron description

extension extension of the polyhedron filename

*Returns:* string with polyhedron filename

**Method** `getPolyhedron()`: gets polyhedron object which name matches the parameter value

*Usage:*

```
PolyhedraDatabase$getPolyhedron(
  source = "netlib",
  polyhedron.name,
  strict = FALSE
)
```

*Arguments:*

source source description  
 polyhedron.name polyhedron description  
 strict halts execution if polyhedron not found

*Returns:* Polyhedron object

**Method** `addPolyhedron()`: add polyhedron object to the database

*Usage:*

```
PolyhedraDatabase$addPolyhedron(
  source = "netlib",
  source.filename,
  polyhedron,
  overwrite = FALSE,
  save.on.change = FALSE
)
```

*Arguments:*

source source description  
 source.filename filename of the polyhedron source definition  
 polyhedron polyhedron object  
 overwrite overwrite exiting definition  
 save.on.change saves Database state after operation

*Returns:* Polyhedron object

**Method** `configPolyhedraSource()`: Process parameter filenames using source.config parameter

*Usage:*

```
PolyhedraDatabase$configPolyhedraSource(
  source.config,
  source.filenames = NULL,
  max.quant = 0,
  save.on.change = FALSE
)
```

*Arguments:*

source.config source configuration for scraping files  
 source.filenames filenames of the polyhedron source definition

max.quant maximum filenames to process  
 save.on.change saves Database state after operation

*Returns:* Modified 'PolyhedraDatabase' object.

**Method saveRDS():** saveRDS

*Usage:*

```
PolyhedraDatabase$saveRDS(save.on.change = TRUE)
```

*Arguments:*

save.on.change saves Database state after operation

*Returns:* saveRDS return status

**Method cover():** Cover objects and applies covering.code parameter

*Usage:*

```
PolyhedraDatabase$cover(  
  mode,  
  sources = names(self$sources.config),  
  covering.code,  
  polyhedra.names = NULL,  
  max.quant = 0,  
  save.on.change = FALSE,  
  seed = NULL  
)
```

*Arguments:*

mode covering mode. Available values are "scrape.queued", "scrape.retry", "skipped", "test"

sources sources names

covering.code code for applying in covering

polyhedra.names polyhedra names to cover (optional)

max.quant maximum numbers of polyhedra to cover

save.on.change saves Database state after operation

seed seed for deterministic random generator

*Returns:* A list with resulting objects covered

**Method scrape():** Scrape polyhedra queued sources

*Usage:*

```
PolyhedraDatabase$scrape(  
  mode = "scrape.queued",  
  sources = names(self$sources.config),  
  max.quant = 0,  
  time2scrape.source = 30,  
  save.on.change = FALSE,  
  skip.still.queued = FALSE  
)
```

*Arguments:*

mode covering mode. Available values are "scrape.queued", "scrape.retry", "skipped", "test"

`sources` sources names  
`max.quant` maximum numbers of polyhedra to cover  
`time2scrape.source` maximum time to spend scraping each source  
`save.on.change` saves Database state after operation  
`skip.still.queued` Flag unscraped files with status 'skipped'  
`covering.code` code for applying in covering  
`polyhedra.names` polyhedra names to cover (optional)

*Returns:* A list with resulting objects covered

**Method** `testRR(): testRR`

*Usage:*

```
PolyhedraDatabase$testRR(sources = names(self$sources.config), max.quant = 0)
```

*Arguments:*

`sources` sources names  
`max.quant` maximum numbers of polyhedra to cover

*Returns:* A list with resulting objects tested

**Method** `generateTestTasks(): generate Test tasks for selected polyhedra`

*Usage:*

```
PolyhedraDatabase$generateTestTasks(
  sources = names(self$sources.config),
  polyhedra.names = NULL,
  TestTaskClass,
  max.quant = 0
)
```

*Arguments:*

`sources` sources names  
`polyhedra.names` polyhedra names to cover (optional)  
`TestTaskClass` an R6 TestTaskClass class  
`max.quant` maximum numbers of polyhedra to cover

*Returns:* A list with resulting TestTasks generated

**Method** `schedulePolyhedraSources(): Schedules polyhedra sources for scraping`

*Usage:*

```
PolyhedraDatabase$schedulePolyhedraSources(
  sources.config = getPackageEnvir(".available.sources"),
  source.fileNames = NULL,
  max.quant = 0,
  save.on.change = FALSE
)
```

*Arguments:*

`sources.config` sources configurations for scraping files  
`source.fileNames` fileNames of the polyhedron source definition

max.quant maximum filenames to process  
 save.on.change saves Database state after operation

*Returns:* Modified 'PolyhedraDatabase' object.

**Method** getAvailableSources(): Returns available sources in current database

*Usage:*

```
PolyhedraDatabase$getAvailableSources()
```

*Returns:* A vector with names of available sources

**Method** getAvailablePolyhedra(): Retrieves all polyhedron within the source those names match with search.string

*Usage:*

```
PolyhedraDatabase$getAvailablePolyhedra(  
  sources = self$getAvailableSources(),  
  search.string = NULL,  
  ignore.case = TRUE  
)
```

*Arguments:*

sources sources names  
 search.string string for matching polyhedron names  
 ignore.case ignore case in search string

*Returns:* A list with resulting objects covered

**Method** clone(): The objects of this class are cloneable with this method.

*Usage:*

```
PolyhedraDatabase$clone(deep = FALSE)
```

*Arguments:*

deep Whether to make a deep clone.

---

Polyhedron

*Polyhedron*

---

## Description

Polyhedron container class, which is accessible by the final users upon call

## Public fields

file.id Polyhedron file.id  
 state Polyhedron state  
 logger class logger

## Methods

### Public methods:

- [Polyhedron\\$new\(\)](#)
- [Polyhedron\\$scrapeNetlib\(\)](#)
- [Polyhedron\\$scrapeDmccooy\(\)](#)
- [Polyhedron\\$deserialize\(\)](#)
- [Polyhedron\\$getName\(\)](#)
- [Polyhedron\\$getState\(\)](#)
- [Polyhedron\\$getSolid\(\)](#)
- [Polyhedron\\$isChecked\(\)](#)
- [Polyhedron\\$getRGLModel\(\)](#)
- [Polyhedron\\$exportToXML\(\)](#)
- [Polyhedron\\$getErrors\(\)](#)
- [Polyhedron\\$checkProperties\(\)](#)
- [Polyhedron\\$clone\(\)](#)

**Method** `new()`: Create a polyhedronState object

*Usage:*

```
Polyhedron$new(file.id, state = NULL)
```

*Arguments:*

`file.id` the file id

`state` polyhedron state object

*Returns:* A new Polyhedron object.

**Method** `scrapeNetlib()`: scrape Netlib polyhedron definition

*Usage:*

```
Polyhedron$scrapeNetlib(netlib.p3.lines)
```

*Arguments:*

`netlib.p3.lines` vector with netlib definition lines

*Returns:* A new PolyhedronStateDefined object.

**Method** `scrapeDmccooy()`: scrape Dmccooy polyhedron definition

*Usage:*

```
Polyhedron$scrapeDmccooy(polyhedra.dmccooy.lines)
```

*Arguments:*

`polyhedra.dmccooy.lines` vector with Dmccooy definition lines

*Returns:* A new PolyhedronStateDefined object.

**Method** `deserialize()`: deserialize a polyhedron state definition

*Usage:*

```
Polyhedron$deserialize(serialized.polyhedron)
```

*Arguments:*

serialized.polyhedron a serialized version of a polyhedron state

*Returns:* A new PolyhedronStateDefined object.

**Method** getName(): get Polyhedron name

*Usage:*

Polyhedron\$getName()

*Returns:* string with polyhedron name

**Method** getState(): Gets polyhedron state

*Usage:*

Polyhedron\$getState()

*Returns:* A new PolyhedronState object.

**Method** getSolid(): Gets a solid definition

*Usage:*

Polyhedron\$getSolid()

*Returns:* A list of vertex vectors composing polyhedron faces.

**Method** isChecked(): checks Edges consistency

*Usage:*

Polyhedron\$isChecked()

*Returns:* A boolean value

**Method** getRGLModel(): Return an 'rgl' model with an optional transformation described by transformation.matrix parameter

*Usage:*

Polyhedron\$getRGLModel(transformation.matrix = NULL)

*Arguments:*

transformation.matrix transformation matrix parameter

*Returns:* An tmesh3d object

**Method** exportToXML(): exports an XML definition of current polyhedron

*Usage:*

Polyhedron\$exportToXML()

*Returns:* A character object with the XML definition

**Method** getErrors(): returns the errors found when processing current polyhedron

*Usage:*

Polyhedron\$getErrors()

*Returns:* a data.frame with polyhedron errors

**Method** checkProperties(): check properties of current polyhedron

*Usage:*

Polyhedron\$checkProperties(expected.vertices, expected.faces)

*Arguments:*

expected.vertices expected vertices number

expected.faces expected faces number

*Returns:* Unmodified polyhedron object

**Method** clone(): The objects of this class are cloneable with this method.

*Usage:*

Polyhedron\$clone(deep = FALSE)

*Arguments:*

deep Whether to make a deep clone.

**Author(s)**

ken4rab

---

PolyhedronState

*PolyhedronState*

---

**Description**

This abstract class provide the basis from which every polyhedron state class derivate.

**Public fields**

source polyhedron definition source

file.id polyhedron file id

errors Errors string

logger class logger

**Methods****Public methods:**

- [PolyhedronState\\$new\(\)](#)
- [PolyhedronState\\$addError\(\)](#)
- [PolyhedronState\\$scrape\(\)](#)
- [PolyhedronState\\$name\(\)](#)
- [PolyhedronState\\$getSolid\(\)](#)
- [PolyhedronState\\$checkEdgesConsistency\(\)](#)
- [PolyhedronState\\$applyTransformationMatrix\(\)](#)
- [PolyhedronState\\$buildRGL\(\)](#)
- [PolyhedronState\\$exportToXML\(\)](#)



- [PolyhedronState\\$clone\(\)](#)

**Method new():** Create a polyhedronState object

*Usage:*

```
PolyhedronState$new(source, file.id)
```

*Arguments:*

source the source file

file.id the file id

*Returns:* A new PolyhedronState object. '@description Adds an error to the error string and log it as info

**Method addError():**

*Usage:*

```
PolyhedronState$addError(current.error)
```

*Arguments:*

current.error the error to add

**Method scrape():** Scrapes the polyhedra folder files

*Usage:*

```
PolyhedronState$scrape()
```

**Method getName():** Get Polyhedron name

*Usage:*

```
PolyhedronState$getName()
```

*Returns:* string with polyhedron name

**Method getSolid():** Returns the object corresponding to the solid

*Usage:*

```
PolyhedronState$getSolid()
```

**Method checkEdgesConsistency():** Checks edge consistency

*Usage:*

```
PolyhedronState$checkEdgesConsistency()
```

**Method applyTransformationMatrix():** Apply transformation matrix to polyhedron

*Usage:*

```
PolyhedronState$applyTransformationMatrix(transformation.matrix)
```

*Arguments:*

transformation.matrix the transformation matrix to apply to the polyhedron

**Method buildRGL():** Creates a 'rgl' representation of the object

*Usage:*

```
PolyhedronState$buildRGL(transformation.matrix)
```

*Arguments:*

transformation.matrix the transformation matrix to apply to the polyhedron

**Method** exportToXML(): Gets an XML representation out of the polyhedron object

*Usage:*

PolyhedronState\$exportToXML()

**Method** clone(): The objects of this class are cloneable with this method.

*Usage:*

PolyhedronState\$clone(deep = FALSE)

*Arguments:*

deep Whether to make a deep clone.

**Author(s)**

ken4rab

---

PolyhedronStateDefined

*PolyhedronStateDefined*

---

**Description**

Polyhedron State scraped and defined

**Super class**

[Rpolyhedra::PolyhedronState](#) -> PolyhedronStateDefined

**Public fields**

file.id polyhedron filename in original

source polyhedron definition source (netlibdmccoey)

name polyhedron name (netlibdmccoey)

symbol the eqn(1) input for two symbols separated by a tab; the Johnson symbol, and the Schläfli symbol (netlib)

dual the name of the dual polyhedron optionally followed by a horizontal tab and the number of the dual (netlib)

sfaces polyhedron solid face list (netlib)

svertices polyhedron solid vertices list (netlib)

vertices Polyhedron vertices list (netlibdmccoey)

vertices.centered centered vertices for applying transformation matrices

net polyhedron 2D net model with vertices defined for a planar representation (netlib)

solid polyhedron list of edges which generate a solid (netlibdmccoey)  
 hinges Polyhedron hinge list (netlib)  
 dih Dih attribute (netlib)  
 edges polyhedron edges (netlibdmccoey)  
 transformation.matrix transformation matrix for calculations and visualizing polyhedron

## Methods

### Public methods:

- [PolyhedronStateDefined\\$new\(\)](#)
- [PolyhedronStateDefined\\$scrape\(\)](#)
- [PolyhedronStateDefined\\$saveToJson\(\)](#)
- [PolyhedronStateDefined\\$name\(\)](#)
- [PolyhedronStateDefined\\$symbol\(\)](#)
- [PolyhedronStateDefined\\$adjustVertices\(\)](#)
- [PolyhedronStateDefined\\$vertices\(\)](#)
- [PolyhedronStateDefined\\$net\(\)](#)
- [PolyhedronStateDefined\\$solid\(\)](#)
- [PolyhedronStateDefined\\$inferEdges\(\)](#)
- [PolyhedronStateDefined\\$checkEdgesConsistency\(\)](#)
- [PolyhedronStateDefined\\$triangulate\(\)](#)
- [PolyhedronStateDefined\\$convHull\(\)](#)
- [PolyhedronStateDefined\\$calculateMassCenter\(\)](#)
- [PolyhedronStateDefined\\$normalizedSize\(\)](#)
- [PolyhedronStateDefined\\$transformedVertices\(\)](#)
- [PolyhedronStateDefined\\$resetTransformationMatrix\(\)](#)
- [PolyhedronStateDefined\\$applyTransformationMatrix\(\)](#)
- [PolyhedronStateDefined\\$buildRGL\(\)](#)
- [PolyhedronStateDefined\\$exportToXML\(\)](#)
- [PolyhedronStateDefined\\$expectEqual\(\)](#)
- [PolyhedronStateDefined\\$serialize\(\)](#)
- [PolyhedronStateDefined\\$clone\(\)](#)

**Method** `new()`: object initialization routine

*Usage:*

```

PolyhedronStateDefined$new(
  source,
  file.id,
  name,
  vertices,
  solid,
  net = NULL,
  symbol = "",

```

```

    dual = NULL,
    sfaces = NULL,
    svertices = NULL,
    hinges = NULL,
    dih = NULL,
    normalize.size = TRUE
)

```

*Arguments:*

*source* the library to use  
*file.id* identifier of the definition file.  
*name* the polyhedron name  
*vertices* the vertices  
*solid* the solid object  
*net* the net  
*symbol* the symbol  
*dual* whether it is dual or not  
*sfaces* the solid faces  
*svertices* the solid vertices  
*hinges* the hinges  
*dih* the dih  
*normalize.size* whether it has to normalize the size or not

*Returns:* A new PolyhedronStateDefined object.

**Method** `scrape()`: scrape polyhedron. As the state is defined this functions do nothing

*Usage:*

```
PolyhedronStateDefined$scrape()
```

*Returns:* current object

**Method** `saveToJson()`: saves the state to a JSON file

*Usage:*

```
PolyhedronStateDefined$saveToJson(pretty = FALSE)
```

*Arguments:*

*pretty* whether json output is pretty or not

*Returns:* a json object

**Method** `getName()`: get Polyhedron name

*Usage:*

```
PolyhedronStateDefined$getName()
```

*Returns:* string with polyhedron name

**Method** `getSymbol()`: get Polyhedron symbol

*Usage:*

```
PolyhedronStateDefined$getSymbol()
```

*Returns:* string with polyhedron symbol

**Method** `adjustVertices()`: adjust polyhedron Vertices

*Usage:*

```
PolyhedronStateDefined$adjustVertices(normalize.size = TRUE)
```

*Arguments:*

`normalize.size` whether it has to normalize the size or not

*Returns:* modified PolyhedronStateDefined object.

**Method** `getVertices()`: Get the polyhedron state

*Usage:*

```
PolyhedronStateDefined$getVertices(solid = FALSE)
```

*Arguments:*

`solid` toggles the production of solid vertices.

**Method** `getNet()`: Gets the net property

*Usage:*

```
PolyhedronStateDefined$getNet()
```

**Method** `getSolid()`: Gets the solid property

*Usage:*

```
PolyhedronStateDefined$getSolid()
```

**Method** `inferEdges()`: Infer edges

*Usage:*

```
PolyhedronStateDefined$inferEdges(force.recalculation = FALSE)
```

*Arguments:*

`force.recalculation` forces the recalculation of the edges

**Method** `checkEdgesConsistency()`: Checks edges consistency

*Usage:*

```
PolyhedronStateDefined$checkEdgesConsistency()
```

**Method** `triangulate()`: Triangulates the polyhedron

*Usage:*

```
PolyhedronStateDefined$triangulate(force = FALSE)
```

*Arguments:*

`force` forces the triangulation.

**Method** `getConvHull()`: Gets the convex hull

*Usage:*

```
PolyhedronStateDefined$getConvHull(
  transformation.matrix = self$transformation.matrix,
  vertices.id.3d = private$vertices.id.3d
)
```

*Arguments:*

transformation.matrix the transformation matrix  
 vertices.id.3d the vertices ids

*Returns:* the convex hull

**Method** calculateMassCenter(): Calculates the center of mass.

*Usage:*

```
PolyhedronStateDefined$calculateMassCenter(
  vertices.id.3d = private$vertices.id.3d,
  applyTransformation = TRUE
)
```

*Arguments:*

vertices.id.3d the vertices ids  
 applyTransformation does it need to apply transformations?

**Method** getNormalizedSize(): Gets the normalized size

*Usage:*

```
PolyhedronStateDefined$getNormalizedSize(size)
```

*Arguments:*

size the object's size

**Method** getTransformedVertices(): Gets the transformed vertices

*Usage:*

```
PolyhedronStateDefined$getTransformedVertices(
  vertices = self$vertices.centered,
  transformation.matrix = self$transformation.matrix
)
```

*Arguments:*

vertices input vertices  
 transformation.matrix the transformation matrix

**Method** resetTransformationMatrix(): Resets the transformation matrix

*Usage:*

```
PolyhedronStateDefined$resetTransformationMatrix()
```

**Method** applyTransformationMatrix(): Apply transformation matrix to polyhedron

*Usage:*

```
PolyhedronStateDefined$applyTransformationMatrix(transformation.matrix)
```

*Arguments:*

transformation.matrix the transformation matrix to apply to the polyhedron

*Returns:* an applied transformation.matrix

**Method** buildRGL(): Build 'rgl'

*Usage:*

```
PolyhedronStateDefined$buildRGL(transformation.matrix = NULL)
```

*Arguments:*

transformation.matrix the transformation matrix

**Method** exportToXML(): Exports the object to XML format

*Usage:*

```
PolyhedronStateDefined$exportToXML()
```

**Method** expectEqual(): Determines if a polyhedron is equal to this one.

*Usage:*

```
PolyhedronStateDefined$expectEqual(polyhedron)
```

*Arguments:*

polyhedron the polyhedron to compare to.

**Method** serialize(): Serialize the object.

*Usage:*

```
PolyhedronStateDefined$serialize()
```

**Method** clone(): The objects of this class are cloneable with this method.

*Usage:*

```
PolyhedronStateDefined$clone(deep = FALSE)
```

*Arguments:*

deep Whether to make a deep clone.

**Author(s)**

ken4rab

---

PolyhedronStateDeserializer

*PolyhedronStateDeserializer*

---

**Description**

Polyhedron state for deserialize from database

**Super class**

[Rpolyhedra::PolyhedronState](#) -> PolyhedronStateDeserializer

**Public fields**

serialized.polyhedron polyhedron definition serialized

## Methods

### Public methods:

- [PolyhedronStateDeserializer\\$new\(\)](#)
- [PolyhedronStateDeserializer\\$scrape\(\)](#)
- [PolyhedronStateDeserializer\\$clone\(\)](#)

**Method** `new()`: Initialize PolyhedronStateDeserializer object

*Usage:*

```
PolyhedronStateDeserializer$new(serialized.polyhedron)
```

*Arguments:*

`serialized.polyhedron` a serialized polyhedron

*Returns:* A new PolyhedronStateDeserializer object.

**Method** `scrape()`: Generates a PolyhedronStateDefined from a serialized polyhedron

*Usage:*

```
PolyhedronStateDeserializer$scrape()
```

*Returns:* A new PolyhedronStateDefined object.

**Method** `clone()`: The objects of this class are cloneable with this method.

*Usage:*

```
PolyhedronStateDeserializer$clone(deep = FALSE)
```

*Arguments:*

`deep` Whether to make a deep clone.

## Author(s)

ken4rab

---

PolyhedronStateDmccooleyScraper

*PolyhedronStateDmccooleyScraper*

---

## Description

Scrapes polyhedra from a dmccooley file format

## Super class

[Rpolyhedra::PolyhedronState](#) -> PolyhedronStateDmccooleyScraper



**Public fields**

regexp.values.names regexp for scraping values names  
 regexp.rn regexp for scraping real numbers  
 regexp.values regexp for scraping values  
 regexp.vertex regexp for scraping vertices  
 regexp.faces regexp for scraping faces  
 polyhedra.dmccoey.lines dmccoey polyhedra definition lines  
 labels.map labels map where values are  
 values labels map where values are  
 vertices specification  
 vertices.replaced 3D values  
 faces definition

**Methods****Public methods:**

- [PolyhedronStateDmccoeyScraper\\$new\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$setupRegexp\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$scrapeValues\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$scrapeVertices\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$scrapeFaces\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$scrape\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$getName\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$applyTransformationMatrix\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$buildRGL\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$exportToXML\(\)](#)
- [PolyhedronStateDmccoeyScraper\\$clone\(\)](#)

**Method** `new()`: Initialize Dmccoey scraper

*Usage:*

```
PolyhedronStateDmccoeyScraper$new(file.id, polyhedra.dmccoey.lines)
```

*Arguments:*

`file.id` identifier of the definition file.

`polyhedra.dmccoey.lines` raw Dmccoey definition file lines

*Returns:* A new PolyhedronStateDmccoeyScraper object.

**Method** `setupRegexp()`: setupRegexp for Dmccoey definition

*Usage:*

```
PolyhedronStateDmccoeyScraper$setupRegexp()
```

*Returns:* This PolyhedronStateDmccoeyScraper object with regexp defined.

**Method** scrapeValues(): scrape values from Dmccooley definition

*Usage:*

PolyhedronStateDmccooleyScraper\$scrapeValues(values.lines)

*Arguments:*

values.lines values definitions in Dmccooley source

*Returns:* This PolyhedronStateDmccooleyScraper object with values defined.

**Method** scrapeVertices(): scrape polyhedron vertices from definition

*Usage:*

PolyhedronStateDmccooleyScraper\$scrapeVertices(vertices.lines)

*Arguments:*

vertices.lines vertices definitions in Dmccooley source

*Returns:* This PolyhedronStateDmccooleyScraper object with faces defined.

**Method** scrapeFaces(): scrape polyhedron faces from definition

*Usage:*

PolyhedronStateDmccooleyScraper\$scrapeFaces(faces.lines)

*Arguments:*

faces.lines face

*Returns:* This PolyhedronStateDmccooleyScraper object with faces defined.

**Method** scrape(): scrape Dmccooley polyhedron definition

*Usage:*

PolyhedronStateDmccooleyScraper\$scrape()

*Returns:* A new PolyhedronStateDefined object.

**Method** getName(): get Polyhedron name

*Usage:*

PolyhedronStateDmccooleyScraper\$getName()

*Returns:* string with polyhedron name

**Method** applyTransformationMatrix(): Apply transformation matrix to polyhedron

*Usage:*

PolyhedronStateDmccooleyScraper\$applyTransformationMatrix(transformation.matrix)

*Arguments:*

transformation.matrix the transformation matrix to apply to the polyhedron

**Method** buildRGL(): Creates a 'rgl' representation of the object

*Usage:*

PolyhedronStateDmccooleyScraper\$buildRGL(transformation.matrix)

*Arguments:*

transformation.matrix the transformation matrix to apply to the polyhedron

**Method** exportToXML(): serializes object in XML

*Usage:*

PolyhedronStateDmccoeyScraper\$exportToXML()

**Method** clone(): The objects of this class are cloneable with this method.

*Usage:*

PolyhedronStateDmccoeyScraper\$clone(deep = FALSE)

*Arguments:*

deep Whether to make a deep clone.

### Author(s)

ken4rab

---

PolyhedronStateNetlibScraper

*PolyhedronStateNetlibScraper*

---

### Description

Scrapes polyhedra from a PHD file format.

### Super class

[Rpolyhedra::PolyhedronState](#) -> PolyhedronStateNetlibScraper

### Public fields

netlib.p3.lines The path to the PHD files

labels.rows Labels - row of appearance

labels.map Labels - Map of content

errors the errors found

### Methods

#### Public methods:

- [PolyhedronStateNetlibScraper\\$new\(\)](#)
- [PolyhedronStateNetlibScraper\\$extractRowsFromLabel\(\)](#)
- [PolyhedronStateNetlibScraper\\$getLabels\(\)](#)
- [PolyhedronStateNetlibScraper\\$scrapeNet\(\)](#)
- [PolyhedronStateNetlibScraper\\$extractCFOutBrackets\(\)](#)
- [PolyhedronStateNetlibScraper\\$scrapeVertices\(\)](#)
- [PolyhedronStateNetlibScraper\\$setupLabelsOrder\(\)](#)
- [PolyhedronStateNetlibScraper\\$getDataFromLabel\(\)](#)

- `PolyhedronStateNetlibScraper$getName()`
- `PolyhedronStateNetlibScraper$scrape()`
- `PolyhedronStateNetlibScraper$applyTransformationMatrix()`
- `PolyhedronStateNetlibScraper$buildRGL()`
- `PolyhedronStateNetlibScraper$exportToXML()`
- `PolyhedronStateNetlibScraper$clone()`

**Method** `new()`: Initializes the object, taking the file.id and PDH file as parameters

*Usage:*

```
PolyhedronStateNetlibScraper$new(file.id, netlib.p3.lines)
```

*Arguments:*

`file.id` the file id

`netlib.p3.lines` the lines to add

*Returns:* A new PolyhedronStateNetlibScraper object.

**Method** `extractRowsFromLabel()`: Extracts data from the label, taking the label number and the expected label as parameters

*Usage:*

```
PolyhedronStateNetlibScraper$extractRowsFromLabel(label.number, expected.label)
```

*Arguments:*

`label.number` the label number

`expected.label` the expected label

**Method** `getLabels()`: get Labels from current netlib file description

*Usage:*

```
PolyhedronStateNetlibScraper$getLabels()
```

*Returns:* a list containing labels from netlib file description

**Method** `scrapeNet()`: scrape Net Model from netlib format

*Usage:*

```
PolyhedronStateNetlibScraper$scrapeNet(net.txt, offset = 0)
```

*Arguments:*

`net.txt` a vector containing net model in netlib format

`offset` in numbering vertices

*Returns:* a list containing a net model

**Method** `extractCFOutBrackets()`: Remove brackets for current field content

*Usage:*

```
PolyhedronStateNetlibScraper$extractCFOutBrackets(x)
```

*Arguments:*

`x` a string containing brackets

*Returns:* value

**Method** `scrapeVertices()`: scrape vertices described in netlib format

*Usage:*

```
PolyhedronStateNetlibScraper$scrapeVertices(vertices.txt)
```

*Arguments:*

`vertices.txt` vector containing netlib format vertices

*Returns:* data.frame containing netlib vertices

**Method** `setupLabelsOrder()`: setupLabelsOrder

*Usage:*

```
PolyhedronStateNetlibScraper$setupLabelsOrder()
```

*Arguments:*

`vertices.txt` vector containing netlib format vertices

*Returns:* data.frame containing netlib vertices

**Method** `getDataFromLabel()`: Get data from label specified as parameter

*Usage:*

```
PolyhedronStateNetlibScraper$getDataFromLabel(label)
```

*Arguments:*

`label` the label to get data from

*Returns:* value

**Method** `getName()`: get Polyhedron name

*Usage:*

```
PolyhedronStateNetlibScraper$getName()
```

*Returns:* string with polyhedron name

**Method** `scrape()`: scrape Netlib polyhedron definition

*Usage:*

```
PolyhedronStateNetlibScraper$scrape()
```

*Returns:* A new PolyhedronStateDefined object.

**Method** `applyTransformationMatrix()`: Apply transformation matrix to polyhedron

*Usage:*

```
PolyhedronStateNetlibScraper$applyTransformationMatrix(transformation.matrix)
```

*Arguments:*

`transformation.matrix` the transformation matrix to apply to the polyhedron

**Method** `buildRGL()`: Creates a 'rgl' representation of the object

*Usage:*

```
PolyhedronStateNetlibScraper$buildRGL(transformation.matrix)
```

*Arguments:*

`transformation.matrix` the transformation matrix to apply to the polyhedron

**Method** exportToXML(): serializes object in XML

*Usage:*

```
PolyhedronStateNetlibScraper$exportToXML()
```

**Method** clone(): The objects of this class are cloneable with this method.

*Usage:*

```
PolyhedronStateNetlibScraper$clone(deep = FALSE)
```

*Arguments:*

deep Whether to make a deep clone.

### Author(s)

ken4rab

---

polyhedronToXML      *Polyhedron to XML*

---

### Description

Gets an XML representation out of the polyhedron object

### Usage

```
polyhedronToXML(polyhedron.state.defined, is.transformed.vertices = TRUE)
```

### Arguments

polyhedron.state.defined

the polyhedron to get a representation from

is.transformed.vertices

flag which states if vertices are in original position or transformationMatrix applied

### Value

an XML document, ready to be converted to String with XML::saveXML()

### Examples

```
# get the representation of a cube (netlib library)
XML::saveXML(polyhedronToXML(getPolyhedron("netlib", "cube")$state))
```

---

scrapePolyhedra	<i>Scrape polyhedra objects</i>
-----------------	---------------------------------

---

**Description**

Gets polyhedra objects from text files of different sources, scheduling and scraping using predefined configurations.

**Usage**

```
scrapePolyhedra(
  scrape.config,
  source.fileNames = NULL,
  sources.config = getUserEnvir(".available.sources"),
  logger = lgr
)
```

**Arguments**

scrape.config predefined configuration for scraping  
 source.fileNames if not null specify which source filenames to scrape  
 sources.config the sources that will be used by the function  
 logger logger for inheriting threshold from calling class/function

**Value**

polyhedra db object

---

scrapePolyhedraSources	<i>Scrape polyhedra sources</i>
------------------------	---------------------------------

---

**Description**

Scrapes polyhedra objects from text files of different sources, in order to make them available to the package.

**Usage**

```
scrapePolyhedraSources(sources.config =
  getUserEnvir(".available.sources"),
  max.quant.config.schedule = 0,
  max.quant.scrape = 0, time2scrape.source = 30,
  source.fileNames = NULL, retry.scrape = FALSE,
  logger = lgr)
```

**Arguments**

sources.config the sources that will be used by the function  
 max.quant.config.schedule  
                   number of files to schedule  
 max.quant.scrape  
                   number of files scrape  
 time2scrape.source  
                   time applied to scrape source  
 source.filenames  
                   if not null specify which source filenames to scrape  
 retry.scrape should it retry scrape?  
 logger logger for inheriting threshold from calling class/function

**Value**

polyhedra db object

---

switchToFullDatabase *Switch to full database*

---

**Description**

Prompts user for changing database to fulldb in user filespace. Also, allows the user to switch back to the package database, which is a minimal one for testing purposes.

**Usage**

```
switchToFullDatabase(env = NA, logger = lgr)
```

**Arguments**

env The environment to run on, can be PACKAGE,  
 logger logger for inheriting threshold from calling class/function HOME or NA. If NA, it asks the user for a an Environment.

**Value**

.data.env



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