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Module: TestData

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With this module some test data can be generated.

Modules

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Functions

Cuboid(sides, res)

Creates a Cuboid in arbitrary dimension (centered at the origin) (intersected with a finite grid)

Args:

sides(list): Entries are the intervals in each dimension.

Example: To create the cuboid $[-2, 2] \times [0, 1]$ the input has to be $[[-2, 2], [0, 1]]$

res (float): Resolution of the grid, which will be intersected with the cuboid to obtain a finite data set.

Returns:

numpy.ndarray: Created data.

Ellipsoid2D(a, b, res)

Creates a 2-dimensional ellipsoid (centered at the origin) (intersected with a finite grid)

Args:

a (float): $0.5 \times$ width of the ellipseb (float): $0.5 \times$ height of the ellipse

res (float): Resolution of the grid, which will be intersected with the ellipsoid to obtain a finite data set.

Returns:

numpy.ndarray: Created data.

cuttedRect(a1, b1, a2, b2, res)

Creates a rectangle, where a smaller rectangle is removed (centered at the origin) (intersected with a finite grid)

Args:

a1,b1 (floats): side lengths of the inner rectangle

a2,b2 (floats): side lengths of the outer rectangle

res (float): Resolution of the grid, which will be intersected with the rectangle to obtain a finite data set.

Returns:

numpy.ndarray: Created data.

grid(W, res)

Creates a grid with resolution res inside a cuboid W

Args:

W (list): Cuboid

Example: The cuboid $[-2, 2] \times [0, 1]$ is represented by $[[-2, 2], [0, 1]]$

res (float): Resolution of the grid

Returns:

list: j-th entry contains all the coordinates w.r.t. to the j-th dimension.

To get all the points of the grid, one has to take all combinations of those values.

plotData(D, s, d1=1, d2=2)

Plots given data

Args:

D (numpy.ndarray): Data, which shall be plotted

s (int): size of the points in the plot

d1,d2 (int, optional): If data has more than 2 dimensions, the dimensions d1 and d2 will be plotted.

Returns:

Nothing, but creates a plot.

rotObject(D)

Rotates a given data set

Args:

D (numpy.ndarray): Data set, which shall be rotated.

Returns:

Nothing (the data given will be rotated)

roundCub(sides, res, r)

Creates a Cuboid with rounded corners in arbitrary dimension (centered at the origin) (intersected with a finite grid)

Args:

sides(list): Entries are the intervals in each dimension (for the inner cuboid)

Example: To create the cuboid $[-2, 2] \times [0, 1]$ the input has to be $[[-2, 2], [0, 1]]$

res (float): Resolution of the grid, which will be intersected with the cuboid with rounded corners to obtain a finite data set.

r (float): Radii of the spherical segments at the corners.

Returns:

numpy.ndarray: Created data.

spShell(r1, r2, res)

Creates a spherical shell (a ball, where a smaller ball is removed) (centered at the origin) (intersected with a finite grid)

Args:

r1 (float): radius of the inner ball

r2 (float): radius of the outer ball

res (float): Resolution of the grid, which will be intersected with the spherical shell to obtain a finite data set.

Returns:

numpy.ndarray: Created data.