

Package volesti

July 19, 2018

CheBall

Compute the Chebychev ball of a H-polytope, $P := Ax \leq b$

Description

Compute the Chebychev ball of a H-polytope, $P := Ax \leq b$

Usage

CheBall(A, b)

Arguments

A the matrix of the H-polytope
b the vector with the constants of the hyperplanes

Value

The Chebychev center of the Polytope discribed by the matrix A and the vector b

Examples

CheBall(A,b)

ineToMatrix	<i>function to get a ine file and return matrix A in ine format for VolEsti()</i>
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Description

function to get a ine file and return matrix A in ine format for VolEsti()

Usage

```
ineToMatrix(P)
```

Arguments

P	It is in format, read.cs('path/to/file.ine'). The ine file describes the H-polytope
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Value

The numerical matrix in ine format of read.cs('path/to/file.ine')

Examples

```
ineToMatrix(read.cs('path/to/data/cube40.ine'))
```

modifyMat	<i>takes a numerical matrix in ine format and return numerical matrix A and vector b: $Ax \leq b$</i>
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Description

takes a numerical matrix in ine format and return numerical matrix A and vector b: $Ax \leq b$

Usage

```
modifyMat(A)
```

Arguments

A	the numerical matrix in ine format of the H-polytope
---	--

Value

numerical matrix A and vector b: $Ax \leq b$

Examples

```
modifyMat(A)
```

testRvolEsti	<i>Run some experiments</i>
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Description

Run some experiments

Usage

```
testRvolEsti()
```

Value

Print the computed volumes and the total time

Examples

```
testRvolEsti()
```

VolEsti	<i>The main R function for volume approximation of a convex H-Polytope</i>
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Description

The main R function for volume approximation of a convex H-Polytope

Usage

```
VolEsti(Inputs)
```

Arguments

list("path", "matrix", "vector", "Chebychev", "verbose", "coordinate", "rounding", "Walk_length", "HnR")	A list that includes all the parameters of the algorithm
path	The path to the ine file that describes the H-polytope. If path is given then "matrix" and "vector" inputs are not needed
matrix	The matrix A of the polytope. If it is in ine format then the input "vector" is not needed
vector	The vector b that contains the constants of the hyperplanes
Chebychev	Optional. A d+1 vector that contains the chebychev center in the first d coordinates and the radius of the chebychev ball in the last coordinate
verbose	Optional. A boolean parameter for printing. Default is False
coordinate	Optional. A boolean parameter for the hit-and-run. True for Coordinate Directions HnR, false for Random Directions HnR. Default is True

rounding	Optional. A boolean parameter to activate the rounding option. Default is False
Walk_length	Optional. Declare the number of the steps for the random walk, default is $10+d/10$
error	Optional. Declare the goal for the approximation error. Default is 1
test	Optional. A boolean parameter. Declare if the current execution is a test or not. Default is False

Value

The approximation of the volume of an H-polytope

Examples

```
VolEsti(list("path"="/path/to/ine/file", "verbose"=TRUE))
```

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