

Package ‘suq2’

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Type Package

Title Simulation Uncertainty Quantification Querying (SUQ^2)

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Description More about what it does (maybe more than one line)
Use four spaces when indenting paragraphs within the Description.

Imports lmomco,
GLDEX,
ggplot2,
Rcpp (>= 0.12.16)

License MIT

Encoding UTF-8

LazyData true

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VignetteBuilder knitr

LinkingTo Rcpp

R topics documented:

suq2.clustering.gldClusterComparison	2
suq2.clustering.gldClustering	3
suq2.fit.gldfitLmoments	3
suq2.fit.gldfitMoments	4
suq2.fit.gldFitParallel	4
suq2.plot.gld	5
suq2.plot.gldClustersL3L4	6
suq2.plot.gldPlot	6
suq2.plot.gldToPlot	7

suq2.plot.image_display	7
suq2.utils.checkGLDValid1	8
suq2.utils.checkGLDValidN	8
suq2.utils.createDataset	9
suq2.utils.distGLDComparison	9
suq2.utils.distGLDComparisonKL	10
suq2.utils.gldComparison	11
suq2.utils.gldComparisonKL	11

Index	13
--------------	-----------

suq2.clustering.gldClusterComparison

Evaluate if the centroid of a cluster is a good representative of the other members of this cluster

Description

This function return a list of D distances from the ks-test that compare the centroid of a cluster wiht n members of this cluster.

Usage

```
suq2.clustering.gldClusterComparison(cluster_number, n, centroid)
```

Arguments

cluster_number The cluster ID we are interesting in.

n Number of elements of the cluster to analize.

centroid The lambda values of the centroid of the cluster.

Author(s)

Noel Moreno Lemus

Examples

```
Ds <- suq2.clustering.gldClusterComparison(3, 60, c(0, 2, 1.5, 1.3))
```

`suq2.clustering.gldClustering`*Clustering of the GLDs in function of its l2, l3 and l4 values*

Description

TODO.

Usage

```
suq2.clustering.gldClustering(lambdas, no_clusters, l234 = TRUE)
```

Arguments

<code>lambdas</code>	A matrix of $n \times m \times 4$ of all the lambda values.
<code>no_clusters</code>	Number of clusters.

Author(s)

Noel Moreno Lemus

Examples

```
suq2.clustering.gldClustering(lambdas, 10, TRUE)
```

`suq2.fit.gldfitLmoments`*Compute the lambda values of the GLD using the method of the Lmoments*

Description

This function allows you to show image with scale.

Usage

```
suq2.fit.gldfitLmoments(data)
```

Arguments

<code>data</code>	The raw data to fit.
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Examples

```
suq2.fit.gldfitLmoments(data)
```

```
suq2.fit.gldfitMoments
```

Compute the lambda values of the GLD using the method of Moments

Description

This function allows you to show image with scale.

Usage

```
suq2.fit.gldfitMoments(data)
```

Arguments

data	The raw data to fit.
------	----------------------

Examples

```
suq2.fit.gldfitMoments(data)
```

```
suq2.fit.gldFitParallel
```

Fit the GLD to a multidimensional array in parallel.

Description

This function compute the GLD that best fit each distribution on each spatial location.

Usage

```
suq2.fit.gldFitParallel(nodes, dimension, mArray)
```

Arguments

nodes	number of nodes to be used in the computation.
dimension	the dimensions to be used, NxMxS.
mArray	a multidimensional array with dimensions @param dimension

Author(s)

Noel Moreno Lemus

Examples

```
mArray <- createDataset(directory, pattern, dimension)
result <- suq2.fit.gldFitParallel(4, dimension = c(60, 60), mArray = mArray)
```

suq2.plot.gld	<i>Plot the GLD based in its lambda values.</i>
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Description

This function read all the csv that are stored in a directory and create an $N \times M \times S$ array, where N and M are sparial dimensions and S is the number of simulations on each spatial point.

This function read all the csv that are stored in a directory and create an $N \times M \times S$ array, where N and M are sparial dimensions and S is the number of simulations on each spatial point.

Usage

```
suq2.plot.gld(n = 1000, L = c(0, 2, 4, 4), param = "fmkl")
```

```
suq2.plot.gld(n = 1000, L = c(0, 2, 4, 4), param = "fmkl")
```

Arguments

n	the directory where the .csv files are stored.
L	a pattern to read the .csv (e.g. pattern="^[h]").
param	(default = "fmkl")
n	the directory where the .csv files are stored.
L	a pattern to read the .csv (e.g. pattern="^[h]").
param	(default = "fmkl")

Author(s)

Noel Moreno Lemus

Noel Moreno Lemus

Examples

```
suq2.plot.gld(L = c(0, 2, 0.14, 0.14))
```

```
suq2.plot.gld(L = c(0, 2, 0.14, 0.14))
```

```
suq2.plot.gldClustersL3L4
```

Plot the clusters in l3-l4 space.

Description

TODO.

Usage

```
suq2.plot.gldClustersL3L4(clusters, x)
```

Arguments

<code>clusters</code>	An n x m matrix wiht the clusters by positions.
<code>x</code>	Array used to create the clusters in function @method gldClustering.

Author(s)

Noel Moreno Lemus

Examples

```
suq2.plot.gldClustersL3L4(clusters, x)
```

```
suq2.plot.gldPlot
```

Plot the GLD based in the Lambda values

Description

This function allows you to show image with scale.

Usage

```
suq2.plot.gldPlot(L, param = "fmk1")
```

Arguments

<code>L</code>	Lambda values of the GLD.
----------------	---------------------------

Examples

```
L = c(0, 2, 0.25, 1.5)
suq2.plot.gldPlot(L)
```

suq2.plot.gldToPlot	<i>Return (x, y) values of the GLD based in the Lambda values</i>
---------------------	---

Description

This function allows you to return the (x,y) values of the GLD, based in the Lambda values.

Usage

```
suq2.plot.gldToPlot(L, param = "fmk1")
```

Arguments

L	Lambda values of the GLD.
---	---------------------------

Examples

```
L = c(0, 2, 0.25, 1.5)
suq2.plot.gldToPlot(L)
```

suq2.plot.image_display	<i>Color image display with scale</i>
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Description

This function allows you to show image with scale.

Usage

```
suq2.plot.image_display(data)
```

Arguments

date	The image matrix you like to display.
------	---------------------------------------

Examples

```
suq2.plot.image_display()
```

```
suq2.utils.checkGLDValid1
```

Check if one GLD is valid

Description

This function check if one GLD is valid.

Usage

```
suq2.utils.checkGLDValid1(lambdas)
```

Arguments

lambdas	lambda values of a single GLD function.
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Examples

```
suq2.utils.checkGLDValid1(lambdas)
```

```
suq2.utils.checkGLDValidN
```

Check if many GLDs are valid

Description

This function check if many GLDs are valid.

Usage

```
suq2.utils.checkGLDValidN(lambdas)
```

Arguments

lambdas	lambda values of multiple GLD functions.
---------	--

Examples

```
suq2.utils.checkGLDValidN(lambdas)
```

`suq2.utils.createDataset`*Create a multidimensional array with simulations from a set of .csv.*

Description

This function read all the csv that are stored in a directory and create an $N \times M \times S$ array, where N and M are sparial dimensions and S is the number of simulations on each spatial point.

Usage

```
suq2.utils.createDataset(directory, pattern, dimension)
```

Arguments

directory	the directory where the .csv files are stored.
pattern	a pattern to read the .csv (e.g. pattern="^[h]").
dimension	the dimensions to be used, $N \times M \times S$.

Author(s)

Noel Moreno Lemus

Examples

```
directory = "~/PhD/thesis_phd/python_codes/datasets/20"
pattern="^[h]"
dimension = c(60, 60, 500)
mArray <- suq2.utils.createDataset(directory, pattern, dimension)
```

`suq2.utils.distGLDComparison`*Function to be used as a distance function in clustering algorithms*

Description

This function return the distances between all the centroids and the elements of the dataset, using a KS-test as a measure of the distance.

Usage

```
suq2.utils.distGLDComparison(x, centers)
```

Arguments

x	dataset.
centers	the centroids to be analyzed.

Author(s)

Noel Moreno Lemus

Examples

TODO

```
suq2.utils.distGLDComparisonKL
```

Function to be used as a distance function in clustering algorithms

Description

This function return the distances between all the centroids and the elements of the dataset, using KL-divergence as a measure of the distance.

Usage

```
suq2.utils.distGLDComparisonKL(x, centers)
```

Arguments

x	dataset.
centers	the centroids to be analyzed.

Author(s)

Noel Moreno Lemus

Examples

TODO

`suq2.utils.gldComparison`*Compare if two GLDs belongs to the same distribution*

Description

This function return D distance from the ks-test that compare if both GLDs belongs to the same distribution.

Usage

```
suq2.utils.gldComparison(L1, L2, param = "fmkl", no.test = 1000,  
  len = floor(0.9 * no.test), alpha = 0.05)
```

Arguments

L1	Lambda values of the first GLD.
L2	Lambda values of the second GLD.

Author(s)

Noel Moreno Lemus

Examples

```
L1 = c(0, 2, 0.25, 1.5)  
L2 = c(0, 2, 0.3, 1.75)  
D <- suq2.utils.gldComparison(L1, L2)
```

`suq2.utils.gldComparisonKL`*Compare if two GLDs belongs to the same distribution based in its
KL.dist*

Description

This function return the KL.dist of two GLDs.

Usage

```
suq2.utils.gldComparisonKL(L1, L2, param = "fmkl", no.test = 1000,  
  len = floor(0.9 * no.test), alpha = 0.05)
```

Arguments

L1	Lambda values of the first GLD.
L2	Lambda values of the second GLD.

Author(s)

Noel Moreno Lemus

Examples

```
L1 = c(0, 2, 0.25, 1.5)
L2 = c(0, 2, 0.3, 1.75)
D <- suq2.utils.gldComparisonKL(L1, L2)
```

Index

*Topic **image**

suq2.plot.image_display, [7](#)

*Topic **lambdas**

suq2.utils.checkGLDValid1, [8](#)

suq2.utils.checkGLDValidN, [8](#)

*Topic **lmoments**

suq2.fit.gldfitLmoments, [3](#)

suq2.fit.gldfitMoments, [4](#)

suq2.plot.gldPlot, [6](#)

suq2.clustering.gldClusterComparison,
[2](#)

suq2.clustering.gldClustering, [3](#)

suq2.fit.gldfitLmoments, [3](#)

suq2.fit.gldfitMoments, [4](#)

suq2.fit.gldFitParallel, [4](#)

suq2.plot.gld, [5](#)

suq2.plot.gldClustersL3L4, [6](#)

suq2.plot.gldPlot, [6](#)

suq2.plot.gldToPlot, [7](#)

suq2.plot.image_display, [7](#)

suq2.utils.checkGLDValid1, [8](#)

suq2.utils.checkGLDValidN, [8](#)

suq2.utils.createDataset, [9](#)

suq2.utils.distGLDComparison, [9](#)

suq2.utils.distGLDComparisonKL, [10](#)

suq2.utils.gldComparison, [11](#)

suq2.utils.gldComparisonKL, [11](#)