Package 'DOSE'

April 11, 2018

Type Package

Title Disease Ontology Semantic and Enrichment analysis

Version 3.4.0

Maintainer Guangchuang Yu <guangchuangyu@gmail.com>

Description This package implements five methods proposed by
Resnik, Schlicker, Jiang, Lin and Wang respectively
for measuring semantic similarities among DO terms and
gene products. Enrichment analyses including hypergeometric
model and gene set enrichment analysis are also implemented
for discovering disease associations of high-throughput
biological data.

Depends R (>= 3.3.1)

Imports AnnotationDbi, BiocParallel, DO.db, fgsea, ggplot2, GOSemSim
(>= 2.0.0), graphics, grDevices, grid, igraph, methods, qvalue,
reshape2, rvcheck, S4Vectors, scales, stats, stats4, utils

Suggests BiocStyle, clusterProfiler, knitr, org.Hs.eg.db, testthat,
UpSetR

VignetteBuilder knitr

ByteCompile true

License Artistic-2.0

URL https://guangchuangyu.github.io/DOSE

BugReports https://github.com/GuangchuangYu/DOSE/issues

biocViews Annotation, Visualization, MultipleComparison,
GeneSetEnrichment, Pathways, Software

RoxygenNote 6.0.1

NeedsCompilation no

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Giovanni Dall'Olio [ctb]

R **topics documented:**

DOSE-package	*Disease Ontology Semantic and Enrichment analysis Implemented five methods proposed by Resnik, Schlicker, Jiang, Lin and Wang respectively for measuring DO semantic similarities, and hypergeometric test for enrichment analysis.*

Description

This package is designed to estimate DO-based semantic similarity measurement and enrichment analysis.

Details

Package:	DOSE
Type:	Package
Version:	2.3.5
Date:	2-27-2012
biocViews:	Bioinformatics, Annotation
Depends:	
Imports:	methods, AnnotationDbi, DO.db
Suggests:	clusterProfiler, GOSemSim
License:	Artistic-2.0

Author(s)

Guangchuang Yu, Li-Gen Wang

Maintainer: Guangchuang Yu <guangchuangyu@gmail.com>

See Also

enrichResult

barplot.enrichResult	*barplot*

Description

barplot of enrichResult

Usage

```
## S3 method for class 'enrichResult'
barplot(height, x = "Count", colorBy = "pvalue",
  showCategory = 5, font.size = 12, title = "", ...)
```

Arguments

`height`	enrichResult object
`x`	one of 'Count' and 'GeneRatio'
`colorBy`	one of 'pvalue', 'p.adjust', 'qvalue'
`showCategory`	number of categories to show
`font.size`	font size
`title`	plot title
`...`	other parameter, ignored

`clusterSim`	*clusterSim*

Description

semantic similarity between two gene clusters

Usage

```
clusterSim(cluster1, cluster2, measure = "Wang", combine = "BMA")
```

Arguments

`cluster1`	a vector of gene IDs
`cluster2`	another vector of gene IDs
`measure`	One of "Resnik", "Lin", "Rel", "Jiang" and "Wang" methods.
`combine`	One of "max", "avg", "rcmax", "BMA" methods, for combining

Details

given two gene clusters, this function calculates semantic similarity between them.

Value

similarity

Author(s)

Yu Guangchuang

Examples

```
cluster1 <- c("835", "5261","241", "994")
cluster2 <- c("307", "308", "317", "321", "506", "540", "378", "388", "396")
clusterSim(cluster1, cluster2)
```

---

cnetplot *cnetplot method*

Description

cnetplot

Usage

```
cnetplot(x, showCategory = 5, categorySize = "geneNum", foldChange = NULL,
  fixed = TRUE, ...)

## S4 method for signature 'enrichResult'
cnetplot(x, showCategory = 5,
  categorySize = "pvalue", foldChange = NULL, fixed = TRUE, ...)

## S4 method for signature 'gseaResult'
cnetplot(x, showCategory = 5,
  categorySize = "pvalue", foldChange = NULL, fixed = TRUE, ...)
```

Arguments

x	enrichResult object
showCategory	number of category plotted
categorySize	one of geneNum or pvalue
foldChange	fold change of expression value
fixed	logical
...	additional parameters

Value

plot

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

---

cnetplot_internal *cnetplot_internal*

Description

plot function of gene Concept Net.

Usage

```
cnetplot_internal(inputList, categorySize = "geneNum", showCategory = 5,
  pvalue = NULL, foldChange = NULL, fixed = TRUE, DE.foldChange = NULL,
  ...)
```

Arguments

`inputList`	a list of gene IDs
`categorySize`	setting category size
`showCategory`	number of categories to plot
`pvalue`	pvalue
`foldChange`	fold Change
`fixed`	logical
`DE.foldChange`	logical
`...`	additional parameters

Value

plotted igraph object.

Author(s)

Guangchuang Yu <http://ygc.name>

`computeIC`	*compute information content*

Description

compute information content

Usage

```
computeIC(ont = "DO", organism = "human")
```

Arguments

`ont`	"DO"
`organism`	"human"

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

`DataSet`	*Datasets*

Description

Information content and DO term to entrez gene IDs mapping

---

doSim   *doSim*

Description

measuring similarities between two DO term vectors.

Usage

```
doSim(DOID1, DOID2, measure = "Wang")
```

Arguments

DOID1	DO term vector
DOID2	DO term vector
measure	one of "Wang", "Resnik", "Rel", "Jiang", and "Lin".

Details

provide two DO term vectors, this function will calculate their similarities.

Value

score matrix

Author(s)

Guangchuang Yu <https://guangchuangyu.github.io>

---

dotplot   *dotplot method*

Description

dotplot

dotplot for enrichResult

dotplot for gseaResult

Usage

```
dotplot(object, ...)

## S4 method for signature 'enrichResult'
dotplot(object, x = "geneRatio",
  colorBy = "p.adjust", showCategory = 10, split = NULL, font.size = 12,
  title = "")

## S4 method for signature 'gseaResult'
dotplot(object, x = "geneRatio",
  colorBy = "p.adjust", showCategory = 10, split = NULL, font.size = 12,
  title = "")
```

Arguments

`object`	an instance of enrichResult
`...`	additional parameter
`x`	variable for x axis
`colorBy`	one of 'pvalue', 'p.adjust' and 'qvalue'
`showCategory`	number of category
`split`	separate result by 'category' variable
`font.size`	font size
`title`	plot title

Value

plot

Author(s)

Guangchuang Yu

Guangchuang Yu

Guangchuang Yu

---

enrichDGN   *Enrichment analysis based on the DisGeNET (*[http://www.](http://www.disgenet.org/)
                                   [disgenet.org/)](http://www.disgenet.org/)

Description

given a vector of genes, this function will return the enrichment NCG categories with FDR control

Usage

```
enrichDGN(gene, pvalueCutoff = 0.05, pAdjustMethod = "BH", universe,
  minGSSize = 10, maxGSSize = 500, qvalueCutoff = 0.2, readable = FALSE)
```

Arguments

`gene`	a vector of entrez gene id
`pvalueCutoff`	pvalue cutoff
`pAdjustMethod`	one of "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none"
`universe`	background genes
`minGSSize`	minimal size of genes annotated by NCG category for testing
`maxGSSize`	maximal size of each geneSet for analyzing
`qvalueCutoff`	qvalue cutoff
`readable`	whether mapping gene ID to gene Name

Value

A `enrichResult` instance

Author(s)

Guangchuang Yu

References

Janet et al. (2015) DisGeNET: a discovery platform for the dynamical exploration of human diseases and their genes. *Database* bav028 http://database.oxfordjournals.org/content/2015/bav028.long

---

enrichDGNv	*enrichDGN*

Description

Enrichment analysis based on the DisGeNET (http://www.disgenet.org/)

Usage

```
enrichDGNv(snp, pvalueCutoff = 0.05, pAdjustMethod = "BH", universe,
  minGSSize = 10, maxGSSize = 500, qvalueCutoff = 0.2, readable = FALSE)
```

Arguments

snp	a vector of SNP
pvalueCutoff	pvalue cutoff
pAdjustMethod	one of "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none"
universe	background genes
minGSSize	minimal size of genes annotated by NCG category for testing
maxGSSize	maximal size of each geneSet for analyzing
qvalueCutoff	qvalue cutoff
readable	whether mapping gene ID to gene Name

Details

given a vector of genes, this function will return the enrichment NCG categories with FDR control

Value

A `enrichResult` instance

Author(s)

Guangchuang Yu

References

Janet et al. (2015) DisGeNET: a discovery platform for the dynamical exploration of human diseases and their genes. *Database* bav028 http://database.oxfordjournals.org/content/2015/bav028.long

---

enrichDO   *DO Enrichment Analysis*

Description

Given a vector of genes, this function will return the enrichment DO categories with FDR control.

Usage

```
enrichDO(gene, ont = "DO", pvalueCutoff = 0.05, pAdjustMethod = "BH",
  universe, minGSSize = 10, maxGSSize = 500, qvalueCutoff = 0.2,
  readable = FALSE)
```

Arguments

gene	a vector of entrez gene id
ont	one of DO or DOLite.
pvalueCutoff	pvalue cutoff
pAdjustMethod	one of "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none"
universe	background genes
minGSSize	minimal size of genes annotated by NCG category for testing
maxGSSize	maximal size of each geneSet for analyzing
qvalueCutoff	qvalue cutoff
readable	whether mapping gene ID to gene Name

Value

A enrichResult instance.

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

See Also

[enrichResult-class](#)

Examples

```
data(geneList)
gene = names(geneList)[geneList > 1]
yy = enrichDO(gene, pvalueCutoff=0.05)
summary(yy)
```

enricher_internal   *enrich.internal*

Description

interal method for enrichment analysis

Usage

```
enricher_internal(gene, pvalueCutoff, pAdjustMethod = "BH", universe = NULL,
  minGSSize = 10, maxGSSize = 500, qvalueCutoff = 0.2, USER_DATA)
```

Arguments

gene	a vector of entrez gene id.
pvalueCutoff	Cutoff value of pvalue.
pAdjustMethod	one of "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none"
universe	background genes
minGSSize	minimal size of genes annotated by Ontology term for testing.
maxGSSize	maximal size of each geneSet for analyzing
qvalueCutoff	cutoff of qvalue
USER_DATA	ontology information

Details

using the hypergeometric model

Value

A enrichResult instance.

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

enrichMap   *enrichMap*

Description

enrichment map

Usage

```
enrichMap(x, n = 50, fixed = TRUE, vertex.label.font = 1, ...)
```

Arguments

x	gseaResult or enrichResult object
n	maximum number of category to shown
fixed	if set to FALSE, will invoke tkplot
vertex.label.font	
	font size of vertex label
...	additional parameter

Details

enrichment map

Value

figure

Author(s)

G Yu

---

enrichNCG   *enrichNCG*

Description

Enrichment analysis based on the Network of Cancer Genes database (http://ncg.kcl.ac.uk/)

Usage

```
enrichNCG(gene, pvalueCutoff = 0.05, pAdjustMethod = "BH", universe,
  minGSSize = 10, maxGSSize = 500, qvalueCutoff = 0.2, readable = FALSE)
```

Arguments

gene	a vector of entrez gene id
pvalueCutoff	pvalue cutoff
pAdjustMethod	one of "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none"
universe	background genes
minGSSize	minimal size of genes annotated by NCG category for testing
maxGSSize	maximal size of each geneSet for analyzing
qvalueCutoff	qvalue cutoff
readable	whether mapping gene ID to gene Name

Details

given a vector of genes, this function will return the enrichment NCG categories with FDR control

Value

A `enrichResult` instance

Author(s)

Guangchuang Yu

---

enrichResult-class	*Class "enrichResult" This class represents the result of enrichment analysis.*

Description

Class "enrichResult" This class represents the result of enrichment analysis.

Slots

`result` enrichment analysis

`pvalueCutoff` pvalueCutoff

`pAdjustMethod` pvalue adjust method

`qvalueCutoff` qvalueCutoff

`organism` only "human" supported

`ontology` biological ontology

`gene` Gene IDs

`keytype` Gene ID type

`universe` background gene

`gene2Symbol` mapping gene to Symbol

`geneSets` gene sets

`readable` logical flag of gene ID in symbol or not.

Author(s)

Guangchuang Yu https://guangchuangyu.github.io

See Also

enrichDO

EXTID2NAME   *EXTID2NAME*

Description

mapping gene ID to gene Symbol

Usage

```
EXTID2NAME(OrgDb, geneID, keytype)
```

Arguments

OrgDb	OrgDb
geneID	entrez gene ID
keytype	keytype

Value

gene symbol

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

---

fortify.enrichResult   *fortify*

Description

convert enrichResult object for ggplot2

Usage

```
## S3 method for class 'enrichResult'
fortify(model, data, showCategory = 5, by = "Count",
  order = FALSE, drop = FALSE, split = NULL, ...)
```

Arguments

model	enrichResult object
data	not use here
showCategory	Category numbers to show
by	one of Count and GeneRatio
order	logical
drop	logical
split	separate result by 'split' variable
...	additional parameter

---

gene2DO   *convert Gene ID to DO Terms*

Description

provide gene ID, this function will convert to the corresponding DO Terms

Usage

```
gene2DO(gene)
```

Arguments

gene   entrez gene ID

Value

DO Terms

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

---

geneID   *geneID generic*

Description

geneID generic

Usage

```
geneID(x)
```

Arguments

x   enrichResult object

Value

'geneID' return the 'geneID' column of the enriched result which can be converted to data.frame
via 'as.data.frame'

Examples

```
data(geneList, package="DOSE")
de <- names(geneList)[1:100]
x <- enrichDO(de)
geneID(x)
```

---

geneInCategory   *geneInCategory generic*

Description

geneInCategory generic

Usage

```
geneInCategory(x)
```

Arguments

x   enrichResult

Value

'geneInCategory' return a list of genes, by spliting the input gene vector to enriched functional categories

Examples

```
data(geneList, package="DOSE")
de <- names(geneList)[1:100]
x <- enrichDO(de)
geneInCategory(x)
```

---

geneSim   *geneSim*

Description

measuring similarities bewteen two gene vectors.

Usage

```
geneSim(geneID1, geneID2 = NULL, measure = "Wang", combine = "BMA")
```

Arguments

geneID1	entrez gene vector
geneID2	entrez gene vector
measure	one of "Wang", "Resnik", "Rel", "Jiang", and "Lin".
combine	One of "max", "avg", "rcmax", "BMA" methods, for combining semantic similarity scores of multiple DO terms associated with gene/protein.

Details

provide two entrez gene vectors, this function will calculate their similarity.

Value

score matrix

Author(s)

Guangchuang Yu <http://ygc.name>

---

gseaplot	*visualize analyzing result of GSEA*

Description

plotting function for gseaResult

Usage

```
gseaplot(gseaResult, geneSetID, by = "all", title = "", color = "black",
  color.line = "green", color.vline = "#FA5860")
```

Arguments

gseaResult	gseaResult object
geneSetID	geneSet ID
by	one of "runningScore" or "position"
title	plot title
color	color of line segments
color.line	color of running enrichment score line
color.vline	color of vertical line which indicating the maximum/minimal running enrichment score

Value

ggplot2 object

Author(s)

Yu Guangchuang

---

gseaResult-class   *Class "gseaResult" This class represents the result of GSEA analysis*

Description

Class "gseaResult" This class represents the result of GSEA analysis

Slots

result GSEA anaysis

organism organism

setType setType

geneSets geneSets

geneList order rank geneList

keytype ID type of gene

permScores permutation scores

params parameters

gene2Symbol gene ID to Symbol

readable whether convert gene ID to symbol

Author(s)

Guangchuang Yu https://guangchuangyu.github.io

See Also

gseaplot

GSEA_internal   *GSEA_internal*

Description

generic function for gene set enrichment analysis

Usage

```
GSEA_internal(geneList, exponent, nPerm, minGSSize, maxGSSize, pvalueCutoff,
  pAdjustMethod, verbose, seed = FALSE, USER_DATA, by = "fgsea")
```

Arguments

geneList	order ranked geneList
exponent	weight of each step
nPerm	permutation numbers
minGSSize	minimal size of each geneSet for analyzing
maxGSSize	maximal size of each geneSet for analyzing
pvalueCutoff	p value Cutoff
pAdjustMethod	p value adjustment method
verbose	print message or not
seed	set seed inside the function to make result reproducible. FALSE by default.
USER_DATA	annotation data
by	one of 'fgsea' or 'DOSE'

Value

gseaResult object

Author(s)

Yu Guangchuang

---

gseDGN   *DisGeNET Gene Set Enrichment Analysis*

Description

perform gsea analysis

Usage

```
gseDGN(geneList, exponent = 1, nPerm = 1000, minGSSize = 10,
  maxGSSize = 500, pvalueCutoff = 0.05, pAdjustMethod = "BH",
  verbose = TRUE, seed = FALSE, by = "fgsea")
```

Arguments

geneList	order ranked geneList
exponent	weight of each step
nPerm	permutation numbers
minGSSize	minimal size of each geneSet for analyzing
maxGSSize	maximal size of each geneSet for analyzing
pvalueCutoff	pvalue Cutoff
pAdjustMethod	p value adjustment method
verbose	print message or not
seed	logical
by	one of 'fgsea' or 'DOSE'

Value

gseaResult object

Author(s)

Yu Guangchuang

---

gseDO   *DO Gene Set Enrichment Analysis*

Description

perform gsea analysis

Usage

```
gseDO(geneList, exponent = 1, nPerm = 1000, minGSSize = 10,
  maxGSSize = 500, pvalueCutoff = 0.05, pAdjustMethod = "BH",
  verbose = TRUE, seed = FALSE, by = "fgsea")
```

Arguments

geneList	order ranked geneList
exponent	weight of each step
nPerm	permutation numbers
minGSSize	minimal size of each geneSet for analyzing
maxGSSize	maximal size of each geneSet for analyzing
pvalueCutoff	pvalue Cutoff
pAdjustMethod	p value adjustment method
verbose	print message or not
seed	logical
by	one of 'fgsea' or 'DOSE'

Value

gseaResult object

Author(s)

Yu Guangchuang

---

gseNCG   *NCG Gene Set Enrichment Analysis*

Description

perform gsea analysis

Usage

```
gseNCG(geneList, exponent = 1, nPerm = 1000, minGSSize = 10,
    maxGSSize = 500, pvalueCutoff = 0.05, pAdjustMethod = "BH",
    verbose = TRUE, seed = FALSE, by = "fgsea")
```

Arguments

geneList	order ranked geneList
exponent	weight of each step
nPerm	permutation numbers
minGSSize	minimal size of each geneSet for analyzing
maxGSSize	maximal size of each geneSet for analyzing
pvalueCutoff	pvalue Cutoff
pAdjustMethod	p value adjustment method
verbose	print message or not
seed	logical
by	one of 'fgsea' or 'DOSE'

Value

gseaResult object

Author(s)

Yu Guangchuang

---

gsfilter   *gsfilter*

Description

filter enriched result by gene set size or gene count

Usage

```
gsfilter(x, by = "GSSize", min = NA, max = NA)
```

Arguments

x	instance of enrichResult or compareClusterResult
by	one of 'GSSize' or 'Count'
min	minimal size
max	maximal size

Value

update object

Author(s)

Guangchuang Yu

---

gsInfo   *gsInfo*

Description

extract gsea result of selected geneSet

Usage

```
gsInfo(object, geneSetID)
```

Arguments

object	gseaResult object
geneSetID	gene set ID

Value

data.frame

Author(s)

Guangchuang Yu

---

list2graph   *convert gene IDs to igraph object*

Description

convert a list of gene IDs to igraph object.

Usage

```
list2graph(inputList)
```

Arguments

inputList   a list of gene IDs

Value

a igraph object.

Author(s)

Guangchuang Yu <http://ygc.name>

---

mclusterSim   *mclusterSim*

Description

Pairwise semantic similarity for a list of gene clusters

Usage

```
mclusterSim(clusters, measure = "Wang", combine = "BMA")
```

Arguments

clusters	A list of gene clusters
measure	one of "Wang", "Resnik", "Rel", "Jiang", and "Lin".
combine	One of "max", "avg", "rcmax", "BMA" methods, for combining semantic similarity scores of multiple DO terms associated with gene/protein.

Value

similarity matrix

Author(s)

Yu Guangchuang

Examples

```
cluster1 <- c("835", "5261","241")
cluster2 <- c("578","582")
cluster3 <- c("307", "308", "317")
clusters <- list(a=cluster1, b=cluster2, c=cluster3)
mclusterSim(clusters, measure="Wang")
```

---

netplot   *netplot*

Description

plot network

Usage

```
netplot(g, vertex.label.font = 2, vertex.label.color = "#666666",
  vertex.label.cex = 1.5, layout = layout.fruchterman.reingold,
  foldChange = NULL, fixed = TRUE, col.bin = 10, legend.x = 1,
  legend.y = 1, ...)
```

Arguments

g	igraph object
vertex.label.font	
	font size
vertex.label.color	
	font text color
vertex.label.cex	
	cex of vertex label
layout	layout
foldChange	fold change
fixed	logical
col.bin	number of legend color bin
legend.x	x-axis position of legend
legend.y	y-axis position of legend
...	additional parameters

Details

plot network of igraph object

Value

plot

Author(s)

Yu Guangchuang

---

plot	*plot method*

Description

plot method generics

plot method for gseaResult

Usage

```
## S4 method for signature 'enrichResult,ANY'
plot(x, type = "bar", ...)

## S4 method for signature 'gseaResult,ANY'
plot(x, type = "gseaplot", ...)
```

Arguments

x	A enrichResult instance
type	one of bar, cnet or enrichMap
...	Additional argument list

Value

plot

plot

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>
Yu Guangchuang

---

rebuildAnnoData	*rebuiding annotation data*

Description

rebuilding entrez and DO mapping datasets

Usage

```
rebuildAnnoData(file)
```

Arguments

file	do_rif.human.txt

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

---

ridgeplot   *ridgeplot*

Description

ridgeplot for GSEA result

Usage

```
ridgeplot(x, showCategory = 30, fill = "p.adjust", core_enrichment = TRUE)
```

Arguments

x	gseaResult object
showCategory	number of categories for plotting
fill	one of "pvalue", "p.adjust", "qvalue"
core_enrichment	
	whether only using core_enriched genes

Value

ggplot object

Author(s)

guangchuang yu

---

scaleNodeColor   *scaleNodeColor*

Description

scale color nodes

Usage

```
scaleNodeColor(g, foldChange, node.idx = NULL, DE.foldChange)
```

Arguments

g	igraph object
foldChange	fold Change
node.idx	index of node to color
DE.foldChange	logical

Details

color nodes based on fold change of expression

Value

igraph object

Author(s)

Yu Guangchuang

---

setReadable   *setReadable*

Description

mapping geneID to gene Symbol

Usage

```
setReadable(x, OrgDb, keytype = "auto")
```

Arguments

x	enrichResult Object
OrgDb	OrgDb
keytype	keytype of gene

Value

enrichResult Object

Author(s)

Yu Guangchuang

---

setting.graph.attributes
                    setting.graph.attributes

Description

setting basic attributes of a graph

Usage

```
setting.graph.attributes(g, node.size = 8, node.color = "#B3B3B3",
  edege.width = 2, edege.color = "#8DA0CB")
```

Arguments

g	igraph object
node.size	size of node
node.color	color of node
edege.width	edege width
edege.color	color of edege

Details

setting size and color of node and edege

Value

igraph object

Author(s)

Yu Guangchuang

---

show   *show method*

Description

show method for enrichResult instance

show method for gseaResult instance

Usage

```
show(object)

show(object)
```

Arguments

object	A enrichResult instance.

Value

message

message

Author(s)

Guangchuang Yu https://guangchuangyu.github.io

Guangchuang Yu https://guangchuangyu.github.io

---

simplot	*simplot*

Description

plotting similarity matrix

Usage

```
simplot(sim, xlab = "", ylab = "", color.low = "white",
  color.high = "red", labs = TRUE, digits = 2, labs.size = 3,
  font.size = 14)
```

Arguments

sim	similarity matrix
xlab	xlab
ylab	ylab
color.low	color of low value
color.high	color of high value
labs	logical, add text label or not
digits	round digit numbers
labs.size	lable size
font.size	font size

Value

ggplot object

Author(s)

Yu Guangchuang

---

summary	*summary method*

Description

summary method for enrichResult instance

summary method for gseaResult instance

Usage

```
summary(object, ...)
```

```
summary(object, ...)
```

Arguments

`object`	A `enrichResult` instance.
`...`	additional parameter

Value

A data frame

A data frame

Author(s)

Guangchuang Yu <http://guangchuangyu.github.io>

Guangchuang Yu <https://guangchuangyu.github.io>

---

theme_dose   *theme_dose*

Description

ggplot theme of DOSE

Usage

```
theme_dose(font.size = 14)
```

Arguments

`font.size`	font size

---

upsetplot   *upsetplot method*

Description

upsetplot method generics

upsetplot

Usage

```
upsetplot(x, ...)

## S4 method for signature 'enrichResult'
upsetplot(x, n = 10, ...)
```

Arguments

`x`	object
`...`	additional parameters
`n`	number of categories to be plotted

Value

plot

Author(s)

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Examples

```
## Not run:
require(DOSE)
data(geneList)
de=names(geneList)[1:100]
x <- enrichDO(de)
upsetplot(x, 8)

## End(Not run)
```

Index