**GOHyperG**

Hypergeometric test for GO category enrichment.

Description

This function is adapted from the function of the same name in \texttt{GOstats} package. Main difference is that it draws the GO annotations of the genes in \texttt{candidates} from the data.frame \texttt{gff}. It also draws a plot.

Usage

\begin{verbatim}
GOHyperG(candidates, gff, plotmain)
\end{verbatim}

Arguments

\begin{verbatim}
candidates character vector
gff see \texttt{getAllGO}
plotmain character, plot title
\end{verbatim}
Details

The elements of \( x \) are matched against the column `gene` in `gff`. All are required to match. A list of GO terms is then extracted from the corresponding rows in the `Ontology_term` column. A gene may be annotated by several terms, separated by ",". Then the GO package is used to augment this by all ancestor terms.

Value

List of character vectors.

Author(s)

W. Huber <huber@ebi.ac.uk>

See Also

`getAllGO`

data:davidTiling  
*Dataset of class eSet with the raw ‘CEL file’ intensities*

Description

The data are from an experiment that used Affymetrix Scerevisiaetiling chips from 2004, which where custom-made for the Stanford Genome Center. The chips tile the complete genome of *S. cerevisiae* in steps of 8 bases, separately for each strand of each chromosome. The two tiles for one chromosome (Watson and Crick strands) are offset by 4 bases.

Note that the class `eSet` was used instead of `AffyBatch` since the additional overhead of `CDF environments` in the latter is not needed here.

Usage

```r
data("davidTiling")
```

Format

Intensity data for 8 arrays. The `phenoData` slot contains the file names and the nucleic acid type.

Author(s)

W. Huber <huber@ebi.ac.uk>

Source

Lior David and Lars Steinmetz, both from the Stanford Genome Center. Lars Steinmetz is also at EMBL Heidelberg.

Examples

```r
data("davidTiling")
dim(exprs(davidTiling))
```
getAttributeField  Extract the value of a certain field out of a character vector such as in the "attributes" column of a GFF table.

Description

Extract the value of a certain field out of a character vector such as in the "attributes" column of a GFF table.

Usage

getAttributeField(x, field, attrsep=";")

Arguments

x character vector.
field character vector of length 1, containing the field name.
attrsep character vector of length 1, containing the separator name.

Details

See example.

Value

Character vector.

Author(s)

W. Huber <huber@ebi.ac.uk>

Examples

acol = c("ID=46891;Name=TEL01L-TR;Note=Bla",
       "ID=46892;Name=TEL01L;Note=Di",
       "ID=46893;Name=TEL01L-XR;Note=Bla")

g.getAttributeField(acol, "Name")
g.getAttributeField(acol, "ID")
getAllGO

Get all GO categories for a list of genes.

Description

The function uses the GO categories in the data.frame gff to obtain annotated GO categories, then the GO**ANCESTOR data in the GO package to add all parent terms as well.

Usage

getAllGO(x, gff)

Arguments

x
character vector.

gff
data.frame with columns feature, Name, and (Ontology_term or attributes), see details

Details

The elements of x are matched against the column gene in gff. All are required to match. A list of GO terms is then extracted from the corresponding rows in the Ontology_term column. A gene may be annotated by several terms, separated by ",". Then the GO package is used to augment this by all ancestor terms.

Value

List of character vectors.

Author(s)

W. Huber <huber@ebi.ac.uk>

data:gff

Genomic features of Saccharomyces cerevisiae

Description

A data frame with genomic features of Saccharomyces cerevisiae.

Usage

data("gff")

Format

Object of class data.frame. GFF is a file format for annotating genomes, see <insert the URL to the documentation page for GFF at Sanger here>. The format is essentially a rectangular table, and here it is represented as a data frame.
Author(s)

W. Huber ⟨huber@ebi.ac.uk⟩

Source

Two GFF files were downloaded: saccharomyces_cerevisiae.gff from ftp://genome-
ftp.stanford.edu/pub/yeast/data_download/chromosomal_feature on 7 Aug
upon suggestion from the SGD curators on 30 Aug 2005. (Future versions of SGD’s GFF files are
likely to include the latter as well). They were parsed, combined and written into the gff data.frame
with the script makeProbeAnno.R in the inst/scripts directory of this package.

Examples

data("gff")
str(gff)

---

data:probeAnno An environment with probe mapping information for the Scerevisiae
tiling array

Description

The environment contains probe mapping information for the Affymetrix Scerevisiae tiling chip
from 2004, which was custom-made for the Stanford Genome Center. The chips tile the complete
genome of S. cerevisiae in steps of 8 bases, separately for each strand of each chromosome. The
two tiles for one chromosome (Watson and Crick strands) are offset by 4 bases.

In the following a brief description of the 138 elements of the probeAnno environment.

probeReverse: a list of 8 factors, each of length 6553600, corresponding to the rows of davidTiling.
For example, if the probe corresponding to the j-th row in davidTiling maps to the coding se-
quence of a gene, then the factor level of probeRevers$CDS[j] is the name of the gene, and
the empty string "" otherwise. This applies to samples that were hybridized to the chip after a
reverse transcription step.

probeDirect: analogous to probeReverse, but for samples that were hybridized to the chip
without a reverse transcription step. The probes map to the opposite chromosomal strand compared
to experiments with reverse transcription.

1.+.index: indices (from 1...6553600, corresponding to the rows of davidTiling) of probes
mapping to the Watson strand of chromosome 1.

1.+.start,1.+.end: start and end positions in genomic coordinates of the alignments of the
probes (in the same order as in 1.+.index) to the Watson strand of chromosome 1. For 25-
mers, the values in 1.+.end are those in 1.+.start plus 24, but not all probes on the array are
25-mers.

1.-.unique: specificity of the probe:

0 has exactly one perfect match (PM) and no near-matches in the genome
1 has exactly one PM and some near-matches
2 has no PM but one or more near-matches
3 has multiple PMs in the genome
scatterWithHist

1.-.index, 1.-.start, 1.-.end, 1.-.unique: analogous to the above, but for the Crick strand of chromosome 1. 2.+.index, 2.+.start, 2.+.end, 2.-.unique: analogous to the above, but for the Watson strand of chromosome 2; and so forth. "Chromosome 17" is mitochondrial DNA.

Usage

data("probeAnno")

Author(s)

W. Huber ⟨huber@ebi.ac.uk⟩

Source

Probe sequences were obtained from Affymetrix in a file called S.cerevisiae_tiling.1llq. The genomic sequences of the S. cerevisiae chromosomes were downloaded from ftp://genome-ftp.stanford.edu/pub/yeast/data_download/sequence/genomic_sequence/chromosomes/ on 7 Aug 2005, 18:16 BST in 17 files chr01.fsa–chr16.fsa, and chrmt.fsa. The probe sequences were matched against the chromosomal sequencences with the program MUMmer, see the script mapProbesToGenome.sh (in the inst/scripts directory of this package). MUMmer results were parsed and processed into the probeAnno environment with the script makeProbeAnno.R (in the inst/scripts directory of this package).

Examples

data("probeAnno")
ls(probeAnno)
str(probeAnno$"1.+.start")

scatterWithHist Scatterplot with histograms of marginal distributions

Description

Scatterplot with histograms of marginal distributions.

Usage

scatterWithHist(x, breaks, barcols, xlab, ylab, ...)

Arguments

x numeric matrix with 2 columns.
b breaks numeric vector with histogram breaks, see hist.
barcols character vector of length 2, colors for the histogram filling.
xlab character of length 1, label for x-axis.
ylab character of length 1, label for y-axis.
... further arguments that get passed on to plot.
scoreSegments

Value

The function is called for its side effect.

Author(s)

W. Huber <huber@ebi.ac.uk>

Examples

```r
x = rexp(100)
x = cbind(x, x+0.6*rnorm(length(x)))
scatterWithHist(x,
   breaks=seq(min(x),max(x),length=20),
   barcols=c("mistyrose", "lightblue"),
   xlab="Daffodil", ylab="Petunia", pch=16)
```

Description

Score the segments found by a previous call to findSegments by comparing to genome annotation

Usage

```r
scoreSegments(s, gff,
   nrBasePerSeg = 1500,
   probeLength = 25,
   params = c(overlapFraction = 0.5, oppositeWindow = 100, flankProbes=10),
   verbose = TRUE)
```

Arguments

- `s`: environment. See details.
- `gff`: GFF dataframe.
- `nrBasePerSeg`: Numeric of length 1. This parameter determines the number of segments.
- `probeLength`: Numeric of length 1.
- `params`: vector of additional parameters, see details.
- `verbose`: Logical.

Details

This function scores segments. It is typically called after a segmentation. For an example segmentation script, see the script `segment.R` in the `scripts` directory of this package. For an example scoring script, which loads the data and then calls this function, see the script `scoreSegments.R`.

Value

A dataframe with columns as described in the details section.

Author(s)

W. Huber <huber@ebi.ac.uk>
showDens  

Plot function for more than one density

Description

Plot function for more than one density

Usage

showDens(z, breaks, xat, xtickLabels=paste(xat), col, ylab = "", ...)  

Arguments

z  List: numeric vectors for computing histograms for
breaks  Numeric vector: breaks of the histogram
xat  Numeric vector: where to put the x-axis ticks
xtickLabels  Character vector: what to write underneath them
col  Character vector: colours of the histograms
ylab  Character scalar: y-axis label
...  further arguments passed on to plot

Details

...

Value

returns scale factor

Author(s)

Wolfgang Huber (huber@ebi.ac.uk)

See Also

hist

Examples

showDens(list(x1=runif(100), x2=exp(runif(50))-1, x3=runif(20)),
breaks=seq(0, 2, 0.2), xat=seq(0, 2, 0.5), col=rainbow(3), xlab="Random Numbers")
yeastFeatures

A data.frame with metadata about the features in SGD GFF files

Description

The rows of the data frame correspond to feature categories, such as "gene", "CDS", "telomere".
The column `isTranscribed` is a logical vector that denotes whether this feature category is considered to be transcribable.

Usage

data(yeastFeatures)

Format

A data.frame

Author(s)

W. Huber <huber@ebi.ac.uk>

Examples

data(yeastFeatures)
Index

*Topic datasets
  - data:davidTiling, 2
  - data:gff, 4
  - data:probeAnno, 5
  - yeastFeatures, 8

*Topic hplot
  - scatterWithHist, 6
  - showDens, 7

*Topic manip
  - getAllGO, 3
  - getAttributeField, 2
  - GOHyperG, 1
  - scoreSegments, 7

AffyBatch, 2

data:davidTiling, 2
data:gff, 4
data:probeAnno, 5
davidTiling, 5
davidTiling (data:davidTiling), 2

eSet, 2

getAllGO, 1, 3
getAttributeField, 2

gff (data:gff), 4
 GOHyperG, 1

hist, 6, 8

phenoData, 2
plot, 6
probeAnno (data:probeAnno), 5

scatterWithHist, 6
scoreSegments, 7
showDens, 7

yeastFeatures, 8