

Package ‘CongreveLamsdell2016’

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Title Distance metrics for trees generated by Congreve and Lamsdell (2016)

Description Includes the 100 datasets simulated by Congreve and Lamsdell (2016) <doi:10.1111/pala.12236>, and analyses of the partition and quartet distance of reconstructed trees from the generative tree, as analysed by Smith (2019).

URL <https://github.com/ms609/CongreveLamsdell2016>

BugReports <https://github.com/ms609/Quartet/issues>

Copyright Data from Congreve & Lamsdell (2016) released under a CC0 license <doi:10.5061/dryad.7dq0j/1>.

License GPL (>= 2)

Encoding UTF-8

Language en-GB

Depends R (>= 3.4.0)

Imports Ternary

Suggests ape,
knitr,
phangorn,
Quartet,
TreeSearch (> 0.2.0),
Ternary,
usethis

Remotes ms609/Quartet,
ms609/TreeSearch

LazyData true

ByteCompile true

VignetteBuilder knitr

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Roxygen list(markdown = TRUE)

R topics documented:

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| | |
|------|--|
| clCI | <i>Congreve Lamsdell consistency indices</i> |
|------|--|

Description

Congreve Lamsdell consistency indices

Usage

clCI

Format

An object of class numeric of length 100.

| | |
|-----------|-------------------------------------|
| clColours | <i>Default colours for analyses</i> |
|-----------|-------------------------------------|

Description

Default colours for analyses

Usage

clColours

Format

An object of class character of length 8.

clInitializeTernaryQuarts

Initialize ternary plots for quartet plotting

Description

Initialize ternary plots for quartet plotting

Usage

```
clInitializeTernaryQuarts(zoom = 1, padding = 0.1, gridLines = 10,
  fontSize = 1, gridCol = rgb(0.92, 0.92, 0.92),
  backgroundCol = rgb(0.985, 0.985, 0.992), xLim = c(0, 1/zoom) - 0.01,
  yLim = c(0.5 - (1/zoom), 0.5))
```

clInitializeTernarySplits

Initialize ternary plots for partition plotting

Description

Initialize ternary plots for partition plotting

Usage

```
clInitializeTernarySplits(fontSize = 1, xlim = NULL, ylim = NULL,
  gridCol = rgb(0.92, 0.92, 0.92), padding = 0.1)
```

clPhyDat

100 simulated data matrices

Description

Contains the 100 simulated matrices generated by Congreve & Lamsdell (2016) using a heterogeneous Markov-k model, generated from the [clReferenceTree](#) topology, with all branches sharing an equal length.

Usage

clPhyDat

clMatrices

Format

- clPhyDat: A list with 100 entries, each comprising a phyDat object of 55 characters for 22 taxa.
- clMatrices: A list with 100 entries, each comprising a list of character tokens for each simulated character, as read from raw nexus files using `ape::read.nexus.data`. The four dummy 'characters' have been removed.

Source

<http://datadryad.org/resource/doi:10.5061/dryad.7dq0j>

References

- Congreve, C. R. & Lamsdell, J. C. (2016). Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. *Palaeontology* 59(3), 447–465. doi: [10.1111/pala.12236](https://doi.org/10.1111/pala.12236).
- Congreve, C. R. & Lamsdell, J. C. (2016). Data from: Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. Dryad Digital Repository. doi: [10.5061/dryad.7dq0j](https://doi.org/10.5061/dryad.7dq0j).

clPlotQuartets

Plot results

Description

Plot results

Usage

```
clPlotQuartets(dataset, tree, cex = 1.1, pch = 2, col = clColours,
  ...)

clPlotAverageQuartets(dataset, cex = 1.1, pch = 2, col = clColours,
  ...)

clPlotTheseAverageQuartets(dataset, cex = 1.1, pch = 2,
  col = "black", ...)

clPlotSplits(dataset, tree, cex = 1.1, pch = 2, col = clColours, ...)

clPlotTheseAverageSplits(dataset, cex = 1.1, pch = 2, col = "black",
  ...)

clPlotTheseBestAverageSplits(dataset, cex = 1.1, pch = 2,
  col = "black", ...)
```

```
clPlotAverageSplits(dataset, cex = 1.1, pch = 2, col = clColours,
  ...)

clPlotBestAverageSplits(dataset, cex = 1.1, pch = 2, col = clColours,
  ...)
```

Arguments

| | |
|---------------|---|
| tree | Integer specifying which tree to plot |
| cex, pch, ... | Graphical parameters to pass to JoinTheDots |
| col | Named vector specifying colour in which to plot each analysis |

Value

Returns [invisible](#).

Functions

- `clPlotAverageQuartets`: Plots average across all 100 trees
- `clPlotTheseAverageQuartets`: Plot average for single dataset across all 100 trees
- `clPlotSplits`: Splits equivalent of `clPlotQuartets`
- `clPlotTheseAverageSplits`: Splits equivalent of `clPlotTheseAverageQuartets`
- `clPlotTheseBestAverageSplits`: Splits equivalent of `clPlotTheseBestAverageQuartets`
- `clPlotAverageSplits`: Splits equivalent of `clPlotAverageQuartets`
- `clPlotBestAverageSplits`: Splits equivalent of `clPlotAverageQuartets`

Author(s)

Martin R. Smith

| | |
|-----------------|--|
| clReferenceTree | <i>Tree topology for matrix simulation</i> |
|-----------------|--|

Description

The tree topology used to generate the matrices in [clMatrices](#) Congreve & Lamsdell (2016)

Usage

```
clReferenceTree
```

Format

A single phylogenetic tree saved as an object of class `phylo`

Source

Congreve, C. R. & Lamsdell, J. C. (2016). Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. *Palaeontology* 59(3), 447–465. doi: [10.1111/pala.12236](https://doi.org/10.1111/pala.12236).

References

- Congreve, C. R. & Lamsdell, J. C. (2016). Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. *Palaeontology* 59(3), 447–465. doi: [10.1111/pala.12236](https://doi.org/10.1111/pala.12236).
- Congreve, C. R. & Lamsdell, J. C. (2016). Data from: Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. Dryad Digital Repository. doi: [10.5061/dryad.7dq0j](https://doi.org/10.5061/dryad.7dq0j).

Examples

```
library(ape) # Contains tree plotting functions
data(clReferenceTree)
plot(clReferenceTree)
```

clResults

Congreve and Lamsdell tree distances

Description

Distance of CL trees from generative tree.

Usage

```
clBremQuartets
clBremPartitions
clMkvPartitions
clMkvQuartets
clBootFreqPartitions
clBootFreqQuartets
clJackFreqPartitions
clJackFreqQuartets
clBootGcPartitions
```

```
clBootGcQuartets
```

```
clJackGcPartitions
```

```
clJackGcQuartets
```

Format

An object of class `list` of length 7.

Details

For each of the 100 matrices generated by Congreve & Lamsdell (2016), I conducted phylogenetic analysis under different methods:

- `markov`: Using the Markov K model in MrBayes.
- `equal`: Using equal weights in TNT.
- `implied1`, `implied2`, `implied3`, `implied5`, `implied10`: Using implied weights in TNT, with the concavity constant (k) set to 1, 2, 3, 5, or 10
- `impliedC`: By taking the strict consensus of all trees recovered by implied weights parsimony analysis under the k values 2, 3, 5 and 10 (but not 1).

For each analysis, I recorded the strict consensus of all optimal trees, and also the consensus of trees that were suboptimal by a specified degree.

I then calculated, of the total number of quartets or partitions that were resolved in the reference tree, how many were the same or *different* in the tree that resulted from the phylogenetic analysis, and how many were not resolved in this tree ($r2$).

The data object contains a list whose elements are named after the methods, as listed above.

Each list entry is a three-dimensional array, whose dimensions are:

1. The suboptimality of the tree. Different measures of node support are employed: * `Mkv`: Posterior probabilities, at 2.5 97.5 * `Brem`: Bremer supports: the consensus of all trees that are (equal weights) 0, 1, ..., 19, 20 steps less optimal than the optimal tree (implied weights: the consensus of all trees that are 0.73¹⁹ less optimal than the optimal tree). * `Boot`: Bootstrap supports (symmetric resampling, $p = 0.33$). * `Jack`: Jackknife supports ($p = 0.36$). Boot and Jack results are reported both as the frequency of splits among replicates, and using the `gc` (Groups Present / Contradicted) measure (Goloboff *et al.* 2003)
2. The number of quartets or partitions in total, the same, different, resolved in the estimated tree but not the generative tree (= 0), resolved in the generative tree but not the estimated tree
3. The number of the matrix, from 1 to 100.

Source

Congreve, C. R. & Lamsdell, J. C. (2016). Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. *Palaeontology* 59(3), 447–465. doi: [10.1111/pala.12236](https://doi.org/10.1111/pala.12236).

References

Goloboff, P. A., J. S. Farris, M. Källersjö, B. Oxelman, M. J. Ramírez, and C. A. Szumik. 2003. Improvements to resampling measures of group support. *Cladistics* 19, 324–332. doi: [10.1016/S07483007\(03\)000604](https://doi.org/10.1016/S07483007(03)000604).

See Also

[clMatrices](#), [clReferenceTree](#).

SplitsToPoints

Convert splits data to ternary-plottable points

Description

Convert splits data to ternary-plottable points

Usage

`SplitsToPoints(itemData)`

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