Package 'BTTL'

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Type Package

Title Bradley-Terry Transfer Learning

Version 1.0.0

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Description Implements the methodological developments found in Hermes, van Heerwaarden, and Behrouzi (2024) <doi:10.48550/arXiv.2408.10558>, and allows for the statistical modeling of multi-attribute pairwise comparison data.

License GPL-3

Encoding UTF-8

LazyData true

Depends R (>= 3.10)

NeedsCompilation no

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Repository CRAN

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bttl	*Bradley-Terry Transfer Learning*

Description

Contains the main function of this package that is used to estimate the parameter of interest α. The inner workings of the function are described in Hermes et al., (2024).

Usage

```
bttl(y, M, c_s)
```

Arguments

y	A list consisting of S matrices with each matrix containing pairwise comparisons across M objects. The first matrix in the list should contain the pairwise comparisons on the primary attribute. The other matrices should contain pairwise comparisons on the secondary attributes. The first column of each matrix should contain the preferred object (winner) and the second column should contain the non-preferred object (loser).
M	Total number of objects encountered across the pairwise comparisons.
c_s	Constant determining the strictness of the inclusion of attributes in the informative set. Smaller values lead to smaller S. We typically set this parameter equal to 1.

Value

alpha_est	A vector of length M that contains the parameter estimates $\hat{\alpha}$ for all objects in the data on the primary attribute.
S_hat	A vector containing the indices of attributes that are included in $\hat{S}$.

Author(s)

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References

1. Hermes, S., van Heerwaarden, J., and Behrouzi, P. (2024). Multi-Attribute Preferences: A Transfer Learning Approach. arXiv preprint, arXiv:2408.10558

Examples

```
# we first obtain the pairwise comparison data
y <- data(eba)

# now we can fit our model
result <- bttl(y, 13, 1)
```

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eba   *Pairwise comparison data*

Description

This is a real dataset containing pairwise preferences on 13 different eba varieties across eight attributes.

Usage

```
data("eba")
```

Format

A list with eight matrices. Each matrix consists of pairwise comparisons across one of the eight attributes. The first column contains the preferred object, whilst the second column contains the non-preferred object. In order of appearance, the matrices contain pairwise comparisons on the following attributes: consumer overall preference, color, odour, firmness, stretchability, taste, smoothness and mouldability.

Details

Contains the data used in the Hermes et al. (2024) paper.

Source

Data from the Hermes et al. (2024) paper is based on Olaosebikan et al. (2023).

References

1. Hermes, S., van Heerwaarden, J., and Behrouzi, P. (2024). Multi-Attribute Preferences: A Transfer Learning Approach. arXiv preprint, arXiv:2408.10558
2. Olaosebikan, O., A. Bello, K. De Sousa, R. Ndjouenkeu, M. Adesokan, E. Alamu, A. Agbona, J. Van Etten, F. N. K´egah, D. Dufour, et al. (2023). Drivers of consumer acceptability of cassava gari-eba food products across cultural and environmental settings using the triadic comparison of technologies approach (tricot). Journal of the Science of Food and Agriculture.

Examples

```
data(eba)
```

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