Package 'McMiso'

November 21, 2025

Type Package

Title Multicore Multivariable Isotonic Regression

Version 0.1.2

Description The goal of 'McMiso' is to provide functions for isotonic regression when there are multiple independent
variables. The functions solve the optimization problem using recursion and leverage parallel computing to improve
speed, and are useful for situations with relatively large number of covariates. The estimation method follows the
projective Bayes solution described in Cheung and Diaz (2023) <doi:10.1093/jrsssb/qkad014>.

Depends R (>= 4.0.0)

Imports dplyr, future (>= 1.33.0), stats

License GPL-3

Encoding UTF-8

RoxygenNote 7.3.2

NeedsCompilation no

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Repository CRAN

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Contents

miso *Fit Bayesian misclassification model (binary)*

Description

Fit Bayesian misclassification model (binary)

Usage

```
miso(X, y, incr = 0.01)
```

Arguments

X	numeric matrix
y	numeric response vector
incr	numeric, increment for threshold grid

Value

A list containing fitted parameters

References

Cheung YK, Diaz KM. Monotone response surface of multi-factor condition: estimation and Bayes classifiers. *J R Stat Soc Series B Stat Methodol.* 2023 Apr;85(2):497-522. doi: 10.1093/jrsssb/qkad014. Epub 2023 Mar 22. PMID: 38464683; PMCID: PMC10919322.

Examples

```
A <- as.matrix(expand.grid(rep(list(0:1), 6)))
set.seed(2025)
X <- A[sample(nrow(A),size=500, replace = TRUE),]
y <- as.numeric(rowSums(X)>=3)
miso(X,y)
```

PBclassifier *Probabilistic Bayesian classifier*

Description

Probabilistic Bayesian classifier

Usage

```
PBclassifier(X, y, method = "DU", a0 = 0.25, b0 = 0.25, t0 = 0.5)
```

Arguments

X	numeric matrix of doses
y	numeric response vector
method	character, either "DU" or "UD"
a0	numeric, prior alpha
b0	numeric, prior beta
t0	numeric, threshold

Value

A list with class "pbc"

References

Cheung YK, Diaz KM. Monotone response surface of multi-factor condition: estimation and Bayes classifiers. *J R Stat Soc Series B Stat Methodol.* 2023 Apr;85(2):497-522. doi: 10.1093/jrsssb/qkad014. Epub 2023 Mar 22. PMID: 38464683; PMCID: PMC10919322.

Examples

```
A <- as.matrix(expand.grid(rep(list(0:1), 6)))
set.seed(2025)
X <- A[sample(nrow(A),size=500, replace = TRUE),]
y <- as.numeric(rowSums(X)>=3)
PBclassifier(X,y)
```

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predict.pbc *S3 predict method for class "pbc"*

Description

S3 predict method for class "pbc"

Usage

```
## S3 method for class 'pbc'
predict(object, Xnew, ...)
```

Arguments

object	object of class "pbc"
Xnew	numeric matrix of inputs
...	additional arguments (not used)

Value

List containing predictions

Examples

```
A <- as.matrix(expand.grid(rep(list(0:1), 6)))
set.seed(2025)
X <- A[sample(nrow(A),size=500, replace = TRUE),]
y <- as.numeric(rowSums(X)>=3)
fit <- PBclassifier(X,y)
predict(fit,X)
```

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