Package ‘poisDoubleSamp’

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approxMargMLE

Description

Compute the marginal MLE of the ratio of two Poisson rates in a two-sample Poisson rate problem with misclassified data given fallible and infallible datasets.

Usage

approxMargMLE(data, N1, N2, N01, N02, l = 0, u = 1000, out = c("par", "all"), tol = 1e-10)

Arguments

data the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
N1 the opportunity size of group 1 for the fallible data
N2 the opportunity size of group 2 for the fallible data
N01 the opportunity size of group 1 for the infallible data
N02 the opportunity size of group 2 for the infallible data
l the lower end of the range of possible phi’s (for optim)
u the upper end of the range of possible phi’s (for optim)
out "par" or "all" (for the output of optim)
tol tolerance parameter for the rmle EM algorithm

Value

a named vector containing the marginal mle of phi

Examples

```r
## Not run:

# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)

fullMLE(data, N1, N2, N01, N02)
marginLE(data, N1, N2, N01, N02)
approxMargMLE(data, N1, N2, N01, N02)
```
approxMargMLECI

Compute the profile MLE CI of phi

Description
Compute the profile MLE confidence interval of the ratio of two Poisson rates in a two-sample Poisson rate problem with misclassified data given fallible and infallible datasets. This uses a C++ implementation of the EM algorithm.

Usage
approxMargMLECI(data, N1, N2, N01, N02, conf.level = 0.95, l = 0.001, u = 1000, tol = 1e-10)

Arguments
data the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
N1 the opportunity size of group 1 for the fallible data
N2 the opportunity size of group 2 for the fallible data
N01 the opportunity size of group 1 for the infallible data
N02 the opportunity size of group 2 for the infallible data
conf.level confidence level of the interval
l the lower end of the range of possible phi’s (for optim)
u the upper end of the range of possible phi’s (for optim)
tol tolerance used in the EM algorithm to declare convergence

Value
a named vector containing the marginal mle of phi
Examples

```r
## Not run:

# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)

waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)

# big example :
z11 <- 477; z12 <- 1025; N1 <- 16186;
z21 <- 255; z22 <- 1450; N2 <- 18811;
m011 <- 38; m012 <- 90; y01 <- 15; N01 <- 1500;
m021 <- 41; m022 <- 200; y02 <- 9; N02 <- 2500;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)

waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)
```

```r
## End(Not run)
```

---

**fullMLE**  
*Compute the full MLEs*

**Description**

Compute the MLEs of a two-sample Poisson rate problem with misclassified data given fallible and infallible datasets.

**Usage**

`fullMLE(data, N1, N2, N01, N02)`

**Arguments**

- `data`  
  the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
margMLE

N1 the opportunity size of group 1 for the fallible data
N2 the opportunity size of group 2 for the fallible data
N01 the opportunity size of group 1 for the infallible data
N02 the opportunity size of group 2 for the infallible data

Details

These are the closed-form expressions for the MLEs.

Value

a named vector containing the mles of each of the parameters (phi, la12, la21, la22, th1, and th2)

Examples

```r
## Not run:

# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
fullmle(data, N1, N2, N01, N02)

# big example:
z11 <- 477; z12 <- 1025; N1 <- 16186;
z21 <- 255; z22 <- 1450; N2 <- 18811;
m011 <- 38; m012 <- 90; y01 <- 15; N01 <- 1500;
m021 <- 41; m022 <- 200; y02 <- 9; N02 <- 2500;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
fullmle(data, N1, N2, N01, N02)

## End(Not run)
```

margMLE

Compute the marginal MLE of phi

Description

Compute the marginal MLE of the ratio of two Poisson rates in a two-sample Poisson rate problem with misclassified data given fallible and infallible datasets.
Usage

margMLE(data, N1, N2, N01, N02, l = 0.001, u = 1000, out = c("par", "all"))

Arguments

data  the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
N1  the opportunity size of group 1 for the fallible data
N2  the opportunity size of group 2 for the fallible data
N01  the opportunity size of group 1 for the infallible data
N02  the opportunity size of group 2 for the infallible data
l  the lower end of the range of possible phi’s (for optim)
u  the upper end of the range of possible phi’s (for optim)
out  "par" or "all" (for the output of optim)

Value

a named vector containing the marginal mle of phi

Examples

## Not run:

# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
fullMLE(data, N1, N2, N01, N02)
margMLE(data, N1, N2, N01, N02)

# big example :
z11 <- 477; z12 <- 1025; N1 <- 16186;
z21 <- 255; z22 <- 1450; N2 <- 18811;
m011 <- 38; m012 <- 90; y01 <- 15; N01 <- 1500;
m021 <- 41; m022 <- 200; y02 <- 9; N02 <- 2500;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
fullMLE(data, N1, N2, N01, N02)
margMLE(data, N1, N2, N01, N02)
Compute the marginal MLE confidence interval for the phi

Description
Compute the marginal MLE confidence interval of the ratio of two Poisson rates in a two-sample Poisson rate problem with misclassified data given fallible and infallible datasets.

Usage
margMLECI(data, N1, N2, N01, N02, conf.level = 0.95, l = 1e-10, u = 1e+10)

Arguments
data the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
N1 the opportunity size of group 1 for the fallible data
N2 the opportunity size of group 2 for the fallible data
N01 the opportunity size of group 1 for the infallible data
N02 the opportunity size of group 2 for the infallible data
conf.level confidence level of the interval
l the lower end of the range of possible phi’s (for optim)
u the upper end of the range of possible phi’s (for optim)

Value
a named vector containing the lower and upper bounds of the confidence interval

Examples
## Not run:

```
# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)
```
# big example:
z11 <- 477; z12 <- 1025; N1 <- 16186;
z21 <- 255; z22 <- 1450; N2 <- 18811;
m011 <- 38; m012 <- 90; y01 <- 15; N01 <- 1500;
m021 <- 41; m022 <- 200; y02 <- 9; N02 <- 2500;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)

waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)

## End(Not run)

---

### poisDoubleSamp

**poisDoubleSamp**

*Confidence intervals with Poisson double sampling*

#### Description

Functions to create confidence intervals for ratios of Poisson rates under misclassification using double sampling.

#### profMLECI

**Compute the profile MLE CI of phi**

#### Description

Compute the profile MLE confidence interval of the ratio of two Poisson rates in a two-sample Poisson rate problem with misclassified data given fallible and infallible datasets. This uses a C++ implementation of the EM algorithm.

#### Usage

```r
profMLECI(data, N1, N2, N01, N02, conf.level = 0.95, l = 0.001, u = 1000, tol = 1e-10)
```

#### Arguments

- **data**: the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
- **N1**: the opportunity size of group 1 for the fallible data
- **N2**: the opportunity size of group 2 for the fallible data
profMLECI

N01 the opportunity size of group 1 for the infallible data
N02 the opportunity size of group 2 for the infallible data
cnf.level confidence level of the interval
l the lower end of the range of possible phi’s (for optim)
u the upper end of the range of possible phi’s (for optim)
tol tolerance used in the EM algorithm to declare convergence

Value

a named vector containing the marginal mle of phi

Examples

```r
## Not run:

# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)

# big example :
z11 <- 477; z12 <- 1025; N1 <- 16186;
z21 <- 255; z22 <- 1450; N2 <- 18811;
m011 <- 38; m012 <- 90; y01 <- 15; N01 <- 1500;
m021 <- 41; m022 <- 200; y02 <- 9; N02 <- 2500;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)

## End(Not run)
```
Compute the Wald confidence interval of a two-sample Poisson rate with misclassified data given fallible and infallible datasets.

Usage

waldCI(data, N1, N2, N01, N02, conf.level = 0.95)

Arguments

data | the vector of counts of the fallible data (z11, z12, z21, z22) followed by the infallible data (m011, m012, m021, m022, y01, y02)
N1 | the opportunity size of group 1 for the fallible data
N2 | the opportunity size of group 2 for the fallible data
N01 | the opportunity size of group 1 for the infallible data
N02 | the opportunity size of group 2 for the infallible data
conf.level | confidence level of the interval

Value

a named vector containing the lower and upper bounds of the confidence interval

Examples

## Not run:

```r
# small example
z11 <- 34; z12 <- 35; N1 <- 10;
z21 <- 22; z22 <- 31; N2 <- 10;
m011 <- 9; m012 <- 1; y01 <- 3; N01 <- 3;
m021 <- 8; m022 <- 8; y02 <- 2; N02 <- 3;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)
waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)

# big example :
z11 <- 477; z12 <- 1025; N1 <- 16186;
z21 <- 255; z22 <- 1450; N2 <- 18811;
m011 <- 38; m012 <- 90; y01 <- 15; N01 <- 1500;
```
waldCI

m021 <- 41; m022 <- 200; y02 <- 9; N02 <- 2500;
data <- c(z11, z12, z21, z22, m011, m012, m021, m022, y01, y02)

waldCI(data, N1, N2, N01, N02)
margMLECI(data, N1, N2, N01, N02)
profMLECI(data, N1, N2, N01, N02)
approxMargMLECI(data, N1, N2, N01, N02)

## End(Not run)
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