Package 'LIMBARE'

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Type Package

Title LIMBARE: an Advanced Linear Mixed-effects Breakpoint Analysis with Robust Estimation Method

Version 0.1.0

Maintainer TingFang Lee <Ting-Fang.Lee@nyulangone.org>

Description LIMBARE is an advanced linear mixed-effects breakpoint analysis with robust estimation, especially designed for longitudinal studies which accommodates repeated measurements, and effectively address the presence of outliers.

Depends segmented, dplyr, nlme, ggplot2

License `use_mit_license()`

Encoding UTF-8

LazyData true

RoxygenNote 7.3.1

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

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limbare *limbare*

Description

Description A robust method to estimate breakpoints on longitudinal studies. This method combined with least trimmed squared technique to accommodate outliers in the dataset. Fits linear mixed models with piece-wise relationships between response and one or more covariates.

Usage

```
limbare(mixed.model, alpha, seg.Z, npsi, tol, max.iter)
```

Arguments

mixed.model	linear mixed effects model of class "lme".
alpha	percentage of data after trimming
seg.Z	the segmented variable(s), i.e. the continuous covariate(s) which have a piecewise linear relationship with the response variable. It is a formula with no response variable, such as seg.Z=~x or seg.Z=~x1+x2.
npsi	A named vector or list meaning the number (and not locations) of breakpoints to be estimated.
tol	tolerance level
max.iter	max number of iterations

Details

Details

Examples

```
obs_data=sample_data

mixed.model=lme(y~x+duration, random = ~1|Subject_ID/Eye, data=obs_data, na.action = na.omit)
model=limbare(mixed.model, seg.Z = ~x, npsi=list(x=1), alpha=0.9, tol = 0.005, max.iter = 200)

model$psi
summary(model$model)
```

plot.limbare *plot.limbare*

Description

Description

Usage

```
## S3 method for class 'limbare'
plot(
  model,
  seg.Z,
  intercept = 0,
  break.point = FALSE,
  break.point.CI = FALSE,
  ...
)
```

Arguments

model	limbare model object
seg.Z	the segmented variable(s), i.e. the continuous covariate(s) which have a piece-wise linear relationship with the response variable. It is a formula with no response variable, such as seg.Z=~x.
intercept	a constant to adjust the piece-wise lines vertically. Default is 0.
...	some settings for this generic require additional arguments.
breakpoint	If TRUE, a vertical line to indicate the estimated breakpoints will be presented. Default is FALSE.
breakpoint.CI	If TRUE, two vertical lines to indicate the 95 of the estimated breakpoints will be presented. Default is FALSE.

Details

Details

Examples

```
plot.limbare(model, seg.Z = ~x, intercept = 50, break.point = T,
             break.point.CI = T, color = "red")+
  geom_point(data=obs_data, aes(x, y), color = "red")+
  geom_point(data = model$data, aes(x, y))
```

---

sample_data *Simulated sample data*

Description

Simulated data that contains 50 subjects and 60 measurements from both eyes in which each eye had 3 or 4 repeated measurements with 3 The true breakpoints were set at -4, and slopes 1, and 3.

Usage

```
data(sample_data)
```

Format

An object of class "cross"; see read.cross.

Source

Simulated

References

Simulation

Examples

```
data(sample_data)
```

`slope` *slope*

Description

Description Returns the estimated slopes and standard errors of each segment.

Usage

```
slope(model, seg.Z)
```

Arguments

`model`	limbare model object
`seg.Z`	the segmented variable(s), i.e. the continuous covariate(s) which have a piecewise linear relationship with the response variable. It is a formula with no response variable, such as seg.Z=~x.

Details

Details

Examples

```
slope(model = model, seg.Z = ~x)
```

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