

Package ‘glmm.hp’

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Type Package

Title Hierarchical Partitioning of Marginal R2 for Generalized Mixed-Effect Models

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Depends R (>= 3.4.0),MuMIn,ggplot2,vegan

Imports lme4

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Description Conducts hierarchical partitioning to calculate individual contributions of each predictor (fixed effects) towards marginal R2 for generalized linear mixed-effect model (including lm, glm and glmm) based on output of r.squaredGLMM() in 'MuMIn', applying the algorithm of Lai J.,Zou Y., Zhang S.,Zhang X.,Mao L.(2022)glmm.hp: an R package for computing individual effect of predictors in generalized linear mixed models.Journal of Plant Ecology,15(6)1302-1307<doi:10.1093/jpe/rtac096>.

License GPL

Encoding UTF-8

URL <https://github.com/laijiangshan/glmm.hp>

RoxygenNote 7.3.1

NeedsCompilation no

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Description

Hierarchical Partitioning of Marginal R2 for Generalized Mixed-Effect Models

Usage

```
glmm.hp(mod, iv = NULL, type = "adjR2", commonality = FALSE)
```

Arguments

mod	Fitted lme4, nlme, glmmTMB, glm or lm model objects.
iv	optional The relative importance of predictor groups will be assessed. The input for iv should be a list, where each element contains the names of variables belonging to a specific group. These variable names must correspond to the predictor variables defined in the model (mod).
type	The type of R-square of lm, either "R2" or "adjR2", in which "R2" is unadjusted R-square and "adjR2" is adjusted R-square, the default is "adjR2". The adjusted R-square is calculated using Ezekiel's formula (Ezekiel 1930) for lm.
commonality	Logical; If TRUE, the result of commonality analysis (2^{N-1} fractions for N predictors) is shown, the default is FALSE.

Details

This function conducts hierarchical partitioning to calculate the individual contributions of each predictor towards total (marginal) R2 for Generalized Linear Mixed-effect Model (including lm, glm and glmm). The marginal R2 is the output of r.squaredGLMM in MuMIn package for glm and glmm.

Value

r.squaredGLMM	The R2 for the full model.
commonality.analysis	If commonality=TRUE, a matrix containing the value and percentage of all commonality (2^{N-1} for N predictors or matrices).
hierarchical.partitioning	A matrix containing individual effects and percentage of individual effects towards total (marginal) R2 for each predictor.

Author(s)

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References

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- Nakagawa, S., & Schielzeth, H. (2013). A general and simple method for obtaining R2 from generalized linear mixed-effects models. Methods in Ecology and Evolution, 4(2), 133-142.
- Nakagawa, S., Johnson, P. C., & Schielzeth, H. (2017). The coefficient of determination R2 and intra-class correlation coefficient from generalized linear mixed-effects models revisited and expanded. Journal of the Royal Society Interface, 14(134), 20170213.
- Ezekiel, M. (1930) Methods of Correlational Analysis. Wiley, New York.

Examples

```
library(MuMIn)
library(lme4)
mod1 <- lmer(Sepal.Length ~ Petal.Length + Petal.Width+(1|Species),data = iris)
r.squaredGLMM(mod1)
glmm.hp(mod1)
a <- glmm.hp(mod1)
plot(a)
mod2 <- glm(Sepal.Length ~ Petal.Length + Petal.Width, data = iris)
r.squaredGLMM(mod2)
glmm.hp(mod2)
b <- glmm.hp(mod2)
plot(b)
plot(glmm.hp(mod2))
mod3 <- lm(Sepal.Length ~ Petal.Length + Petal.Width + Petal.Length:Petal.Width, data = iris)
glmm.hp(mod3,type="R2")
glmm.hp(mod3,commonality=TRUE)
mod4 <- lm(Sepal.Length ~ Petal.Length + Petal.Width + Sepal.Width, data = iris)
iv=list(pred1="Sepal.Width",pred2=c("Petal.Length","Petal.Width"))
glmm.hp(mod4,iv)
```

`plot.glmhnp`*Plot for a `glmm.hp` object*

Description

Plot for a `glmm.hp` object

Usage

```
## S3 method for class 'glmmhp'  
plot(x, plot.perc = FALSE, color = NULL, n = 1, dig = 4, ...)
```

Arguments

<code>x</code>	A <code>glmm.hp</code> object.
<code>plot.perc</code>	Logical; if TRUE, the bar plot (based on <code>ggplot2</code> package) of the percentage to individual effects of variables or groups towards total explained variation, the default is FALSE to show plot with original individual effects.
<code>color</code>	Color of variables.
<code>n</code>	Integer; which marginal R2 in output of <code>r.squaredGLMM</code> to plot.
<code>dig</code>	Integer; number of decimal places in Venn diagram.
<code>...</code>	unused

Value

a `ggplot` object

Author(s)

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Examples

```
library(MuMIn)  
library(lme4)  
mod1 <- lmer(Sepal.Length ~ Petal.Length + Petal.Width +(1 | Species), data = iris)  
a <- glmm.hp(mod1)  
plot(a)  
mod3 <- lm(Sepal.Length ~ Petal.Length+Petal.Width,data = iris)  
plot(glmm.hp(mod3,type="R2"))  
plot(glmm.hp(mod3,commonality=TRUE),color = c("#8DD3C7", "#FFFB3"))
```

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