

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

Maintainer Jiangshan Lai <lai@njfu.edu.cn>

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>

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NeedsCompilation no

Author Jiangshan Lai [aut, cre] (<<https://orcid.org/0000-0002-0279-8816>>),
Kim Nimon [aut]

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glmm.hp	<i>Hierarchical Partitioning of Marginal R2 for Generalized Mixed-Effect Models</i>
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Description

Hierarchical Partitioning of Marginal R2 for Generalized Mixed-Effect Models

Usage

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

Arguments

mod	Fitted lme4, nlme, glmmTMB, glm or lm model objects.
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.
hierarchical.partitioning	A matrix containing individual effects and percentage of individual effects towards total (marginal) R2 for each predictor.

Author(s)

Jiangshan Lai <lai@njfu.edu.cn>

References

- Lai J., Zhu W., Cui D., Mao L. (2023) Extension of the glmm.hp package to Zero-Inflated generalized linear mixed models and multiple regression. *Journal of Plant Ecology*, 16(6):rtad038 <DOI:10.1093/jpe/rtad038>
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- Lai J., Zou Y., Zhang J., Peres-Neto P. (2022) Generalizing hierarchical and variation partitioning in multiple regression and canonical analyses using the rdacca.hp R package. *Methods in Ecology and Evolution*, 13(4):782-788 <DOI:10.1111/2041-210X.13800>
- Chevan, A. & Sutherland, M. (1991). Hierarchical partitioning. *American Statistician*, 45, 90-96. doi:10.1080/00031305.1991.10475776
- Nimon, K., Oswald, F.L. & Roberts, J.K. (2013). Yhat: Interpreting regression effects. R package version 2.0.0.
- 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)
```

plot.glmhnp

Plot for a [glmm.hp](#) object

Description

Plot for a [glmm.hp](#) object

Usage

```
## S3 method for class 'glmhnp'
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)

Jiangshan Lai <lai@njfu.edu.cn>

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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