Package: mvtweedie (via r-universe)

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Type Package

Title Fit multivariate logit Tweedie model using mgcv or glmmTMB

Version 1.1.0

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Description Defines predict function that transforms output from a Tweedie GLM fitted using mgcv or glmmTMB, and returns predictions of an equivalent multivariate logit Tweedie model. This can then be used for standard plotting and diagnostics.

Suggests ggplot2

Enhances mgcv, glmmTMB

License GPL-3

RoxygenNote 7.1.1

Depends R (>= 2.10)

Repository https://james-thorson-noaa.r-universe.dev

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Contents

Middleton_Island_TUPU *Data to demonstrate and test multivariate logit Tweedie model*

Description

Data sufficient to demonstrate how to use a Tweedie GLM to provide inference about proportions e.g. in food habits analysis, where the model output is processed to represent a multivariate logit Tweedie model.

Usage

```
data(Middleton_Island_TUPU)
```

Details

Specifically includes Tufted Puffin bill loads sampled at Middleton Island.

- `Response` Numeric prey biomass in bill load samples
- `Year` Numeric year
- `group` factor representing prey species or category
- `SampleID` factor with a level for every sampling occasion, e.g., for use in row normalization

Author(s)

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predict.mvtweedie *Predict proportions for new data*

Description

Predict proportions and associated standard errors using a standard S3 object interface

Usage

```
## S3 method for class 'mvtweedie'
predict(
  x,
  category_name = "group",
  newdata,
  origdata = x$frame,
  se.fit = FALSE
)
```

Arguments

x	output from gam or glmmTMB, but with class(x)=c("mvtweedie",...) where ... indicates the original values for class(x)
category_name	name of column that indicates grouping variable
newdata	An optional data frame in which to look for variables with which to predict. If omitted, the fitted values are used.
origdata	original data used when fitting
se.fit	A switch indicating if standard errors are required.

Details

A Tweedie GLM using a log-link and multiple categories can be transformed to yield predicted proportions and associated SEs, where the model is interpreted as a multivariate logit Tweedie distribution. This function does this transformation for a model fitted using:

- A generalized additive model (GAM) using gam
- A generalized linear mixed model (GLMM) using glmmTMB

It then also calculates an approximation to the standard error for this proportion

Examples

```
## Not run:
# Load packages
library(mvtweedie)

# load data set
data( Middleton_Island_TUPU, package="mvtweedie" )
DF = Middleton_Island_TUPU

# Run Tweedie GLM
gam0 = gam( formula = Response ~ 0 + group, data = DF, family = tw )

# Inspect results
class(gam0) = c( "mvtweedie", class(gam0) )
predict(gam0, se.fit=TRUE, origdata = DF)

## End(Not run)
```

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predict_mvtweedie *Get predictions from a multivariate logit interpretation of a Tweedie GLM*

Description

It returns a tibble with predicted proportions from a Tweedie GAM model.

Usage

```
predict_mvtweedie(
  model,
  exclude_terms = NULL,
  length_out = 50,
  values = NULL,
  ...
)
```

Details

The created tibble can then be plotted using `ggplot2`

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