

Package ‘splineplot’

May 9, 2026

Type Package

Title Visualization of Spline Effects in GAM and GLM Models

Version 0.3.0

Date 2026-03-29

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Description Creates 'ggplot2'-based visualizations of smooth effects from GAM (Generalized Additive Models) fitted with 'mgcv' and spline effects from GLM (Generalized Linear Models). Supports survey-weighted models ('svyglm', 'svycoxph') from the 'survey' package, interaction terms, and provides hazard ratio plots with histograms for survival analysis. Wood (2017, ISBN:9781498728331) provides comprehensive methodology for generalized additive models.

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Encoding UTF-8

Imports ggplot2 (>= 3.0.0), splines, stats

Suggests mgcv, survival, survey, testthat (>= 3.0.0), knitr, rmarkdown, covr, pkgdown

RoxygenNote 7.3.3

VignetteBuilder knitr

URL <https://github.com/jinseob2kim/splineplot>,
<https://jinseob2kim.github.io/splineplot/>

BugReports <https://github.com/jinseob2kim/splineplot/issues>

Config/testthat/edition 3

NeedsCompilation no

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Repository CRAN

Date/Publication 2026-03-30 09:40:02 UTC

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extract_spline_data	<i>Extract Spline Data</i>
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Description

Extract predictions and confidence intervals from fitted models

Usage

```
extract_spline_data(
  fit,
  data,
  xvar,
  refx,
  model_info,
  term_index = 1,
  log_scale = FALSE,
  ci_level = 0.95
)
```

Arguments

fit	Fitted model object
data	Data frame
xvar	Variable name
refx	Reference value
model_info	Model information list
term_index	Which smooth term to use (for multiple s() terms)
log_scale	Whether to use log scale
ci_level	Confidence level

Value

Data frame with predictions

Examples

```
# Create sample data
set.seed(123)
n <- 100
x <- rnorm(n, mean = 50, sd = 10)
y <- rbinom(n, 1, plogis(-0.05*(x - 50)))
dat <- data.frame(x = x, y = y)

# Fit GLM with splines
library(splines)
fit <- glm(y ~ ns(x, df = 4), family = binomial(), data = dat)

# Extract spline data
model_info <- list(type = "glm", family = "binomial", ylabel = "Odds Ratio")
df <- extract_spline_data(fit, dat, "x", refx = 50, model_info,
                          log_scale = FALSE, ci_level = 0.95)

head(df)
```

splineplot

Spline Plot for GAM and GLM Models

Description

Create ggplot2 visualizations of smooth or spline effects from GAM and GLM models. Supports Linear, Logistic, Poisson, and Cox models with interaction terms. Handles GAM smooth terms (s(), te(), ti()), GLM splines (ns(), bs()), and Cox pspline().

Usage

```
splineplot(
  fit,
  data,
  xvar = NULL,
  by_var = NULL,
  refx = NULL,
  term_index = 1,
  bins = 12,
  xlim = NULL,
  ylim = NULL,
  show_hist = NULL,
  log_scale = FALSE,
  ci_level = 0.95,
  show_ref_point = TRUE,
  colors = NULL,
  ribbon_ci = FALSE,
  xlab = NULL,
  ylab = NULL,
```

```
  ylab_right = "Percent of Population"
)
```

Arguments

fit	A fitted model object (gam, glm, lm, coxph, svyglm, svycoxph)
data	The data frame used to fit the model
xvar	Character string specifying the variable name for x-axis (default: first spline term)
by_var	Character string specifying the interaction variable (default: auto-detect from model)
refx	Reference value for the x variable (default: median)
term_index	For GAM with multiple smooth terms, which term to plot (default: 1)
bins	Number of bins for histogram (default: 12)
xlim	X-axis limits (default: range of x variable)
ylim	Y-axis limits (default: auto-determined, e.g., c(0.25, 2.0) for HR/OR/RR)
show_hist	Logical, whether to show histogram (default: TRUE)
log_scale	Logical, whether to use log scale for OR/RR/HR (default: FALSE)
ci_level	Confidence interval level (default: 0.95)
show_ref_point	Logical, whether to show reference point marker (default: TRUE)
colors	Named vector of colors for by_var levels
ribbon_ci	Logical, whether to use ribbon style for CI (default: FALSE, uses dotted lines)
xlab	Custom x-axis label (default: xvar name)
ylab	Custom y-axis label (default: auto-determined based on model type)
ylab_right	Custom right y-axis label for histogram (default: "Percent of Population")

Value

A ggplot2 object

Examples

```
# Create sample data
set.seed(123)
n <- 200
x <- rnorm(n, mean = 50, sd = 10)
lp <- -0.05*(x - 50) + 0.001*(x - 50)^2
y <- rbinom(n, 1, plogis(lp))
dat <- data.frame(x = x, y = y)

# GLM with natural splines
library(splines)
fit_glm <- glm(y ~ ns(x, df = 4), family = binomial(), data = dat)
p <- splineplot(fit_glm, dat)
```

```
# GAM example (requires mgcv)
if (requireNamespace("mgcv", quietly = TRUE)) {
  fit_gam <- mgcv::gam(y ~ s(x), family = binomial(), data = dat)
  p2 <- splineplot(fit_gam, dat)
}

# Cox model example (requires survival)
if (requireNamespace("survival", quietly = TRUE)) {
  time <- rexp(n, rate = exp(lp/2))
  status <- rbinom(n, 1, 0.8)
  dat$time <- time
  dat$status <- status
  fit_cox <- survival::coxph(survival::Surv(time, status) ~ ns(x, df = 4),
    data = dat)
  p3 <- splineplot(fit_cox, dat)
}
```

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