

Package: blendR (via r-universe)

March 5, 2025

Title Blended Survival Curves

Version 1.0.0

Description Create blended survival curves, see 'Che et al.' (2022)

<[doi:10.1177/0272989X221134545](https://doi.org/10.1177/0272989X221134545)>.

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Imports INLA, dplyr, flexsurv, ggplot2, manipulate, sn, survHE, tibble

Depends R (>= 4.4.0)

Suggests knitr, rlang, rmarkdown, remotes, survival, testthat (>= 3.0.0)

VignetteBuilder knitr

Additional_repositories <https://inla.r-inla-download.org/R/stable/>

URL <https://github.com/StatisticsHealthEconomics/blendR/>,

<https://StatisticsHealthEconomics.github.io/blendR/>,

<https://github.com/StatisticsHealthEconomics/blendR/>

BugReports <https://github.com/StatisticsHealthEconomics/blendR/issues/>

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Repository <https://n8thangreen.r-universe.dev>

RemoteUrl <https://github.com/StatisticsHealthEconomics/blendR>

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Contents

blendsurv	2
dat_FCR	3
ext_surv_sim	3
fit_inla_pw	4
make_surv_methods	5
manip_plot	6
plot.blended	7
weightplot	8
Index	9

blendsurv	<i>Blended survival object</i>
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Description

This is the main function in the **blendR** package. Two survival curves are supplied and blended according to the blending distribution characterised by the blending interval and the beta distribution parameters.

Usage

```
blendsurv(
  obs_Surv,
  ext_Surv,
  blend_interv,
  beta_params = list(alpha = 3, beta = 3),
  times = NULL,
  nsim = 100
)
```

Arguments

obs_Surv, ext_Surv	Observed and external data survival curves. These can come from survHE , INLA or flexsurv fits.
blend_interv	Maximum and minimum values for the blending interval.
beta_params	coefficients of a beta distribution
times	A vector of times for which the survival curves are to be computed; optional
nsim	The number of simulations from the distribution of the survival curves; default 100

Value

List of S for observed, external and blended curves.

Examples

```

library(survHE)

## trial data
data("TA174_FCR", package = "blendR")

## externally estimated data
data_sim <- ext_surv_sim(t_info = 144,
                        S_info = 0.05,
                        T_max = 180)

obs_Surv <- fit.models(formula = Surv(death_t, death) ~ 1,
                      data = dat_FCR,
                      distr = "exponential",
                      method = "hmc")

ext_Surv <- fit.models(formula = Surv(time, event) ~ 1,
                      data = data_sim,
                      distr = "exponential",
                      method = "hmc")

blend_interv <- list(min = 48, max = 150)
beta_params <- list(alpha = 3, beta = 3)

ble_Surv <- blendsurv(obs_Surv, ext_Surv, blend_interv, beta_params)

plot(ble_Surv)

```

dat_FCR

Survival data

Description

Survival data

ext_surv_sim

Create an external survival data based on expert opinion

Description

Generally, the sampling is done in two steps

$$p(T) = p(T|intervali)p(intervali)$$

Usage

```
ext_surv_sim(t_info, S_info, T_max, n = 100)
```

Arguments

t_info	A vector of times for which expert opinion is elicited
S_info	A vector of mean survival probabilities estimated by experts corresponding to time points in t_info
T_max	The maximum survival time to be used
n	The number of patients to construct the artificial external data set; default 100

Details

In particular $T U(x_i, x_{i+1})$ *i multinomial*($\hat{\pi}$)

Value

Dataframe of times and censoring status

Examples

```
dat <- ext_surv_sim(t_info = c(10,20,50),
                  S_info = c(0.9, 0.8, 0.2),
                  T_max = 100, n = 100)
if (require(survival)) {
  km_fit <- survfit(Surv(time, event) ~ 1, data = dat)
  plot(km_fit)
}
```

fit_inla_pw	<i>Generate survival estimates with a piecewise exponential Cox model (using INLA)</i>
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Description

Generate survival estimates with a piecewise exponential Cox model (using INLA)

Usage

```
fit_inla_pw(
  inla.formula = inla.surv(death_t, death) ~ -1,
  data,
  cutpoints,
  nsim = 100,
  ...
)
```

Arguments

`inla.formula` The formula for PEM which must be an `inla.surv` object
`data` A dataframe for survival data with time (`death_t`) and event (`death`)
`cutpoints` A sequence of cut points for intervals in the baseline hazard
`nsim` The number of simulations from posteriors; default 100
`...` Additional arguments

Value

INLA object

Examples

```

## Not run:
data("TA174_FCR", package = "blendR")
head(dat_FCR)

obs_Surv <- fit_inla_pw(data = dat_FCR, cutpoints = seq(0, 180, by = 5))

## End(Not run)

```

make_surv_methods *Create survival probabilities*

Description

These function are version of the `survHE::make.surv()` function from **survHE**. These are needed prior to blending.

Usage

```

make_surv(Surv, ...)

## S3 method for class 'survHE'
make_surv(Surv, t, nsim = 100, ...)

## S3 method for class 'flexsurvreg'
make_surv(Surv, t = NULL, nsim = 100, ...)

## S3 method for class 'inla'
make_surv(Surv, t = NULL, nsim = 100, ...)

## Default S3 method:
make_surv(Surv, t = NULL, nsim = 100, ...)

```

Arguments

Surv	survival analysis object
...	Additional arguments
t	Time points; vector
nsim	Number of simulations; integer

Value

matrix of survival probabilities

Examples

```
library(survHE)

## trial data
data("TA174_FCR", package = "blendR")

## externally estimated data
data_sim <- ext_surv_sim(t_info = 144,
                        S_info = 0.05,
                        T_max = 180)

ext_Surv <- fit.models(formula = Surv(time, event) ~ 1,
                      data = data_sim,
                      distr = "exponential",
                      method = "hmc")

S_ext <- make_surv(ext_Surv, t = 1:100, nsim = 100)
```

manip_plot

Blended survival plot with manipulate

Description

RStudio bug need to run base R first `manipulate(plot(1:x), x = slider(5, 10))`

Usage

```
manip_plot(obs_Surv, ext_Surv, blend_interv)
```

Arguments

obs_Surv	Observed survival
ext_Surv	External survival
blend_interv	Blending interval

Value

Blended survival plot

plot.blended	<i>Blended survival curve based on short-term data and external information</i>
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Description

Blended survival curve based on short-term data and external information

Usage

```
## S3 method for class 'blended'
plot(x, alpha = c(0.1, 0.05), ...)
```

Arguments

x	A blended survival curve object obtain from blendsurv()
alpha	A vector specifying the opacity of ribbon for the blended curve and other curves
...	Additional arguments

Value

ggplot2 object

See Also

[blendsurv\(\)](#)

Examples

```
library(survHE)

## trial data
data("TA174_FCR", package = "blendR")

## externally estimated data
data_sim <- ext_surv_sim(t_info = 144,
                        S_info = 0.05,
                        T_max = 180)

obs_Surv <- fit.models(formula = Surv(death_t, death) ~ 1,
                      data = dat_FCR,
                      distr = "exponential",
                      method = "hmc")

ext_Surv <- fit.models(formula = Surv(time, event) ~ 1,
```

```
      data = data_sim,  
      distr = "exponential",  
      method = "hmc")  
  
blend_interv <- list(min = 48, max = 150)  
beta_params <- list(alpha = 3, beta = 3)  
  
ble_Surv <- blendsurv(obs_Surv, ext_Surv, blend_interv, beta_params)  
  
plot(ble_Surv)
```

weightplot

Plots the weights for the blending procedure

Description

Plots the weights for the blending procedure

Usage

```
weightplot(x, ...)
```

Arguments

x	A blended survival curve object obtained from blendsurv()
...	Additional arguments

Value

ggplot2 object

See Also

[blendsurv\(\)](#)

Index

* datasets

dat_FCR, 3

blendsurv, 2

blendsurv(), 7, 8

dat_FCR, 3

ext_surv_sim, 3

fit_inla_pw, 4

make_surv (make_surv_methods), 5

make_surv_methods, 5

manip_plot, 6

plot.blended, 7

survHE::make_surv(), 5

weightplot, 8