Package: CoxRMSTSimpson (via r-universe)

October 23, 2026

Title Restricted Mean Survival Time from Cox Models

Version 0.1.0

Description Calculates restricted mean survival time from predicted Cox proportional hazards survival curves using composite Simpson's rule and provides plots with shaded areas under the survival curves. Includes simulated survival data for reproducible examples.

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Depends R (>= 4.1.0)

Imports survival, graphics, grDevices, stats

Suggests testthat (>= 3.0.0)

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Repository https://fordeia.r-universe.dev

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cox_rmst — *Calculate RMST from a Cox Model*

Description

Predicts survival curves for supplied covariate profiles and calculates their RMST using Simpson's rule.

Usage

```
cox_rmst(fit, newdata, tau, n_grid = 101)
```

Arguments

`fit`	A fitted survival::coxph model.
`newdata`	Data frame of covariate profiles. Each row defines one survival curve.
`tau`	Positive restriction time.
`n_grid`	Odd number of equally spaced grid points.

Value

An object of class "cox_rmst" containing survival curves, RMST estimates, the fitted model, and the time grid.

plot_cox_rmst — *Plot Cox Survival Curves with Shaded RMST Areas*

Description

Plot Cox Survival Curves with Shaded RMST Areas

Usage

```
plot_cox_rmst(x, colors = NULL, alpha = 0.2, legend_position = "topright", ...)
```

Arguments

`x`	An object returned by cox_rmst().
`colors`	Colors for the survival curves.
`alpha`	Transparency for shaded areas, between 0 and 1.
`legend_position`	Position passed to graphics::legend().
`...`	Additional arguments reserved for future methods.

Value

Invisibly returns x.

simpson_rmst — *Integrate a Survival Curve Using Simpson's Rule*

Description

Calculates the area under a survival curve using composite Simpson's 1/3 rule.

Usage

```
simpson_rmst(t, S)
```

Arguments

t	Equally spaced, increasing time points.
S	Survival probabilities corresponding to t.

Value

A numeric scalar representing the integrated area.

simulate_survival_data — *Simulate Survival Data Under a Proportional Hazards Model*

Description

Simulate Survival Data Under a Proportional Hazards Model

Usage

```
simulate_survival_data(
  n = 200,
  beta = 0.7,
  lambda = 0.03,
  censor_rate = 0.005,
  seed = NULL
)
```

Arguments

n	Number of subjects.
beta	True regression coefficient for X.
lambda	Baseline exponential hazard rate.
censor_rate	Independent exponential censoring rate.
seed	Optional random seed.

Value

A data frame with time, status, and X.

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