Package 'fastrerandomize'

September 26, 2023

Title fastrerandomize: R Package for Ultra-fast Re-randomization Using a JAX Backend

Version 0.1

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Description An R Package for Ultra-fast Re-randomization Using a JAX Backend

Depends R (>= 3.3.3)

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Encoding UTF-8

LazyData false

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Imports reticulate

RoxygenNote 7.2.3

R topics documented:

`GenerateCausalData` *This function generates simulated causal data based on specified parameters.*

Description

This function generates simulated causal data based on specified parameters.

Usage

```
GenerateCausalData(n_units)
```

Arguments

n_units	A numeric value specifying the total number of units in the sample.
proportion_treated	A numeric value between 0 and 1 indicating the proportion of units that receive treatment.
k_covars	A numeric value indicating the number of covariates to be generated.
rho	A numeric value representing the correlation coefficient.
SD_inherent	A numeric value indicating the standard deviation inherent to the data.
treatment_effect_mean	A numeric value representing the mean of the treatment effect.
treatment_effect_SD	A numeric value indicating the standard deviation of the treatment effect.
covariates_SD	A numeric value or vector specifying the standard deviation of the covariates.
Y0_coefficients	An optional numeric vector specifying the coefficients for the control outcome model. If not provided, the function assumes a NULL value.
Y1_coefficients	An optional numeric vector specifying the coefficients for the treated outcome model. If not provided, the function assumes a NULL value.

Value

A list consisting of

- data_matrix A data frame containing the simulated covariates and outcomes for both control (Y0) and treatment (Y1) groups.
- Y0_coefficients A numeric vector representing the coefficients used for the control outcome model.
- Y1_coefficients A numeric vector representing the coefficients used for the treated outcome model.

Examples

```
# For a tutorial, see
# github.com/cjerzak/fastrerandomization-software
```

InitializeJAX *Initialize JAX*

Description

Initialize JAX

Usage

```
InitializeJax(conda_env, conda_env_required)
```

Arguments

conda_env	A character string representing the conda environment to activate. A version of JAX should live in that environment.
conda_env_required	A logical representing whether to force use the specified conda environment.

Value

This function initializes a JAX-containing conda environment as specified by conda_env. This function must be run before any others in fastrerandomize.

Examples

```
# For a tutorial, see
# github.com/cjerzak/fastrerandomization-software
```

RandomizationTest *Fast randomization test*

Description

Fast randomization test

Usage

```
RandomizationTest(X, ...)
```

Arguments

obsW	A numeric vector where 0's correspond to control units and 1's to treated units.
obsY	An optional numeric vector of observed outcomes. If not provided, the function assumes a NULL value.
X	A numeric matrix of covariates.
alpha	The significance level for the test. Default is 0.05.
candidate_randomizations	A numeric matrix of candidate randomizations.
candidate_randomizations_array	An optional JAX array of candidate randomizations. If not provided, the function coerces candidate_randomizations into a JAX array.
n0_array	An optional array specifying the number of control units.
n1_array	An optional array specifying the number of treated units.
prior_treatment_effect_mean	An optional numeric value for the prior mean of the treatment effect. Default is NULL.
prior_treatment_effect_SD	An optional numeric value for the prior standard deviation of the treatment effect. Default is NULL.
true_treatment_effect	An optional numeric value specifying the true treatment effect. Default is NULL.

simulate	A logical value indicating whether to run RandomizationTest in simulation mode. Default is FALSE.
coef_prior	An optional function generating coefficients on values of X for predicting Y(0).
nSimulate_obsW	A numeric value specifying the number of simulated values for obsW. Default is 50L.
nSimulate_obsY	A numeric value specifying the number of simulated values for obsY. Default is 50L.
randomization_accept_prob	An numeric scalar or vector of probabilities for accepting each randomization.
findFI	A logical value indicating whether to find the fiducial interval. Default is FALSE.
c_initial	A numeric value representing the initial criterion for the randomization. Default is 2.

Value

A list consisting of

- p_value A numeric value or vector representing the p-value of the test (or the expected p-value under the prior structure specified in the function inputs).
- FI A numeric vector representing the fiducial interval if findFI=T.
- tau_obs A numeric value or vector representing the estimated treatment effect(s)

References

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Examples

```
# For a tutorial, see
# github.com/cjerzak/fastrerandomization-software
```

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