

Package: SIVMethod (via r-universe)

September 28, 2026

Type Package

Title R tool for Semiparametric Instrumental Variable Method

Version 0.1.0

Description Analysing Semiparametric Instrumental Variable Model.
Tools are provided for simulation and empirical study.

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Encoding UTF-8

LazyData true

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

URL <https://github.com/Greatknee/SIVMethod>

BugReports <https://github.com/Greatknee/SIVMethod/issues>

Imports glmnet, stats

Depends R (>= 3.5)

Config/roxygen2/version 8.0.0

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

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Sim

Unified simulation engine for Example B.2.1

Description

Unified simulation engine for Example B.2.1

Usage

```
Sim(n, no_sim, case, k = NULL)
```

Arguments

n	Integer. Number of observations.
no_sim	Integer. Number of simulation replications.
case	Character. One of "A", "B", "C" or "D".
k	Integer. The truncation parameter.

Value

A list with:

output Summary statistics matrix.

selection Average selection frequencies.

Examples

```
Sim(100L, 200L, case = "A")
```

Sim_test

Unified simulation engine for Example B.2.3

Description

This function combines Case A and Case B into a single package-ready simulation interface.

Usage

```
Sim_test(n, no_sim, case = "A", c = 0.75, k = NULL)
```

Arguments

n	Integer. Number of observations.
no_sim	Integer. Number of simulation replications.
case	Character. One of "A" or "B".
c	Numeric scalar with $c \geq 0$. Used in $\epsilon_i = c\sqrt{k/nm}(x_i)$. If $c = 0$, do not need to specify case.
k	Integer vector. The range of truncation parameters to be considered via Generalized Cross-Validation.

Value

A list with:

output Summary statistics matrix.

TestRate_n Average test rate.

Examples

```
Sim_test(100L, 200L, case = "A", c = 1)
```

SIV

This function implements the SIV method for the linear form

Description

This function implements the SIV method for the linear form

Usage

```
SIV(Y, X, k)
```

Arguments

Y	Response vector, n-by-1.
X	Regressor matrix, n-by-d.
k	Integer vector including the possible values of the truncation parameter, L_k-by-1.

Value

A list containing the following components:

- `b_SIV_*`: Estimated coefficients (d-by-1).
- `gam_SIV_*`: Estimated gams.
- `sd_*`: Standard deviation of `b_SIV_*` and `gam_SIV` (d-by-1).
- `e_*`: Estimated residuals (n-by-1).
- `eps_LS0`: Estimated `epsilon_i`'s of the paper (n-by-1), i.e., $m(x_i) + e_i$.
- `V_LS0`: The `psi_i()`'s after selection (n-by-k).
- `Ind_LS0`: Selection result for the LASSO method.
- `m_all`: Estimated `m(.)` and its 95% CI.

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