# Package 'manCTMed'

July 1, 2025

```
Title Continuous Time Mediation
Version 1.0.9
Description Research compendium for the manuscript
     Pesigan, I. J. A., Russell, M. A., & Chow, S.-M. (2025).
     Inferences and Effect Sizes for Direct, Indirect, and Total Effects
     in Continuous-Time Mediation Models.
     Psychological Methods.
     <doi:10.0000/0000000000>.
URL https://github.com/jeksterslab/manCTMed,
     https://jeksterslab.github.io/manCTMed/, https://osf.io/qwnmf/,
     https://doi.org/10.0000/0000000000
BugReports https://github.com/jeksterslab/manCTMed/issues
License MIT + file LICENSE
Encoding UTF-8
LazyData true
LazyDataCompression xz
Roxygen list(markdown = TRUE)
Depends R (>= 4.0.0)
Imports stats, dynr, OpenMx, dynUtils, simStateSpace (== 1.2.9),
     bootStateSpace (== 1.0.2), cTMed (== 1.0.6), ggplot2
Suggests knitr, rmarkdown, testthat, DT
Remotes jeksterslab/dynUtils@dc3f47b
RoxygenNote 7.3.2
NeedsCompilation no
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```

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BootPara

Parametric Bootstrap

# Description

The function generates simulated datasets based on a fitted model and refits the model to each generated dataset using the dynr package.

# Usage

```
BootPara(
  fit,
  path,
  prefix,
  taskid,
  B = 1000L,
  ncores = NULL,
  seed = NULL,
  clean = TRUE
)
```

# Arguments

fit	R object. Output of the FitDynr(), FitMx(), IllustrationFitDynr(), or IllustrationFitMx(), functions.
path	Path to a directory to store bootstrap samples and estimates.
prefix	Character string. Prefix used for the file names for the bootstrap samples and estimates.
taskid	Positive integer. Task ID.
В	Positive integer. Number of bootstrap samples.
ncores	Positive integer. Number of cores to use.
seed	Integer. Random seed.
clean	Logical. If clean = TRUE, delete intermediate files generated by the function.

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### See Also

Other Confidence Interval Functions: BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaXYM(), DeltaXYM(), IllustrationBootPara(), MCStdXMY(), MCStdXYM(), MCStdXMY(), MCXYM(), MCXYM(), MCYMX()

### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
## End(Not run)</pre>
```

BootParaStdXMY

Parametric Bootstrap Confidence Intervals for X-M-Y (Standardized)

### **Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \to M \to Y$  (Standardized).

### Usage

```
BootParaStdXMY(boot, theta_hat, delta_t = 1:30, ncores = NULL)
```

### **Arguments**

boot R object. Output of the BootPara() function.
theta\_hat R object. Output of the ThetaHat() function.
delta\_t Numeric vector. Vector of time intervals.
ncores Positive integer. Number of cores to use.

```
Other Confidence Interval Functions: BootPara(), BootParaStdXYM(), BootParaStdYMX(), BootParaXMY(), BootParaXYM(), BootParaYMX(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXMY(), MCXMY(), MCXMX()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)</pre>
data <- RandomMeasurement(sim)</pre>
fit <- FitDynr(data, taskid = 1)</pre>
boot <- BootPara(</pre>
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
theta_hat <- ThetaHat(fit)</pre>
ci <- BootParaStdXMY(boot = boot, theta_hat = theta_hat)</pre>
plot(ci)
plot(ci, type = "bc")
## End(Not run)
```

BootParaStdXYM

Parametric Bootstrap Confidence Intervals for X-Y-M (Standardized)

### **Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \to Y \to M$  (Standardized).

### Usage

```
BootParaStdXYM(boot, theta_hat, delta_t = 1:30, ncores = NULL)
```

### **Arguments**

```
boot R object. Output of the BootPara() function.
theta_hat R object. Output of the ThetaHat() function.
delta_t Numeric vector. Vector of time intervals.
ncores Positive integer. Number of cores to use.
```

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdYMX(), BootParaXMY(), BootParaXYM(), BootParaYMX(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXMY(), MCStdXMY(), MCStdXMY(), MCStdXMX(), MCXMY(), MCXMY(), MCXMX()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)</pre>
fit <- FitDynr(data, taskid = 1)</pre>
boot <- BootPara(</pre>
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
theta_hat <- ThetaHat(fit)</pre>
ci <- BootParaStdXYM(boot = boot, theta_hat = theta_hat)</pre>
plot(ci)
plot(ci, type = "bc")
## End(Not run)
```

BootParaStdYMX

Parametric Bootstrap Confidence Intervals for Y-M-X (Standardized)

### **Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $Y \to M \to X$  (Standardized).

### Usage

```
BootParaStdYMX(boot, theta_hat, delta_t = 1:30, ncores = NULL)
```

### **Arguments**

```
boot R object. Output of the BootPara() function.
theta_hat R object. Output of the ThetaHat() function.
delta_t Numeric vector. Vector of time intervals.
ncores Positive integer. Number of cores to use.
```

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaXMY(), BootParaXYM(), BootParaYMX(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXMY(), MCXMY(), MCXMX()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)</pre>
data <- RandomMeasurement(sim)</pre>
fit <- FitDynr(data, taskid = 1)</pre>
boot <- BootPara(</pre>
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
theta_hat <- ThetaHat(fit)</pre>
ci <- BootParaStdYMX(boot = boot, theta_hat = theta_hat)</pre>
plot(ci)
plot(ci, type = "bc")
## End(Not run)
```

BootParaXMY

Parametric Bootstrap Confidence Intervals for X-M-Y

### **Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \to M \to Y$ .

### Usage

```
BootParaXMY(boot, phi_hat, delta_t = 1:30, ncores = NULL)
```

### **Arguments**

```
boot R object. Output of the BootPara() function.

phi_hat R object. Output of the PhiHat() function.

delta_t Numeric vector. Vector of time intervals.

ncores Positive integer. Number of cores to use.
```

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaYMX(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXMY(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)</pre>
data <- RandomMeasurement(sim)</pre>
fit <- FitDynr(data, taskid = 1)</pre>
boot <- BootPara(</pre>
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
phi_hat <- PhiHat(fit)</pre>
ci <- BootParaXMY(boot = boot, phi_hat = phi_hat)</pre>
plot(ci)
plot(ci, type = "bc")
## End(Not run)
```

BootParaXYM

Parametric Bootstrap Confidence Intervals for X-Y-M

### **Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \to Y \to M$ .

### Usage

```
BootParaXYM(boot, phi_hat, delta_t = 1:30, ncores = NULL)
```

### **Arguments**

```
boot R object. Output of the BootPara() function.

phi_hat R object. Output of the PhiHat() function.

delta_t Numeric vector. Vector of time intervals.

ncores Positive integer. Number of cores to use.
```

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXMY(), BootParaYMX(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXMY(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)</pre>
data <- RandomMeasurement(sim)</pre>
fit <- FitDynr(data, taskid = 1)</pre>
boot <- BootPara(</pre>
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
phi_hat <- PhiHat(fit)</pre>
ci <- BootParaXYM(boot = boot, phi_hat = phi_hat)</pre>
plot(ci)
plot(ci, type = "bc")
## End(Not run)
```

BootParaYMX

Parametric Bootstrap Confidence Intervals for Y-M-X

### **Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $Y \to M \to X$ .

### Usage

```
BootParaYMX(boot, phi_hat, delta_t = 1:30, ncores = NULL)
```

### **Arguments**

```
boot R object. Output of the BootPara() function.

phi_hat R object. Output of the PhiHat() function.

delta_t Numeric vector. Vector of time intervals.

ncores Positive integer. Number of cores to use.
```

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXMY(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)</pre>
data <- RandomMeasurement(sim)</pre>
fit <- FitDynr(data, taskid = 1)</pre>
boot <- BootPara(</pre>
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
phi_hat <- PhiHat(fit)</pre>
ci <- BootParaYMX(boot = boot, phi_hat = phi_hat)</pre>
plot(ci, type = "bc")
## End(Not run)
```

Compress

Compress Replication

### **Description**

Compress Replication

### Usage

```
Compress(taskid, repid, output_folder)
```

### **Arguments**

taskid Positive integer. Task ID.
repid Positive integer. Replication ID.
output\_folder Character string. Output folder.

### Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

### See Also

Other Compression Functions: IllustrationCompress()

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DeltaStdXMY

Delta Method Confidence Intervals for X-M-Y (Standardized)

### **Description**

The function generates delta method confidence intervals for the mediation model  $X \to M \to Y$  (Standardized).

### Usage

```
DeltaStdXMY(theta_hat, delta_t = 1:30)
```

### **Arguments**

```
theta_hat R object. Output of the ThetaHat() function.

delta_t Numeric vector. Vector of time intervals.
```

### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXYM(), DeltaStdXYM(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXYM(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- DeltaStdXMY(theta_hat)
plot(ci)
## End(Not run)</pre>
```

DeltaStdXYM

Delta Method Confidence Intervals for X-Y-M (Standardized)

### **Description**

The function generates delta method confidence intervals for the mediation model  $X \to Y \to M$  (Standardized).

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### Usage

```
DeltaStdXYM(theta_hat, delta_t = 1:30)
```

# Arguments

theta\_hat R object. Output of the ThetaHat() function.

delta\_t Numeric vector. Vector of time intervals.

### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaYMX(), DeltaStdXMY(), DeltaStdYMX(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXMY(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

# Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- DeltaStdXYM(theta_hat)
plot(ci)
## End(Not run)</pre>
```

DeltaStdYMX

Delta Method Confidence Intervals for Y-M-X (Standardized)

### **Description**

The function generates delta method confidence intervals for the mediation model  $Y \to M \to X$  (Standardized).

### Usage

```
DeltaStdYMX(theta_hat, delta_t = 1:30)
```

### **Arguments**

```
theta_hat R object. Output of the ThetaHat() function.

delta_t Numeric vector. Vector of time intervals.
```

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### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaXMY(), DeltaXMY(), DeltaXMY(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCStdXYM(), MCXYM(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- DeltaStdYMX(theta_hat)
plot(ci)
## End(Not run)</pre>
```

DeltaXMY

Delta Method Confidence Intervals for X-M-Y

### Description

The function generates delta method confidence intervals for the mediation model  $X \to M \to Y$ .

### Usage

```
DeltaXMY(phi_hat, delta_t = 1:30)
```

### **Arguments**

```
phi_hat R object. Output of the PhiHat() function.

delta_t Numeric vector. Vector of time intervals.
```

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXYM(), DeltaYMX(), IllustrationBootPara(), MCStdXMY(), MCStdXYM(), MCStdYMX(), MCXMY(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

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### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- DeltaXMY(phi_hat)
plot(ci)
## End(Not run)</pre>
```

DeltaXYM

Delta Method Confidence Intervals for X-Y-M

### **Description**

The function generates delta method confidence intervals for the mediation model  $X \to Y \to M$ .

#### Usage

```
DeltaXYM(phi_hat, delta_t = 1:30)
```

# Arguments

```
phi_hat R object. Output of the PhiHat() function.
delta_t Numeric vector. Vector of time intervals.
```

### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaYMX(), IllustrationBootPara(), MCStdXMY(), MCStdXYM(), MCStdYMX(), MCXMY(), MCXYM(), MCXYM(), MCXYM(), MCXYM()
```

### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- DeltaXYM(phi_hat)
plot(ci)
## End(Not run)</pre>
```

FigPlotEffects

DeltaYMX

Delta Method Confidence Intervals for Y-M-X

### **Description**

The function generates delta method confidence intervals for the mediation model  $Y \to M \to X$ .

### Usage

```
DeltaYMX(phi_hat, delta_t = 1:30)
```

### **Arguments**

```
phi_hat R object. Output of the PhiHat() function.

delta_t Numeric vector. Vector of time intervals.
```

### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXYM(), IllustrationBootPara(), MCStdXMY(), MCStdXYM(), MCStdYMX(), MCXMY(), MCXYM(), MCXYM(), MCXYM()
```

### **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- DeltaYMX(phi_hat)
plot(ci)
## End(Not run)</pre>
```

FigPlotEffects

Plot Total, Direct, and Indirect Effects

### **Description**

```
Effects for the model X \to M \to Y.
```

### Usage

```
FigPlotEffects(dynamics = 0, std = FALSE, max_delta_t = 30, xmy = TRUE)
```

### **Arguments**

dynamics	Integer dynamics =	0 for original drift matrix.	dynamics = -1 for near-neutral

dynamics, and dynamics = 1 for stronger damping.

std Logical. If std = TRUE, standardized total, direct, and indirect effects. If std =

FALSE, unstandardized total, direct, and indirect effects.

max\_delta\_t Numeric. Maximum time interval.

xmy Logical. If xmy = TRUE, plot the effects for the  $x \rightarrow m \rightarrow y$  mediation model. If xmy

= FALSE, plot the effects for the  $y \rightarrow m \rightarrow x$  mediation model.

### Author(s)

Ivan Jacob Agaloos Pesigan

### See Also

Other Figure Functions: FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotSeBias(), FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotCoverage(), IllustrationFigScatterPlotPower(), IllustrationFigScatterPlotSeBias()

### **Examples**

FigPlotEffects()

FigScatterPlotCoverage

Plot Coverage Probabilities

### **Description**

Coverage probabilities for the model  $X \to M \to Y$ .

### Usage

FigScatterPlotCoverage(results, delta\_t = NULL, dynamics = 0, std = FALSE)

### **Arguments**

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = $0$ for original drift matrix, dynamics = $-1$ for near-neutral dynamics, and dynamics = $1$ for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

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#### Author(s)

Ivan Jacob Agaloos Pesigan

#### See Also

Other Figure Functions: FigPlotEffects(), FigScatterPlotPower(), FigScatterPlotSeBias(), FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotCoverage(), IllustrationFigScatterPlotPower(), IllustrationFigScatterPlotSeBias()

### **Examples**

```
data(results, package = "manCTMed")
FigScatterPlotCoverage(results)
FigScatterPlotCoverage(results, delta_t = 1:14)
FigScatterPlotCoverage(results, delta_t = 15:30)
```

FigScatterPlotPower

Plot Statistical Power

### **Description**

Statistical power for the model  $X \to M \to Y$ .

### Usage

```
FigScatterPlotPower(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

### **Arguments**

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = $0$ for original drift matrix, dynamics = $-1$ for near-neutral dynamics, and dynamics = $1$ for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotSeBias(),
FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotCoverage(),
IllustrationFigScatterPlotPower(), IllustrationFigScatterPlotSeBias()
```

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### **Examples**

```
data(results, package = "manCTMed")
FigScatterPlotPower(results)
FigScatterPlotPower(results, delta_t = 1:14)
FigScatterPlotPower(results, delta_t = 15:30)
```

FigScatterPlotSeBias Plot Standard Error Bias

# Description

Standard Error Bias for the model  $X \to M \to Y$ .

### Usage

```
FigScatterPlotSeBias(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

# Arguments

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = $0$ for original drift matrix, dynamics = $-1$ for near-neutral dynamics, and dynamics = $1$ for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

### Author(s)

Ivan Jacob Agaloos Pesigan

#### See Also

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotCoverage(), IllustrationFigScatterPlotPower(), IllustrationFigScatterPlotSeBias()
```

### **Examples**

```
data(results, package = "manCTMed")
FigScatterPlotSeBias(results)
```

FigScatterPlotType1

FigScatterPlotType1 Plot Type I Error

# Description

Type I error for the model  $Y \to M \to X$ .

# Usage

```
FigScatterPlotType1(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

### **Arguments**

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = $0$ for original drift matrix, dynamics = $-1$ for near-neutral dynamics, and dynamics = $1$ for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

### Author(s)

Ivan Jacob Agaloos Pesigan

### See Also

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotSeBias(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotCoverage(), IllustrationFigScatterPlotPower(), IllustrationFigScatterPlotSeBias()
```

### **Examples**

```
data(results, package = "manCTMed")
FigScatterPlotType1(results)
FigScatterPlotType1(results, delta_t = 1:14)
FigScatterPlotType1(results, delta_t = 15:30)
```

FitDynr 21

FitDynr

Fit the Model using the dynr Package

### **Description**

The function fits the model using the dynr package.

### Usage

```
FitDynr(data, taskid)
```

# Arguments

data R object. Output of the RandomMeasurement() function.

taskid Positive integer. Task ID.

### See Also

Other Model Fitting Functions: FitMx(), IllustrationFitDynr(), IllustrationFitMx(), IllustrationMCPhiSigma() IllustrationPrepData(), PhiHat(), ThetaHat()

# **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
summary(fit)
## End(Not run)</pre>
```

FitMx

Fit the Model using the OpenMx Package

# Description

The function fits the model using the OpenMx package.

### Usage

```
FitMx(data, taskid)
```

22 GenData

### **Arguments**

data R object. Output of the RandomMeasurement() function.

taskid Positive integer. Task ID.

### See Also

```
Other Model Fitting Functions: FitDynr(), IllustrationFitDynr(), IllustrationFitMx(), IllustrationMCPhiSigma(), IllustrationPrepData(), PhiHat(), ThetaHat()
```

### **Examples**

```
## Not run:
set.seed(42)
library(OpenMx)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitMx(data, taskid = 1)
summary(fit)
## End(Not run)</pre>
```

GenData

Simulate Data

# Description

The function simulates data using the simStateSpace::SimSSMOUFixed() function.

### Usage

```
GenData(taskid)
```

### **Arguments**

taskid Positive integer. Task ID.

### See Also

Other Data Generation Functions: IllustrationGenData(), RandomMeasurement()

# **Examples**

```
## Not run:
set.seed(42)
sim <- GenData(taskid = 1)
plot(sim)
## End(Not run)</pre>
```

IllustrationBootPara 23

IllustrationBootPara Parametric Bootstrap (Illustration)

### **Description**

The function generates simulated datasets based on a fitted model and refits the model to each generated dataset using the dynr package.

### Usage

```
IllustrationBootPara(
  fit,
  path,
  prefix,
  taskid,
  B = 1000L,
  ncores = NULL,
  seed = NULL
)
```

### **Arguments**

```
fit R object. Fitted CT-VAR model.

path Path to a directory to store bootstrap samples and estimates.

prefix Character string. Prefix used for the file names for the bootstrap samples and estimates.

taskid Positive integer. Task ID.

B Positive integer. Number of bootstrap samples.

ncores Positive integer. Number of cores to use.

seed Integer. Random seed.
```

### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), MCStdXMY(), MCStdXMY(), MCXMY(), MCXMY(), MCXMY(), MCXMY(), MCXMY(), MCXMY(), MCXMX()
```

# Examples

```
## Not run:
library(dynr)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitDynr(data)
summary(fit)</pre>
```

24 IllustrationCompress

```
IllustrationBootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L,
  seed = 42
)

## End(Not run)
```

IllustrationCompress Compress Replication (Illustration)

# Description

Compress Replication (Illustration)

### Usage

```
IllustrationCompress(taskid, repid, output_folder)
```

# Arguments

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

### Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

#### See Also

Other Compression Functions: Compress()

 $Illustration {\tt FigPlotEffects}$ 

Plot Total, Direct, and Indirect Effects (Illustration)

### **Description**

Effects for the model  $X \to M \to Y$ .

### Usage

```
IllustrationFigPlotEffects(std = FALSE, max_delta_t = 30)
```

### **Arguments**

std Logical. If std = TRUE, standardized total, direct, and indirect effects. If std =

FALSE, unstandardized total, direct, and indirect effects.

max\_delta\_t Numeric. Maximum time interval.

### Author(s)

Ivan Jacob Agaloos Pesigan

### See Also

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotSeBias(), FigScatterPlotType1(), IllustrationFigScatterPlotCoverage(), IllustrationFigScatterPlotPower(), IllustrationFigScatterPlotSeBias()
```

### **Examples**

```
IllustrationFigPlotEffects(std = FALSE)
IllustrationFigPlotEffects(std = TRUE)
```

IllustrationFigScatterPlotCoverage

Illustration Plot Coverage Probabilities

### **Description**

Coverage probabilities for the model  $X \to M \to Y$ .

### Usage

IllustrationFigScatterPlotCoverage(illustration\_results)

#### **Arguments**

```
illustration_results
```

Summary results data frame.

### Author(s)

Ivan Jacob Agaloos Pesigan

#### See Also

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotSeBias(), FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotIllustrationFigScatterPlotSeBias()
```

### **Examples**

```
data(illustration_results, package = "manCTMed")
IllustrationFigScatterPlotCoverage(illustration_results)
```

 $Illustration {\tt FigScatterPlotPower}$ 

Illustration Plot Statistical Power

### Description

Statistical Power for the model  $X \to M \to Y$ .

#### **Usage**

IllustrationFigScatterPlotPower(illustration\_results)

### **Arguments**

```
illustration_results
```

Summary results data frame.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotSeBias(), FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotIllustrationFigScatterPlotSeBias()
```

### **Examples**

```
data(illustration_results, package = "manCTMed")
IllustrationFigScatterPlotPower(illustration_results)
```

IllustrationFigScatterPlotSeBias

Illustration Plot Standard Error Bias

### **Description**

Standard Error Bias for the model  $X \to M \to Y$ .

# Usage

IllustrationFigScatterPlotSeBias(illustration\_results)

### Arguments

illustration\_results

Summary results data frame.

### Author(s)

Ivan Jacob Agaloos Pesigan

#### See Also

```
Other Figure Functions: FigPlotEffects(), FigScatterPlotCoverage(), FigScatterPlotPower(), FigScatterPlotSeBias(), FigScatterPlotType1(), IllustrationFigPlotEffects(), IllustrationFigScatterPlotIllustrationFigScatterPlotPower()
```

### **Examples**

```
data(illustration_results, package = "manCTMed")
IllustrationFigScatterPlotSeBias(illustration_results)
```

28 IllustrationFitMx

IllustrationFitDynr Fit the Model using the dynr Package (Illustration)

### Description

The function fits the model using the dynr package.

### Usage

```
IllustrationFitDynr(data)
```

### **Arguments**

data

R object. Output of the IllustrationPrepData() function.

### See Also

```
Other Model Fitting Functions: FitDynr(), FitMx(), IllustrationFitMx(), IllustrationMCPhiSigma(), IllustrationPrepData(), PhiHat(), ThetaHat()
```

# **Examples**

```
## Not run:
library(dynr)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitDynr(data)
summary(fit)
## End(Not run)</pre>
```

Illustration Fit Mx

Fit the Model using the OpenMx Package (Illustration)

### **Description**

The function fits the model using the OpenMx package.

# Usage

```
IllustrationFitMx(data)
```

### **Arguments**

data

R object. Output of the IllustrationPrepData() function.

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### See Also

```
Other Model Fitting Functions: FitDynr(), FitMx(), IllustrationFitDynr(), IllustrationMCPhiSigma(), IllustrationPrepData(), PhiHat(), ThetaHat()
```

# **Examples**

```
## Not run:
library(OpenMx)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitMx(data)
summary(fit)
## End(Not run)</pre>
```

IllustrationGenData Simulate Data (Illustration)

### **Description**

The function simulates data using the simStateSpace::SimSSMOUFixed() function.

### Usage

```
IllustrationGenData(seed = NULL, n = 133, m = 101, delta_t_gen = 0.1)
```

# **Arguments**

```
seed Integer. Random seed.

n Positive integer. Sample size.

m Positive integer. Measurement occasions.

delta_t_gen Numeric. Time interval used to generate data.
```

#### See Also

Other Data Generation Functions: GenData(), RandomMeasurement()

# Examples

```
## Not run:
sim <- IllustrationGenData(seed = 42)
plot(sim)
## End(Not run)</pre>
```

30 IllustrationPrepData

```
IllustrationMCPhiSigma
```

Generate a Sampling Distribution of Drift Matrices and Process Noise Covariance Matrices (Illustration)

### **Description**

The function generates a sampling distribution of drift matrices and process noise covariance matrices using te Monte Carlo method.

### Usage

```
IllustrationMCPhiSigma(fit, R = 20000L, seed = NULL)
```

### **Arguments**

fit R object. Fitted CT-VAR model.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

### See Also

```
Other Model Fitting Functions: FitDynr(), FitMx(), IllustrationFitDynr(), IllustrationFitMx(), IllustrationPrepData(), PhiHat(), ThetaHat()
```

# Examples

```
## Not run:
library(dynr)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitDynr(data)
IllustrationMCPhiSigma(fit, seed = 42)
## End(Not run)</pre>
```

IllustrationPrepData Prepare Data Before Model Fitting (Illustration)

### **Description**

The function converts the output of IllustrationGenData() into a data frame.

### Usage

```
IllustrationPrepData(sim)
```

illustration\_dist 31

### **Arguments**

sim

R object. Output of the IllustrationGenData() function.

#### See Also

```
Other Model Fitting Functions: FitDynr(), FitMx(), IllustrationFitDynr(), IllustrationFitMx(), IllustrationMCPhiSigma(), PhiHat(), ThetaHat()
```

# **Examples**

```
## Not run:
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
head(data)
dim(data)
## End(Not run)</pre>
```

illustration\_dist

Illustration Sampling Distribution

### **Description**

Illustration Sampling Distribution

# Usage

```
data(illustration_dist)
```

### **Format**

A matrix with 1000 rows and 27 columns:

phi\_xx Elements of the drift matrix.

sigma\_xx Elements of the process noise covariance matrix.

theta\_xx Elements of the measurement error covariance matrix.

mu0\_x Elements of the initial condition mean vector.

sigma0\_xx Elements of the initial condition covariance matrix.

### Author(s)

### **Description**

Illustration Sampling Distribution Discrete Time - Time Interval of 1

### Usage

```
data(illustration_dist_dt)
```

#### **Format**

A matrix with 1000 rows and 15 columns:

beta\_xx Elements of the matrix of lagged coefficients.

psi\_xx Elements of the process noise covariance matrix.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
illustration_dist_dt_mc
```

Illustration Sampling Distribution Discrete Time - Time Interval of 1 (Monte Carlo Method)

### Description

Illustration Sampling Distribution Discrete Time - Time Interval of 1 (Monte Carlo Method)

### Usage

```
data(illustration_dist_dt_mc)
```

#### **Format**

A matrix with 20000 rows and 15 columns:

beta\_xx Elements of the matrix of lagged coefficients.

psi\_xx Elements of the process noise covariance matrix.

#### Author(s)

illustration\_dist\_mc 33

# Description

Illustration Sampling Distribution (Monte Carlo Method)

### Usage

```
data(illustration_dist_mc)
```

#### **Format**

A matrix with 20000 rows and 15 columns:

phi\_xx Elements of the drift matrix.

**sigma\_xx** Elements of the process noise covariance matrix.

### Author(s)

Ivan Jacob Agaloos Pesigan

### **Description**

Illustration Sampling Distribution Total, Direct, and Indirect Effects - Time Interval of 1

# Usage

```
data(illustration_dist_med)
```

### **Format**

A matrix with 1000 rows and 27 columns:

total Total effect.

direct Direct effect.

indirect Indirect effect.

#### Author(s)

```
illustration_dist_med_mc
```

Illustration Sampling Distribution Total, Direct, and Indirect Effects -Time Interval of 1 (Monte Carlo Method)

### **Description**

Illustration Sampling Distribution Total, Direct, and Indirect Effects - Time Interval of 1 (Monte Carlo Method)

### Usage

```
data(illustration_dist_med_mc)
```

### **Format**

A matrix with 20000 rows and 27 columns:

total Total effect.

direct Direct effect.

indirect Indirect effect.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
illustration\_dist\_med\_std
```

Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of  $\it 1$ 

### **Description**

Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of  $\mathbf{1}$ 

### Usage

```
data(illustration_dist_med_std)
```

### **Format**

A matrix with 1000 rows and 27 columns:

total Total effect.

direct Direct effect.

indirect Indirect effect.

### Author(s)

Ivan Jacob Agaloos Pesigan

illustration\_dist\_med\_std\_mc

Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of 1 (Monte Carlo Method)

# Description

Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of 1 (Monte Carlo Method)

### Usage

```
data(illustration_dist_med_std_mc)
```

#### **Format**

A matrix with 20000 rows and 27 columns:

total Total effect.

direct Direct effect.

indirect Indirect effect.

### Author(s)

Ivan Jacob Agaloos Pesigan

 $illustration\_results \quad \textit{Illustration Small Scale Simulation Results}$ 

### **Description**

Illustration Small Scale Simulation Results

### Usage

```
data(illustration_results)
```

36 illustration\_results

### **Format**

```
A with 22 columns:
```

taskid Task ID.

replications Number of replications.

effect Total, direct, or indirect effect.

interval Time interval.

parameter Population parameter.

method Method used to generate confidence intervals.

**xmy** Logical. TRUE for x to m to y path.

std Logical. TRUE for standardized. FALSE for unstandardized.

est Mean parameter estimate.

se Mean standard error.

**z** Mean z statistic.

**p** Mean p-value.

**R** Number of Monte Carlo or bootstrap replications.

Il Mean lower limit of the 95% confidence interval.

ul Mean upper limit of the 95% confidence interval.

sig Proportion of statistically significant results.

zero\_hit Proportion of replications where the confidence intervals included zero.

**theta\_hit** Proportion of replications where the confidence intervals included the population parameter.

sq\_error Mean squared error.

se\_bias Bias in standard error estimate.

coverage Coverage probability.

power Statistical power.

### Author(s)

MCStdXMY 37

MCStdXMY

Monte Carlo Method Confidence Intervals for X-M-Y (Standardized)

### **Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \to M \to Y$  (Standardized).

### Usage

```
MCStdXMY(theta_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

### **Arguments**

theta\_hat R object. Output of the ThetaHat() function.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

#### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXYM(), DeltaXYM(), IllustrationBootPara(), MCStdXYM(), MCStdYMX(), MCXMY(), MCXYM(), MCXYM(), MCXYM()
```

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- MCStdXMY(theta_hat, seed = 42)
plot(ci)
## End(Not run)</pre>
```

38 MCStdXYM

MCStdXYM

Monte Carlo Method Confidence Intervals for X-Y-M (Standardized)

### **Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \to Y \to M$  (Standardized).

### Usage

```
MCStdXYM(theta_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

### **Arguments**

theta\_hat R object. Output of the ThetaHat() function.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

#### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdYMX(), DeltaXMY(), DeltaXYM(), DeltaXYM(), IllustrationBootPara(), MCStdXMY(), MCStdYMX(), MCXMY(), MCXYM(), MCXYM(), MCXYM()
```

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- MCStdXYM(theta_hat, seed = 42)
plot(ci)
## End(Not run)</pre>
```

MCStdYMX 39

MCStdYMX

Monte Carlo Method Confidence Intervals for Y-M-X (Standardized)

### **Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $Y \to M \to X$  (Standardized).

### Usage

```
MCStdYMX(theta_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

### **Arguments**

theta\_hat R object. Output of the ThetaHat() function.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

#### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXYM(), DeltaXYM(), IllustrationBootPara(), MCStdXMY(), MCStdXYM(), MCXMY(), MCXYM(), MCXYM(), MCXYM()
```

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- MCStdYMX(phi_hat, seed = 42)
plot(ci)
## End(Not run)</pre>
```

40 MCXMY

**MCXMY** 

Monte Carlo Method Confidence Intervals for X-M-Y

### **Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \to M \to Y$ .

### Usage

```
MCXMY(phi_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

### **Arguments**

phi\_hat R object. Output of the PhiHat() function.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

#### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaXYM(), DeltaXYM(), MCStdXMY(), MCStdXMY(), MCStdXMY(), MCStdXMY(), MCStdXMY(), MCXYM(), MCYMX()
```

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- MCXMY(phi_hat, seed = 42)
plot(ci)
## End(Not run)</pre>
```

MCXYM 41

**MCXYM** 

Monte Carlo Method Confidence Intervals for X-Y-M

### **Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \to Y \to M$ .

### Usage

```
MCXYM(phi_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

### **Arguments**

phi\_hat R object. Output of the PhiHat() function.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

#### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXYM(), DeltaStdYMX(), DeltaXMY(), DeltaXYM(), DeltaXYM(), IllustrationBootPara(), MCStdXMY(), MCStdXYM(), MCStdXYM(), MCStdXMY(), MCXMY(), MCYMX()
```

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- MCXYM(phi_hat, seed = 42)
plot(ci)
## End(Not run)</pre>
```

42 MCYMX

**MCYMX** 

Monte Carlo Method Confidence Intervals for Y-M-X

### **Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $Y \to M \to X$ .

### Usage

```
MCYMX(phi_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

### **Arguments**

phi\_hat R object. Output of the PhiHat() function.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

seed Integer. Random seed.

#### See Also

```
Other Confidence Interval Functions: BootPara(), BootParaStdXMY(), BootParaStdXYM(), BootParaStdYMX(), BootParaXYM(), BootParaXYM(), BootParaXYM(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaStdXMY(), DeltaXYM(), DeltaXYM(), MCStdXMY(), MCStdXMY(), MCStdXMY(), MCStdXMY(), MCXMY(), MCXYM()
```

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- MCYMX(phi_hat, seed = 42)
plot(ci)
## End(Not run)</pre>
```

params 43

params

Simulation Parameters

## **Description**

Simulation Parameters

## Usage

data(params)

#### **Format**

A dataframe with 30 rows and 3 columns:

taskid Simulation Task ID.

n Sample size.

**dynamics** Dynamics. 0 for original drift matrix, -1 for near-neutral dynamics, and 1 for stronger damping.

## Author(s)

Ivan Jacob Agaloos Pesigan

PhiHat

Estimated Drift Matrix

## **Description**

The function extracts the estimated drift matrix from the fitted model.

### Usage

PhiHat(fit)

## **Arguments**

fit

R object. Output of the FitDynr(), FitMx(), IllustrationFitDynr(), or IllustrationFitMx(), functions.

### See Also

```
Other Model Fitting Functions: FitDynr(), FitMx(), IllustrationFitDynr(), IllustrationFitMx(), IllustrationMCPhiSigma(), IllustrationPrepData(), ThetaHat()
```

44 RandomMeasurement

## **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(n = 50)
data <- RandomMeasurement(sim)
fit <- FitDynr(data)
PhiHat(fit)
## End(Not run)</pre>
```

RandomMeasurement

Simulate Random Measurement

# Description

The function randomly selects 100 observations from the generated data and replaces the unselected observations with NA.

# Usage

RandomMeasurement(sim)

# Arguments

sim

R object. Output of the GenData() function.

## See Also

Other Data Generation Functions: GenData(), IllustrationGenData()

```
## Not run:
set.seed(42)
sim <- GenData(taskid = 1)
RandomMeasurement(sim)
## End(Not run)</pre>
```

results 45

results

Simulation Results

## Description

Simulation Results

### Usage

data(results)

#### **Format**

A dataframe with 24 columns:

taskid Task ID.

replications Number of replications.

effect Total, direct, or indirect effect.

interval Time interval.

**dynamics** Dynamics. 0 for original drift matrix, -1 for near-neutral dynamics, and 1 for stronger damping.

parameter Population parameter.

**method** Method used to generate confidence intervals.

**xmy** If TRUE, the mediation model is  $X \to M \to Y$ . If FALSE, the mediation model is  $Y \to M \to X$ .

std If TRUE, standardized total, direct, and indirect effects. If FALSE, unstandardized total, direct, and indirect effects.

n Sample size.

est Mean parameter estimate.

- se Mean standard error.
- **z** Mean z statistic.
- **p** Mean *p*-value.
- R Number of Monte Carlo replications.
- **ll** Mean lower limit of the 95% confidence interval.
- ul Mean upper limit of the 95% confidence interval.
- sig Proportion of statistically significant results.

**zero\_hit** Proportion of replications where the confidence intervals contained zero.

**theta\_hit** Proportion of replications where the confidence intervals contained the population parameter.

sq\_error Mean squared error.

se\_bias Bias in standard error estimate.

coverage Coverage probability.

power Statistical power.

46 Sim

### Author(s)

Ivan Jacob Agaloos Pesigan

Sim Simulation Replication

#### **Description**

Simulation Replication

## Usage

```
Sim(
  taskid,
  repid,
  output_folder,
  overwrite,
  integrity,
  seed,
  ci,
  pb,
  delta_t,
  R,
  B
)
```

## Arguments

Positive integer. Task ID. taskid repid Positive integer. Replication ID. Character string. Output folder. output\_folder overwrite Logical. Overwrite existing output in output\_folder. Logical. If integrity = TRUE, check for the output file integrity when overwrite integrity = FALSE. Integer. Random seed. seed Logical. Run simulations for confidence intervals. ci pb Logical. Run simulations for parametric bootstrap confidence intervals. delta\_t Numeric vector. Vector of time intervals. R Positive integer. Number of Monte Carlo replications. В Positive integer. Number of bootstrap samples.

### Value

The output is saved as an external file in output\_folder.

SimDynrBootPara 47

### Author(s)

Ivan Jacob Agaloos Pesigan

SimDynrBootPara Simulation Replication - BootPara

# Description

Simulation Replication - BootPara

## Usage

```
SimDynrBootPara(
   taskid,
   repid,
   output_folder,
   seed,
   suffix,
   overwrite,
   integrity,
   B,
   ncores = NULL
)
```

## **Arguments**

Positive integer. Task ID. taskid repid Positive integer. Replication ID. output\_folder Character string. Output folder. seed Integer. Random seed. suffix Character string. Output of manCTMed:::.SimSuffix(). Logical. Overwrite existing output in output\_folder. overwrite Logical. If integrity = TRUE, check for the output file integrity when overwrite integrity = FALSE. В Positive integer. Number of bootstrap samples. Positive integer. Number of cores to use. ncores

### **Details**

This function is executed via the Sim function.

## Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

SimDynrBootParaStdXMY Simulation Replication - BootParaStdXMY

## **Description**

Simulation Replication - BootParaStdXMY

# Usage

```
SimDynrBootParaStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## Arguments

taskid Positive integer. Task ID.
repid Positive integer. Replication ID.
output\_folder Character string. Output folder.
seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().
overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

## **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrBootParaStdYMX Simulation Replication - BootParaStdYMX

### **Description**

Simulation Replication - BootParaStdYMX

## Usage

```
SimDynrBootParaStdYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

#### **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrBootParaXMY

Simulation Replication - BootParaXMY

## **Description**

Simulation Replication - BootParaXMY

## Usage

```
SimDynrBootParaXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

#### **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrBootParaYMX Sim

Simulation Replication - BootParaYMX

## **Description**

Simulation Replication - BootParaYMX

## Usage

```
SimDynrBootParaYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

#### **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrDeltaStdXMY

Simulation Replication - DynrDeltaStdXMY

## **Description**

Simulation Replication - DynrDeltaStdXMY

## Usage

```
SimDynrDeltaStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

#### **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrDeltaStdYMX Simulation Replication - DynrDeltaStdYMX

### **Description**

Simulation Replication - DynrDeltaStdYMX

## Usage

```
SimDynrDeltaStdYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

#### **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

54 SimDynrDeltaXMY

SimDynrDeltaXMY

Simulation Replication - DynrDeltaXMY

## **Description**

Simulation Replication - DynrDeltaXMY

## Usage

```
SimDynrDeltaXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

# **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrDeltaYMX 55

SimDynrDeltaYMX Simulation Replication - DynrDeltaYMX	SimDynrDeltaYMX	Simulation Replication - DynrDeltaYMX	
---	-----------------	---------------------------------------	--

## **Description**

Simulation Replication - DynrDeltaYMX

# Usage

```
SimDynrDeltaYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID. repid Positive integer. Replication ID. output\_folder Character string. Output folder. seed Integer. Random seed. suffix Character string. Output of manCTMed:::.SimSuffix(). Logical. Overwrite existing output in output\_folder. overwrite integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE. Numeric vector. Vector of time intervals. delta\_t

#### **Details**

This function is executed via the Sim function.

### Value

The output is saved as an external file in output\_folder.

## Author(s)

SimDynrMCStdXMY

Simulation Replication - DynrMCStdXMY

### **Description**

Simulation Replication - DynrMCStdXMY

# Usage

```
SimDynrMCStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
 overwrite,
  integrity,
  delta_t,
 R
)
```

## **Arguments**

taskid Positive integer. Task ID. Positive integer. Replication ID. repid output\_folder Character string. Output folder. Integer. Random seed. seed Character string. Output of manCTMed:::.SimSuffix(). suffix overwrite Logical. Overwrite existing output in output\_folder. Logical. If integrity = TRUE, check for the output file integrity when overwrite integrity = FALSE. Numeric vector. Vector of time intervals.

delta\_t

R Positive integer. Number of Monte Carlo replications.

### **Details**

This function is executed via the Sim function.

## Value

The output is saved as an external file in output\_folder.

# Author(s)

SimDynrMCStdYMX 57

SimDynrMCStdYMX Simulation Replication - DynrMCStdYMX

Description

Simulation Replication - DynrMCStdYMX

# Usage

```
SimDynrMCStdYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

## Arguments

taskid Positive integer. Task ID. repid Positive integer. Replication ID. output\_folder Character string. Output folder. Integer. Random seed. seed Character string. Output of manCTMed:::.SimSuffix(). suffix overwrite Logical. Overwrite existing output in output\_folder. Logical. If integrity = TRUE, check for the output file integrity when overwrite integrity = FALSE. Numeric vector. Vector of time intervals. delta\_t R Positive integer. Number of Monte Carlo replications.

### **Details**

This function is executed via the Sim function.

## Value

The output is saved as an external file in output\_folder.

# Author(s)

58 SimDynrMCXMY

SimDynrMCXMY

Simulation Replication - DynrMCXMY

### **Description**

Simulation Replication - DynrMCXMY

# Usage

```
SimDynrMCXMY(
   taskid,
   repid,
   output_folder,
   seed,
   suffix,
   overwrite,
   integrity,
   delta_t,
   R
)
```

## Arguments

taskid Positive integer. Task ID.

repid Positive integer. Replication ID.

output\_folder Character string. Output folder.

seed Integer. Random seed.

Suffix Character string. Output of many

suffix Character string. Output of manCTMed:::.SimSuffix().
overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

### **Details**

This function is executed via the Sim function.

## Value

The output is saved as an external file in output\_folder.

# Author(s)

SimDynrMCYMX 59

SimDynrMCYMX

Simulation Replication - DynrMCYMX

### **Description**

Simulation Replication - DynrMCYMX

# Usage

```
SimDynrMCYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

## Arguments

taskid Positive integer. Task ID. Positive integer. Replication ID. repid output\_folder Character string. Output folder. Integer. Random seed. seed Character string. Output of manCTMed:::.SimSuffix(). suffix overwrite Logical. Overwrite existing output in output\_folder. Logical. If integrity = TRUE, check for the output file integrity when overwrite integrity = FALSE. Numeric vector. Vector of time intervals. delta\_t

Positive integer. Number of Monte Carlo replications.

### **Details**

R

This function is executed via the Sim function.

## Value

The output is saved as an external file in output\_folder.

# Author(s)

60 SimFitDynr

# Description

Simulation Replication - FitDynr

## Usage

```
SimFitDynr(taskid, repid, output_folder, seed, suffix, overwrite, integrity)
```

# Arguments

taskid Positive integer. Task ID.

repid Positive integer. Replication ID.
output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

### **Details**

This function is executed via the Sim function.

# Value

The output is saved as an external file in output\_folder.

### Author(s)

SimFitMx 61

SimFitMx	Simulation Replication - FitMx

# Description

Simulation Replication - FitMx

## Usage

```
SimFitMx(taskid, repid, output_folder, seed, suffix, overwrite, integrity)
```

# Arguments

taskid Positive integer. Task ID.

repid Positive integer. Replication ID.

output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

### **Details**

This function is executed via the Sim function.

# Value

The output is saved as an external file in output\_folder.

### Author(s)

62 SimGenData

SimFN	Simulation File Name	

## **Description**

Simulation File Name

### Usage

```
SimFN(output_type, output_folder, suffix)
```

# Arguments

output\_type Character string. Output type.
output\_folder Character string. Output folder.

suffix Character string. Output of manCTMed:::.SimSuffix().

#### Value

Returns a character string file name with the output\_folder in the OS-specific format.

|--|

## **Description**

Simulation Replication - GenData

### Usage

```
SimGenData(taskid, repid, output_folder, seed, suffix, overwrite, integrity)
```

#### **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

SimIllustration 63

## **Details**

This function is executed via the Sim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustration

Simulation Replication (Illustration)

# Description

Simulation Replication (Illustration)

## Usage

```
SimIllustration(
  taskid,
  repid,
  output_folder,
  overwrite,
  integrity,
  seed,
  ci,
  pb,
  delta_t,
  R,
  B
)
```

### **Arguments**

```
taskid
                  Positive integer. Task ID.
                  Positive integer. Replication ID.
repid
                  Character string. Output folder.
output_folder
                  Logical. Overwrite existing output in output_folder.
overwrite
                  Logical. If integrity = TRUE, check for the output file integrity when overwrite
integrity
                  = FALSE.
                  Integer. Random seed.
seed
                  Logical. Run simulations for confidence intervals.
ci
                  Logical. Run simulations for parametric bootstrap confidence intervals.
pb
```

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

B Positive integer. Number of bootstrap samples.

### Value

The output is saved as an external file in output\_folder.

#### Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustrationDynrBootPara

Simulation Replication - BootPara

## **Description**

Simulation Replication - BootPara

# Usage

```
SimIllustrationDynrBootPara(
   taskid,
   repid,
   output_folder,
   seed,
   suffix,
   overwrite,
   integrity,
   B,
   ncores = NULL
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().
overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

B Positive integer. Number of bootstrap samples.

ncores Positive integer. Number of cores to use.

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
SimIllustrationDynrBootParaStdXMY
```

Simulation Replication - BootParaStdXMY

# Description

Simulation Replication - BootParaStdXMY

### Usage

```
SimIllustrationDynrBootParaStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

# **Arguments**

delta\_t

repid Positive integer. Task ID.

repid Positive integer. Replication ID.

output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

Numeric vector. Vector of time intervals.

This function is executed via the IllustrationSim function.

### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
SimIllustrationDynrBootParaXMY
```

Simulation Replication - BootParaXMY

# Description

Simulation Replication - BootParaXMY

## Usage

```
SimIllustrationDynrBootParaXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

# **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
SimIllustrationDynrDeltaStdXMY
```

Simulation Replication - Illustration (DynrDeltaStdXMY)

# Description

Simulation Replication - Illustration (DynrDeltaStdXMY)

### Usage

```
SimIllustrationDynrDeltaStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## **Arguments**

```
taskid
                  Positive integer. Task ID.
repid
                  Positive integer. Replication ID.
                  Character string. Output folder.
output_folder
                  Integer. Random seed.
seed
suffix
                  Character string. Output of manCTMed:::.SimSuffix().
overwrite
                  Logical. Overwrite existing output in output_folder.
integrity
                  Logical. If integrity = TRUE, check for the output file integrity when overwrite
                  = FALSE.
                  Numeric vector. Vector of time intervals.
delta_t
```

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
SimIllustrationDynrDeltaXMY
```

Simulation Replication - Illustration (DynrDeltaXMY)

# Description

Simulation Replication - Illustration (DynrDeltaXMY)

### Usage

```
SimIllustrationDynrDeltaXMY(
   taskid,
   repid,
   output_folder,
   seed,
   suffix,
   overwrite,
   integrity,
   delta_t
)
```

## **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

```
SimIllustrationDynrMCPhiSigma
```

Simulation Replication - Illustration (MCPhiSigma)

# Description

Simulation Replication - Illustration (MCPhiSigma)

### Usage

```
SimIllustrationDynrMCPhiSigma(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  R
)
```

## **Arguments**

taskid Positive integer. Task ID.
repid Positive integer. Replication ID.
output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

R Positive integer. Number of Monte Carlo replications.

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustrationDynrMCStdXMY

Simulation Replication - Illustration (DynrMCStdXMY)

## **Description**

Simulation Replication - Illustration (DynrMCStdXMY)

# Usage

```
SimIllustrationDynrMCStdXMY(
   taskid,
   repid,
   output_folder,
   seed,
   suffix,
   overwrite,
   integrity,
   delta_t,
   R
)
```

### **Arguments**

taskid Positive integer. Task ID.
repid Positive integer. Replication ID.
output\_folder Character string. Output folder.
seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().
overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

delta\_t Numeric vector. Vector of time intervals.

R Positive integer. Number of Monte Carlo replications.

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustrationDynrMCXMY

Simulation Replication - Illustration (DynrMCXMY)

## **Description**

Simulation Replication - Illustration (DynrMCXMY)

# Usage

```
SimIllustrationDynrMCXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

### **Arguments**

taskid Positive integer. Task ID. repid Positive integer. Replication ID. output\_folder Character string. Output folder. seed Integer. Random seed. suffix Character string. Output of manCTMed:::.SimSuffix(). overwrite Logical. Overwrite existing output in output\_folder. integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE. Numeric vector. Vector of time intervals. delta\_t Positive integer. Number of Monte Carlo replications. R

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

### Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustrationFitDynr

Simulation Replication - IllustrationFitDynr

# Description

Simulation Replication - IllustrationFitDynr

## Usage

```
SimIllustrationFitDynr(
  taskid,
  repid,
 output_folder,
  seed,
  suffix,
 overwrite,
  integrity
)
```

### **Arguments**

taskid Positive integer. Task ID. Positive integer. Replication ID. repid output\_folder Character string. Output folder.

Integer. Random seed. seed

suffix Character string. Output of manCTMed:::.SimSuffix(). overwrite Logical. Overwrite existing output in output\_folder.

Logical. If integrity = TRUE, check for the output file integrity when overwrite integrity

= FALSE.

### **Details**

This function is executed via the IllustrationSim function.

SimIllustrationFitMx 73

# Value

The output is saved as an external file in output\_folder.

## Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustrationFitMx Simulation Replication - IllustrationFitMx

# **Description**

Simulation Replication - IllustrationFitMx

## Usage

```
SimIllustrationFitMx(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity
)
```

#### **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID. output\_folder Character string. Output folder.

seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().
overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

# **Details**

This function is executed via the IllustrationSim function.

#### Value

The output is saved as an external file in output\_folder.

74 SimIllustrationGenData

#### Author(s)

Ivan Jacob Agaloos Pesigan

SimIllustrationGenData

Simulation Replication - IllustrationGenData

# Description

Simulation Replication - IllustrationGenData

#### Usage

```
SimIllustrationGenData(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity
)
```

# Arguments

taskid Positive integer. Task ID.
repid Positive integer. Replication ID.
output\_folder Character string. Output folder.
seed Integer. Random seed.

suffix Character string. Output of manCTMed:::.SimSuffix().

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the IllustrationSim function.

## Value

The output is saved as an external file in output\_folder.

#### Author(s)

SimIllustrationPara 75

SimIllustrationPara Simulation Replication Parametric Bootstrap (Parallel)

# Description

Simulation Replication Parametric Bootstrap (Parallel)

# Usage

```
SimIllustrationPara(
  taskid,
  repid,
  output_folder,
  overwrite,
  integrity,
  seed,
  B
)
```

# **Arguments**

taskid Positive integer. Task ID.

repid Positive integer. Replication ID.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

seed Integer. Random seed.

B Positive integer. Number of bootstrap samples.

## Value

The output is saved as an external file in output\_folder.

#### Author(s)

76 SimProj

SimPara	Simulation Replication Parametric Bootstrap (Parallel)

# Description

Simulation Replication Parametric Bootstrap (Parallel)

# Usage

```
SimPara(taskid, repid, output_folder, overwrite, integrity, seed, B)
```

# Arguments

taskid Positive integer. Task ID.

repid Positive integer. Replication ID.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

seed Integer. Random seed.

B Positive integer. Number of bootstrap samples.

#### Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

SimProj	Simulation Project Name	

# Description

Simulation Project Name

# Usage

SimProj()

# Value

Returns the project name as a character string.

Sum 77

#### Author(s)

Ivan Jacob Agaloos Pesigan

Sum Summary

# **Description**

Summary

# Usage

Sum(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

## Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

SumDynrDeltaStdXMY Summary (DynrDeltaStdXMY)

# Description

Summary (DynrDeltaStdXMY)

# Usage

SumDynrDeltaStdXMY(taskid, reps, output\_folder, overwrite, integrity)

## **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

## **Details**

This function is executed via the Sum function.

#### Value

The output is saved as an external file in output\_folder.

## Author(s)

Ivan Jacob Agaloos Pesigan

SumDynrDeltaStdYMX Summary (DynrDeltaStdYMX)

# **Description**

Summary (DynrDeltaStdYMX)

#### Usage

SumDynrDeltaStdYMX(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the Sum function.

SumDynrDeltaXMY 79

# Value

The output is saved as an external file in output\_folder.

#### Author(s)

Ivan Jacob Agaloos Pesigan

SumDynrDeltaXMY Summary (DynrDeltaXMY)

# **Description**

Summary (DynrDeltaXMY)

#### Usage

SumDynrDeltaXMY(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

## Details

This function is executed via the Sum function.

# Value

The output is saved as an external file in output\_folder.

#### Author(s)

SumDynrDeltaYMX	Summary (DynrDeltaYMX)
Juliby III DCI Call IX	Summary (Bym Benarmar)

# Description

Summary (DynrDeltaYMX)

#### Usage

```
SumDynrDeltaYMX(taskid, reps, output_folder, overwrite, integrity)
```

#### **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the Sum function.

# Value

The output is saved as an external file in output\_folder.

#### Author(s)

Ivan Jacob Agaloos Pesigan

SumDynrMCStdXMY Summary (DynrMCStdXMY)

# Description

Summary (DynrMCStdXMY)

# Usage

SumDynrMCStdXMY(taskid, reps, output\_folder, overwrite, integrity)

SumDynrMCStdYMX 81

## **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the Sum function.

#### Value

The output is saved as an external file in output\_folder.

## Author(s)

Ivan Jacob Agaloos Pesigan

SumDynrMCStdYMX Summary (DynrMCStdYMX)

# **Description**

Summary (DynrMCStdYMX)

#### Usage

SumDynrMCStdYMX(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the Sum function.

82 SumDynrMCXMY

# Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

SumDynrMCXMY Summary (DynrMCXMY)

# Description

Summary (DynrMCXMY)

#### Usage

SumDynrMCXMY(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

## Details

This function is executed via the Sum function.

# Value

The output is saved as an external file in output\_folder.

# Author(s)

SumDynrMCYMX 83

ary (DynrMCYMX)
iry (DynimCim

# Description

Summary (DynrMCYMX)

#### Usage

```
SumDynrMCYMX(taskid, reps, output_folder, overwrite, integrity)
```

## **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the Sum function.

# Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

SumFitDynr Summary (FitDynr)

# Description

Summary (FitDynr)

# Usage

SumFitDynr(taskid, reps, output\_folder, overwrite, integrity)

84 SumIllustration

#### **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the Sum function.

#### Value

The output is saved as an external file in output\_folder.

#### Author(s)

Ivan Jacob Agaloos Pesigan

SumIllustration Summary (Illustration)

# Description

Summary (Illustration)

# Usage

SumIllustration(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### Value

The output is saved as an external file in output\_folder.

#### Author(s)

 ${\tt SumIllustrationDynrBootParaStdXMY}$ 

Summary - Illustration (DynrBootParaStdXMY)

# Description

Summary - Illustration (DynrBootParaStdXMY)

# Usage

```
SumIllustrationDynrBootParaStdXMY(
  taskid,
  reps,
  output_folder,
  overwrite,
  integrity,
  type = "pc"
)
```

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

type Character string. Confidence interval type.

# **Details**

This function is executed via the IllustrationSum function.

#### Value

The output is saved as an external file in output\_folder.

#### Author(s)

 ${\tt SumIllustrationDynrBootParaXMY}$ 

Summary - Illustration (DynrBootParaXMY)

# Description

Summary - Illustration (DynrBootParaXMY)

# Usage

```
SumIllustrationDynrBootParaXMY(
   taskid,
   reps,
   output_folder,
   overwrite,
   integrity,
   type = "pc"
)
```

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

type Character string. Confidence interval type.

# **Details**

This function is executed via the IllustrationSum function.

#### Value

The output is saved as an external file in output\_folder.

#### Author(s)

 ${\tt SumIllustrationDynrDeltaStdXMY}$ 

Summary - Illustration (DynrDeltaStdXMY)

# Description

Summary - Illustration (DynrDeltaStdXMY)

# Usage

```
SumIllustrationDynrDeltaStdXMY(
  taskid,
  reps,
  output_folder,
  overwrite,
  integrity
)
```

# Arguments

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

## **Details**

This function is executed via the IllustrationSum function.

#### Value

The output is saved as an external file in output\_folder.

# Author(s)

SumIllustrationDynrDeltaXMY

Summary - Illustration (DynrDeltaXMY)

# Description

Summary - Illustration (DynrDeltaXMY)

# Usage

SumIllustrationDynrDeltaXMY(taskid, reps, output\_folder, overwrite, integrity)

# **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the IllustrationSum function.

## Value

The output is saved as an external file in output\_folder.

# Author(s)

Ivan Jacob Agaloos Pesigan

 ${\tt SumIllustrationDynrMCStdXMY}$ 

Summary - Illustration (DynrMCStdXMY)

#### **Description**

Summary - Illustration (DynrMCStdXMY)

#### Usage

SumIllustrationDynrMCStdXMY(taskid, reps, output\_folder, overwrite, integrity)

#### **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the IllustrationSum function.

#### Value

The output is saved as an external file in output\_folder.

## Author(s)

Ivan Jacob Agaloos Pesigan

SumIllustrationDynrMCXMY

Summary - Illustration (DynrMCXMY)

# **Description**

Summary - Illustration (DynrMCXMY)

# Usage

SumIllustrationDynrMCXMY(taskid, reps, output\_folder, overwrite, integrity)

#### **Arguments**

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

output\_folder Character string. Output folder.

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the IllustrationSum function.

# Value

The output is saved as an external file in output\_folder.

#### Author(s)

Ivan Jacob Agaloos Pesigan

 ${\tt SumIllustrationFitDynr}$ 

Summary - Illustration (FitDynr)

# Description

Summary - Illustration (FitDynr)

# Usage

SumIllustrationFitDynr(taskid, reps, output\_folder, overwrite, integrity)

# Arguments

taskid Positive integer. Task ID.

reps Positive integer. Number of replications.

 $output\_folder \quad Character\ string.\ Output\ folder.$ 

overwrite Logical. Overwrite existing output in output\_folder.

integrity Logical. If integrity = TRUE, check for the output file integrity when overwrite

= FALSE.

#### **Details**

This function is executed via the IllustrationSum function.

#### Value

The output is saved as an external file in output\_folder.

#### Author(s)

ThetaHat 91

ThetaHat

Estimated Drift Matrix and Process Noise

# Description

The function extracts the estimated drift matrix and process noise from the fitted model.

# Usage

```
ThetaHat(fit)
```

# **Arguments**

fit

R object. Output of the FitDynr(), FitMx(), IllustrationFitDynr(), or IllustrationFitMx(), functions.

# See Also

```
Other Model Fitting Functions: FitDynr(), FitMx(), IllustrationFitDynr(), IllustrationFitMx(), IllustrationMCPhiSigma(), IllustrationPrepData(), PhiHat()
```

# **Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(n = 50)
data <- RandomMeasurement(sim)
fit <- FitDynr(data)
ThetaHat(fit)
## End(Not run)</pre>
```

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