Package 'NPMVCP'

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Type Package

Title Nonparametric Multivariate Change Point Model

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Description Nonparametric Multivariate Change Point Model

License GPL (>= 2)

LazyLoad yes

NeedsCompilation no

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R topics documented:

Alsmelterdata — *Aluminum Smelter Dataset*

Description

This data set contains process readings from aluminum smelter dataset.

Usage

```
Alsmelterdata
```

CLp10c15 — *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 10, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp10c15
```

CLp2c9 — *Control Limits for data vector dimension p=2, quarantine period c = 2*

Description

This data set contains control limits for data vector dimension p = 2, quarantine period c = 9 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp2c9
```

CLp3c15 *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 3, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp3c15
```

CLp4c15 *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 4, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp4c15
```

CLp5c15 *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 5, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp5c15
```

CLp6c15 *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 6, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp6c15
```

CLp7c15 *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 7, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp7c15
```

CLp8c15 *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 8, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp8c15
```

CLp9c15 — *Control Limits for data vector dimension p=3, quarantine period c = 15*

Description

This data set contains control limits for data vector dimension p = 9, quarantine period c = 15 for in control average run length (ARL) values: 100, 200, 500, 1000, 2000.

Usage

```
CLp9c15
```

Figure1tau150 — *Out of Control Average Run Length for shift location tau = 150*

Description

This data set contains out of control average run length (ARL) values for nonparametric multivariate change point model. Shift location tau = 150 for shift size delta and several quarantine values (from Figure 1).

Usage

```
Figure1tau150
```

Figure1tau33 — *Out of Control Average Run Length for shift location tau = 33*

Description

This data set contains out of control average run length (ARL) values for nonparametric multivariate change point model. Shift location tau = 33 for shift size delta and several quarantine values (from Figure 1).

Usage

```
Figure1tau33
```

Figure2Parametric — *Out of Control Average Run Length for Parametric Multivariate Change Point Model*

Description

This data set contains out of control average run length (ARL) values for parametric multivariate change point model (from Figure 2).

Usage

```
Figure2Parametric
```

NPMVCP — *Nonparametric Multivariate Change Point Model*

Description

Computes control chart values for Nonparametric Multivariate Change Point Model

Usage

```
NPMVCP(X)
```

Arguments

X	A matrix containing observed process readings. Each row represents a single realization of a random vector.

Details

Computes control chart value for nonparametric multivariate change point model.

Value

A data frame containing original data vectors, control chart values (Rmax), and estimated shift location (tauhat).

Examples

```
library(NPMVCP)
data("Alsmelterdata")
output <- NPMVCP(Alsmelterdata)

# p = dimension of each data vector #
p <- ncol(Alsmelterdata)

# c = degree of quarantine #
c <- 15

# N = total number of observation vectors #
N <- nrow(Alsmelterdata)

# set monitoring start value #
monitoring.start <- max(p + 10, 2*c + 3)

# load control limits #
CLdatastring <- paste("CLp", p, "c", c, sep="")
data(list=CLdatastring)
CL <- get(CLdatastring)[,"0.002"]

# extrapolate control limits beyond n = 500, if necessary #
nmax <- N-(monitoring.start-1)
if (nmax > 500) {
    ninv <- 1/(100:500)
    CLexmodel <- lm(CL[100:500] ~ ninv)
    CL <- c(CL, pmax(CL[500], CLexmodel$coef[1] + CLexmodel$coef[2]*(1/(501:nmax))))
}

# adjust index of control limit vector for plotting #
CLtoplot <- c(rep(NA, monitoring.start-1), CL[1:(N-(monitoring.start-1))])

## Not run: plot(output$Rmax, ylim=c(0, 24), type="b")
## Not run: lines(CLtoplot)
```

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