# Package 'HS'

April 12, 2019

**Type** Package

**Title** Homogenous Segmentation for Spatial Lines Data

**Date** 2019-04-07

**Version** 1.0

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**Description** Methods of homogenous segmentation for spatial lines data, such as pavement performance indicators and traffic volumes. A moving coefficient of variation method is available for homogenous segmentation.

**Imports** zoo

**Depends** R (>= 3.4.0)

**License** GPL-2

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.0.1

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2019-04-12 09:02:42 UTC

## R topics documented:

## deflection *Road deflection dataset.*

### Description

The "deflection" dataset is a sample of the road deflection data monitored and collected by Main Roads Western Australia.

### Usage

```
deflection
```

### Format

`deflection`: A data frame with 1000 rows and 2 variables.

- SLK. Spatial location of data. SLK is short for the straight line kilometer.
- Deflection. The monitored road deflection value.

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## preprocessing *Preprocessing for field monitoring data.*

### Description

The preprocessing includes two steps: removing missing data and ordering data by spatial locations.

### Usage

```
preprocessing(var = "Deflection", location = "SLK", data = data)
```

### Arguments

| | |
|---|---|
| `var` | A character of the name of a variable in a dataset, such as a road pavement performance indicator. |
| `location` | A character of the name of spatial locations in a dataset. |
| `data` | A data frame of monitoring data. |

### Examples

```
def <- preprocessing(var = "Deflection", location = "SLK", data = deflection)
```

seg *Homogenous segmentation for road data.*

## Description

Function for homogenous segmentation for road data using a moving coefficient of variation (CV) method.

## Usage

```
seg(var = "Deflection", location = "SLK", interval = interval, unit = 10, data = data)
## S3 method for class 'seg'
print(x, ...)
## S3 method for class 'seg'
plot(x, range = 1:300, legend_location = "topright", ...)
```

## Arguments

| | |
|---|---|
| var | A character of the name of a variable in a dataset, such as a road pavement performance indicator. |
| location | A character of the name of spatial locations in a dataset. |
| interval | A vector of available segmentation intervals. The length of the vector is longer than 1. |
| unit | A number of the unit of the interval data. |
| data | A data frame of monitoring data. |
| x | A list of homogenous segmentation result. |
| range | A vector of a range of plot data. |
| legend_location | A character of legend location. |
| ... | Ignore. |

## Examples

```
# preprocessing
def <- preprocessing(var = "Deflection", location = "SLK", data = deflection)
# smoothing
def$smooth_def <- segsmooth(var = "Deflection", range = 11, data = def)
# segmentation
interval <- seq(100, 500, 20)
seg1 <- seg(var = "smooth_def", location = "SLK", interval = interval, unit = 10, data = def)
seg1
plot(seg1, range = 1:994, legend_location = "topleft")
```

segsmooth *Smoothing data using the moving average method for the homogenous segmentation.*

## Description

A center aligned moving window is used for the moving average method.

## Usage

```
segsmooth(var = "Deflection", range = 11, data = data)
```

## Arguments

| | |
|---|---|
| var | A character of the name of a variable in a dataset, such as a road pavement performance indicator. |
| range | A number of the size of moving window. An odd number is required. |
| data | A data frame of monitoring data. |

## Examples

```
# preprocessing
def <- preprocessing(var = "Deflection", location = "SLK", data = deflection)
# smoothing
def$smooth_def <- segsmooth(var = "Deflection", range = 11, data = def)
# plot
n <- 1:500
plot(def$SLK[n], def$Deflection[n], type = "l",
     col = "lightblue", xlab = "SLK", ylab = "Deflection")
lines(def$SLK[n], def$smooth_def[n])
```

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