

# Package ‘SMLoutliers’

October 12, 2022

**Type** Package

**Title** Outlier Detection Using Statistical and Machine Learning Methods

**Version** 0.1

**Date** 2017-06-06

**Author** Siddharth Jain and Prabhanjan Tattar

**Maintainer** Siddharth Jain <siddharthjain242@gmail.com>

**Description** Local Correlation Integral (LOCI) method for outlier identification is implemented here. The LOCI method developed here is invented in Breunig, et al. (2000), see <[doi:10.1145/342009.335388](https://doi.org/10.1145/342009.335388)>.

**License** GPL-2

**NeedsCompilation** no

**Repository** CRAN

**Date/Publication** 2017-02-06 17:38:16

## R topics documented:

SMLoutliers-package . . . . .	1
LOCI . . . . .	2
stiff . . . . .	3
<b>Index</b>	<b>4</b>

---

SMLoutliers-package    *An R package for identifying outliers using statistical and machine learning methods*

---

## Description

We intend to provide host of methods for identifying outliers. This will cut across statistical and machine learning methods.

## References

M.M. Breunig, H.P. Kriegel, R.T. Ng, and J. Sander. Lof: Identifying density-based local outliers. In Proc. SIGMOD Conf., pages 93-104, 2000.

## Examples

```
data(stiff)
summary(stiff)
```

---

LOCI

*Local Correlation Integral*

---

## Description

We provide an R implementation of the Local Correlation Integral method for detecting outliers as developed by Breunig, et al. (2000), and we follow its description given in Papadimitriou, et al. (2002).

## Usage

```
LOCI(data, alpha)
```

## Arguments

data	Any R data.frame which consists of numeric values only
alpha	a number in the unit interval for the fractional circle search

## Details

A simple implementation is provided here. The core function is the distance function. For each observation, a search is made for nearest neighbors within  $r$  distance of it, and then for each of these neighbors, we find the number of observations in the fractional circle. Calculations based on multi-granularity deviation factor, MDEF, help in determining the outlier.

## Author(s)

Siddharth Jain and Prabhanjan Tattar

## References

M.M. Breunig, H.P. Kriegel, R.T. Ng, and J. Sander. Lof: Identifying density-based local outliers. In Proc. SIGMOD Conf., pages 93-104, 2000. Papadimitriou, S., Kitagawa, H., Gibbons, P.B. and Faloutsos, C., 2003, March. Loci: Fast outlier detection using the local correlation integral. In Data Engineering, 2003. Proceedings. 19th International Conference on (pp. 315-326). IEEE.

**Examples**

```
data(stiff)
OM <- LOCI(stiff,0.5)
OM
```

---

stiff

*The Board Stiffness Dataset*

---

**Description**

Four measures of stiffness of 30 boards are available. The first measure of stiffness is obtained by sending a shock wave down the board, the second measure is obtained by vibrating the board, and remaining are obtained from static tests.

**Usage**

```
data(stiff)
```

**Format**

A data frame with 30 observations on the following 4 variables.

- x1 first measure of stiffness is obtained by sending a shock wave down the board
- x2 second measure is obtained by vibrating the board
- x3 third measure is obtained by a static test
- x4 fourth measure is obtained by a static test

**References**

Johnson, R.A., and Wichern, D.W. (1982-2007). *Applied Multivariate Statistical Analysis*, 6e. Pearson Education. Tattar, et al. (2016). *A Course in Statistics with R*. J. Wiley.

**Examples**

```
data(stiff)
summary(stiff)
```

# Index

- \* **LOCI**

- LOCI, [2](#)

- SMLoutliers-package, [1](#)

- \* **datasets**

- stiff, [3](#)

- \* **multi granularity deviation factor**

- LOCI, [2](#)

- \* **outliers**

- SMLoutliers-package, [1](#)

LOCI, [2](#)

SMLoutliers (SMLoutliers-package), [1](#)

SMLoutliers-package, [1](#)

stiff, [3](#)