

# Package ‘spearmanCI’

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**Version** 1.0

**Date** 2018-05-09

**Title** Jackknife Euclidean / Empirical Likelihood Inference for Spearman's Rho

**Description** Functions for conducting jackknife Euclidean / empirical likelihood inference for Spearman's rho (de Carvalho and Marques (2012) <10.1080/10920277.2012.10597644>).

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**Depends** R (>= 3.0.1)

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**License** GPL (>= 3)

**Repository** CRAN

**Imports** emplik, MASS

**NeedsCompilation** no

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fire	<i>Danish Fire Insurance Claims Database</i>
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## Description

Danish Fire Insurance Claims Database includes 2167 industrial fire losses gathered from the Copenhagen Reinsurance Company over the period 1980–1990.

**Usage**

```
fire
```

**Format**

A dataframe with 2167 observations on five variables. The object is of class `data.frame`.

**Examples**

```
data(fire)
attach(fire)
plot(building, contents, pch = 20, xlim = c(0,95), ylim = c(0,133),
      xlab = "Loss of Building", ylab = "Loss of Contents",
      main = "Danish Fire Insurance Claims")
```

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spearmanCI

*Jackknife Euclidean / Empirical Likelihood Inference for Spearman's Correlation*

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**Description**

Computes jackknife Euclidean / empirical likelihood confidence intervals for Spearman's correlation.

**Usage**

```
spearmanCI(x, y, level = 0.95, method = "Euclidean", plot = FALSE)
```

**Arguments**

<code>x</code>	vector with data.
<code>y</code>	vector with data.
<code>level</code>	the confidence level required.
<code>method</code>	This must be one of the strings "Euclidean" or "empirical"; see references below for details.
<code>plot</code>	plot log-likelihood ratio function?

**Author(s)**

Miguel de Carvalho

**References**

de Carvalho, M. and Marques, F. J. (2012). Jackknife Euclidean likelihood-based inference for Spearman's rho. *North American Actuarial Journal*, **16**, 487–492.

Wang, R., and Peng, L. (2011). Jackknife Empirical likelihood intervals for Spearman's rho. *North American Actuarial Journal*, **15**, 475–486.

**Examples**

```
## Real data example
data(fire)
attach(fire)
spearmanCI(building, contents)

## The intervals in de Carvalho and Marques (2012, Section 3.2)
## differ slightly as they are based on the estimate
## spearman <- function(x, y) {
##   n <- length(x)
##   F <- ecdf(x); G <- ecdf(y)
##   return(12 / n * sum((F(x) - 1 / 2) * (G(y) - 1 / 2)))
## }

## Simulated data example
library(MASS)
pearson <- .7
Sigma <- matrix(c(1, pearson, pearson, 1), 2, 2)
xy <- mvrnorm(n = 1000, rep(0, 2), Sigma)
spearmanCI(xy[, 1], xy[, 2])
abline(v = 6 / pi * asin(pearson / 2), col = "grey", lty = 3)
```

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