Package 'Rpcop'

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Type Package

Title Principal Curves of Oriented Points

Version 1.0

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Description Principal curves generalize the notion of a first principal component to the case in which it is a non linear smooth curve. This package provides a function pcop(X) to compute principal curves with the algorithm defined in Delicado (2001) <doi:10.1006/jmva.2000.1917> from a data matrix X.

License GPL (>= 2)

Imports Rcpp (>= 1.0.7)

LinkingTo Rcpp

Depends princurve

RoxygenNote 7.1.2

NeedsCompilation yes

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https://www-eio.upc.es/~delicado/PCOP/index.html),
Mario Huerta [aut] (C++ original),
Kevin Michael Frick [trl, aut, cre] (Fixes for modern C++ and Rcpp port, with permission from the original authors),
Stephen L. Moshier [cph] (Wrote eigens(), which computes eigenvalues and eigenvectors of a real symmetric matrix)

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Repository CRAN

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R topics documented:

pcop *pcop*

Description

Computes a principal curve of oriented points as defined in Delicado (2001).

Usage

```
pcop(x, Ch = 1.5, Cd = 0.3, plot.true = FALSE, ...)
```

Arguments

x	a matrix of n points in dimension p
Ch	The smoothing parameter h is C_H times the value given by the normal reference rule. Default value 1.5. Constraints 0.5 <= C_H <= 1.5
Cd	The distance between two consecutive principal oriented points in a PCOP is about C_D times the value of the smoothing parameter h. Default value 0.3. Constraints 0.25 <= C_D <= .5
plot.true	if TRUE, the function produces a plot
...	Additional parameters passed to function "lines"

Value

A list with two data frames. One contains a list with the following names: 'param': Value of the parameter t such the the principal oriented point is PCOP(t). 'dens': Density estimation for the random variable induced over the PCOP at t. 'span': proportion of original data involved in the determination of the principal oriented point. 'orth.var': Variance over the hyperplane orthogonal to the PCOP at the principal oriented point. 'pop': a p-dimensional array. The p coordinates of the principal oriented point. 'pr.dir': a p-dimensional array. The p coordinates of the principal direction for the principal oriented point. For the second, look at the package princurve.

Examples

```
x <- runif(100,-1,1)
x <- cbind(x, x ^ 2 + rnorm(100, sd = 0.1))
pcop(x, plot.true=TRUE, lwd=4, col=2)
```

pcop_backend *Computes a principal curve as defined in Delicado (2001). DO NOT use this function unless you know what you are doing. Use 'pcop()' instead.*

Description

Computes a principal curve as defined in Delicado (2001). DO NOT use this function unless you know what you are doing. Use 'pcop()' instead.

Usage

```
pcop_backend(x, c_d, c_h)
```

Arguments

x	See 'pcop()'
c_d	See 'pcop()'
c_h	See 'pcop()'

Value

A numeric matrix to be parsed by 'pcop()'.

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