Package 'plugdensity'

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Title Plug-in Kernel Density Estimation

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R interface etc by Martin Maechler

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Description Kernel density estimation with global bandwidth selection
via ``plug-in''.

Imports utils

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https://r-forge.r-project.org/R/?group_id=846,

https://r-forge.r-project.org/scm/viewvc.php/pkg/plugdensity/?root=curves-etc
,

svn://svn.r-forge.r-project.org/svnroot/curves-etc/pkg/plugdensity

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R topics documented:

plugin.density	*Kernel Density Estimation by Plug-In Bandwidth Selection*

Description

The function `plugin.density()` provides kernel density estimation with iterative plug-in bandwidth selection.

`bw.EH()` computes the bandwidth (smoothing parameter) which `plugin.density()` also uses.

Usage

```
plugin.density(x, nout = 201, xout = NULL, na.rm = FALSE)
bw.EH(x)
```

Arguments

x	vector of numbser whose density is to be estimated.
nout	integer specifying the number of equispaced xout values to use *only when* xout = NULL (as by default).
xout	numeric vector of abscissa values at which the density is to be evaluated. By default, an equispaced sequence of values covering (slightly more than) the range of x.
na.rm	logical; if TRUE, missing values are removed from x. If FALSE any missing values cause an error.

Value

`bw.EH()` returns the bandwidth h computed by Eva Herrmann's plugin bandwith selector.

`plugin.density()` returns an object of class `"densityEHpi"` inheriting also from class `"`[density](#)`"`. It is a [list](#) with components

x	the n coordinates of the points where the density is estimated.
y	the estimated density values.
bw	the bandwidth used.
n	the sample size after elimination of missing values.
call	the call which produced the result.
data.name	the deparsed name of the x argument.

Author(s)

Algorithm and C code: Eva Herrmann <eherrmann@mathematik.tu-darmstadt.de>; R interface: Martin Maechler <maechler@R-project.org>.

Source

Original code, no longer available, from 'http://www.unizh.ch/biostat/Software/' .

References

J. Engel, Eva Herrmann and Theo Gasser (1994). An iterative bandwidth selector for kernel estimation of densities and their derivatives. *Journal of Nonparametric Statistics* **4**, 21–34.

See Also

density.

Examples

```
data(co2)
plot(dco2 <- density(co2), ylim = c(0, 0.03))
(pdco2 <- plugin.density(co2, xout = dco2$x))
lines(pdco2, col = "red")

plot(pdco2)# calls 'plot.density' method

str(pdco2 <- plugin.density(co2))
xo <- pdco2 $x
str(d.co2 <- density(co2, n = length(xo), from=xo[1],to=max(xo),
                     width= 4 * pdco2$bw))
nms <- c("x","y", "bw", "n")
all.equal(d.co2[nms], pdco2[nms])
## are close: "Component 2 (= 'y'): Mean relative difference: 0.0009..."
## be.EH() directly computes the bandwidth only:
stopifnot(all.equal(bw.EH(co2), pdco2$bw, tol = 3e-16))
```

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