R documentation

June 25, 2015

R topics documented:

`hSIMEXUknown-package` *Computes bandwidth h and ridge parameter rho using a version of the SIMEX method*

Description

Computes bandwidth h and ridge parameter rho using a version of the SIMEX method of Delaigle, A. and Hall, P. (2008). Using SIMEX for smoothing-parameter choice in errors-in-variables problems. JASA, 103, 280-287

Details

Package:	hSIMEXUknown
Type:	Package
Version:	1.0
Date:	2015-06-12
License:	GPL>=2

Author(s)

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References

Delaigle, A. and Hall, P. (2008). Using SIMEX for smoothing-parameter choice in errors-in-variables problems. JASA, 103, 280-287

Examples

```
#Sample size
NSR=0.2
n=500

#Generate data from a normal mixture
X=rnorm(n,5,.4);
X2=matrix(rnorm(n*n,2,1),nrow=n,ncol=n,byrow=TRUE);

pmix=0.75;
tmp=matrix(runif(n,0,1),nrow=1,ncol=n,byrow=TRUE);
X[which(tmp<pmix)]=X2[which(tmp<pmix)];
#Specify error distribution (normal or Laplace in this case) and generate data from this error distribution
errortype="Lap";
if (errortype=="Lap")
{sigU=sqrt(NSR*var(X)/2);
 varU=2*sigU^2;
 U=rlap(sigU,1,n);}
#Contaminated data
W=as.vector(X+U);
e = rnorm(n, 0, sqrt(.01))
Y=3*X+e
outcome<-hSIMEXUknown(W,Y,errortype,sigU)
```

`hSIMEXUknown` *Computes bandwidth h and ridge parameter rho using a version of the SIMEX method of*

Description

Computes bandwidth h and ridge parameter rho using a version of the SIMEX method of

Usage

```
hSIMEXUknown(W,Y,errortype,sigU)
```

Arguments

`W`	vector of contaminated data;
`Y`	vector of response data;
`errortype`	"Lap" for Laplace errors and "norm" for normal errors.
`sigU`	parameter of Laplace or normal errors used only to define phiU.

Details

For outcomes, h: bandwidth using SIMEX; rho: ridge parameter; indrho: index for the minimum rho.

Author(s)

Aurore Delaigle

References

Delaigle, A. and Hall, P. (2008). Using SIMEX for smoothing-parameter choice in errors-in-variables problems. JASA, 103, 280-287

Examples

```
#Sample size
NSR=0.2
n=500

#Generate data from a normal mixture
X=rnorm(n,5,.4);
X2=matrix(rnorm(n*n,2,1),nrow=n,ncol=n,byrow=TRUE);

pmix=0.75;
tmp=matrix(runif(n,0,1),nrow=1,ncol=n,byrow=TRUE);
X[which(tmp<pmix)]=X2[which(tmp<pmix)];
#Specify error distribution (normal or Laplace in this case) and generate data from this error distribution
errortype="Lap";
if (errortype=="Lap")
{sigU=sqrt(NSR*var(X)/2);
 varU=2*sigU^2;
 U=rlap(sigU,1,n);}
#Contaminated data
W=as.vector(X+U);
e = rnorm(n, 0, sqrt(.01))
Y=3*X+e
outcome<-hSIMEXUknown(W,Y,errortype,sigU)
```

NWDecUknown — *Compute the measurement error version of the Nadaraya-Watson regression estimator*

Description

Compute the measurement error version of the Nadaraya-Watson regression estimator

Usage

```
NWDecUknown (xx,W,Y,errortype,sigU,h,rho)
```

Arguments

xx	vector of x-values where to compute the regression estimator;
W	vector of contaminated data;
errortype	"Lap" for Laplace errors and "norm" for normal errors.
sigU	standard deviation of U, parameter of Laplace or normal errors used only to define phiU.

h	bandwidth
rho	ridge parameter

Details

Goal: estimate m where Y=m(X)+epsilon, and we observe data on (W,Y), where W=X+U. See Fan, J., and Truong, Y. K. (1993), Nonparametric Regression With Errors in Variables, The Annals of Statistics, 21, 1900-1925. See Delaigle, A. and Hall, P. (2008). Using SIMEX for smoothing-parameter choice in errors-in-variables problems. JASA, 103, 280-287 The outcome is the Nadaraya-Watson regression estimator.

Author(s)

Aurore Delaigle

References

Fan, J., and Truong, Y. K. (1993), Nonparametric Regression With Errors in Variables, The Annals of Statistics, 21, 1900-1925. Delaigle, A. and Hall, P. (2008). Using SIMEX for smoothing-parameter choice in errors-in-variables problems. JASA, 103, 280-287

Examples

```
#Noise to signal ratio=varU/varX
NSR=0.2

#Sample size
n=500

#Generate data from a normal mixture
X=rnorm(n,5,.4);
X2=matrix(rnorm(n*n,2,1),nrow=n,ncol=n,byrow=TRUE);
pmix=0.75;
tmp=matrix(runif(n,0,1),nrow=1,ncol=n,byrow=TRUE);
X[which(tmp<pmix)]=X2[which(tmp<pmix)];

sigU=sqrt(NSR*var(X)/2);
 varU=2*sigU^2;
U=rlap(sigU,1,n)
 Y=3*X
 errortype="Lap"
 h=0.144
 rho=0.089
xx=seq(-2,8,0.1);
W=as.vector(X+U)
outcome<-NWDecUknown (xx,W,Y,errortype,sigU,h,rho)
```

---

rlap *Generate a matrix of size n1 x n2 from a Laplace(szC)*

Description

Generate a matrix of size n1 x n2 from a Laplace(szC)

Usage

```
rlap(szC,n1,n2)
```

Arguments

szC	real number
n1	real number
n2	real number

Author(s)

Aurore Delaigle

Examples

```
#Noise to signal ratio=varU/varX
NSR=0.2

#Sample size
n=500

#Generate data from a normal mixture
X=rnorm(n,5,.4);
X2=matrix(rnorm(n*n,2,1),nrow=n,ncol=n,byrow=TRUE);
pmix=0.75;
tmp=matrix(runif(n,0,1),nrow=1,ncol=n,byrow=TRUE);
X[which(tmp<pmix)]=X2[which(tmp<pmix)];

sigU=sqrt(NSR*var(X)/2);
 varU=2*sigU^2;
 U=rlap(sigU,1,n)
```

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