Package ‘COP’

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Type Package

Title Variables selection for index models via correlation pursuit

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Depends dr, MASS

Description This is the package for selecting variables for SDR models via correlation pursuit.

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R topics documented:

cop.cv *select the optimal variable in and variable out threshold in correlation pursuit using K fold cross validation*

Description

This function calculate the K-fold CV for selecting the optimal variable-in and variable-out threshold in correlation pursuit method

Usage

```
cop.cv(x,y,my.sel,K.fold,KK)
```

Arguments

x	is a n by p matrix of predictors.
y	is a response variable.
my.sel	is the selected subset of variables obtained using step.cop function.
K.fold	the number of fold in the CV calculation
KK	specify the number of principle directions of the selected subset of variables

Author(s)

Wenxuan Zhong

See Also

cop.cv

Examples

```
## generate data with n=200 and p=8
beta<-c(3,1.5,1,1,2,0,0,0)
x<-mvrnorm(200,rep(0,8),diag(1,8))
y<-x%*%beta+rnorm(200)
alpha.in=c(0.9,0.95,0.99)
i=1
my.cop.sel=list()
while(i <=3){
my.cop.sel[[i]]<-step.cop(x,y,5,alpha.in[i],alpha.in[i]-0.05,8,1)
i=i+1
}
my.cop.cv=NULL
for(i in 1:3){
my.cop.cv[i]=cop.cv(x,y,my.cop.sel[[i]],10,1)
}
my.cop.cv
```

GIC *select the optimal number of principle directions using GIC function in correlation pursuit algorithm*

Description

This function can estimate the best number of principle directions by minimizing the GIC function

Usage

```
GIC(x,y,my.sel,KK)
```

Arguments

`x`	is a n by p matrix of predictors.
`y`	is a response variable.
`my.sel`	is the selected subset of variables obtained using step.cop function.
`KK`	specify the candidate number of principle directions

Author(s)

Wenxuan Zhong

See Also

`cop.cv`

Examples

```
## generate data with n=200 and p=8
beta<-c(3,1.5,1,1,2,0,0,0)
x<-mvrnorm(200,rep(0,8),diag(1,8))
y<-x%*%beta+rnorm(200)
alpha.in=c(0.9,0.95,0.99)
i=1
my.cop.sel=list()
while(i <=3){
my.cop.sel[[i]]<-step.cop(x,y,5,alpha.in[i],alpha.in[i]-0.05,8,1)
i=i+1
}
my.d=NULL
for(i in 1:3){
my.d[i]=GIC(x,y,my.cop.sel[[i]],i)
}
my.d
```

step.cop *stepwise variable selection procedure using correlation pursuit*

Description

This function perform the stepwise variable selection for fixed number of principle directions and a pre-defined threshold for adding and deleting variable from the selected subset of variables

Usage

```
step.cop(x,y,H,alpha.in,alpha.out,my.range,k)
```

Arguments

x	is a n by p matrix of predictors
y	is a response variable
H	is the number of slices
alpha.in	is the threshold to add a significant variable in the selected subset of variables
alpha.out	is the threshold to delete a redundant variable from the selected subset of variables, alpha.out has to be smaller than alpha.in
my.range	is maximum number of variables that will be selected
k	is the number of principle directions

Author(s)

Wenxuan Zhong

See Also

cop.cv

Examples

```
## generate data with n=200 and p=8
beta<-c(3,1.5,1,1,2,0,0,0)
x<-mvrnorm(200,rep(0,8),diag(1,8))
y<-x%*%beta+rnorm(200)
my.cop.sel<-step.cop(x,y,5,0.95,0.90,8,1)
```

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