

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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NeedsCompilation no

R topics documented:

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|--------|---|
| cop.cv | <i>select the optimal variable in and variable out threshold in correlation pursuit using K fold cross validation</i> |
|--------|---|

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 | <i>select the optimal number of principle directions using GIC function in correlation pursuit algorithm</i> |
|-----|--|

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

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