Package 'hdqpt'

May 2, 2024

Type Package

Title Hypothesis testing in quantile regression with ultrahigh-dimensional treatment effects

Version 0.1.0

Author Xiao Zhang [aut,cre],
Xiangyong Tan [aut],
Runze Li [aut],
Xu Liu [aut]

Maintainer Xiao Zhang <zhangxiao1994@cuhk.edu.cn>

Description We provide an quantile partial test statistic for hypothesis testing in high-dimensional quantile model with high dimensional treatment effects. Both partial test and decorrelated partial test are supported.

License GPL (>= 2)

Imports Matrix, glmnet, hqreg, rqPen

Repository github

Encoding UTF-8

LazyData true

LazyDataCompression xz

URL https://github.com/XiaoZhangryy/hsqpt

BugReports https://github.com/XiaoZhangryy/hsqpt/issues

RoxygenNote 7.3.1

NeedsCompilation yes

R topics documented:

hdqpt 2

Index **4**

hdqpt *High dimensional quantile partial test*

Description

High dimensional quantile partial test

Usage

```
hdqpt(
  x,
  u,
  y,
  tau = 0.5,
  coef = NULL,
  decorrelate = TRUE,
  W = NULL,
  method = c("hqreg", "rqPen"),
  seed = 1
)
```

Arguments

x	The design matrix, which is a n by p matrix.
u	The control factors, which is a n by q matrix.
y	The outcome.
tau	The quantile.
coef	The coefficient of control factors, the first element corresponding to intercept. If not provided, we will first estimate according to the user's choice of estimation method, and then test process.
decorrelate	An indicator of whether do decorrelate test.
W	The decorrelate matrix, should be a q by p matrix when provided. Necessary when decorrelate is TRUE. If not provided, we will estimate it using cv.glmnet function from glmnet.
method	Method used to estimator the coefficient of control factors when it is not provided. "hqreg" means using "cv.hqreg" funcction from "hqreg" package and "rqPen" means using "rq.pen" function with "aLASSO" penalty.
seed	seed for hqreg estimation process.

Value

A list.

- ts - Test statistic.
- pval - p value.
- tr_sigma - trace sigma square.
- coef - the coefficient of control factors.

Examples

```
set.seed(0)
n <- 300
p <- 710
x <- matrix(rnorm(n * p), n, p)
u <- matrix(rnorm(n * p), n, p)
alpha <- c(rep(1, 5), rep(0, p - 5))
beta <- c(rep(1, 5), rep(0, p - 5))
y <-  u %*% alpha + x %*% beta + rnorm(n)
test_result <- hdqpt(x, u, y, tau = 0.5, decorrelate = FALSE, method = "hqreg")
print(test_result)
```

Index

hdqpt, 2