Package: coxerr (via r-universe)

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Title Cox Regression with Dependent Error in Covariates

Depends R (>= 2.8.0)

Suggests knitr, rmarkdown

VignetteBuilder knitr

Description Perform the functional modeling methods of Huang and Wang (2018) <doi:10.1111/biom.12741> to accommodate dependent error in covariates of the proportional hazards model. The adopted measurement error model has minimal assumptions on the dependence structure, and an instrumental variable is supposed to be available.

License GPL (>= 2)

NeedsCompilation yes

Author Yijian Huang [aut, cre, cph]

Maintainer Yijian Huang <yhuang5@emory.edu>

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coxerr *Cox regression with dependent error in covariates*

Description

Estimation methods of Huang and Wang (2018)

Usage

```
coxerr(t,dlt,wuz,method,initbt=rep(0,dim(as.matrix(wuz))[2]-1),
       derr=1e-6)
```

Arguments

t	follow-up time.
dlt	censoring indicator: 1 - event, 0 - censored.
wuz	covariate-related variables: wuz[,1] - mismeasured, wuz[,2] - instrumental variable (IV), wuz[,-c(1,2)] - accurately measured.
method	estimation method: 1 - Prop1, 2 - Prop 2.
initbt	initial value for the estimate.
derr	error tolerance.

Value

bt	point estimate.
va	estimated variance-covariance matrix.
succ	indicator for estimate-finding success.

Author(s)

Yijian Huang

References

Huang, Y. and Wang, C. Y. (2018) Cox Regression with dependent error in covariates, *Biometrics* 74, 118–126.

Examples

```
## simulate a dataset following Scenario 1 of Table 1 in Huang and Wang (2018)
size <- 300
bt0 <- 1

## true covariate
x <- rnorm(size)
```

```
## survival time, censoring time, follow-up time, censoring indicator
s <- rexp(size) * exp(-bt0 * x)
c <- runif(size) * ifelse(x <= 0, 4.3, 8.6)
t <- pmin(s, c)
dlt <- as.numeric(s <= c)

## mismeasured covariate with heterogeneous error, IV
w <- x + rnorm(size) * sqrt(pnorm(x) * 2) * 0.5 + 1
u <- x * 0.8 + rnorm(size) * 0.6
wuz <- cbind(w, u)

## estimation using PROP1
fit1 <- coxerr(t, dlt, wuz, 1)
## estimation using PROP2
fit2 <- coxerr(t, dlt, wuz, 2)
```

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