

Package ‘misPRIME’

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Type Package

Title Partial Replacement Imputation Estimation for Missing Covariates

Version 0.1.0

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Description

Partial Replacement Imputation Estimation (PRIME) can overcome problems caused by missing covariates in additive partially linear model. PRIME conducts imputation and regression simultaneously with known and unknown model structure. More details can be referred to Zishu Zhan, Xiangjie Li and Jingxiao Zhang. (2022) <[doi:10.48550/arXiv.2205.14994](https://doi.org/10.48550/arXiv.2205.14994)>.

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Imports splines, quadprog, MASS, stats

Depends R (>= 2.10)

LazyData true

NeedsCompilation no

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PRIME	<i>Partial Replacement Imputation Estimation (PRIME) for Missing Covariates</i>
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Description

partial replacement imputation estimation conducts imputation and regression simultaneously for missing covariates in additive partially linear model.

Usage

```
PRIME(
  Y,
  X,
  method = c("PRIME", "PRIME-MA"),
  model_structure = NULL,
  intercept = FALSE,
  bw = NULL,
  k_type = NULL,
  weight_type = c("CP", "CV"),
  L = NULL
)
```

Arguments

Y	a numeric vector, the response variable.
X	a numeric matrix that may include NAs (missing), the covariate matrix.
method	Users can choose PRIME or PRIME-MA. If method="PRIME", users must provide the model structure (nonlinear part index) in the input argument; If method=="PRIME-MA", then the program automatically applies model averaging methods to reduce the loss of misspecification of models without model structure.
model_structure	only available when method="PRIME". It is a 0/1 index vector representing whether each variable is linear/nonlinear in the partially linear model. For details see Example section.
intercept	logical. if TRUE, an intercept is included in the basis; default is FALSE.
bw	a positive value, specify the bandwidth in estimating missing values, default as NULL. When bw=NULL, it is automatically selected by Silverman's rule of thumb method.
k_type	an optional character string, specify the type of kernel used in iterative estimating algorithm and support 'epk', 'biweight', 'triangle', 'gaussian', 'triweight', 'tricube', 'cosine', 'uniform' in current version, default as 'gaussian'.
weight_type	Options for computing weights for PRIME-MA method. Users can choose among CP and CV.
L	an optional positive integer, degree of the piecewise polynomial, default as '3' for cubic splines.

Value

an object of class "prime" is a list containing at least the following components:

coef	only available when method="PRIME". A vector of coefficients of partially linear model.
beta	only available when method="PRIME". A vector of coefficients of linear parts in partially linear model.
Cmat	only available when method="PRIME-MA". A list of coefficients of candidate partially linear models.
weight	only available when method="PRIME-MA". The weights for candidate models, each candidate model involves one nonlinear part and others are linear parts.

Examples

```
data(PRIME_SimuData)
X = PRIME_SimuData[,-1]
Y = PRIME_SimuData[,1]
model_structure <- c(rep(0,5),1,1,1)

# estimation
result <- PRIME(Y, X, method = 'PRIME', model_structure, intercept = FALSE, weight_type = 'CV')
result$coef
result$beta
```

PRIME_SimuData *prime_SimuData An Example of Simulated Data for PRIME*

Description

prime_SimuData An Example of Simulated Data for PRIME

Usage

```
PRIME_SimuData
```

Format

The dataset prime_SimuData contains $n = 200$ samples with $p = 8$ covariates with missing

Y the response

X the covariates with missing data

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* datasets

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