Package ‘misPRIME’

October 13, 2022

Type Package
Title Partial Replacement Imputation Estimation for Missing Covariates
Version 0.1.0
Maintainer Zishu Zhan <zishu927@hotmail.com>
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) <arXiv:2205.14994>.
License GPL-3
Encoding UTF-8
RoxygenNote 7.1.2
Imports splines, quadprog, MASS, stats
Depends R (>= 2.10)
LazyData true
NeedsCompilation no
Author Zishu Zhan [aut, cre], Xiangjie Li [aut], Jingxiao Zhang [aut]
Repository CRAN
Date/Publication 2022-06-01 13:00:02 UTC

R topics documented:

PRIME ................................................................. 2
PRIME_SimuData .................................................. 3
Index 4
PRIME

Partial Replacement IMputation Estimation (PRIME) for Missing Covariates

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

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
Index

* datasets
  PRIME_SimuData, 3

PRIME, 2
PRIME_SimuData, 3