Package ‘ssfit’

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Type Package
Title Fitting of parametric models using summary statistics
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Description Fits complex parametric models using the method proposed by Cox and Kartsonaki (2012) without likelihoods.
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Description

Fits complex parametric models without likelihoods, using the method proposed by Cox and Kartsonaki (2012).

Details
See fit.model.

Author(s)

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**fit.model**  
*Fitting of parametric models using summary statistics*

## Description

Fits complex parametric models with intractable likelihood using the method proposed by Cox and Kartsonaki (2012).

## Usage

```r
fit.model(p, q, n, r, starting_values, h_vector, data_true, sim_data, features, n_iter, print_results = TRUE, variances = TRUE)
```

## Arguments

- **p**  
  Number of parameters to be estimated.

- **q**  
  Number of features / summary statistics.

- **n**  
  Sample size. Usually equal to the number of observations in the data (`data_true`).

- **r**  
  Number of simulations to be run at each design point, in each iteration.

- **starting_values**  
  A vector of starting values for the parameter vector.

- **h_vector**  
  A vector of spacings `h`.

- **data_true**  
  The dataset.

- **sim_data**  
  A function which simulates data using the model to be fitted.

- **features**  
  A function which calculates the features / summary statistics.
n_iter Number of iterations of the algorithm to be performed.
print_results If TRUE, the estimates of the parameters are printed at each iteration.
variances If TRUE, the covariance matrix of the estimates of the parameters at each iteration are saved into a list. If FALSE, only that of the estimates obtained at the last iteration is obtained.

Details

Function sim_data should simulate from the model, taking as arguments the sample size and the parameter vector. Function features must take as an argument the simulated data generated by sim_data and calculate the features / summary statistics. The format of the dataset and the simulated data should be the same and should match the format needed by the function features. Function features must return a vector of length q.

Value

estimates The estimates of the parameters.
var_estimates The covariance matrix of the final estimates.
L The matrix of coefficients L.
sigma The covariance matrix of the features.
zbar The average values of the simulated features at each design point.
z_D The values of the features calculated from the data.
ybar The linear combinations of the simulated features at each design point.
y_D The linear combinations of the features calculated from the data.

Author(s)

Christiana Kartsonaki

References


Examples

# estimate the mean of a N(2, 1) distribution

```r
sim_function <- function(n, mu) {
  rnorm(n, unlist(mu), 1)
}
```

```r
features_function <- function(data) {
  a <- median(data)
  b <- sum(data) - (min(data) + max(data))
  c <- (min(data) + max(data)) / 2
  return(c(a, b, c))
}
```
fit1 <- fit.model(p = 1, q = 3, n = 100, r = 100, starting_values = 5, h_vector = 0.1, data_true = rnorm(100, 2, 1), sim_data = sim_function, features = features_function, n_iter = 50, print_results = TRUE, variances = TRUE)
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