Package ‘EEMDSVR’

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Type Package

Title Ensemble Empirical Mode Decomposition and Its Variant Based
Support Vector Regression Model

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CEEMDSVR

Complementary Ensemble Empirical Mode Decomposition Based Support Vector Regression Model

Description

The CEEMDSVR function helps to fit the Complementary Ensemble Empirical Mode Decomposition with Adaptive Noise Based Support Vector Regression Model. It will also provide you with accuracy measures along with an option to select the proportion of training and testing data sets. Users can choose among the available choices of kernel and types of regression model for fitting the Support Vector Regression model. In this package we have modelled the dependency of the study variable assuming first order autocorrelation. This package will help the researchers working in the area of hybrid machine learning models.

Usage

CEEMDSVR(data,k,ensem.size, ker.funct="",svm.type="")

Arguments

data  Input univariate time series data.
k  Partition value for splitting the data set into training and testing.
ensem.size  Number of copies of the input signal to use as the ensemble.
ker.funct  The available choices of kernel functions like radial basis, linear, polynomial and sigmoid for fitting Support Vector Regression. By default radial basis function works.
svm.type  SVM can be used as a regression machine. User can apply eps-regression or nu-regression. By default the CEEMDSVR uses eps-regression.

Details

Torres et al. (2011) proposed Complementary Ensemble Empirical Mode Decomposition with Adaptive Noise (CEEMDAN). This algorithm generates a Fewer IMFs on the premise of successfully separating different components of a series, which can reduce the computational cost. Further Support Vector Regression (SVR) model applied to each decomposed items to forecast them. Finally all forecasted values are aggregated to produce final forecast value (Das et al, 2020).

Value

Total_No_IMF  Total number of IMFs after decomposition by EEMD method.
Prediction_Accuracy_CEEMDSVR  List of performance measures of the fitted CEEMDSVR model.
Final_Prediction_CEEMDSVR  Final forecasted value of the CEEMDAN based SVR model. It is obtained by combining the forecasted value of all individual IMF and residue.
Author(s)

Pankaj Das, Kapil Choudhary, Girish Kumar Jha, Achal Lama

References


See Also

EMDSVRhybrid, CEEMD, EEMDSVR

Examples

```r
set.seed(6)
example_data=rnorm(500,30,5)
CEEMDSVR(example_data,0.9,250,"radial","nu-regression")
```

Description

The EEMDSVR function helps to fit the Ensemble Empirical Mode Decomposition with Adaptive Noise Based Support Vector Regression Model. It will also provide you with accuracy measures along with an option to select the proportion of training and testing data sets. Users can choose among the available choices of kernel and types of regression model for fitting the Support Vector Regression model. In this package we have modelled the dependency of the study variable assuming first order autocorrelation. This package will help the researchers working in the area of hybrid machine learning models.

Usage

```r
EEMDSVR(data,k,ensem.size, ker.funct="",svm.type="")
```
Arguments

data  Input univariate time series data.
k  Partition value for splitting the data set into training and testing.
ensem.size  Number of copies of the input signal to use as the ensemble.
ker.funct  The available choices of kernel functions like radial basis, linear, polynomial and sigmoid for fitting Support Vector Regression. By default radial basis function works.
svm.type  SVM can be used as a regression machine. User can apply eps-regression or nu-regression. By default the CEEMDSVR uses eps-regression.

Details

Ensemble Empirical Mode Decomposition (EEMD) method was developed by Wu and Huang (2009). EEMD significantly reduces the chance of mode mixing and represents a substantial improvement over the original EMD. This algorithm generates a Fewer IMFs on the premise of successfully separating different components of a series. Further Support Vector Regression (SVR) model applied to each decomposed components to forecast them. Finally all forecasted values are aggregated to produce final forecast value (Das et al, 2020).

Value

Total_No.IMF  Total number of IMFs after decomposition by EEMD method.
Prediction_Accuracy_CEEMDSVR  List of performance measures of the fitted CEEMDSVR model.
Final_Prediction_CEEMDSVR  Final forecasted value of the CEEMDAN based SVR model. It is obtained by combining the forecasted value of all individual IMF and residue.

Author(s)

Pankaj Das, Kapil Choudhary, Girish Kumar Jha, Achal Lama

References


See Also

EMDSVRhybrid, CEEMD
Examples

```r
set.seed(6)
example_data=rnorm(500,30,5)
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