

Package ‘WaveletSVR’

May 7, 2026

Type Package

Title Wavelet-SVR Hybrid Model for Time Series Forecasting

Version 0.1.0

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Description The main aim of this package is to combine the advantage of wavelet and support vector machine models for time series forecasting. This package also gives the accuracy measurements in terms of RMSE and MAPE. This package fits the hybrid Wavelet SVR model for time series forecasting. The main aim of this package is to combine the advantage of wavelet and Support Vector Regression (SVR) models for time series forecasting. This package also gives the accuracy measurements in terms of Root Mean Square Error (RMSE) and Mean Absolute Prediction Error (MAPE). This package is based on the algorithm of Raimundo and Okamoto (2018) <[DOI:10.1109/INFOCT.2018.8356851](https://doi.org/10.1109/INFOCT.2018.8356851)>.

License GPL-3

Encoding UTF-8

RoxygenNote 7.1.2

Imports stats, wavelets, fracdiff, forecast, e1071, tsutils

NeedsCompilation no

Repository CRAN

Date/Publication 2022-01-06 10:00:08 UTC

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WaveletFitting	<i>Wavelet Transform Using Maximal Overlap Discrete Wavelet Transform (MODWT) Algorithm</i>
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Description

Transforms the time series data by using hybrid MODWT algorithm.

Usage

```
WaveletFitting(
  ts,
  Wvlevels,
  WFilter = "haar",
  bndry = "periodic",
  FFlag = TRUE
)
```

Arguments

ts	Univariate time series
Wvlevels	The level of wavelet decomposition
WFilter	Wavelet filter use in the decomposition
bndry	The boundary condition of wavelet decomposition: 'periodic' or 'reflection'
FFlag	The FastFlag condition of wavelet decomposition: True or False

Value

- WaveletSeries - The wavelet transform of the series

References

- Aminghafari, M. and Poggi, J.M. 2007. Forecasting time series using wavelets. International Journal of Wavelets, Multiresolution and Information Processing, 5, 709 to 724
- Percival D. B. and Walden A. T. 2000. Wavelet Methods for Time-Series Analysis. Cambridge Univ. Press, U.K.
- Paul R. K., Prajneshu and Ghosh H. 2013. Wavelet Frequency Domain Approach for Modelling and Forecasting of Indian Monsoon Rainfall Time-Series Data. Journal of the Indian society of agricultural statistics, 67, 319 to 327.

Examples

```
data<-rnorm(100,mean=100,sd=50)
Wavelet<-WaveletFitting(ts=data,Wvlevels=3,WFilter='haar',bndry='periodic',FFlag=TRUE)
```

WaveletFittingsvr *Wavelet-SVR Hybrid Model for Forecasting*

Description

The main aim of this package is to combine the advantage of wavelet and Support Vector Regression (SVR) models for time series forecasting. This package also gives the accuracy measurements in terms of Root Mean Square Error (RMSE) and Mean Absolute Prediction Error (MAPE).

Usage

```
WaveletFittingsvr(  
  ts,  
  tlag = ACF,  
  Waveletlevels,  
  WaveletFilter = "haar",  
  boundary = "periodic",  
  FastFlag = TRUE,  
  SplitRatio = 0.8  
)
```

Arguments

ts	Univariate time series
tlag	Number of lags
Waveletlevels	The level of wavelet decomposition
WaveletFilter	Wavelet filter use in the decomposition
boundary	The boundary condition of wavelet decomposition
FastFlag	The FastFlag condition of wavelet decomposition: True or False
SplitRatio	Training and testing data split

Value

- TrainFittedValue - Fitted value of train data
- TestPredictedValue - Predicted value of test data
- AccuracyTable - RMSE and MAPE of train and test data

References

- Aminghafari, M. and Poggi, J.M. 2007. Forecasting time series using wavelets. *International Journal of Wavelets, Multiresolution and Information Processing*, 5, 709 to 724
- Percival, D. B. and Walden A. T. 2000. *Wavelet Methods for Time-Series Analysis*. Cambridge Univ. Press, U.K.

- Paul, R. K., Prajneshu and Ghosh H. 2013. Wavelet Frequency Domain Approach for Modelling and Forecasting of Indian Monsoon Rainfall Time-Series Data. Journal of the Indian society of agricultural statistics, 67, 319 to 327.
- Paul, R. K. and BIRTHAL, P.S. 2015. Investigating rainfall trend over India using wavelet technique. Journal of Water and Climate Change, 7, 365 to 378.
- Paul, R. K. 2015. ARIMAX-GARCH-WAVELET Model for forecasting volatile data. Model Assisted Statistics and Application, 10, 243 to 252.
- Raimundo, M. S. and Okamoto, J. 2018. SVR-wavelet adaptive model for forecasting financial time series. International Conference on Information and Computer Technologies (ICICT), 111-114, doi: 10.1109/INFOCT.2018.8356851.

Examples

```
data<-rnorm(100,mean=100,sd=50)
WSVR<-WaveletFittingsvr(ts=data,tlag=2,Waveletlevels=3)
```

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