Package ‘WaveletRF’

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Type Package

Title Wavelet-RF Hybrid Model for Time Series Forecasting

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Description
The Wavelet Decomposition followed by Random Forest Regression (RF) models have been applied for time series forecasting. The maximum overlap discrete wavelet transform (MODWT) algorithm was chosen as it works for any length of the series. The series is first divided into training and testing sets. In each of the wavelet decomposed series, the supervised machine learning approach namely random forest was employed to train the model. This package also provides accuracy metrics in the form of Root Mean Square Error (RMSE) and Mean Absolute Prediction Error (MAPE). This package is based on the algorithm of Ding et al. (2021) <DOI:10.1007/s11356-020-12298-3>.

License GPL-3

Encoding UTF-8

RoxygenNote 7.1.2

Imports stats, wavelets, fracdiff, forecast, randomForest, tsutils

NeedsCompilation no

Repository CRAN

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WaveletFitting

Wavelet Transform Using Maximal Overlap Discrete Wavelet Transform (MODWT) Algorithm

Description

Transforms the time series data by using hybrid MODWT algorithm.

Usage

```r
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


Examples

```r
data<-rnorm(200,mean=20,sd=3)
Wavelet<-WaveletFitting(ts=data,Wvlevels=3,WFilter='haar',bndry='periodic',FFlag=TRUE)
```
Description

The Wavelet Decomposition followed by Random Forest Regression (RF) models have been applied for time series forecasting. The maximum overlap discrete wavelet transform (MODWT) algorithm was chosen as it works for any length of the series. The series is first divided into training and testing sets. In each of the wavelet decomposed series, the supervised machine learning approach namely random forest was employed to train the model. This package also provides accuracy metrics in the form of Root Mean Square Error (RMSE) and Mean Absolute Prediction Error (MAPE).

Usage

```r
WaveletFittingRF(
  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


Examples

data<-rnorm(200,mean=20,sd=3)
WRF<-WaveletFittingRF(ts=data,tlag=2,Waveletlevels=3)
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