Package ‘CEEMDANML’

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Type Package

Title CEEMDAN Decomposition Based Hybrid Machine Learning Models

Version 0.1.0

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Description Noise in the time-series data significantly affects the accuracy of the Machine Learning (ML) models (Artificial Neural Network and Support Vector Regression are considered here). Complete Ensemble Empirical Mode Decomposition with Adaptive Noise (CEEMDAN) decomposes the time series data into sub-series and help to improve the model performance. The models can achieve higher prediction accuracy than the traditional ML models. Two models have been provided here for time series forecasting. More information may be obtained from Garai and Paul (2023) <doi:10.1016/j.iswa.2023.200202>.

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Encoding UTF-8

Imports stats, Rlibeemd, tseries, forecast, fGarch, aTSA, FinTS, LSTS,
earth, caret, neuralnet, e1071, pso

RoxygenNote 7.2.1

NeedsCompilation no

Repository CRAN

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carigaan *CEEMDAN Decomposition-Based ARIMA-GARCH-ANN Hybrid Modeling*

Description

CEEMDAN Decomposition-Based ARIMA-GARCH-ANN Hybrid Modeling

Usage

```
carigaan(Y, ratio = 0.9, n_lag = 4)
```

Arguments

Y	Univariate time series
ratio	Ratio of number of observations in training and testing sets
n_lag	Lag of the provided time series data

Value

- Train_fitted: Train fitted result
- Test_predicted: Test predicted result
- Accuracy: Accuracy

References

- Garai, S., & Paul, R. K. (2023). Development of MCS based-ensemble models using CEEMDAN decomposition and machine intelligence. Intelligent Systems with Applications, 18, 200202
- Garai, S., Paul, R. K., Rakshit, D., Yeasin, M., Paul, A. K., Roy, H. S., Barman, S. & Manjunatha, B. (2023). An MRA Based MLR Model for Forecasting Indian Annual Rainfall Using Large Scale Climate Indices. International Journal of Environment and Climate Change, 13(5), 137-150.

Examples

```
Y <- rnorm(100, 100, 10)
result <- carigaan(Y, ratio = 0.8, n_lag = 4)
```

carigas *CEEMDAN Decomposition-Based ARIMA-GARCH-SVR Hybrid Modeling*

Description

CEEMDAN Decomposition-Based ARIMA-GARCH-SVR Hybrid Modeling

Usage

```
carigas(Y, ratio = 0.9, n_lag = 4)
```

Arguments

Y	Univariate time series
ratio	Ratio of number of observations in training and testing sets
n_lag	Lag of the provided time series data

Value

- Train_fitted: Train fitted result
- Test_predicted: Test predicted result
- Accuracy: Accuracy

References

- Garai, S., & Paul, R. K. (2023). Development of MCS based-ensemble models using CEEMDAN decomposition and machine intelligence. Intelligent Systems with Applications, 18, 200202
- Garai, S., Paul, R. K., Rakshit, D., Yeasin, M., Paul, A. K., Roy, H. S., Barman, S. & Manjunatha, B. (2023). An MRA Based MLR Model for Forecasting Indian Annual Rainfall Using Large Scale Climate Indices. International Journal of Environment and Climate Change, 13(5), 137-150.

Examples

```
Y <- rnorm(100, 100, 10)
result <- carigas(Y, ratio = 0.8, n_lag = 4)
```

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