

# Package ‘stLELM’

May 9, 2026

**Type** Package

**Title** Hybrid Forecasting Model Based on STL Decomposition and ELM

**Version** 0.1.1

**Maintainer** Girish Kumar Jha <girish.stat@gmail.com>

**Description** Univariate time series forecasting with STL decomposition based Extreme Learning Machine hybrid model. For method details see Xiong T, Li C, Bao Y (2018). <[doi:10.1016/j.neucom.2017.11.053](https://doi.org/10.1016/j.neucom.2017.11.053)>.

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.2.1

**Imports** forecast, nnfor

**Depends** R (>= 2.10)

**NeedsCompilation** no

**Author** Girish Kumar Jha [aut, cre],  
Ronit Jaiswal [aut, ctb],  
Kapil Choudhary [ctb],  
Rajeev Ranjan Kumar [ctb]

**Repository** CRAN

**Date/Publication** 2022-08-09 07:00:02 UTC

## Contents

Data_potato . . . . .	2
STLELM . . . . .	2
<b>Index</b>	<b>4</b>

---

Data\_potato

*Monthly Average Potato Price of Delhi Market (India)*

---

**Description**

Monthly Average Potato Price of Delhi Market from January 2010 to July 2020.

**Usage**

```
data("Data_potato")
```

**Format**

A time series data with 127 observations.

price a time series

**Details**

Dataset contains 127 observations of monthly average potato price of Delhi Market. It is obtained from Agmarknet Website.

**Source**

<https://agmarknet.gov.in/>

**References**

<https://agmarknet.gov.in/>

**Examples**

```
data(Data_potato)
```

---

STLELM

*STL Based ELM Forecasting Model*

---

**Description**

The STLELM function forecasts a time series using a hybrid model made of a decomposition technique called seasonal trend decomposition based on loess (STL) and a neural network based forecasting technique called extreme learning machine (ELM). The function further computes the values of different forecasting evaluation criteria.

**Usage**

```
STLELM(data, stepahead=10)
```

**Arguments**

<code>data</code>	Input univariate time series (ts) data.
<code>stepahead</code>	The forecast horizon.

**Details**

This function decomposes a nonlinear, nonstationary and seasonal time series into trend-cycle, seasonal and remainder component using STL (Cleveland et al., 1990). Extreme learning machine (ELM) is used to forecast these components individually (Huang et al., 2006, Xiong et al. 2018). Finally, the prediction results of all the three components are aggregated to formulate an ensemble output for the input time series.

**Value**

<code>data_test</code>	Testing set used to measure the out of sample performance.
<code>STLcomp_forecast</code>	Forecasted value of all individual components.
<code>FinalstlELM_forecast</code>	Final forecasted value of the stlELM model. It is obtained by combining the forecasted value of all individual components.
<code>MAE_stlELM</code>	Mean Absolute Error (MAE) for stlELM model.
<code>SMAPE_stlELM</code>	Mean Absolute Percentage Error (MAPE) for stlELM model.
<code>RMSE_stlELM</code>	Root Mean Square Error (RMSE) for stlELM model.

**References**

Cleveland, R.B., Cleveland, W.S., McRae, J.E., Terpenning, I. (1990). STL: A seasonal-trend decomposition procedure based on loess, *Journal of Official Statistics*, 6, 3–73. Huang, G., Zhu, Q., Siew, C. (2006). Extreme learning machine: theory and applications, *Neurocomputing*, 70, 489–501. Xiong, T., Li, C., Bao, Y. (2018). Seasonal forecasting of agricultural commodity price using a hybrid STL and ELM method: Evidence from the vegetable market in China. *Neurocomputing* 275, 2831–2844

**Examples**

```
data("Data_potato")
STLELM(Data_potato)
```

# Index

\* **datasets**

Data\_potato, [2](#)

\* **stl**

STLELM, [2](#)

Data\_potato, [2](#)

STLELM, [2](#)