

Paper ID: MISS21\_81

# Implementation LSTM RNN Models for Univariate Time Series Forecasting

Souramita Bhowmik

Department of Computer Science, Techno College of Engineering Agartala, Tripura, India

Corresponding author

## Abstract

**Background:** Time series prediction problems are a complex type of predictive modeling problem. Machine learning techniques such as Long Short-Term Memory (LSTM) have gained lots of attention with their applications in recent years. Many types of LSTM models are there which is used for every specific type of time series forecasting problem [2].

**Objectives:** Long Short-Term Memory (LSTM) is a type of Recurrent Neutral Network (RNN). It has that capability to remember the values from earlier stages for future purpose. [4] LSTM networks contains memory blocks that are connected with each other through layers. LSTM Network is used in deep learning [1].

**Methodology:** LSTM networks classifies, processes and makes predictions based on time series data. Data preparation is required for the LSTM network which includes time steps. Time steps gives us another way to look up time series problem. After every prediction, the fed back is updated in model to predict the next value in list [3].

**Results and discussion:** With recently happening breakthroughs in Data Science, it is found that for almost every sequence prediction problem, LSTMs have been observed as the most successfully produced solution. Recurrent Neutral Networks suffers from short memory and the solution of this huge issue is LSTM [3]. Based on probabilistic model, the LSDM manages to keep, forget or ignore data points and uses the series of gates with each of its own RNN. LSTM and RNN requires memory bandwidth bound computation and that's why is difficult to train.

**Conclusions and future work:** LSTM runs in four linear layer per cell. LSTM networks are being predicted in future as well like in stocks. With this model, we are able to forecast to a certain extent but we would require more parameter tuning for new data.

## References

- [1] Jason Brownlee on July 21, 2016 in Deep Learning for Time Series
- [2] Jason Brownlee on November 14, 2018 in Deep Learning for Time Series
- [3] Joseph (Iosif) Mushailov on March 30 in LSTM Framework For Univariate Time-Series Prediction
- [4] Series Prediction
- [5] Sima Siami Namini, Neda Tavakoli, Akbar Siami Namin (2018). A Comparison of ARIMA and LSTM in forecasting Time Series

