

Title: Long-Term Memory Time Series Forecasting via Recurrent Neural Networks (RNN)

Abstract:

In this work, we explore the effectiveness of recurrent neural networks (RNNs) as a tool for time series forecasting and implement a model based on this approach using the Python language. RNNs have the capability to learn complex temporal dependencies, making them a promising choice for this type of task. Initially, we perform an exploratory analysis, identifying relevant patterns, trends, and seasonality. Next, we implement a recurrent neural network architecture, using a Long Short-Term Memory (LSTM) layer to capture the long-term memory of the series. Additionally, we investigate the influence of different hyperparameters, such as the number of LSTM layers and the learning rate, on the model's performance. We compare various configurations and discuss their respective contributions to the quality of the predictions. The results obtained in this study suggest that RNNs are an effective and robust approach for time series forecasting.

Keywords: time series, forecasting, recurrent neural networks, LSTM, long-term memory.