

**Univariate Single-Step Style LSTM in Time Series Forecasting**

**Abstract**

Time series prediction with neural networks has been has been focus of research for past few decades. Given the recent deep learning revolution, there has been much attention in using deep learning models for time series prediction. Time series analysis and forecasting in time series data find it significant in many applications such as business, stock market and exchange, weather, electricity demand and usage of product such as fuel, electricity etc. or in any kind of application that has specific seasonal or trendy change with time. The forecasting of time series data provides the organization with useful information that is necessary for making important decisions within certain time span. This study contains a single-step univariate time series forecasting implementation. Recurrent neural network is used specifically LSTM which is long-short term memory is used for the implementation. Even there is evaluation step on how loss is being decreasing which is represented with the help of graph.

**Introduction**

A time series is a series of data points ordered in time. Time series adds an explicit order dependence between observation: a time dimension. In a normal machine learning dataset, the dataset is a collection of observation that are treated equally when the future is being predicted. In time series the order of observation provides a source of additional information that should be analyzed and used in the prediction process. Time series are typically assumed to be generated at regularly spaced interval of time and so are called regular time series. And the data that does not comes in regular interval of time are called irregular time series.

Time series can have one or more variable that changes over time. If there is only one variable varying over time we call it univariate time series. If there is more than one variable that varying over time we call it multivariate time series. Time series are used in various fields such as mathematical finance, manufacturing, event data, IoT or in any domain of applied science and engineering which involve temporal measurements. Time series DBMS (database management system) are the fastest-growing segment in the database industry can testify to growing need for time series forecasting in the industry.

Time series forecasting involves models fit on historical data and use them to predict future observation. At the first step observation are gathered and analyzed to develop model using the data which is collected. In second step future events are predicted using the model.

Tools used for this project are pandas, Numpy, matplotlib, from keras we use sequential, LSTM and Dense

**Scope**

Now a days, people often look for forecast for everything in daily life. For example, future of real estate, even to find the future of stock market. Also people now a days want the future of cryptocurrencies etc. which create increasing demand of such forecasting systems. Health and wellness application have rolled out or been asked to roll out, personalized prediction.