

## SYNOPSIS

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**Project Title:** An Efficient Hybrid Approach For Forecasting Real-Time Stock Market Indices

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### Abstract

The stock market's complexity and volatility demand accurate and efficient prediction methods. This work proposes a hybrid bidirectional-LSTM (H.BLSTM) model that integrates deep learning and incremental learning to predict index prices in real time. Using both univariate and multivariate time series data, including technical indicators, the model addresses challenges of non-linearity, adaptability, and computational efficiency. Experiments on nine global stock indices show the model achieves an average MAPE of 0.001 with a 2-second forecasting delay, outperforming traditional methods and proving suitable for real-time trading applications.

### Specific Contribution

- Data collection, implemented data preprocessing, Linear Regression modelling, H.BLSTM model pipeline building, hyperparameter tuning.

### Specific Learning

- Gained hands-on experience in supervised learning workflows, model evaluation, drift checking using HATR.

### Technical Limitations & Ethical Challenges faced

- Encountered major challenges in acquiring data with the specific time span.
- Feature engineering and hyper-parameter tuning to achieve the required accuracy.
- Creating the pipeline to automatically update the dataset, update the model, and making real-time forecasting was challenging.

**Keywords:** *Real-time forecasting , Stock market indices, Incremental learning , Deep learning , Technical indicators*

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Signature of Guide