

HYBRID ML AND DL BASED STOCK PREDICTION MODEL

The stock market is one of the most complex financial systems in the world. Prices change continuously due to company performance, global news, investor psychology, and economic conditions. Because of this, accurate prediction of stock prices is very difficult, yet extremely valuable for investors and financial institutions. Traditional statistical models such as ARIMA are widely used for forecasting, but they work best only when the data is stable and linear. Modern stock prices are highly nonlinear and unpredictable, which requires advanced artificial intelligence models.

System Overview

Stock Data
ARIMA
CNN + LSTM
Attention Layer
XGBoost
Predicted Price

This hybrid model first uses ARIMA to remove trends and noise from stock price data. Then CNN extracts important features from the data, while LSTM learns how prices change over time. The attention layer highlights important moments in the data. Finally, XGBoost produces the final price prediction. The system was tested on stocks such as Microsoft, Johnson & Johnson, JPMorgan, Disney, and Exxon Mobil. The model showed strong performance on stocks with large price fluctuations, making it useful during volatile market conditions.

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