AI Stock Price Forecasting Web Application

Deep Learning • LSTM • FastAPI • Interactive Visualization

Tabel of Contents

Problem Statement
Project Overview
System Architecture
LSTM Prediction Workflow
Key Features
Deployment Strategy
Limitations
Future Enhancements
Results & Demo
Conclusion

Problem Statement

- Financial markets are highly volatile and difficult to forecast manually
- Investors struggle to identify future stock trends using raw charts alone
- Traditional methods rely heavily on human interpretation and are error-prone
- There is a need for an AI-driven tool to assist in short-term trend forecasting
- Providing a simple, interactive, web-based forecasting tool can aid decision making

Project Overview

- A modern, visually engaging web app that predicts stock prices using LSTM neural networks.
- 60-day historical analysis + 30-day future forecasting
- FastAPI backend with TensorFlow model
- Beautiful frontend with interactive charts
- Deployable on Render + Netlify

System Architecture

- Frontend: HTML, CSS, JavaScript, Chart.js
- Backend: FastAPI, TensorFlow, Uvicorn
- Model: LSTM trained on stock closing prices
- Data Source: Yahoo Finance (yfinance)

LSTM Prediction Workflow

Fetch last 60 days of stock data

Normalize data with MinMaxScaler

LSTM predicts the next day's price

Feed prediction back into model (autoregressive)

Generate 30-day forecast

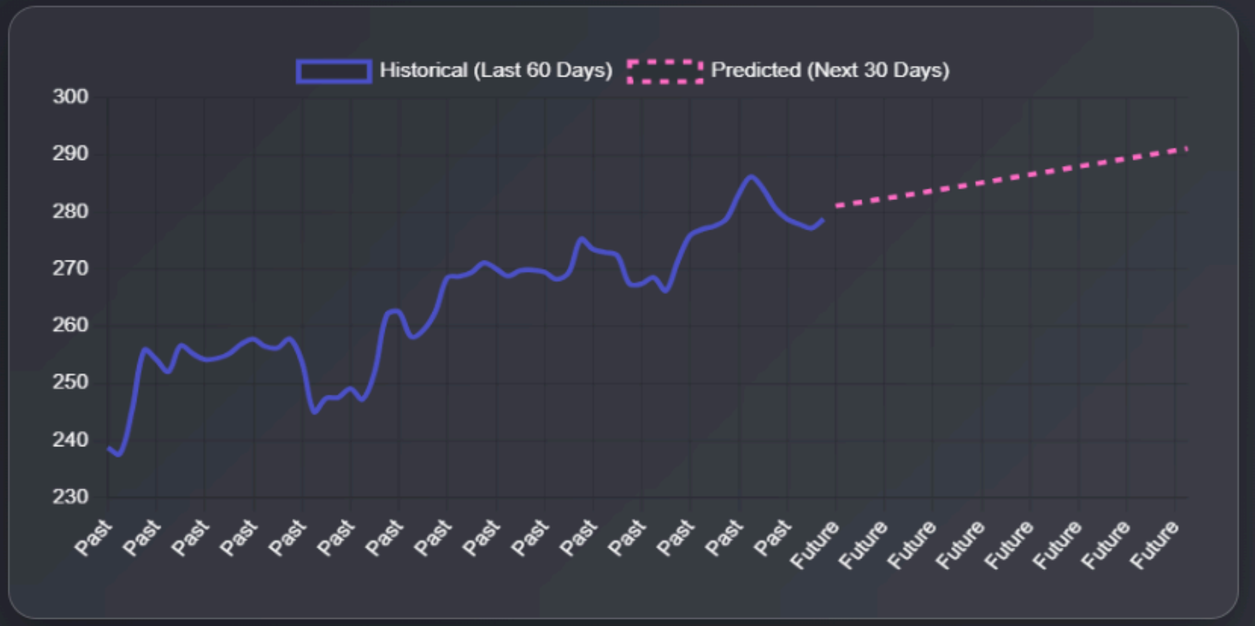
Key Features

Modern UI with glass-morphism
Interactive charts (historical + future trend)
Fast predictions using pre-trained model
Scalable backend deployment

AI Stock Price Predictor

AAPL

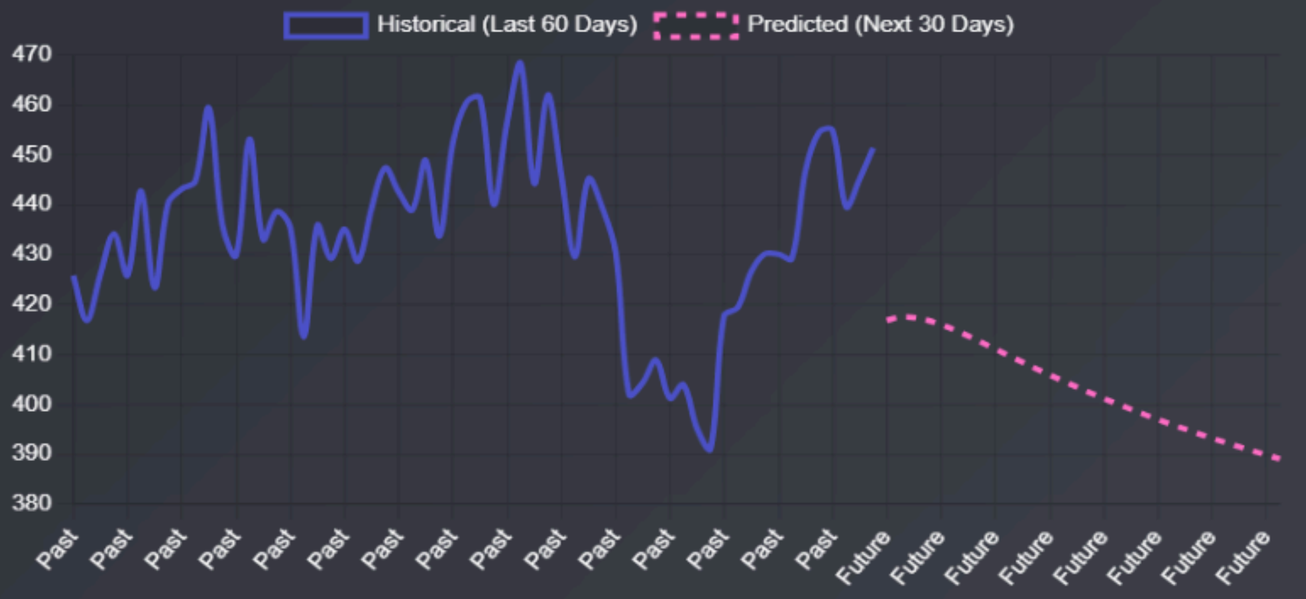
Predict



AI Stock Price Predictor

TSLA

Predict



Deployment Strategy

Backend: Render (FastAPI server)

Frontend: Netlify or Vercel

CI/CD via GitHub integration

Cloud-hosted model inference

Limitations

- LSTM models can struggle with sudden market shifts or global events
- Forecasts do not account for news, sentiment, or external financial indicators
- Does not incorporate volume, indicators (RSI/MACD), or multi-variable inputs
- Predictions may drift over longer horizons (30+ days)
- Model trained on one stock may not generalize equally well to others
- Yahoo Finance data may occasionally lag or be incomplete

Future Enhancements

Add support for Transformer-based forecasting for higher accuracy
Integrate sentiment analysis of news/Twitter to improve predictions
Add candlestick charts with overlays (Bollinger Bands, RSI, MACD)
Multi-stock comparison dashboard with filtering
Add user accounts and personalized watchlists
Support real-time streaming data and intraday prediction
Deploy a mobile-friendly version (Flutter / React Native)

Results & Demo

30-day forecast curve

Smooth visual transitions

Works with any stock symbol (AAPL, TSLA, BTC-USD...)

Clear trend analysis for presentations

Conclusion

- Powerful combination of AI + Web Apps
- Useful for analysis, learning, and financial insights
- Extensible for future upgrades (Transformers, multi-stock, dashboards)