

AI Stock Prediction and Analysis System

System Introduction

This is a stock prediction platform based on AI and financial data analysis.

It possesses the following capabilities:

- Allows users to input stock symbols for automated operation.
 - Real-time acquisition of Yahoo Finance data for time-series prediction.
 - Utilizes ChatGPT (gpt-4o) to predict news sentiment.
 - References the company's fundamental indicators.
 - Incorporates an LSTM model to achieve longer-term stock price predictions.
-

Technical Components

AI Technology

- LSTM Execution for Prediction: Employs a multi-layer LSTM + Dropout + Dense combined structure.
- ChatGPT Sentiment Analysis: Analyzes sentiment fluctuations in stock market news to influence predictions.
- Real-time adjustment of the accuracy ratio of news sources.

Data and Indicators

- Yahoo Finance API: Loads historical stock data.
- TA-Lib: Calculates MACD, RSI, KDJ, MA, Moving Averages.
- NewsAPI: Searches for current news using technology/finance keywords.
- Fundamental Analysis: EPS, PE ratio, PB ratio for supplementary visuals.

ML/AI Techniques

- MinMaxScaler for data scaling.
- EarlyStopping for automatic training termination.
- TimeSeriesSplit for time-series cross-validation.

- ChatGPT for optimizing the final model judgment.
-

Benefits for Enterprise Users

★ It can help users to...

- Select stocks with the highest predictive potential on the spot.
- Integrate professional data, technical indicators, and sentiment analysis for comprehensive prediction.
- Quickly analyze company news and announcements to support investment decisions.

User-Friendly Front-end UI

- Streamlit with Sidebar + Candlestick Chart + Indicator Chart + Sentiment Analysis Table.
 - Real-time display of news and predictions upon entering a stock symbol.
-

Features

Function	Technology Used	Key Advantages
Stock Data Retrieval	yfinance API	Automated data fetching + visualization
Sentiment Analysis	ChatGPT / FinBERT	Influences prediction models simultaneously
LSTM Execution	TensorFlow Keras	Mature execution with EarlyStopping
Internal Data Validation	TimeSeriesSplit	Prevents overfitting; optimizes interactions
User Model Management	model_v{n}.h5	Independent model management per stock

Why is it worth recommending?

- Fully automated prediction process.
 - Incorporates triple analysis of text sentiment, technicals, and fundamentals.
 - Provides an additional perspective by leveraging LSTM + ChatGPT for cross-model optimization.
 - Supports persistent prediction for users' own stock or ETF research portfolios.
-