

MDS581 - PROJECT II (CAPSTONE PROJECT)

SYNOPSIS

InvestIQ

AI-DRIVEN STOCK FORECASTING USING VISUAL PATTERNS



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InvestIQ: AI-Driven Stock Forecasting Using Visual Patterns

In the financial world, stock markets serve as the crucial arenas where individuals and institutions trade shares, creating a direct link between corporate performance and investor sentiment. These markets are more than just platforms for buying and selling; they reflect economic health and the broader market psyche. As investors look to profit within these systems, effective stock trading strategies have emerged as key tools for capital growth. Yet, predicting stock price movements remains challenging due to the complex, often volatile nature of financial data, which reacts to factors such as economic indicators, corporate performance, and political events. Traditional approaches have relied heavily on time series analysis of historical prices, deploying algorithms and statistical models to pinpoint trends and patterns. While insightful, these methods demand vast amounts of data and often encounter noise, which can reduce their predictive power and make them reactive rather than anticipatory.

In response to these challenges, advanced artificial intelligence (AI) techniques have started to gain traction, offering new perspectives in financial forecasting. Our project takes an innovative approach to this evolution by shifting away from time-series-driven forecasts toward an image-based pattern recognition model. By utilizing bar chart images of stock prices as input, we employ a Convolutional Neural Network (CNN) to generate Buy, Hold, or Sell recommendations. Unlike traditional methods that focus on numerical data, this approach lets the CNN detect subtle visual patterns in bar chart images that may be challenging to capture with conventional indicators. This shift to visual pattern recognition aligns with recent advancements in computer vision, where models are trained to recognize complex objects and shapes. Through this method, our model captures market trends without calculating specific statistical indicators, allowing for more intuitive and adaptable insights.

Our primary aim is to develop a trading strategy capable of outperforming the Buy-and-Hold (BaH) approach under specific market conditions. Our model is trained on bar chart images representing a 30-day trading period, helping it to identify patterns correlating with price shifts and trend reversals. By basing decisions on visual data, this strategy introduces a fresh AI-driven approach to stock trading, moving beyond time series to utilize the image-based representations of stock data. This approach not only offers a novel method for interpreting financial markets but also taps into the power of deep learning in computer vision, enabling us to view stock analysis from a different perspective. The practical implications of this approach extend to investors seeking adaptable, AI-powered tools to navigate the markets. This project demonstrates how advanced image processing can lead to more intuitive and insightful financial decisions. By making complex analysis more accessible, our method enables both experienced and novice investors to leverage a flexible, visually-oriented strategy that responds to market shifts with fewer dependencies on traditional indicators. Ultimately, our project highlights the potential for deep learning to uncover hidden trends in stock data, presenting a compelling alternative to established financial models. This convergence of AI and finance reflects the growing demand for innovative financial technologies that can provide actionable insights with simplicity and agility, opening new avenues for data-driven, image-based trading strategies.