

Optimal Investment Strategy using Scalable Machine Learning and Data Analytics for Small-Cap Stocks

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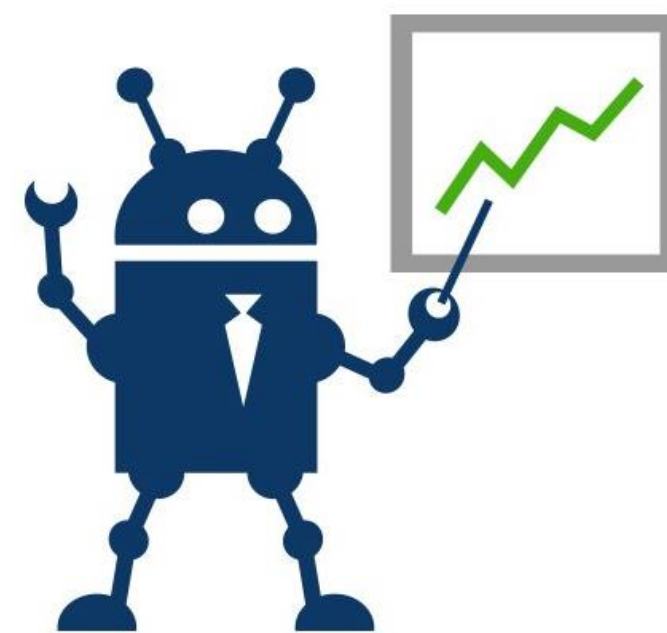
Advised by: Professor David Rossiter



INTRODUCTION

Small capitalization stocks, characterized by higher volatility and higher potential returns, are mainly traded by individual investors.

The purpose of this project is to provide a platform to these retail investors to invest in a portfolio of small cap stocks listed on NASDAQ by leveraging the power of machine learning and artificial intelligence.



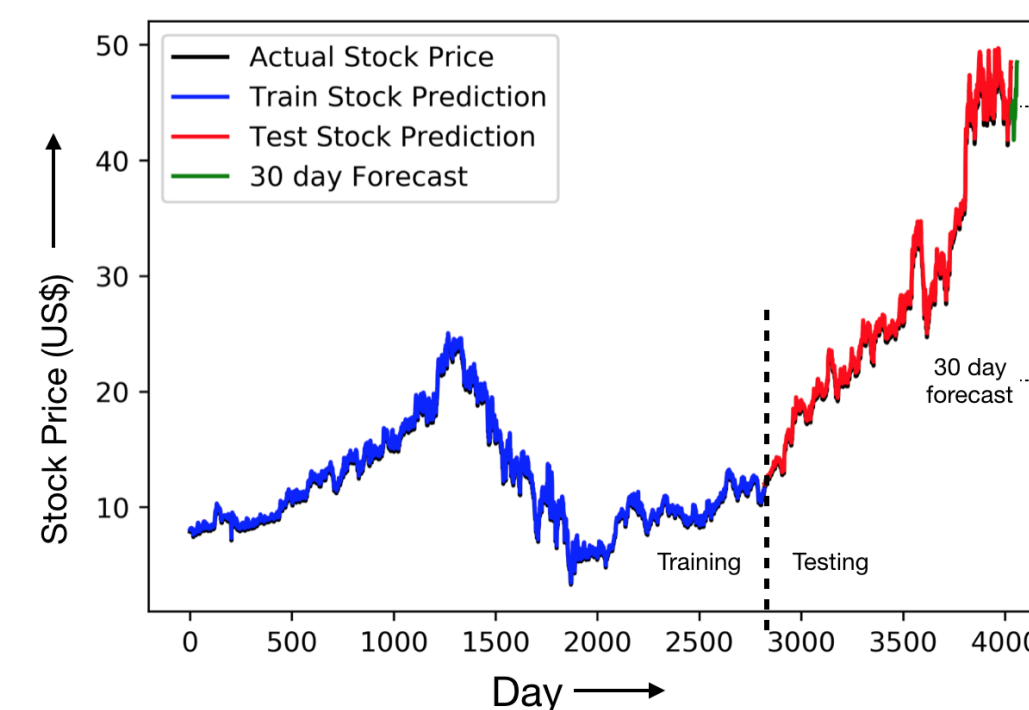
OBJECTIVES

- Use machine learning algorithms and artificial intelligence to forecast stock prices
- Allocate stocks to maximize the return of the portfolio within the risk threshold of the user
- Build a User friendly Web Application that allows users to specify their risk threshold, interact with the system and see the performance of their portfolio

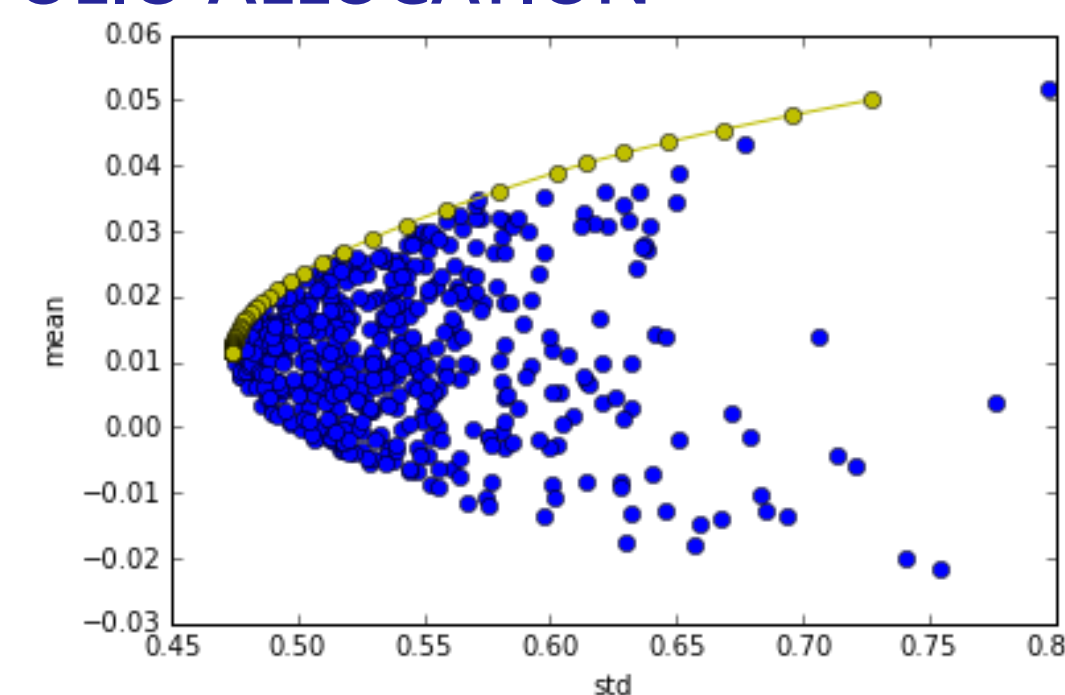
MACHINE LEARNING

Machine Learning Algorithms explored:

- Recurrent Neural Network (Long Short-Term Memory)
- Multiple Linear Regression



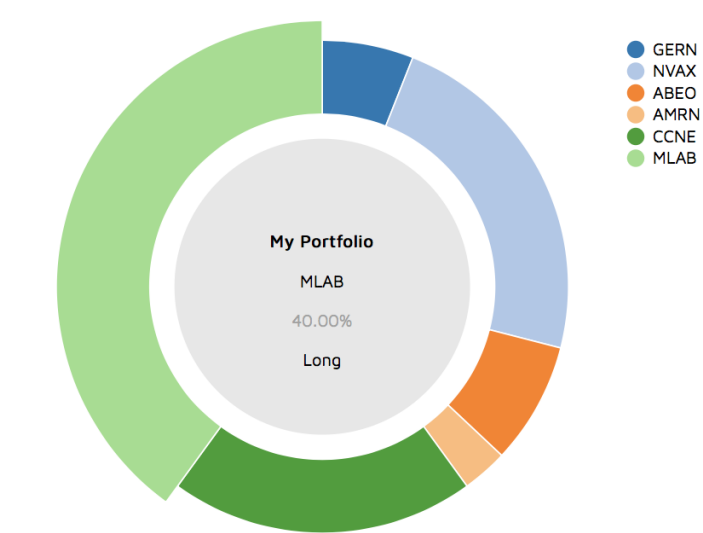
PORTFOLIO ALLOCATION



Stocks are allocated based on user inputs using convex optimization built on Markowitz's Mean Variance Theorem.

WEB APPLICATION

My Current Portfolio



6
Number of Stocks

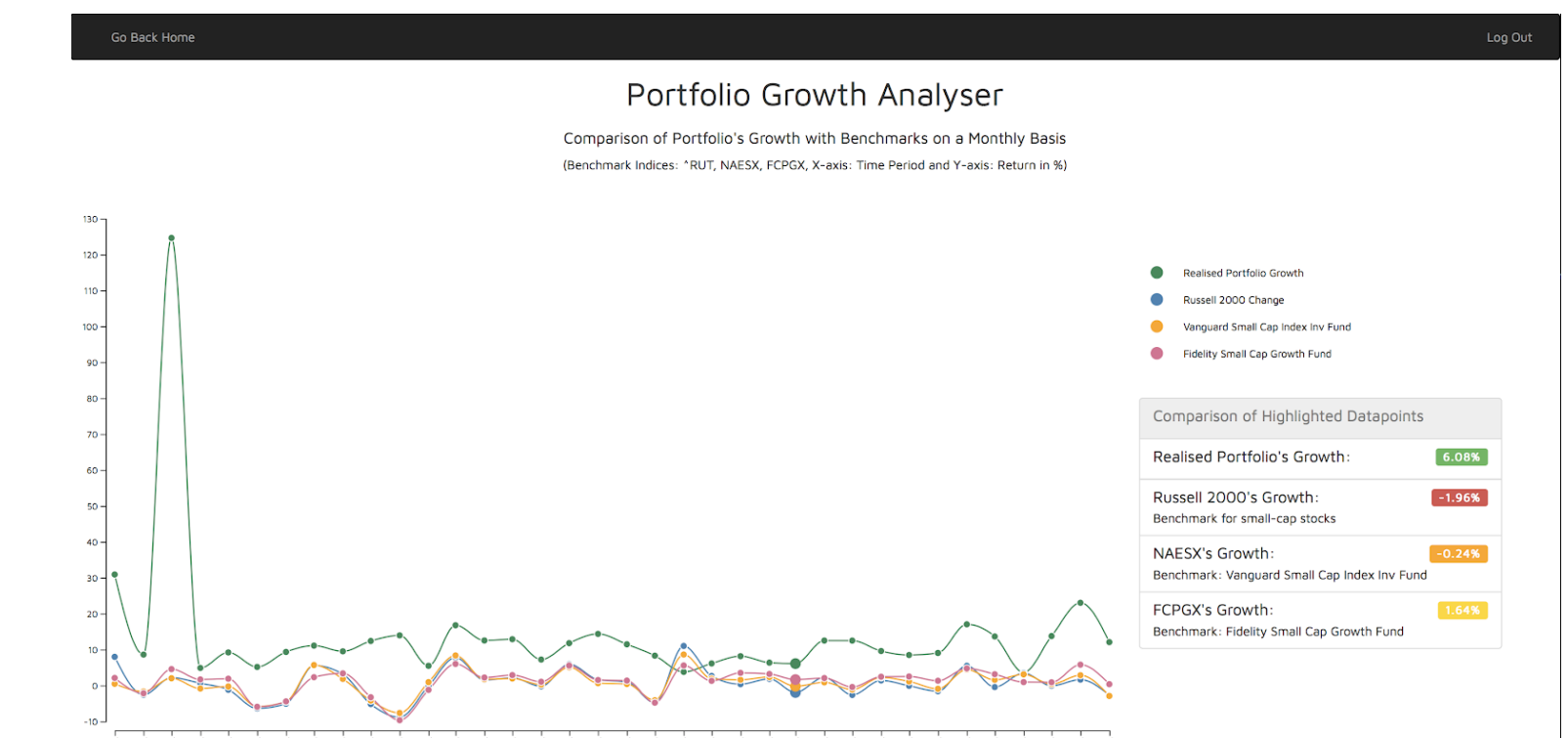
January 2018
Time Period

23.01%
Growth This Month

7.07%
Volatility This Month

Optimise Portfolio

Developed an AngularJS application with multiple features that use Firebase to store user preferences, compute results in real time and D3.js to render charts.



Our project outperformed the popular market benchmarks for small capitalization stocks in 35 of the 36 simulated months.