

Jakob Mørup Wang, Esben Bay Sørensen, Gareth Patrick Walsh, Jakob Kusnick, Stefan Jänicke
Department of Mathematics and Computer Science, University of Southern Denmark, Odense, Denmark

INTRODUCTION

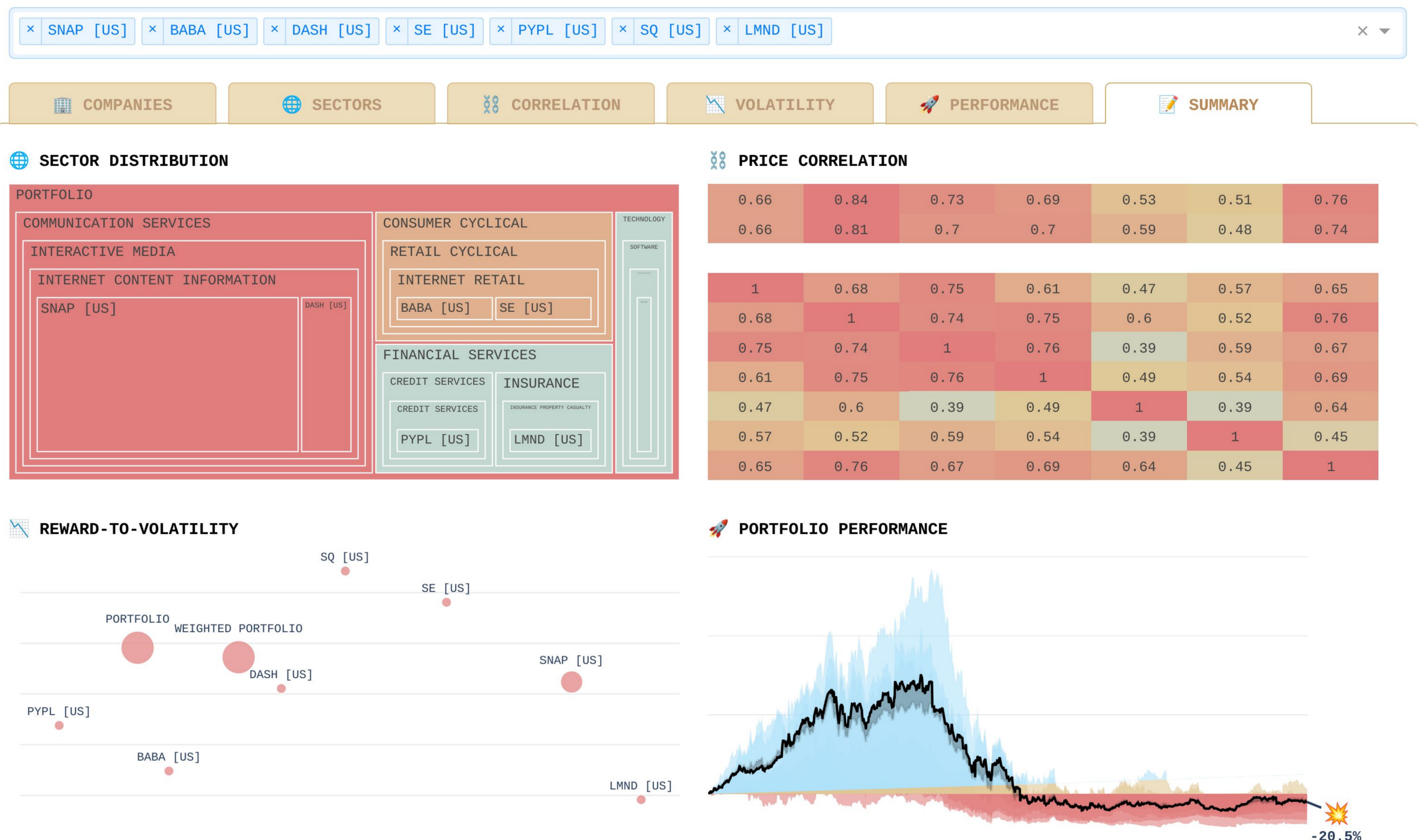
User-friendly investment platforms offer easy access to become shareholders in companies around the world. They often provide key financial figures for fundamental analysis, but rarely guide investors in portfolio level risk. Per incentive, many platforms even promote frequent trading, profiting from fees or spreads, while allowing free signups to attract new customers, by marketing technical indicators as simplified short-term buy and sell signals, despite limited evidence that these strategies outperform the market.

Existing tools or works on portfolio visualization target expert users with sophisticated solutions for quantitative analysis, but too high complexity and low accessibility can prevent inexperienced investors from taking advantage. Therefore, we propose *educative stock portfolio risk visualization for amateur investors*. To demonstrate, we have developed a prototype offering basic, interpretable, and reactive visualizations of the user's dynamically selected portfolio of stocks, through an easily accessible web-based user interface.

VISUALIZATION PROTOTYPE



Visualization Tool:
Stock Portfolio Planning
and Risk Management
(Data from Nordnet)



SECTOR DISTRIBUTION:

We visualize the distribution of the selected stocks across various business branches as nested sector levels (e.g., if a company is within the medicinal sector), using a customizable treemap.

PRICE CORRELATION:

We use a heatmap to display non-parametric price correlations (Kendall's Tau) between the stocks in the portfolio the user selects.

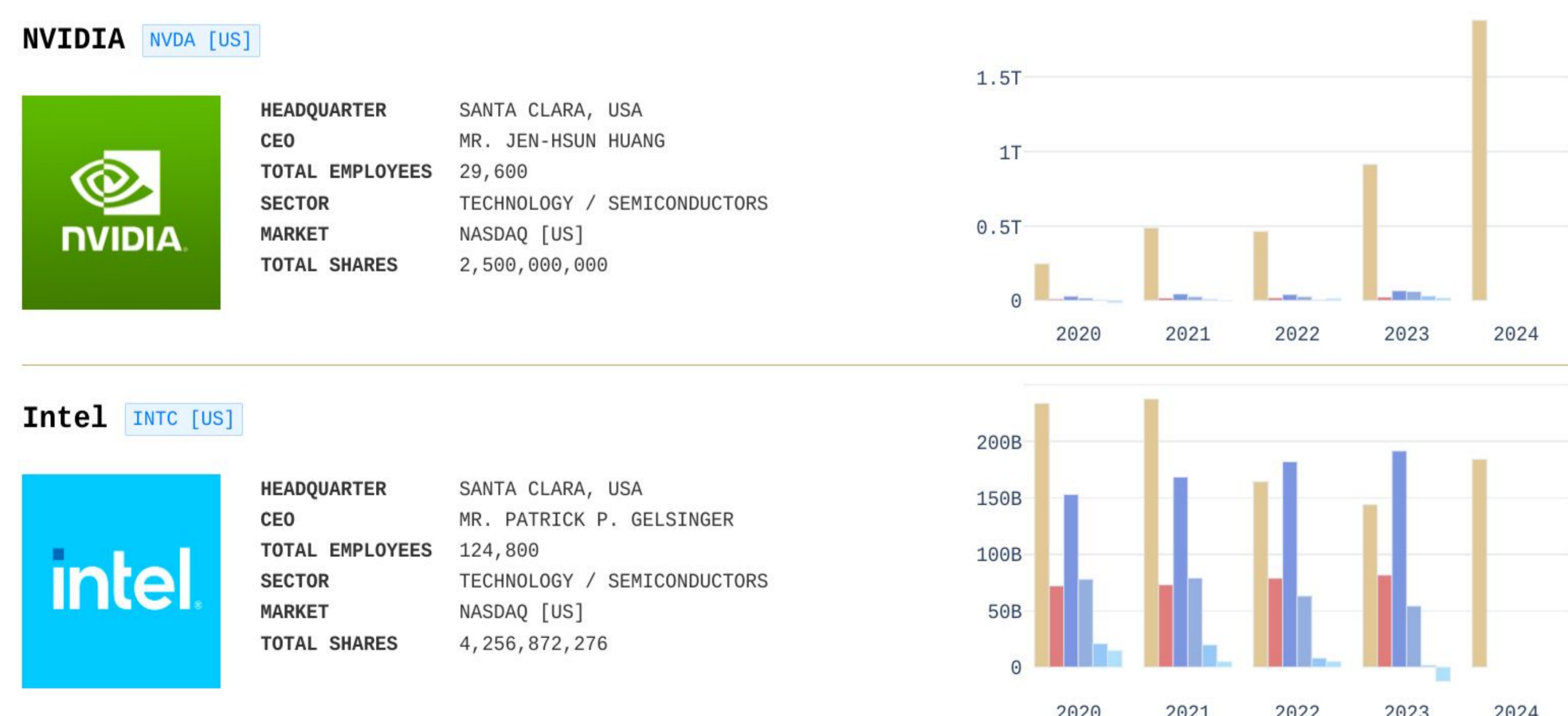
REWARD TO VOLATILITY:

A scatter plot illustrates the *Sharpe* ratio, a common metric for risk-adjusted returns.

PORTFOLIO PERFORMANCE:

We offer a portfolio-oriented perspective on a commonly used visualization of stock performance, namely the line plot showing a stock's price movement for a selected period of time.

GROUPED BAR CHARTS OF KEY FIGURES



Fundamental information guide and confirm selection of stocks. Bar charts show relations between key financial figures for initial assessment.

CONCLUSION

The presented prototype visualization outlines the possibilities of empowering and enabling private investors to protect their savings. However, only few users have evaluated the solution by now, and a sophisticated user study has yet to be conducted. Future improvements include optimizing the layout for mobile-sized screens, reducing cognitive load by initially hiding customization options and adding explanatory videos and textual hints as an inline tutorial.