

## General Questions

At the initial stage of the work, we ensured that all team members were comfortable working on their assigned tasks. Everyone was informed of potential ethical complications the project could have if implemented and exposed/published to the public, which we discussed.

We always strive to implement creative ideas combined with information sourced from the internet (papers, all referenced throughout the report and each notebook). Beyond using this as a foundation, we consistently add our ideas and improvements tailored to our use case. We considered data from various companies across multiple sectors to avoid introducing bias, maintaining methodological and experimental consistency.

The minimal use of material and energy resources was considered. To reduce consumption while running code and LSTM models, the computer with the highest processing load was configured with a CPU undervolt.

## Bias and Related Questions

In our point of view, there is no bias related to:

- ethnicity
- gender
- human characteristics

All data used was verified, free from manipulation, and impartial.  
This raw data was then preprocessed without introducing any bias.

We simply analyze data and stock performance of companies from various sectors, and we were always careful as to not damage data integrity throughout all preprocessing.

We experienced external pressure due to the saturation of projects and tests during this time of the semester, which **heavily** impacted our performance on this project while striving to balance other commitments and deliver a result we would be proud of.

Regarding military use, predicting a sharp rise or fall in the valuation of the top 500 companies could be linked to specific sectors to identify a nation's economic vulnerabilities, potentially causing harm to individuals, living beings, or organizations within that nation.

The project does not involve humans or personal data. Since the data we used is public and easily accessible by any person or organization, it does not need further anonymization, or any type of "learn and forget" rules.

The quality of information, particularly derived features (as well as monthly returned in Portfolio Optimization), is regularly assessed, retaining only those deemed most significant.

## Project-Focused and Missclassification Aspects

Regarding transparency, we ensured our results are explainable, addressing the "black box" nature of LSTMs by providing clear justifications for predictions.  
As developers, we take responsibility for the outcomes, ensuring the project aligns with investor interests and ethical standards.

This means that, although our project should be used by professionals as a support tool (never a replacement), we made sure that the users are well informed of the potential missclassification risks associated with stock prediction.

Our recommendations are tailored to match each user's risk tolerance and investment objectives. We make it clear that the predictions are derived from historical market patterns and trends, serving as insights rather than assured outcomes, to help users make informed decisions. This means that other factors (mentioned in business report) are not taken into consideration, as this only finds mathematical patterns in the data.

Irrational and unexpected results should be resolved with collaboration of expert accountant advisors, as well as the project developers.  
Stock market unpredictability makes the risk of using the tool nearly equivalent to investing directly in stocks, as it only identifies historical patterns.

The program operates strictly within the scope of its trained data, extrapolating to new examples within a limited and concise decision space.

The system is robust to a certain extent; when provided with correct information, it effectively identifies and interprets patterns in the data.  
Results are easily reproducible by following the instructions provided in each `.ipynb` file.

## AI and Explainability Issues

All explainability issues are explained in either the report or individual notebook files. **We strongly suggest you take those into consideration.**

AI is utilized for predicting stock values and optimizing portfolios. If AI features are disabled, the project remains functional with EDA (Exploratory Data Analysis) and preprocessing, both performed manually. In a more publicly implemented project, we would ensure robust support for any AI-related issues, disabling AI functionalities temporarily if necessary until the problem is resolved.

**Decisions should never rely solely on AI, always incorporating expert opinions.**

If such a tool achieved extremely high accuracy and therefore, high popularity, it could disrupt the role of stock-focused accountants, rendering the profession obsolete. Additionally, widespread reliance on a single prediction model could alter fundamental market patterns through groupthink, potentially driving companies to bankruptcy and rendering the predictor ineffective due to change in patterns.

The model runs locally, ensuring no backdoors, but relies on the integrity of yfinance data, assuming its correctness as their responsibility.

Additionally, models are inherently limited to performing the simple tasks they are designed for.