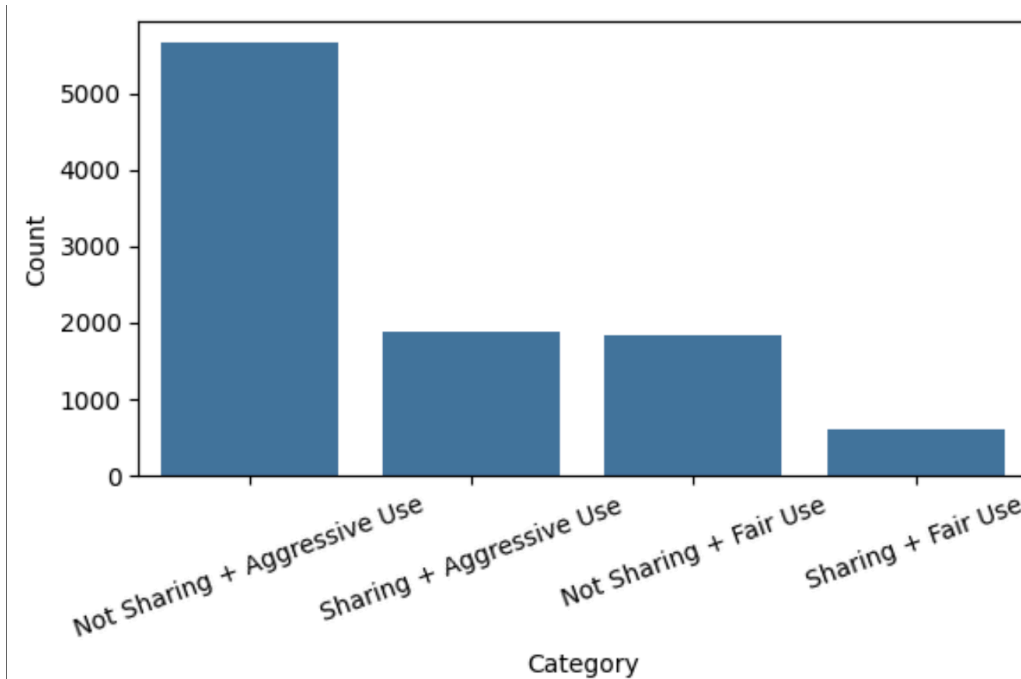


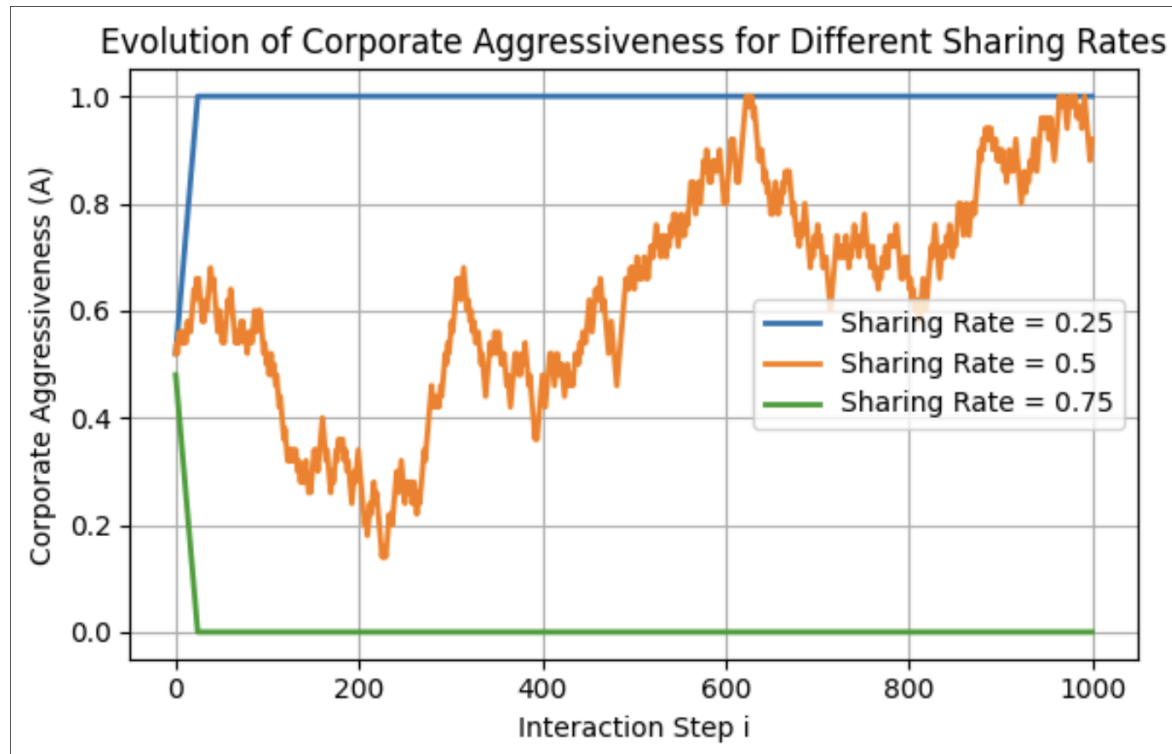
Research Project Insights

06/06/2025

Here are some of the graphs that I have worked on with insights that could help build a story for the simulation model:



1. This is a very basic plot that shows the proportion of the 4 categories.
2. The ratio of sharing and fair use is very less compared to not sharing and aggressive because the probability was fixed to 25% or below hence the least number of occurrences.



This graph shows the behavior of co-operate according to the sharing rates: 0.25, 0.50, 0.75

Sharing Rate = 0.25 (blue):

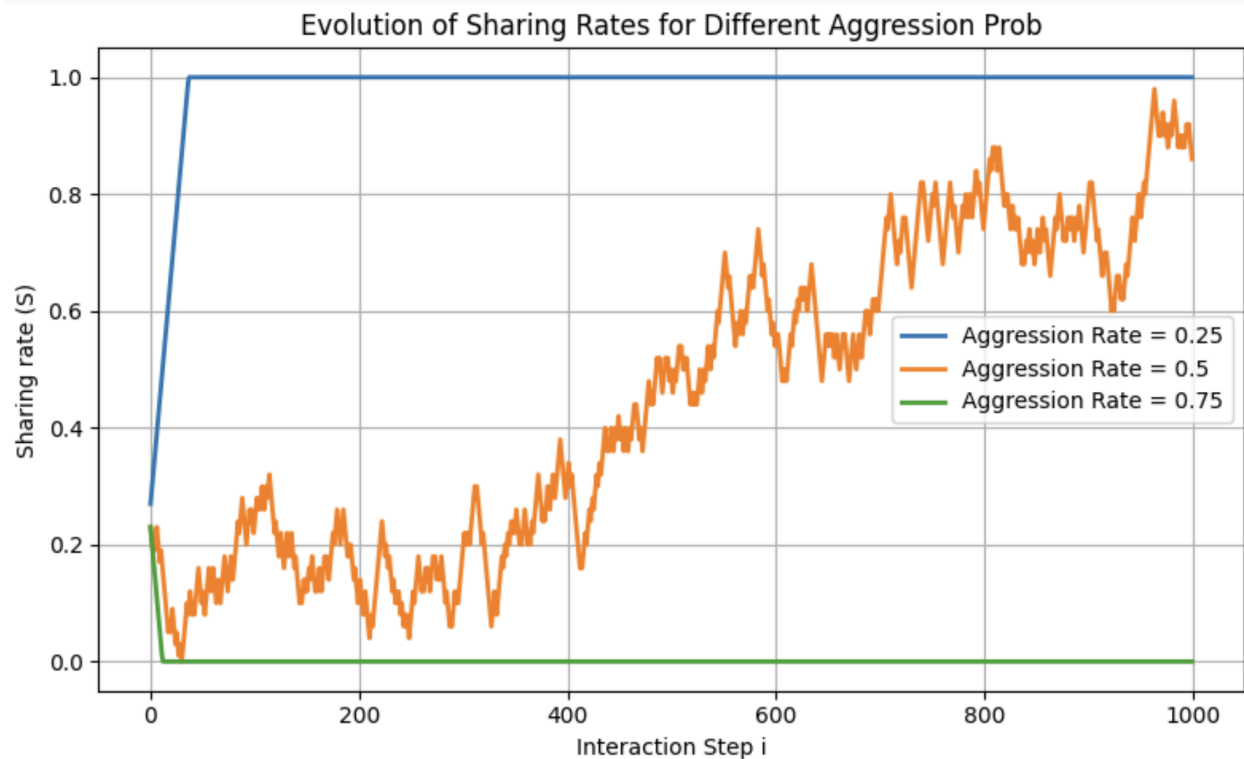
- Aggression rate rapidly increases to 1.0 and stays there
- Low user sharing seems to provoke corporate aggression, as a reaction to get more information

Sharing Rate = 0.5 (orange):

- Aggression fluctuates heavily but eventually trends toward 1.0.
- Mid-level sharing leads to adaptive corporate behavior, trying to balance its response between getting more information and maintaining the corporate reputation

Sharing Rate = 0.75 (green):

- Aggression rate rapidly increases to 0 and stays there
- High sharing makes the corporation more cooperative.



In this graph the sharing rate is varied according to the aggression rate: 0.25, 0.50, 0.75

Aggression = 0.25 (blue):

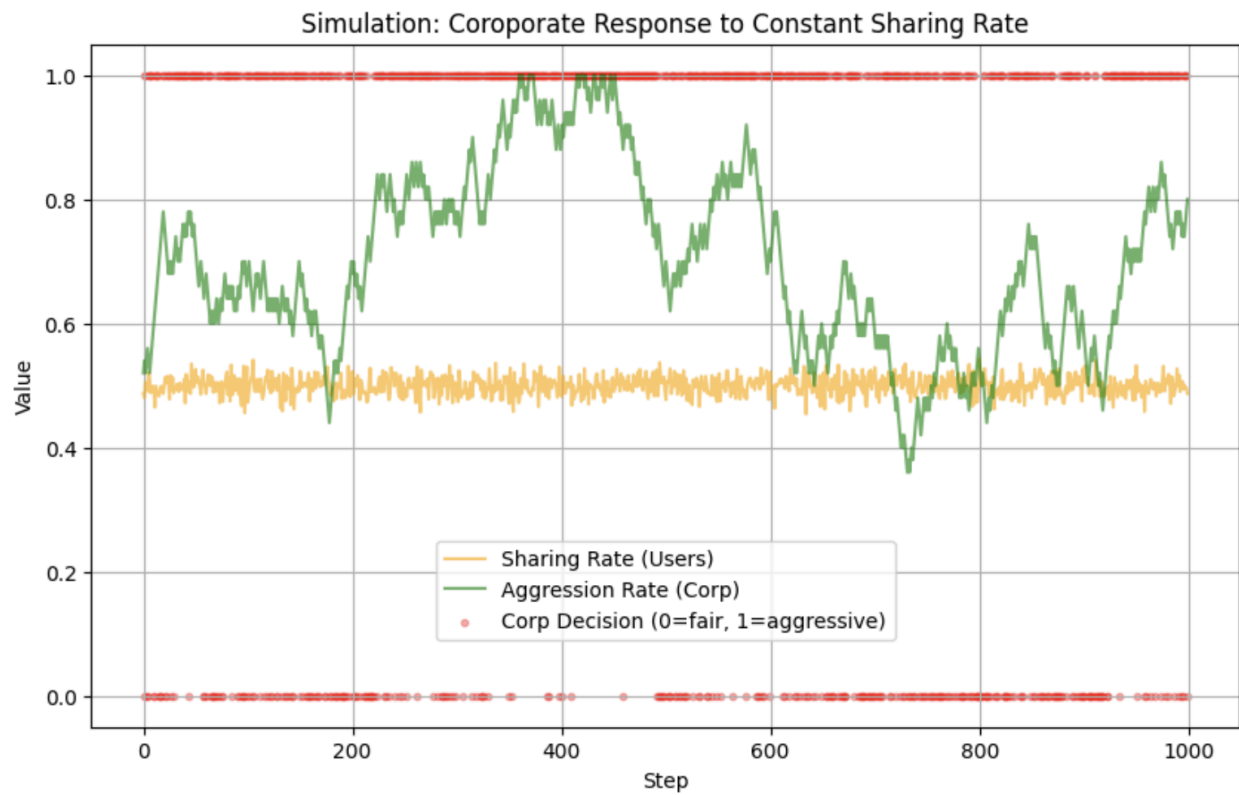
- Sharing rate rapidly increases to 1.0 and stays there
- Low aggression by the company boosts user sharing

Aggression = 0.5 (orange):

- Sharing rate is noisy but gradually increases, peaking around 0.85
- With medium aggression, users are hesitant to share first but participation increases over time

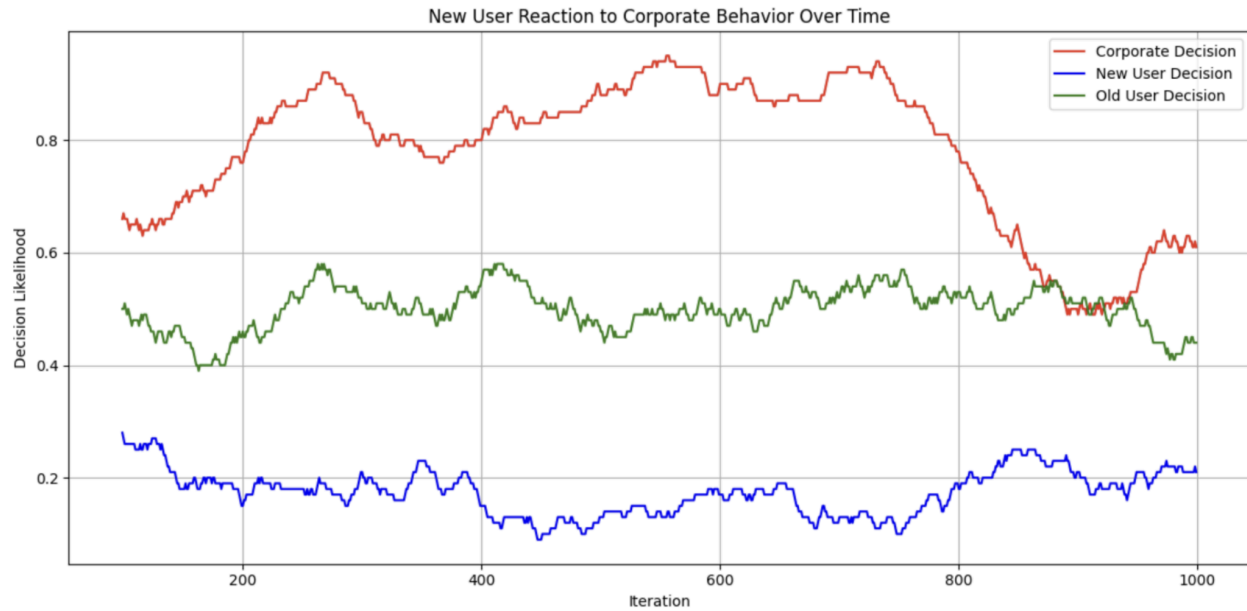
Aggression = 0.75 (green):

- Sharing rate immediately drops to 0 and stays there
- High aggression strongly discourages user sharing



In this graph the sharing rate is constant(0.5) and the corporate decision for every interaction is observed along with the aggression rate.

1. **Corporate Decision (red)** fluctuates between fair and aggressive, mostly trending towards inclined
2. **Aggression rate (green)** is noisy, it increases gradually in the beginning but falls back due to the constant sharing rate
3. **Sharing Rate (yellow)** remains constant throughout



4. **Corporate behavior (red)** shifts gradually in the beginning but rises in order to get more information, as it fails the graph drops again to maintain the reputation of the corporate, likely based on accumulated user responses.
5. **Old users (green)** track corporate behavior, suggesting they've adapted or become predictable.
6. **New users (blue)** are much more cautious — their likelihood of "sharing" is much lower and slower to react.
7. New users likely rely on the historical majority behavior (social proof), but don't immediately conform.

Random Forest Classifier Model

The class is **heavily imbalanced** and hence the model is biased toward the majority class (1 = aggressive)

	precision	recall	f1-score	support
0	0.53	0.56	0.54	68
1	0.77	0.74	0.75	132
accuracy			0.68	200
macro avg	0.65	0.65	0.65	200
weighted avg	0.68	0.68	0.68	200

1. This random forest classifier model that does better at identifying **aggressive corporations** (class 1) with **77%** precision.
2. It struggles with detecting non-aggressive cooperates, hence many false negatives

Logistic Regression Model

This is a logistic regression model, for the same sample:

	precision	recall	f1-score	support
0	0.66	0.60	0.63	68
1	0.80	0.84	0.82	132
accuracy			0.76	200
macro avg	0.73	0.72	0.73	200
weighted avg	0.76	0.76	0.76	200

1. It that captures nearly all **aggressive corporations**, precision rate of **80%**
2. It is misclassifying some class 0 samples.