Enhancing Social Media Governance with Policing Bots - Milestone 5 Evaluation

—

Authors:
- Cody Manning - cmanning2020@my.fit.edu
- Gabriel Silva - jsilva2021@my.fit.edu
- Liam Dumbell - ldumbell2021@my.fit.edu
- Nickolas Falco - nfalco2020@my.fit.edu

Client:
- Dr. Khaled Slhoub - kslhoub@fit.edu

Progress of current milestone (Task Matrix):

Task	Completion	Cody	Gabriel	Liam	Falco	To Do
Find and implement more detection algorithms	80%	20%	20%	10%	30%	Finalize our final detection algorithms.
Figure out the distinguishing module	70%	20%	30%	20%	20%	Refine the methods we use to define maliciousness so that we can get a clearer picture on a bots nature.
Ebook page and Poster	100%	50%	0%	50%	0%	

Discussion for each accomplished task for the milestone:
- Task 1: We have looked into a few more ways to detect bots. We have added a few functions to the program. One checks the age of the account and returns a number if it's 30 days or less old or a higher number if it's less than a week old. The other function checks a user's comments and how fast they reply and uses

statistics to measure the data. The data it returns needs to be fine tuned but it reports the std deviation as well as the mean. We could also add comment length to that function and check the average length of their comments. This level of fine tuning will need to be adjusted. We also cleaned up a bunch of the unnecessary code in the detection algorithms that we have, increasing efficiency (although by a minor amount).

- Task 2: This is the big one. We have added several checks on the users that we detect as bots. Basically we have checks for
  - Excessive profanity / Slurs: If we detect a user as a bot, and it is using racial slurs / excessive profanity, we deem it to be a malicious bot. We are using a wordlist we got from some other projects on GitHub to populate what is deemed as problematic.
  - Attempting to convince a user to leave reddit. Essentially if we deem a user to be a bot, and it is trying to send links that lead off of reddit, we deem it malicious (or at least we look at it poorly). This is especially done if a link shortener is used to obfuscate where it is trying to send the user.
  - Finally, we choose to ignore the above two checks if a bot is in our list of known bots (as our list of known bots are ALL beneficial bots). Basically, if it is in the list of bots we know are good, we ignore the above two checks.
- Task 3: Cody handled the ebook page, highlighting the key features of the project using the template given by the senior design showcase on the senior design canvas page. Liam handled the poster using the same metrics, as well as example posters seen in the Olin Engineering Complex. Our advisor seemed happy with the poster, and gave a little bit of criticism on how it can be improved.

Discussion of contribution for the current milestone:

- Cody Manning: Cody assisted in the improvement of the detection algorithms, as well as lending advice on possible checks for distinguishing maliciousness in bots. He also did checks and cleanup on the code that already existed, making it more readable when run. Cody also wrote the ebook page and this document.
- Gabriel Silva: Gabriel did most of the heavy lifting on the maliciousness detection algorithms, implementing the primary functions that currently drive what we are using to detect maliciousness. He also focused on removing redundancy, trying to get more performance out of the program.
- Liam Dumbell: Liam helped on the detection algorithms, as well as working on performance for the database storage we are using to keep track of our results. Liam was also vital in testing the work we ended up coming up with. Liam also created the senior design poster.
- Nickolas Falco: Falco helped clean up a lot of the code to meet more of a professional standard. This is something that he will be working on into milestone

6. Falco also assisted in getting our detection algorithms improved, as he had experience with this kind of thing before.

Plan for the next milestone (Task Matrix):

Task	Cody	Gabriel	Liam	Falco
Finalize the detection algorithms	20%	10%	10%	60%
Finalize the maliciousness algorithms	10%	50%	20%	20%
Test the framework as a whole	30%	10%	50%	10%
Create developer / User Manual	70%	10%	10%	10%
Final Demo	25%	25%	25%	25%

Discussion for each task of the next milestone:

- Task 1: We are pretty happy with what we have for detecting bots at the moment, especially with the limited data we have with the Reddit API, but it can certainly be improved. Given the current timeframe, we are going to focus on improving the current algorithms, rather than creating entirely new ones. We think this will get the project to a pretty comfortable level of certainty.
- Task 2: This is the main focus of the milestone, while we have a pretty good start with our current maliciousness detection algorithms, they need to be improved with more checks to ensure accuracy. As it stands right now, it is very difficult to justify our current checks with our desired accuracy level. So this will be the primary thing we coalesce together and brainstorm for. If we can come up with more checks on maliciousness here, we will consider the project an overall

success. One such thing we have come up with is repeated posts to multiple subreddits, since each subreddit is focused on a certain subject, someone posting the same thing to multiple subreddits could be considered spammy, since the post will not actually be related to the subreddits theme. There is no perfect science to this, so we are hoping to get to a level where easy stuff is handled automatically (things like mass spam/linking) where the more subtle stuff is deemed 'suspicious' and handed off to a real person for review.

- Task 3: Creating a user / developer manual is key to helping future project creators / users understand the fundamentals of our project. We hope to have a clear and concise manual that can easily be understood by an average user, while also being useful to people who may pick up the project after we are done with it. While our project is pretty easy to understand, we have to ensure clarity for anyone who interacts with it. This will also be where we clean up our GitHub, make sure the program is properly commented, and make the project easier for future developers to pick up where we leave off.

- Task 4: The final demo will be what we present to the senior design showcase, as well as our final presentation. This one will be an overview of the entire project, and should showcase all of its functionalities. We are hoping to cleanup the main UI so it looks a bit nicer when actually running. This project does NOT include a graphical user interface, as it is unnecessary for functionality, but we can make the command line interface look nicer for no real overhead cost.

Dates of meeting with Client:
- March 14, 2024

Client Feedback on Milestone 5:
- See faculty feedback below

Dates of meeting with Faculty Advisor:
- March 14th, 2024

Faculty Advisor Feedback on Milestone 5:
- Task Feedback: Our advisor was happy with our current work, reminding us to continue reading papers on ways that people have found to analyze the behavior of bots online. We need to continue improving what we have for maliciousness, as well as get the project cleaned up for showcasing to the public. He reminded us that this is an always ongoing project, and to continue on the path we are currently working on.

Evaluation by Faculty Advisor:
- Faculty Advisor: detach and return this page to Dr. Chan (HC 214) or email the scores to pkc@cs.fit.edu
- Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Cody Manning	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Gabriel Silva	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Liam Dumbell	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Nickolas Falco	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature _____ Date: _____