

## WHAT IS IT?

This project attempts to model how social media platforms recommend a user followers based on their interests, and how those individual interests change as a result of the influences from those they follow/are followed by.

We have three types of users on the platform:

- Consumers (●), who update their interests based on who they're following.
- Creators (■), who update their interests based on who's following them.
- Bots (⚡), who have fixed interests.

All users follow and unfollow another user on the platform every tick. To visually represent each users interests, they are assigned a color representing the strongest interest they hold.

## HOW IT WORKS

Each user has a set of interests, which is a randomly generated list of floats from 0.0 to 1.0 representing the strength of that particular interest.

Users also have an internal TIRED boolean, which indicates whether an account would like to leave the platform or not. This is only used if SIGN-UP-AND-EXIT is enabled.

Every tick, users follow/unfollow other users on the platform, then update their interests depending on their ruleset.

Creators update their interests based on who's following them, consumer's update their interests based on who they're following, and bots do not change their interests at all.

To follow another user, a user selects one of the interests from their list randomly, then searches for other users on the platform who have a greater intensity in that interest.

The user then follows one of the people they've found who have a greater intensity in that interest.

To unfollow another user, similar logic applies: a user selects one of their interests at random, and investigates the accounts they're currently following. If the interest of one of those accounts is  $\leq$  the user's interest intensity, the user unfollows that account.

To update the user's interests based on who they're followed by (Creators) or are following (Consumers), we average out the collective interests of the accounts a user is influenced by. The user's interests are then set to this average intensity list.

To update the user's color based on their interests, we utilize the HUE wheel in NetLogo's HSB model, and divide up the wheel into sections depending on how many interests we need to represent.

Each interest is mapped to the color of each section, and each user is given a final color according to the weighted average of their interests as mapped on this wheel.

If SIGN-UP-AND-EXIT is enabled, a few more factors are at play. Every tick, we also ask the user if they're tired, and update their size based on if they're tired to visually represent that a particular user is likely to leave the platform. Every SIGN-UP-RATE amount of ticks, we add a user to the platform, and every EXIT-RATE amount of ticks, users who are tired of the platform leave.

## HOW TO USE IT

The sliders on the interface select the initial settings for the model, as well as provide a graphical overview of what interests have taken over the platform. Click SETUP to initialize the users, and GO to begin the simulation. The colors of each user show what interest they believe in most strongly. If a user follows/is followed by another user, it is represented by a directed link to the person being followed.

INITIAL-NUM specifies the number of the users on the platform, while CONSUMER-PROPORTION/CREATOR-PROPORTION/BOT-PROPORTION control the proportions of each type of user.

MIN-SUBS is the minimum amount of links a user can have before they become tired of the platform, and potentially leave, given that SIGN-UP-AND-EXIT is on.

SIGN-UP-AND-EXIT allows new users to sign up every SIGN-UP-RATE ticks, and exit the platform every EXIT-RATE ticks that pass.

## THINGS TO NOTICE

- What factors lead to the interests of the group becoming fully homogenized (one color)?
- Bots usually do not have as much staying power on the platform as Consumers and Creators. Why do you think this may be?
- Some users may grow tired of the platform, then decide against it later. Do these users usually last in comparison to their peers?
- The Max-Strength Interest histogram is a frequency histogram of the strongest interest among all users.

## THINGS TO TRY

- Try changing the MIN-SUBS slider in the middle of the experiment. How does this affect the staying power of each type of user?
- Try changing the initial proportion of users the model starts with. Do the same trends emerge, or do certain users dominate the platform?

## EXTENDING THE MODEL

- Make the Creators/Consumers more complex, not all users immediately take onto the opinions of those they follow. Perhaps you could make each user more/less susceptible to bot accounts, and more likely to stick to the interests of said bot account once they are encountered.
- Some users may follow others not because they have similar interests, but because they know each other offline.
- Create another type of user (MODERATOR) who eliminates bots once their influence is high enough/they are followed by enough accounts. This could reduce their presence on the platform when SIGN-UP-AND-EXIT is not enabled.

## NETLOGO FEATURES

Links are utilized to represent the followings between users on the network, and the “layout-circle” primitive is used to orient our users in a circle so the network is more visually clear. We also use “set-default-shape” to make our links curved, and to give each user their distinct shape.

## RELATED MODELS

Netlogo Model Library:

- Preferential Attachment
- Language Change
- Diffusion on a Directed Network
- Virus on a Network

## CREDITS AND REFERENCES

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Thank you to Dr. Murphy at Northern Illinois University for allowing us the opportunity to work on this project!