

Research Questions

- Algorithmic actors ("bots") are becoming more active on social networks.
- Bots do not have attention limitations as humans, and are rapidly improving as technology advances.
- RQ1:** How do bots gain social capital in human-dominated online networks?
- RQ2:** What is the effect of bot activity on the structure of human social networks?

Reddit Bot Data

- Mostly open-source and explicit about botness
 - e.g., "I'm a bot!"
- Types of activities:
 - Utility: perform some function on url/text/image/etc. in comment thread
 - Entertainment: typically randomly generated text for enjoyment
 - Housekeeping: administrative duties on subreddit
- Bots engage in subreddits by listening to Reddit via API:
 - Push: bot IDs keyword/url/trigger then takes action and comments
 - Pull: human user explicitly triggers bot by name in a comment, which activates bot action
- Bot list taken from bot ranking project:
<https://botrank.pastimes.eu/>
- Top 100 bots selected for data collection
- For selected bots via Pushshift API (<https://pushshift.io/>) we pulled:
 - All bot comments
 - Comments bot was replying to (parent comment)
 - All direct replies to bot comment (1 level below bot)

Example of Human-Bot Interaction on Reddit



Example of human-bot interaction on Reddit.

- GifReversingBot activated when tagged
- Bot pulls link in thread via Reddit API, modifies content (utility), and comments with result
- Other users can reply to the bot's comment and continue thread

Bot Comment Analyses

We can predict the number of replies the comment receives (SocialCapital) based on the following features:

- The number of "good bot" and "bad bot" replies a comment receives (Botness)
- The number of comments the bot has made overall (BotActivity)
- The total amount of karma points the bot has received (BotKarma)

$$SocialCapital = \beta_1 Botness \times \beta_2 BotActivity \times \beta_3 BotKarma$$

We can also predict botness interactions of individual posts with relevant features:

- The amount of karma a single comment receives (CommentKarma)
- The number of replies the comment receives (SocialCapital)
- The number of words in the bot comment (NumWordsInComment)
- Whether the bot has "bot" in its username (BotInName)

$$Botness = \beta_1 CommentKarma \times \beta_2 SocialCapital \times \beta_3 NumWordsInComment \times \beta_4 BotInName$$

Subreddit Analyses

- Each subreddit can be considered an independent social network.
- How do subreddits change with the introduction of bots?
- Comparison of subreddits with and without increased bot activity.
- Direct bot vs human comparison.

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