Automated Epistemology: Computational Propaganda, Algorithmic Curation, and Epistemic Practice

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What is Computational Propaganda?

- The utilization of computational tools by human actors with the explicit intent to mislead or manipulate an information ecosystem in order to affect beliefs, attitudes and preferences of a targeted population in order to obtain the social or political goals of the propagandist (Benkler, Faris, & Roberts, 2018).

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- Computational tools have hugely expanded the reach and depth of network penetration of false or misleading information by way of using the algorithmic prioritization of popularity on social media sites to push this information to the top of news feeds, while rendering other pieces of information invisible (Woolley & Howard 2016).
Bots

- Bots can be understood as small software programs built and deployed to perform simple, repetitive, and typically text-based tasks (Woolley & Howard 2019).

- The work of bots can be benign and quite useful, for instance, the automation of news alerts, weather updates, or link maintenance within information ecosystems such as Wikipedia (Woolley & Howard, 2019).

- One individual, or a small group can fairly easily coordinate an army of bots, and in many cases also human actors (i.e. troll farms), to manipulate the algorithmic curation mechanisms of social media platforms (Woolley & Howard, 2019).
Bots and Algorithmic Manipulation/Curation

- Bots have become increasingly sophisticated and false accounts have become more difficult to distinguish from real users in social media spaces (Chu et. al. 2010).

- Social media algorithms prioritize and amplify content algorithmically perceived as popular via “likes”, “shares”, “comments”, “retweets”, and other metrics in which a piece of content can be viewed as “trending”. Bots can be programmed to do all of these simple, repetitive tasks. This is a values-based alignment problem predicated on attention extraction (Howard, 2020).

- Widespread normalization of the utilization of social media platforms as primary sources of information has allowed socially and politically powerful actors to manipulate, coerce, and control the narrative around specific issues in order to serve a given political or sociocultural agenda (Howard, 2020).
Severity of the Problem

- In 2014 the World Economic Forum labeled the rapidity of the automated spread of misinformation on the internet as among the top 10 perils to civil society (World Economic Forum 2014).

- In a report published in *Morning Consult*, Facebook's Vice President of Integrity, Guy Rosen, reported that between October and December of 2020 alone, Facebook had discovered and removed 1.3 billion fake user accounts from the platform (Rosen, 2021). Rosen goes further in the same report to discuss Facebook's process of removing over 12 million pieces of content posted or shared on the platform specifically related to the Covid-19 pandemic and vaccine misinformation since March of 2020 (Rosen, 2021).

- Woolley and Guilbeault found that bots have reached positions of measurable conversational influence in their examination of automation on the social media platform Twitter (Woolley & Guilbeault, 2019).

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- Researchers have pointed to the generally poor ability of users to detect whether another user that they are interacting with, or that has shared a piece of content is in fact a bot or an actual human being (Edwards, Edwards, Spence, & Shelton, 2014).
Computational Propaganda and Marginalization

- Campaigns of computational propaganda, almost by definition, deliberately target and generate contentious political and sociocultural issues looking to demarcate in and out groups, proliferate othering and divide individuals into tribal adherents of binary ideological loyalty (Hameleers et. al., 2022).

- In studies of US midterm and presidential elections from 2010 to 2020, scholars have found these campaigns to target vaccine debates, women’s reproductive rights, racial equity, immigration, and the Covid-19 pandemic (Nonnecke et. al., 2021).

- In addition to sharing and liking negative content on these topics, bots also author comments and original posts that rely heavily on negative emotional appeals, sensationalism, harassing and defamatory language, and fear mongering (Nonnecke et. al., 2022).

- This tactic of “astroturfing” or blanketing a social media platform with post, comments, shares and likes in order to render a given perspective as dominantly visible within an information ecosystem tends to solidify an inauthentic consensus perpetuating a false perception of an accepted and dominant consensus for that perspective (Chung 2019).

- As these pieces of propaganda become entrenched within homogenous social networks they further the marginalization of targeted groups through the perpetuation of negative stereotyping, and invented essentialist narrative, which not only harms any work towards sociocultural inclusivity but has also led radicalized individuals to enact terroristic violence against falsely demonized groups (Piazza, 2020).
Epistemology and Epistemic Systems

- Philosophers describe the concept of epistemology as the study of the nature of knowledge, and justification: in particular, the study of the defining components, the substantive conditions or sources, and the limits of knowledge and knowledge justification (Moser, 2002).

- Philosophers interested in the ideas of social epistemology are primarily concerned with the evidence gathering processes of groups of individuals all participating in what can be described as an “epistemic system” (Goldman, 2011).

- Our social epistemic systems are now in a sense automated, and very loosely defined and include digital social spaces in which information sharing can be completed at a significant rate, with relative anonymity, and also at a significant depth of network penetration in a very immediate manner, the authority of epistemic testimony is in some cases impossible to verify (Woolley & Howard, 2019).

- How does the influence of social platforms that algorithmically curated and readily accessible in seconds via any internet connected device influence our ability to accurately examine and evaluate newly encountered information? How and why do the tactics of computational propagandists work? (O’Hara, 2022)
Scheibenzuber and colleagues examined the literature and presented a synthesis identifying the four main components of cognitive processing that contribute to epistemic failure: reception, information acceptance, cognitive integration, and sharing (Scheibenzuber, Hofer, & Nistor, 2021).

Reception points towards the initial captivation of attention by the typical tactics of propagandists, such as sensationalism, profound negativity in order to exploit the epistemic failure of negativity bias, and the manufacture of an illusory truth while projecting a false consensus based on repetition (Greifeneder & Jaffe, 2020; Fazio, Brashier, Keith Payne, & Marsh, 2015; Scheibenzuber et al., 2021).

Information acceptance preys upon several epistemic failures inherent in human cognition related to truth evaluation such as validation by intuition rather than evidence, truth bias, confirmation bias, and cognitive dissonance in which we disregard information as untrustworthy or false if it forces us to question a previously held belief rather than confirm that belief (McGrath, 2017; Scheibenzuber et al., 2021; Schwarz & Jalbert, 2020; Van Swol, 2014).

Cognitive integration is rooted in intuitive truth judgement and involves the desire to integrate a given piece of information into one's knowledge structure by seeking out confirmation for that specific piece of information (Scheibenzuber et al., 2021).

The final cognitive phase is sharing in which individuals widely share information related to a misconception in order influence the perspectives of others (Nguyen, 2020; Oyerson, Dawson, Jaffe, Newman, & Schwarz, 2020).
Inoculation Theory as Critical Pedagogy

- The literature on inoculation theory points towards having students confront and problematize computational propaganda in the classroom. Through active-learning based critical pedagogical techniques, students can be placed in situations in which they must directly confront artifacts of propaganda and engage with one another in order to more clearly understand and critique the mechanisms at work behind the spread of computational propaganda (O'Hara, 2022).

- In order to address the reception level, through discussion, we can raise student awareness of framing and the utilization of the visceral, sensationalist, and emotional by propagandists in order to engage the cognitive deficit of negativity bias (Scheibenzuber et al., 2021).

- At the information acceptance level, students can be engaged in discussion that interrogates value framing and and begin to resist the cognitive biases inherent in intuitive truth evaluation (Scheibenzuber et al., 2021). The important component to address here is the illusory truth effect which can be lessened by teaching students about repetition and how to reverse engineer news stories through the utilization of analytical reasoning in place of intuitive reasoning (Osborne, 2018; Roozenbeek & van der Linden, 2019).

- At the cognitive integration level, the creation, perpetuation, and adherence to misconception needs to be addressed (Chi, 2013). In order to correct integrated cognitive misconception, a radical transformation of an individual's epistemic practice and epistemic past must be enacted in order to push that individual towards belief revision, mental model transformation, and categorical shift (Chi, 2013).

- At the final level, sharing, eradicating the problematic cognitive practices that occur at the first two levels of the cognitive process outlined here will improve the student's abilities to accurately discern the truth value of information they've encountered, which the literature has shown, also improves the quality of information individuals decide to share as a whole (Koohikamali & Sidorova, 2017). Students can be taught to conceptualize themselves as stewards of information through exposure to the severity of the problem.
Conclusions

- In our increasingly complex sociotechnical society, we can see the effects of disinformation, misinformation, and computational propaganda all around us, from the 2020 presidential election in the United States, to vaccine misinformation, to the continuous political and sociocultural battles related to race, gender, sexuality, and class.

- A foundational understanding of computational propaganda is essential in order to engender students with the disposition to accurately assign authority and efficacy across multiple information contexts, whilst also avoiding the pitfalls of cognitive deficit that contribute to epistemic failure and the further spread of disinformation.

- The efforts of computation propagandists are currently in their relative infancy, but continue to grow in both complexity and sophistication and in sheer volume, on a global scale.

- Skills of critical algorithmic literacy are increasingly intractable at the individual and social level in order to inoculate the populace against this rise in computational propagandizing and preserve the epistemological viability of our information ecosystem.

- Utilizing the idea of inoculation theory, techniques from critical pedagogy, and active learning, students can be exposed to weaker forms of computational propaganda while working together to discuss and talk through the aspects of computational propaganda that may be present in the exposing example in order to generate a cognitive immunity in their personal information seeking processes.
Questions?

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References


References (Continued)


