Who are We Modelling: Bots or Humans?

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ABSTRACT

Computational techniques such as Behavioural Analytics (BA) have been extremely effective at transforming social media data into useful insights for applications such as recommender systems [1] and customer relation management [2]. However, due to the rise of smarter, more sophisticated social bots [3] and the increasing reliance on algorithmic filtering (which nudges online users to make certain choices and take specific actions) [4], it begs the question, if we are using data from social media for modelling, are we modelling human behavior in social media or simply reverse engineering how bots and other algorithms operate?

The rise of bots and algorithmic filtering may have a big impact on how users behave online and how researchers interpret online data. This is because computational techniques used to analyze social media data are often blind to biases or noise in data unless we specifically model it. There are a lot of emerging work on bot and spam detection [5], but the challenge is to introduce these emerging techniques quickly to researchers who are increasingly relying on social media data as their go-to data source for studying different demographic groups and their behavior online and offline. This is an acute problem for social scientists and others who often rely on ready-to-use applications to mine social media data, but who might not have background or resources to develop custom scripts and run modelling to limit the influence of bot-like accounts and take into account the fact that the data they are collecting might be shaped by the use of algorithmic filtering.

This issue is complicated by the fact that many social media platforms are reluctant to remove suspicious accounts too aggressively as it may affect their 'Monthly Active Users' rate (often equated to a platform's worth by investors). Additionally, in an attempt to combat information overload and to appear more 'relevant' to their users, some social media platforms such as Facebook and Twitter are employing algorithms to customize user experience by showing users only contents that the 'algorithm' thinks are relevant to the users. Putting aside the discussion about whether social media companies should or should not be doing this, the main point here is that they are doing it and that it affects what people see and do in social media. And this has a direct impact on studies that rely on social media data, such as studies related to information diffusion modelling in social media. The issue is less salient if a study is examining how information flows in a particular system, but it would be highly problematic if it relies on data to model human behavior.

Researchers studying various online and computer-mediated communities, like myself, used to be able to argue that the online is an extension of the offline, and that offline and online are just different slices of real life. But the increasing number of bots in our datasets and the increasing use of algorithmic filtering by social media giants are widening the gap between online and offline, and between computer-mediated and algorithm-driven communication. This in turn makes some online data less reliable, at least for those of us studying human behavior. Therefore, there is an urgent need to better understand the nature of bots and algorithmic filtering, and their influence on users' online interactions, not just from a computational, but also from sociological perspective.

I want to conclude this short piece by calling researchers in the Modelling Social Media (MSM) and related fields to develop and share strong principles, protocols, tools and techniques around handling and cleaning social media data. We also need to develop stronger partnerships across social media-related fields (and especially with social science researchers) to start discussing how to handle bot-like accounts and the influence of algorithmic filtering properly once detected. For example, should such accounts be removed from the dataset or kept and treated like any other agents in our models? We may consider as a safe practice (from a research perspective) to remove a group of marketing-related bots that are part of an activist online group, if these bots do not interact with anyone else in the group but are just there to increase their following base, like those observed in studies such as [6]. On the flip side, there is also a good argument for why, in some instances, we might want to keep automated Twitter accounts that are designed to repost certain news stories as they may play an important information propagation role by transmitting information across different online communities. The answer would vary and likely depend on many factors such as the study focus, the nature of bots and their impact (or lack of) on online participants. But getting to the 'answer' would also require more empirical and social science-driven work to be introduced into the computational modelling arena and vice versa; thus, my call for closer partnership among qualitative and quantitative social media researchers.

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