NotBot: a Gamified Online Experience to Increase Awareness of Malicious Social Media Bots

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Abstract
With the presented application NotBot we would like to sensitize people for the mechanisms of bots in social media. Not only will automated agents continue to be part of the online discourse, but through rapid advances in artificial intelligence there is a constant refinement in their ability to mimic human behavior. Therefore we chose the way of a gamified online experience to emancipate the user through a playful and interactive way, without being educational. Through understanding, we hope to sharpen people's awareness, as well as training their ability to scrutinize posts in social media and distinguish human activity from automated ones.

Keywords: bots; social media; interaction design; gamification;

Introduction

Bots are a part of online communication more than ever. With advances in technology and the way social media and other online platforms fail to regulate this emerging problem, bots have become more common and harder to detect, leading to many of us believing what they say and spreading baseless misinformation. By utilizing bots, a powerful individual may sway the public's opinion on a certain topic or subject through the social manipulation that these multiple, seemingly real, "people" can achieve.

We would like to raise awareness for this situation, as its consequences are reaching far beyond cyberspace and into the physical world. Having the power to reverse the reputation of real public individuals, causing economic damage and even undermining democracy itself, reveals the dramatic impact social media bots have on society itself. By looking for the most efficient way to sensitize people to the mechanisms of bots in the context of social media manipulation, we came to the conclusion that a first hand experience with gamification elements would be the best way to convey this rather complex topic.

The Paper will hence outline the progress of developing this experience, by starting with an overview of the given problem and looking at other didactic/artistic approaches to convey societal issues. From this research we derive our design concept and describe our chosen implementation. In the last section the results are being discussed.

Related Work

Other applications have made the attempt to convey complex societal issues through a gamified experience. By looking at three examples we will derive what aspects work well in terms of immersion and information seeding.

Spent [5] is an online poverty simulation in which the user is given a minimum wage and asked to survive on this amount of money, facing the challenges of precarious employment. Spent utilises a narrative to construct it's idea, and to convey it to the player. By making the user go through these experiences in a virtual environment, rather than simple ex- planations, he/she builds empathy towards those who expe- rience them in real life. We can derive from their work that interactivity and engagement can help building a greater understanding of the topic.

Bad News [3] is a fake news game that carries the user through the experience of being the owner of a fake news website, thus giving you a look at how fake news are generated and how they target people and sway their opinion. Much like Spent, Bad News utilizes a narrative to convey a message, although, while Spent puts you in the shoes of the oppressed, Bad News features the perspective of the oppressor. Through embodying the "villain" position, the user gets a peek behind the curtain and learns common practices of fake news creation and upvaluation - thus helping them to gain a more critical perspective in valuing dubious news posts in their online life.

Memopol [6] is an interactive installation that exposes all data in the participant's smartphone to expose him/her to a sensation of surveillance. The performance is tailored to the visitors personal data, hence the whole experience is unique for each person. The data is being analysed by an algorithm which compiles the information to an audiovisual representation, consisting of sensitive information like tracked geo data, online purchases, and even the user's similarity with wanted criminals. Visitors described the experience as frightening, while it gave them a feeling of being surveilled in the most shocking way. In its physicality, the experience represents an impressive approach on how a topic can be conveyed in a lasting manner to the user.

Design Research

Since our main goal is to educate and bring awareness to the Social Bot pandemic, we will have a look at how users perceive social media accounts and what is the main user group of those communication platforms in regard to age and interests. From this we derive our central decisions for designing our experience and creating our content.

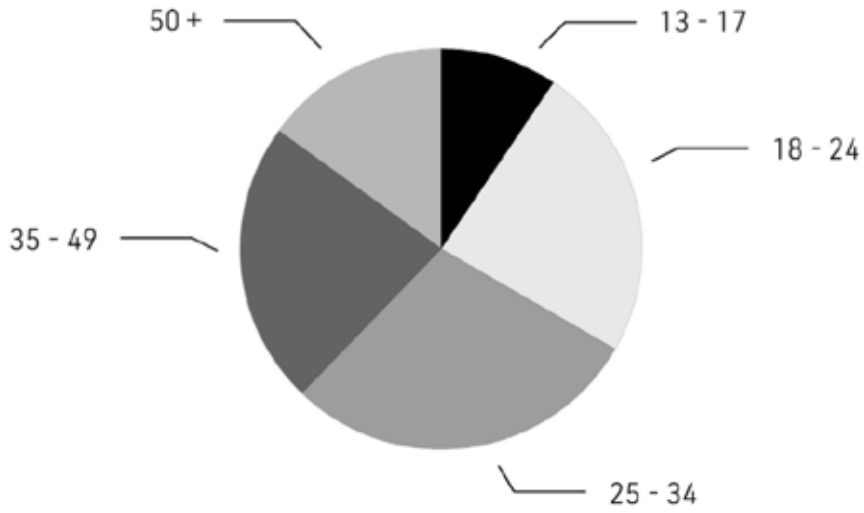

Figure 1: Distribution of Twitter users worldwide as of April 2020, by age group. [2]

Feature	Weight
Profile Image	0.032
Screen Name	0.060
Description	0.211
Location	0.008
Profile URL	0.015
Followers Count	0.014
Friends Count	0.007
Tweet Count	0.009

Table 1: Feature Importance according to Human Perception of Social Media Accounts [1]

User Perspective and Perception of Bots

N. Katherine Hayles in How We Became Posthuman:

> "[...] living in a condition of virtuality implies we participate in the cultural perception that information and materiality are conceptually distinct and that information is in some sense more essential, more important, and more fundamental than materiality." [4]

The quote puts in a nutshell the discrepancy of dealing with the flood of information in the virtual world from a sociological perspective. Statements made online can become "true" just by infinite repetition and reaffirmation, as users (most of them bots) repost and upvote the post in question. But if materiality does no longer matter, how can we tell if a user, posting or sharing information is a machine or made of flesh?

As shown by the research of Appling and Briscoe users tend to assess the authenticity of a social media account mainly by its account appearance (cues like profile im- age/name/ description) as well as its posted content. [1] (see Table 1) Nevertheless as technology evolves, and by incorporating artificial intelligence, it is more and more feasible to mimic those attributes in a more credible way.

From this we conclude that an experience that strives to put awareness on that point has to emphasize to the user the way how bot accounts being created and work on the in- side. This leads us to the central decision of designing the experience in a way that puts the user into the perspective of a bot. By choosing this unusual point of view we would like to breach the habitual perception of the user towards his/her social media consumption, as well as it appears to us as an effective way to illustrate the mechanics of implementation and coordination of multiple bot accounts.

Gamification

As a vehicle we want to create an experience, where the media consumer learns through play and insight rather than via a didactic approach. We believe this to be more effi- cient and engaging to the user and helps him/her to retain a longer attention span. Through the interaction the user gets a different perspective on the subject, making him/her question and rethink his/her opinion and choices about the subject itself.

By implementing a narrative the user is asked to personally engage with the project, making it a custom experience, and thus having a more lasting effect on his memory and behavior towards the subject at hand.

Target Audience

As we want to reach a demographic as broad as possible, we feel the need to include in our target audience people of all races, genders and social situations. In this we want to focus on people who utilize the internet and social networks as daily consumers, not media professionals that have a training or profound experience in the way media manipula- tion works.

Figure 1 shows a breakdown of Twitter Users by age, derived from the research of J. Clement. [2] Looking at the distribution of consumers by age we can infer that middle aged people are the most susceptible party - people who have just started getting used to the internet and wireless interaction and are unaware of the automation that is working in the background. This doesn't mean the experience won't be catering to younger demographics as well, just that it necessitates an ease of understanding for those not so well versed in utilizing technological devices.

Narrative Plot

Thematically, we think political opinion making and commercial profits are the most common use of bots for information manipulation and as well are the most powerful and hazardous in the sense of societal impact. Therefore we want to focus on the user group that is searching and sensible for this kind of media posts, being influenced by them in terms of behavior change and opinion spreading/ multiplication.

Figure 2: Not-Bot Interface: Landing Page.

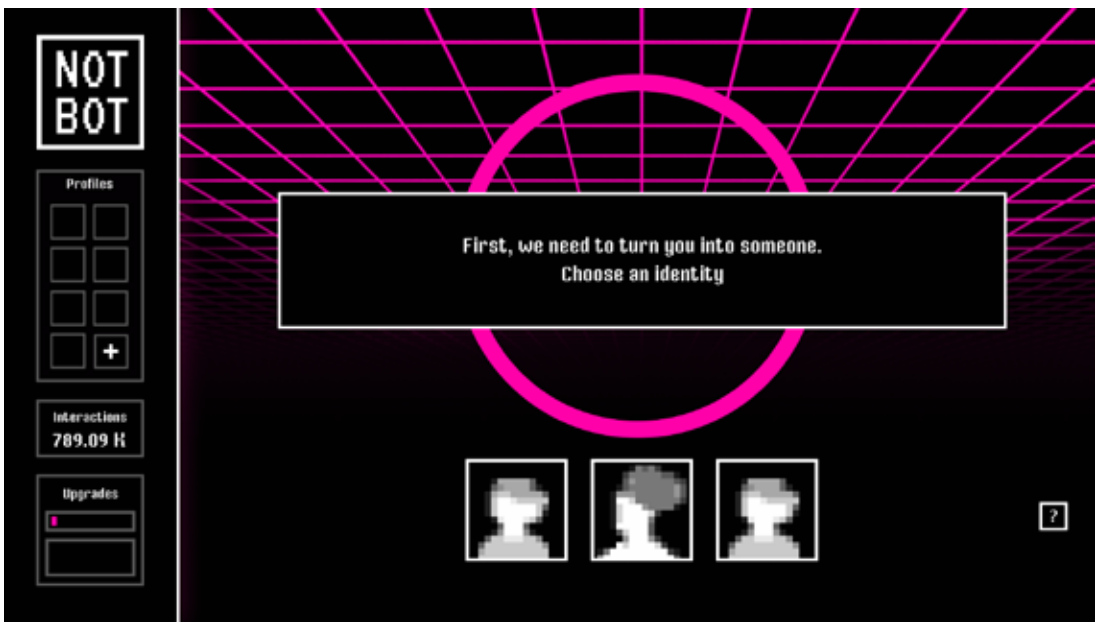

Figure 3: Not-Bot Interface: Main GameScreen.

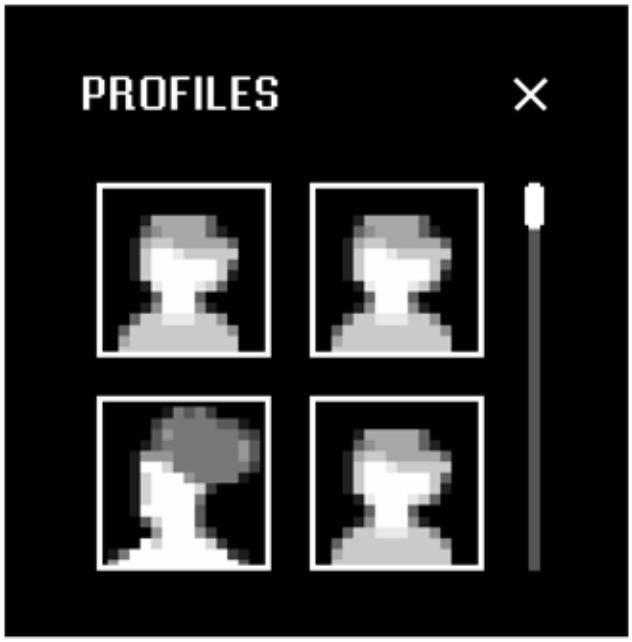

Figure 4: NotBot Interface: Sidebar with Fake Profile Badges

Implementation

In this section we will outline our implementation of the gamified online experience NotBot, departing from our choices for the visual identity, designing the game interface and elaborating on the underlying narrative that altogether influences the user experience.

Visual Identity / Inspirations

To mirror visually the theme of bots in the internet we opted for a representation associated with the early computer age, incorporating pixelated graphics and typography as well as simple geometric forms. Communicating a topic of non-material entities we drew inspiration from landmark science fiction movies such as Tron and 2001: A Space Odyssey that deal with a similar theme of artificial intelligence out of control. This led us to a retro futuristic design approach, that as well connects to contemporary aesthetic movements such as Vaporwave. With this in mind we derived a simple and bold primary color palette, consisting of neon magenta, black and white. (see Figures 2 and 3)

Interface Design

In reminiscence to early computer games and point and click adventures we designed the experience's main screen as a sort of cockpit view, with a central part where the main action takes place and a sidebar for gadgets/upgrades and score monitoring (Figure 3).

The background of the main screen depicts an animated grid landscape that evokes the illusion of permanent forward movement and creates a dynamic restlessness to trigger tension. In the center of the screen a dialog box carries the main narrative part and multiple choice options under neath enable the user to react to the story. A "game score" in the sidebar displays the hypothetical interactions in social media, which grows as the user advances through the story.

Furthermore fake identities can be collected throughout the game which will appear as profile badges in the sidebar (see Figure 4). This shall illustrate to the user the common approach of group spamming practised by multiple bot

accounts that reaffirm each other posts.

The landing page is held intentionally simple, depicting only the title and a play button. Its background is filled by an animation of a grid-lined vortex that seems to drag the viewer into the screen (Figure 2).

Narrative / User Flow

The narrative of our gamified experience puts the user into the role of a social media bot that is being activated by its master (it remains intentionally unclear whether that is a human or another bot). Then the story unfolds, in which different goals have to be achieved through public opinion engineering. The narrative is divided into five episodes or levels, each taking place in another setting to illustrate different real world applications for malicious bot usage such as account boosting, causing damage to an e-commerce or nudging a political election. The interaction is done via multiple choice answers that give the user a illusion of a certain freedom of choice. Whereas the underlying decision tree is pretty linear, the detour via different answers gives the impression of influence on the story, but in the end is leading to the same result.

The story is divided into five levels that can be seen as acts in a storytelling sense and incorporate a narrative arc that consists of an introduction, several stations of quests, a development in the main character and an epilog that sums up the experience and releases the user with a lasting impression about the topic.

Discussion

As user testing showed, the gamification approach towards the complexity of the topic was well received. Users stated that they did enjoy the experience and found it intuitive to use. Some claimed that an introduction to the main topic of bots would have been desirable, considering the very different levels of knowledge each user has of the matter.

Nevertheless most users found the game-like environment helped a lot to understand the complex mechanics of how bots are used in social media to engineer opinions and to spread propaganda.

Altogether it can be said that the narrative helped to keep the users engaged. Showing them only a part of the game story in the testing session, already stimulated them to the topic and made them eager to know more about the story development as well as raised their intention for being more attentive to possible bot content in their daily social media experience. Herefrom we conclude that the gamification approach is well suited to tackle such a complex topic. What remains unclear is if our experience has a long term effect on the user's attention to successfully distinguish bot posts or if falling back into old behavior patterns is more likely to occur. This question requires further observation in a long term study.

Nevertheless we can conclude that the proposed interface design worked out successfully, in terms of interaction experience as well as in the visual communication of our concern.

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