The Truman Platform: Social Media Simulation for Experimental

Research Dominic DiFranzo, Natalie Bazarova
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Exploring the impact of platform design and interaction within social media requires manipulating a variety of individual and collective level variables in a realistic, behavioral context. To study the effect of design in bringing about pro-social actions, participants need to witness cyberbullying, fake news, and mental distress and decide whether to intervene. The normative, connective, and calculus based manipulations must similarly be seamless and undetectable, mimicking the way they would operate if specific socio-technical recommendations were implemented.

With these challenges in mind, we present Truman, a fully operational social media simulation platform. We are currently deploying and testing the prototype of this platform on our current studies. Named after the 1998 film, *The Truman Show* in which the main character was unknowingly situated in a highly controlled and fully observed world, the Truman platform will be an entirely curated, controlled social media experience. Participants observe, interact with, and communicate with other accounts that they believe are users, but these users are actually bots (called "actors") programmed to behave and respond according to specific rules by the research team. When the participant creates a post, the actors issue a varied set of pre-programmed replies. Actors also "read" and like the participant's posts, creating new notifications for the participant. Participants cannot connect with other "real" participants on the site. The Truman platform can also e-mail participants if they provide a valid e-mail address, and can send daily reminder e-mails to participants to encourage completion of the study, reset forgotten passwords, and send links to pre and post surveys at the beginning and end of the study. All interaction takes place in real-time relative to each participant; each participant goes through a script of this social media simulation at their own pace relative to when they began the experiment. Thus, the user engages in a realistic social milieu, but almost every aspect of this experience can be deployed in a randomized, controlled experimental design.

Operational Details. The Truman prototype is a web application that works and was tested on all major modern browsers (Google Chrome 60, Mozilla Firefox 54, Microsoft Edge 14 and Apple Safari 10). It was built using Node.js and MongoDB on the backend with jQuery and Semantic UI framework on the client side. The interface is reactive to device type and resizes itself to work well on desktops, tablets and mobile devices (Android and iOS). The platform also enables best practices in digital security found in other modern social media platforms like HTTPS, Cross-Site Request Forgery protection, and Content Security Policy headers.

In addition to creating the simulated site, the Truman prototype also manages many of the various aspects of running experiments. It randomly assigns all participants into the study conditions defined and developed by the research team, ensuring participants only see the interactions and interfaces as designated by the experimental condition they are in. It connects with the survey platform Qualtrics, to provide pre and post surveys to participants, and combines this survey data to behavioral data captured by the platform. All activities on the site (every page visit, button press, mouse movement, time between events, scrolling) along with participant data (device used, operating system, web browser, etc.) is recorded and logged by the platform. The platform also coming with data export tools to export this data in CSV files for easy integration with statistical data analysis programs like R and SPSS. Once the platform is correctly set up, a research team will need to send participants to the platform and wait for data collection to finish. The Truman platform will also allow for complete replication of any study. All the code, data, and media necessary to run this social media simulation will be freely available on a public github repository (https://github.com/difrad/truman for the Truman prototype).

Truman in Action. The current implementation of the Truman prototype hosts a social media website called EatSnap.Love, which acts as the user presented interface to the Truman Platform. EatSnap.Love was designed as a social networking site where people can share, like and react to pictures of foods. The concept is presented to users as 'Instagram for food," and takes design ideas from other popular social networking sites like Twitter and Instagram.

The look and design of the site's features (See Figure 1) reproduce the basic functionality of other popular social media platforms like Twitter and Instagram. Users start on the site by signing up for an account and creating a profile (with optional full name, bio, location and profile picture fields). They can scroll through a feed of posts from other users. Each post can be replied to, flagged, or liked. Users can view the profiles of others users, which provides the full profile information of that user, along with all the posts and replies that user has created. Users can also block and or report other users as well. When a user gets likes or replies to their own posts, they are notified of this on the notifications page. When new unseen notifications are detected, the bell icon in the top menu bar lights up. Clicking on this bell icon will take the user to the notification page. The notification page shows all the activity a post has generated, and who liked or replied to a posts. Users can create new posts by clicking on the pencil icon in the top menu bar. Users can upload photos of their food and write a comment about the photo. If the user is using a mobile device, they can upload photos to the platform directly from the mobile device's camera.
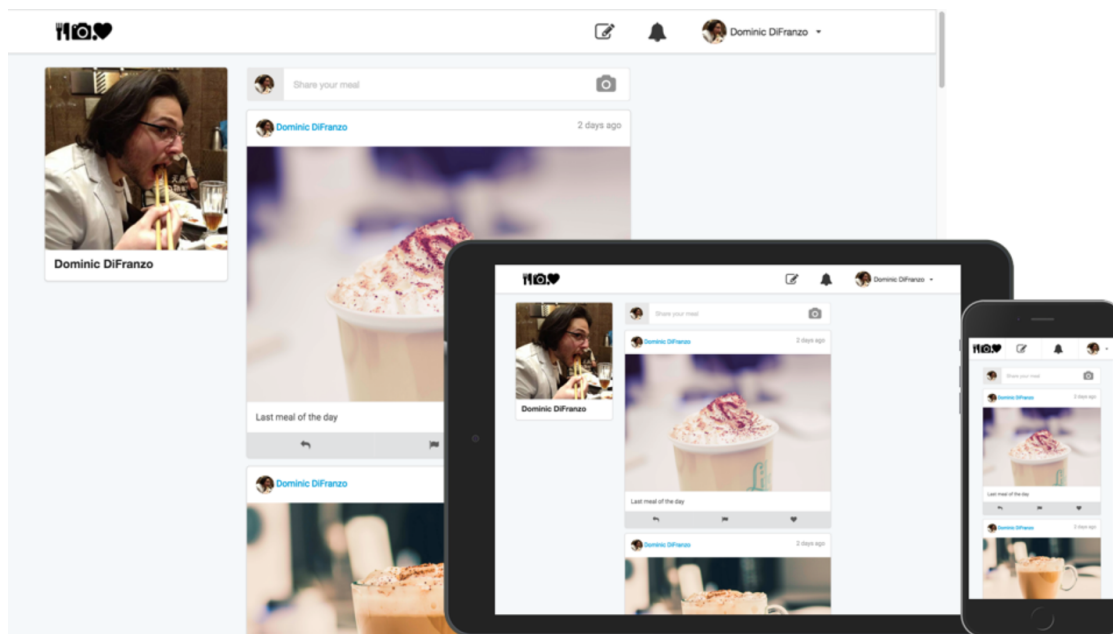

Figure 1: EatSnap.Love

Enhancing Truman. Despite Truman's substantial capabilities, it does not yet have the full functionality needed for the studies outlined in this proposal. In the following section, we explain these needed functionality.

Research Friendly
Truman is currently developed only for use by those with a deep technical understanding of the tools and technology on which it is built. Building new simulation is a long and technical task. Future releases of the platform will provide easy to use tools and documentation allowing anyone with basic web skills the ability to run their own studies with the Truman Platform.

Smart Bots
In the current prototype, the bots in Truman can't dynamically react to the actions of the participants, but are hard coded to respond in exactly the same way. To address this, advances in Artificial Intelligence (AI) and Natural Language Processing (NLP) will be added to the platform. Amazon Web Services have the two useful AI API that will be used to implement these features. Amazon Lex (https://aws.amazon.com/lex/) provides advanced automatic speech recognition (ASR) and natural language understanding (NLU) for both text and voice. Amazon Rekognition (https://aws.amazon.com/rekognition/) can provide automated image analysis to detect objects, scenes,

faces in images. These enhancements should also reduce users' ability to detect that the platform is not real.