

Upside Down Facebook:
Raising Awareness of Behavioral Advertising Through Artistic Provocation

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ABSTRACT

Upside Down Facebook: Raising Awareness of Behavioral Advertising Through Artistic Provocation

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The majority of Americans are aware and concerned about corporations' collection and use of personal data for behavioral advertising, but are resigned to having little to no control. Opaque corporate data disclosures, limited privacy controls, complex data flows, and cognitive limitations impede understanding of behavioral advertising. Alternative tools created by privacy researchers seek to make data transparent and actionable, but fall short in creating an emotional response, fully clarifying behavioral advertising systems, and breaking through digital resignation. Using conceptual artistic perspectives on technology and privacy and privacy research from human-computer interaction as inspirations, this thesis proposes an approach to raising awareness of behavioral advertising through artistic provocation. Using Facebook's "Information About You" data download as a test-bed, I develop a prototype for a new kind of experience called Upside Down Facebook, which re-frames institutional privacy issues as social privacy issues through deliberately "creepy" posts about data made by a personified version of Facebook. In a preliminary evaluation study (n=7), a majority of participants were provoked by this experience to learn more about how their data is used for behavioral advertising and take action to change their settings. This work suggests the potential of Upside Down Facebook to help individuals learn about behavioral advertising and take action, as well as the potential for artistic provocation to inform new perspectives on designing privacy tools and research on data privacy.

Chapter I

Introduction

1.1 Art as Privacy Provocation

The public reception of the popular Netflix documentary “The Social Dilemma” (2020) shows the public’s urgent desire to learn more about social platforms, behavioral advertising, and how they can exercise agency over how these platforms collect and use their data. The documentary conveys urgency, focusing on how platforms like Facebook work to collect data on user behavior and mine it for insights in order to sell advertisements. The film makes this argument through juxtaposing interviews with experts in industry and academia with dramatic reenactments. The film personifies social media algorithms as tiny people in a futuristic control room, gleefully manipulating unsuspecting Facebook users into browsing for long stretches of time, sharing personal information, and tapping on advertisements.

The end credits display a link to thesocialdilemma.com, a site with numerous options for viewers to take action, including sharing the film, starting discussion groups, joining tech policy advocacy initiatives, and committing to a “Social Media Reboot” that includes a pledge to curb screen time. Reading Tweets about “The Social Dilemma” reveals common themes: comments about the discomfort the film caused, citations of the maxim “If you’re not paying for the product, then you’re the product”, and declaring

an intention to “delete everything” [38]. This film has made a lasting impact on those who have seen it, yet it comes as no surprise that many of these users are still on Twitter. Though there is ample discussion of the film on Twitter, how many of these viewers took any of the other actions on the website? Questions about the impact of the film open up a productive line of inquiry about the ability of art to engage, inform, and inspire the public to take action to stop the privacy incursions of companies in the business of behavioral advertising. How might using similar rhetorical and aesthetic strategies employed in art motivate the creation of works with similar goals?

1.2 Description of the Problem

Despite high public awareness and concern about the acquisition and use of personal data by corporations for behavioral advertising, people lack specific understanding of these processes and how they take action to protect their privacy [7,23,28,30]. With corporations providing vague data disclosures and limiting user ability to have control over their data, users may be experiencing digital resignation, a feeling that any action they take to protect their privacy is meaningless in the face of pervasive tracking and surveillance by corporations [11].

While privacy researchers and privacy app developers have created a variety of tools that are designed to help make data flows related to behavioral advertising more transparent and actionable, the tools often fall short due to a lack of usability, clarity, and ability to motivate users to action. Indeed, tools like browser extensions that limit

tracking have not been widely adopted, potentially for these reasons [23,33]. There is a need for new approaches to conceptualizing and designing privacy tools, approaches that engage users, show them it is possible to understand the privacy incursions of behavioral advertising, and inspire them to take action to protect their privacy. Using strategies like appropriation and satire, conceptual art investigating digital privacy topics challenge viewers to think more deeply about how the technologies they use everyday might violate their privacy [15,39]. Conceptual art's design processes and strategies to provoking audiences, in conjunction with research on tool design and mental models from the privacy literature, open new possibilities for emotionally engaging people in personal privacy issues related to behavioral advertising and inspiring them to act.

1.3 Research Questions and Approach

This research seeks to answer the following questions:

- RQ1: How can design approaches from conceptual art and Human-Computer Interaction be brought together to design an experience that provokes people to learn more about behavioral advertiser's use of their data and encourages them to take action to protect their privacy?
- RQ2: How effective can this type of experience be in raising user awareness, comprehension, and action related to data collection practices of behavioral advertisers?

I used Facebook as a test bed for this approach to raising awareness of behavioral advertising. Using user data available from Facebook's "Information About You" data download and research from HCI and privacy art to motivate my design process, I designed a prototype for an interactive experience I call Upside Down Facebook. The Upside Down Facebook website allows users to upload data to an alternative version of the Facebook profile that casts institutional privacy as social privacy, putting Facebook's behavioral advertising practices at the forefront. In this profile, Facebook as an entity speaks to the user, posts on their profile and cheerfully talks to them about how it collects and uses their data for advertising. Through appropriating the Facebook profile user interface, personifying Facebook as a "friend" posting on the user's profile, and creating deliberately "creepy" data disclosures, Upside Down Facebook puts data at the center of an uncomfortable relationship a person has

with Facebook, provoking them to reflect and take action. By testing a prototype of Upside Down Facebook with participants, I found preliminary evidence that suggests the merit of this conceptual approach in engaging users in learning about behavioral advertising through visual metaphor, creating discomfort with their current level of privacy, and providing clear paths for action. Finally, I identify limitations that constrained the design and evaluation process, which may guide future practitioners and researchers.

1.4 Contributions

This work makes the following contributions to research on engaging users in examining behavioral advertising and data privacy issues, as well as the design of privacy tools:

- First, the research creates conceptual connections between conceptual art about privacy and research on perceptions of behavioral advertising and privacy tool design in Human-Computer Interaction. Through defining and exploring a design process based on these concepts, this research seeks to inspire privacy researchers to learn from artists in order to better engage and educate users about privacy issues. It also offers connections that artists may use to better understand the current privacy landscape, and presents opportunities for art-making to engage with these issues.

- Secondly, Upside Down Facebook's core design concepts of provocation, appropriation, casting institutional privacy as social privacy, and personification of Facebook contribute new ways to creatively visualize and re-frame behavioral advertising data. These concepts suggest new directions for the design of privacy tools, as well as artistic production in the privacy sphere.
- Finally, through a preliminary evaluation study of Upside Down Facebook, I show the potential of this approach to data disclosure and privacy action to create strong emotional reactions in users and the potential for action. Participants who interacted with Upside Down Facebook were often alarmed by the extent to which data has been taken from and inferred about them without their knowledge, and were often inspired to take action.

Chapter II

Related Work

2.1 Introduction

In this chapter, I detail related work that situates Upside Down Facebook and my rationale for creating this piece. In this chapter, I provide background on the economic motivations that incentivize companies engaged in behavioral advertising to limit the public's knowledge and control over data collection and use. Section 2.3 provides an overview of how people perceive behavioral advertising on social media, showing how individual sentiments, prior knowledge, and design of interfaces shape individual awareness and comfort. In Section 2.4, I detail how the phenomena of digital resignation, as well as limitations in human decision making capabilities impact people's ability of people to understand and act to limit data collection and use. I survey privacy tools in Section 2.5, showing how these tools use strategies informed by research on decision-making to help individuals make informed privacy choices, but are hampered by low adoption and technically-oriented data disclosures that are difficult to understand. Finally, in section 2.6, I detail how conceptual art offers aesthetic strategies that can provoke people to think more critically about behavioral advertising and privacy, suggesting new possibilities for privacy tool design.

2.2 Surveillance Capitalism

Shoshana Zuboff describes platforms like Facebook as part of a system of surveillance capitalism, an economic system that puts its practitioners in the business of understanding human behavior through collection and analysis of massive amounts of data [37]. Large technology companies like Facebook and Google collect massive amounts of behavioral data through their services, deriving insights about their users' habits and interests. These insights are then sold to businesses; in the case of Facebook, it sells advertisers targeted access to its users. According to Zuboff, insights from data are also used to shape user behavior towards the most profitable goals on these platforms, often to the detriment of the individuals who use these services [37]. Despite widespread public outrage towards intrusive data collection practices, corporations participating in surveillance capitalism have been able to slowly acclimate the public to sharing data by providing vague disclosures about its use, offering free products that become essential and, when scandal emerges, strategically running out the clock on public outrage and regulatory action [11,37]. Consequently, the public has been unable to develop a clear understanding of how behavioral advertising impacts their privacy.

2.3 Awareness of Behavioral Advertising

In this section, I survey research on how people perceive behavioral advertising, what people know about behavioral advertising, and the factors that shape awareness. I show how awareness of behavioral advertising is influenced by multiple factors: awareness of different forms of privacy, perceptions of the public-ness of social media, and comfort with particular data being collected. The design of behavioral advertising disclosures also impacts individual perceptions of how behavioral advertising gathers and uses their data, and the appropriateness of these activities.

2.3.1 Awareness of Behavioral Advertising and Data Collection

Though the public has become more outraged by the data privacy incursions of surveillance capitalist companies like Facebook, it has not necessarily become more informed about how platforms collect data, and how that data is used for behavioral advertising. A Pew Research survey from 2019 shows that the majority of Americans are aware of data collection by corporations and 79% are concerned about this practice, but few know how their personal data is used [7]. While 81% of Americans surveyed believed that the risks outweigh the benefits, only 41% said they had an understanding of data use [7].

People have many misconceptions about how behavioral advertisers collect data, and the level of protection they have. These misconceptions range from mental models of online tracking to overestimating the level protection that privacy policies provide [23,35]. User perceptions of whether unwanted data collection is taking place is

shaped by myriad factors: their trust of the platform they are using, the type of interaction (autocomplete, logging in, etc.), and sensitivity about collection and use of that particular type of data [18,20,28].

2.3.2 Factors Shaping Awareness of Behavioral Advertising on Social Media

A person's understanding of differences between social privacy (how users manage sharing about themselves with others) and institutional privacy (how users manage sharing information with the platform they are using) impact how they understand their privacy as they use the internet [20]. Often people have higher levels of awareness of social privacy than institutional privacy, which can result in lower awareness of behavioral advertising on social platforms like Facebook [19,20,28].

Research on perceptions of social media behavioral advertising presents a complicated situation that is shaped by individual perceptions of social media as private or public, as well as opinions about the usefulness of behavioral advertising [20,31]. Similar to what Rader discovered in a study of perceptions of tracking on Facebook and Google, Kennedy et al.'s research shows that an individual's opinions of the appropriateness of data collection and mining for behavioral advertising on social media is shaped by their comfort with the specific data being collected, whether they believed they gave consent, and if they believe the data is being used within an appropriate context [20]. Though there are several studies on general sentiments about behavioral advertising on social media, less is known about how people react to seeing data profiles from social media platforms. My work provides additional insights in this area by

exploring how framing behavioral advertising data practices in terms of social privacy can impact individual perceptions.

2.3.3 Perception of Behavioral Advertising Data Disclosures

In the absence of government regulation regarding collection and use of personal data, social media users rely upon disclosures and tools created by behavioral advertisers to help them understand how their data is being collected and used. When platforms and data brokers share information with users through disclosures, individuals often believe the explanations are opaque and are mistrustful of whether changing settings will result in any outcome [30]. Though it may seem that people want more transparency and specificity in how their data is being used by behavioral advertising algorithms, research by Eslami et al. suggests some individuals may feel that too much transparency is “creepy” and undesirable [12]. However, there is no research on the effect of deliberately provocative disclosures on perception of behavioral advertising practices.

2.4 Explanations for User Inaction to Limit Behavioral Advertising

In this section, I account for user inaction to limit behavioral advertising, despite evidence of user awareness. Draper and Turow's concept of digital resignation and Acquisti et al.'s theories, building upon research from behavioral economics, offer explanations for inaction due to general disenchantment and the challenges of making privacy decisions in an environment of limited choice [2,11].

2.4.1 Digital Resignation

Draper and Turow argue that this apparent contradiction between awareness of data privacy violations and continued use of platforms that participate in behavioral advertising can be explained by the concept of digital resignation, a feeling of helplessness in the face of pervasive tracking online and corporations' use of personal data [11]. This feeling of helplessness is actively cultivated by corporations in the business of data through purposefully unclear explanations of data use to users — something individuals interacting with behavioral advertisers are aware of [11,12,30]. Digital resignation frames privacy indifference not as an issue of a lack of interest, but of spirit. How could people possibly want to make any change to protect themselves from the platforms they use if they believe their actions, both individual and collective, cannot produce change? How can digital resignation be broken through?

2.4.2 Choice Architectures and Limitations of Human Decision Making

Privacy researchers like Acquisti et al. argue that this paradox between user awareness of behavioral advertising and lack of action has its roots in the limitations of human decision-making capabilities and choices available to consumers [2,3].

Corporations relying on data collection practices play upon these constraints in the design of data disclosure and privacy tools, designing to obfuscate through complex and unclear explanations of data flows [11]. Corporations design the choice architectures available to users, allowing corporations to create preferences and give users a sense of control [1]. People must go through corporate-run data disclosures and adjust settings based on limited choices and information. What options exist outside these corporate-owned interfaces for learning about how data is used for behavioral advertising, and to take action?

2.5 Privacy Tools

Privacy research in Human-Computer Interaction has sought to help individuals transcend limitations created by limited privacy choices and data transparency, building tools that provide users with more detailed levels of data disclosure, and using contextualized nudges and actions to encourage users to change settings and using privacy protective technologies. In the sub-sections below, I detail three major categories of privacy tools designed to call attention to behavioral advertising, make data flows more transparent, and limit tracking. These tools have been limited in their

adoption. Users of these tools have often reported they do not offer satisfying explanations of how behavioral advertising works and that they are hard to use [10].

2.5.1 Privacy Browser Extensions

There are several browser extensions that help users understand how third parties track them on the internet, and provide options to block tracking [1,33]. For example, Ghostery and Privacy Badger are web browser extensions that offer users ways to view third party trackers on websites and selectively block them [40,41]. Privacy browser extensions like these can help raise awareness of online tracking. Though many of these privacy tools exist to help users learn about how their data is collected by behavioral advertisers and users, they have not been adopted en masse due to low public awareness [2,10]. Studies have found that people feel these tools use technical language to explain who is tracking the users and why, often do not give a satisfying explanation of how actions will help users, and overall, have basic usability problems [10,33]. Crucially, no work has explored how these tools do/do not provide useful visual metaphors that engage and inform their users. In my work, I reimagine the privacy tool through the lens of conceptual art, using a wider variety of visual metaphors for privacy tools to provoke viewers to reflect and take action.

2.5.2 Tools Focusing on Data Disclosure and Illustrating Systems

Some tools developed both by researchers and non-profit organizations focus on disclosing data with the goal of illustrating how behavioral advertising works. Browser extensions like the Facebook Data Valuation Tool (FDVT) (see Fig. 2.1) provide transparency for behavioral advertising on Facebook, showing users how much their data and actions are worth [16].

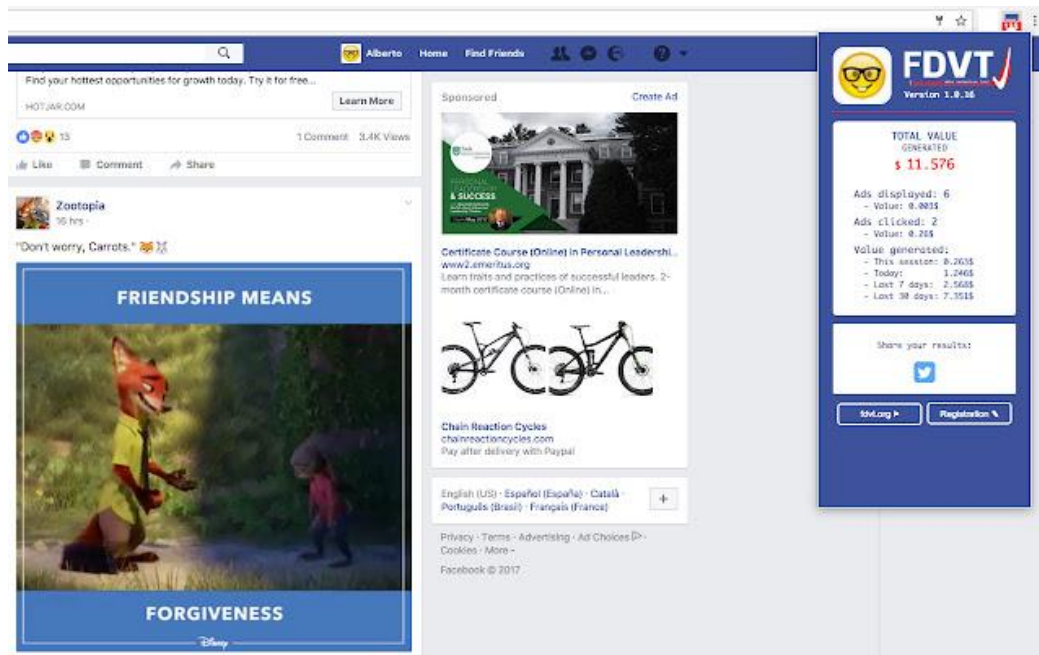


Figure 2.1: Facebook Data Valuation Tool screenshot, showing value user generated for Facebook during a session. Image downloaded from <https://chrome.google.com/webstore/detail/fdvt-social-network-data/blednbbpnnambjaefhlocghajeohlhmh> in April 2021.

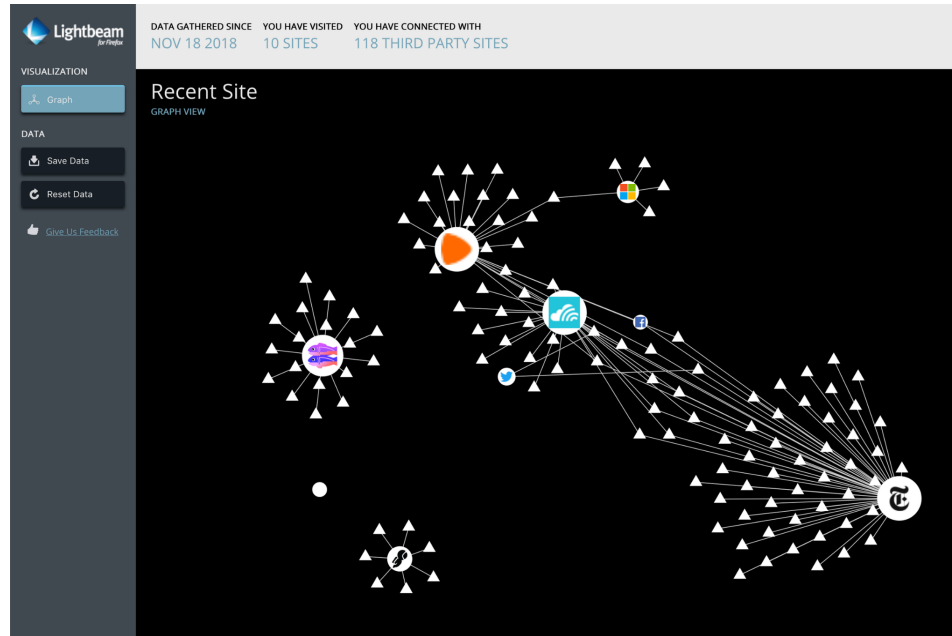


Figure 2.11: Firefox Lightbeam visualizes relationships between third party trackers as a user browses the internet. Image downloaded from https://addons.mozilla.org/en-US/firefox/addon/lightbeam-3-0/?utm_source=addons.mozilla.org&utm_medium=referral&utm_content=search in April 2021.

Similarly, the Firefox Lightbeam browser extension for Mozilla Firefox (see Fig. 2.11) allows users to see how third party tracking monitors them as they track the internet [27]. Tools like Lightbeam and FDVT focus on disclosing data, but do not provide suggestions for how to block or prevent the activity from occurring. Additionally, these tools may be too neutral in their approach to data visualization, focused more on technical accuracy than using the properties of visual design to evoke an emotional response.

2.5.3 Privacy Nudging Tools

Extensive research has been conducted on using nudging as a mechanism to get user attention, surface data, and encourage users to adjust privacy settings [1,4,36]. The theory underpinning privacy nudging tools comes from Thaler and Sunstein's

research on decision making, which proposes that humans are bad at making optimal decisions due to constraints on information, time, and cognition [34]. Privacy researchers have taken up Thaler and Sunstein's call for designers and policy experts to create new choice architectures that help guide people towards better decision making [2]. Privacy researchers have designed tools that use alternative framings of benefits and risks, highlighting the effects of choosing defaults, offering rewards, and carefully timing nudges [1,4,32,36].

Nudging tools for privacy have used these nudging strategies to encourage users to think about their privacy in a variety of contexts across devices and platforms[4,25,36]. Almuhimedi et al.'s research logs permission access records from mobile apps and presents them to users via push notifications, encouraging them to review their permission settings when they see their location has been shared thousands of times [4]. To encourage Facebook users to think about who will see a post, Wang et al. use sentiment analysis of post text and displaying profile pictures of Facebook friends who will see the post [36]. Though nudging-related interventions have been tested on Facebook, no work to date has been done on nudging users to take action to limit Facebook's collection and use of their personal data for behavioral advertising.

2.6 Artistic Perspectives on Privacy and Technology

Just as HCI researchers have studied the impact of data privacy violations on the public and designed interventions, conceptual artists have explored and interrogated the privacy implications of technologies through artmaking that illustrates concepts and

processes of surveillance. In this section, I detail how artists have used conceptually and research-driven artistic processes to investigate privacy and technology, challenging viewers to see privacy in radically new ways by commenting on tech platforms through appropriation, using art to provide institutional data transparency, showing how privacy-related algorithms function, creatively visualizing and disclosing personal data, and providing strategies for resisting surveillance. These approaches to privacy and data disclosure in art offer novel solutions that can be applied to the problem of increasing awareness of behavioral advertising and encouraging privacy action.

2.6.1 What is Conceptual Art?

Conceptual art is an approach to art making that puts concepts and conceptualization at the center of art making [22]. Rather than foregrounding the artist's abilities as a craftsman, conceptual art focuses on letting an idea dictate the form the work takes. Conceptually-driven art works can range widely in concept and execution. One such example is Sol Lewitt's series *Wall Drawings* (1969-2007). This series of room scale drawings is generated based on detailed sets of instructions, which are as much a part of the piece as the drawings themselves. Because anyone with the instructions can execute a wall-drawing, Lewitt transforms the role of the artist into that of a conceptualizer and a director, rather than a skilled craftsman.

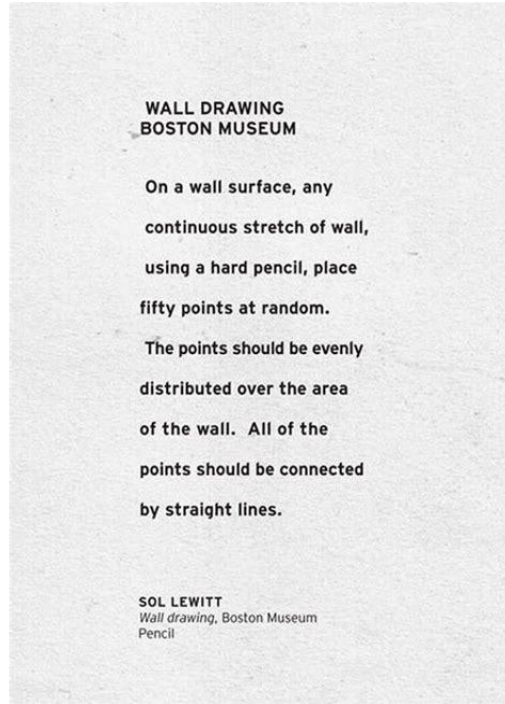


Figure 2.2: Instructions for *Wall Drawing* (1971) by Sol Lewitt. Image downloaded from <https://observer.com/2012/10/here-are-the-instructions-for-sol-lewitts-1971-wall-drawing-for-the-school-of-the-mfa-boston/> in April 2021.



Figure 2.21: *Fountain* (1917) by Marcel Duchamp . Image downloaded from https://en.wikipedia.org/wiki/File:Duchamp_Fontaine.jpg in April 2021.

An earlier example of conceptual art, Marcel Duchamp's *Fountain* (1917), presents a provocative conceptual vision. Duchamp simply bought a standard urinal from a plumbing company, flipped it on its back, signed the name "R. Mutt" on the outer rim, and submitted it to a juried art exhibition to see what the reaction would be. In 1917, the work was met with great controversy and caused a heated debate about whether it was or was not art. *Fountain* (1917) continues to provoke audiences, a conceptual piece that forces its viewers to confront their conceptions about art: in this case, beliefs that art must be "pretty", "tasteful", and the handiwork of a "skillful" artist.

Both Lewitt and Duchamp's pieces are early examples of art that Duchamp reconfigures what art is and the role of the artist. For Lewitt and Duchamp, art is not about the object or a person making objects; rather it is about the concepts that motivate the work. The artist is a conceptualizer rather than a craftsman, a view of the artist that allowed artistic practices to expand to engage with topics like privacy. Throughout this chapter, I detail how conceptual approaches to art making have been used by artists to comment on issues related to the ideologies of the technology industry, institutional privacy, personal data disclosure, algorithmic transparency, and resisting tracking.

2.6.2 Commentary on Tech Platforms

Artists have used conceptual approaches to urge users to examine the ideologies that underpin consumer-facing tech platforms and products. Oli Frost in his website *Flopstarter* (2018) parodies the visual and written language used to advertise fundraising projects for new products on Kickstarter.com. Promoting intentionally poor

ideas like “The Hangover Pill”, *Flopstarter* (2016) shows how sleek user interfaces and graphic design are used to promote often trivial products on the real Kickstarter.com [15].

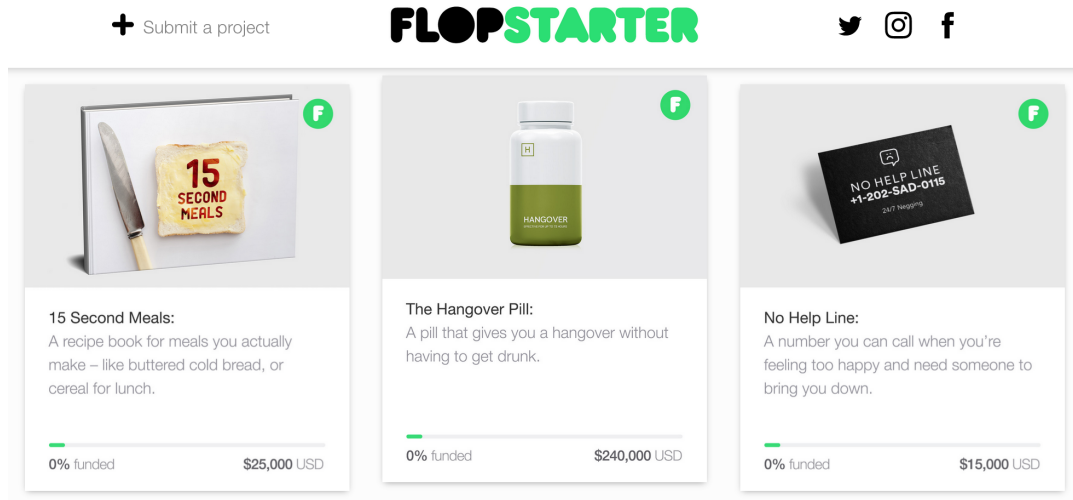


Figure 2.3: *Flopstarter* (2018) by Oli Frost is a fundraising platform for comically bad products and services. Image downloaded from <https://flopstarter.com/> in April 2021.



Figure 2.4: *pplkpr* (2020) app and heart rate monitor packaging by Lauren Lee McCarthy. Images downloaded from <https://lauren-mccarthy.com/pplkpr> in April 2021.

In a similar move, Lauren Lee McCarthy's *pplkpr* (2020) parodies the technocratic solutionism of Silicon Valley. The artist creates a full-fledged marketing campaign for an app that helps people using a cheery looking app, pulse monitoring, and “physical and emotional response tracking” to decide who to keep in their social circle [39]. Much like *Flopstarter* (2018), *pplkpr* (2020) sheds light on how user interface design, copywriting, and graphic design persuade people to use technological products and services. Similarly, I ask in this thesis how an approach to raising awareness, using strategies like appropriation, can be used to more effectively raise user awareness of behavioral advertising.

2.6.3 Institutional Data Transparency Through Transformation

Artists have surfaced data from publically available data sets, transformed, and recontextualized them to comment on the data collection and privacy incursions of large technology companies. With simple changes in media and presentation of data, artists make the routine data collection we have grown comfortable with deeply unsettling.

In a project titled “Street Ghosts” (2012), Paolo Cirio crops out images of people photographed by Google Street View cars, prints life-sized images, and inserts people back into the environment they were photographed in. These images bring Street View’s privacy invasion into public space, surfacing, as Cirio describes it, “collateral damage from the battle between corporations, governments, civilians, and algorithms over public and private information” [42].



Fig 2.5: *Street Ghosts* (2012) by Paolo Cirio. Print on brick wall (left) and digital image from Google Street View (right). Image downloaded from <https://paolocirio.net/work/street-ghosts/> in April 2021.

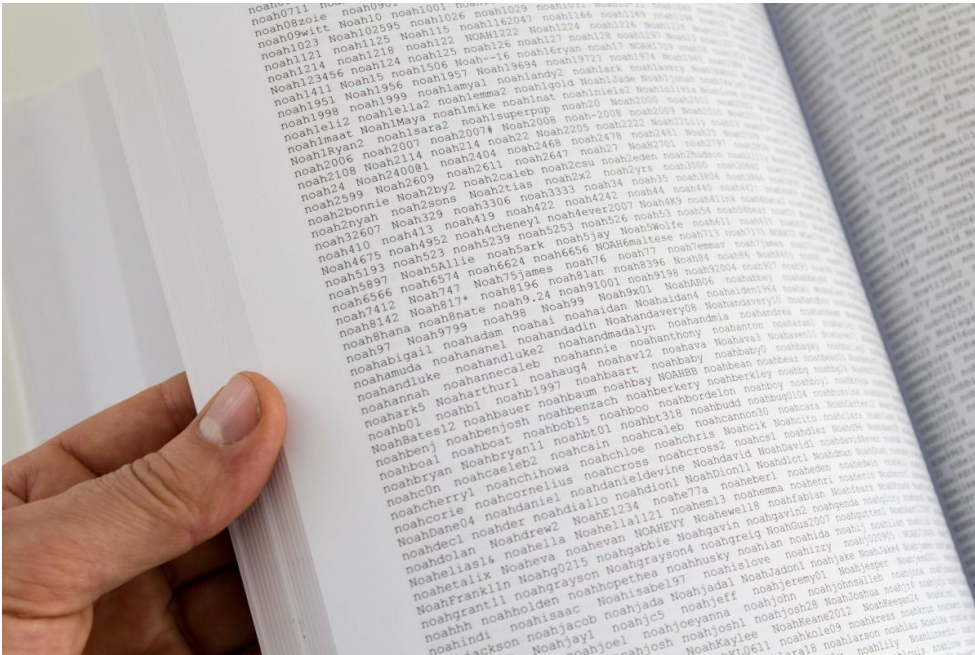


Fig 2.6: Page of passwords from *Forgot Your Password* (2013) by Aram Bartholl. Image downloaded from <https://arambartholl.com/forgot-your-password/> in April 2021.

Employing similar strategies, Aram Bartholl's piece *Forgot Your Password* (2013) surfaces passwords stolen during the 2012 LinkedIn data breach in the form of an eight volume set of books of email addresses and decrypted passwords [43]. In this work, Bartholl makes personal data and loss of privacy tangible, inviting viewers to look through the book and experience their data being exposed to the public "in real life." Though artists have engaged with topics like data breaches and public surveillance, there is surprisingly little work that seeks to reveal behavioral advertisers' data collection practices through surfacing and transforming collected data sets.

2.6.4 Algorithmic Transparency

Artists have also been interested in producing work that explores how algorithms collect and analyze behavioral data. By inverting algorithms that are designed to measure and capture human behavior and showing their inner workings, artists demystify algorithms, allowing audiences to think about how they may be impacted.

Artists like Raphael Lozano-Hemmer have reversed computer vision algorithms to show the privacy implications of this technology, demonstrating how facial recognition can be used by law enforcement to try to associate individuals with images in a database (see figure 2.7) [44].



Fig. 2.7: *Levels of Confidence* (2015) by Raphael Lozano Hemmer.
 Image downloaded from https://lozano-hemmer.com/level_of_confidence.php in April 2021.

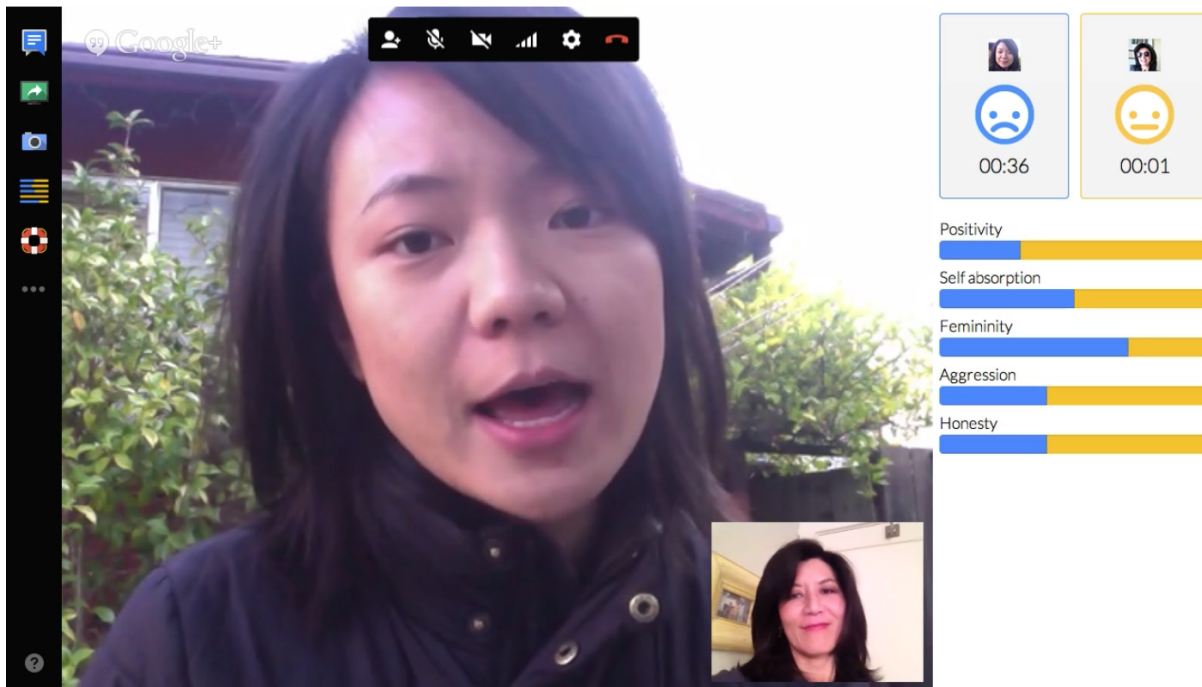


Fig. 2.8: Screenshot from *us+* (2020) demo video by Lauren Lee McCarthy.
 Image downloaded from <https://lauren-mccarthy.com/us> in April 2021.

Lauren Lee McCarthy and Kyle McDonald's *Us+* (2020) is a Google Hangouts app that shows how Linguistic Inquiry Word Count (LIWC) and Linguistic Style Matching (LSM) models analyze speech in real time [45]. The app shows participants how their speech might be understood by natural language processing, using shifting bars to visualize changes in the "femininity" and "positivity" of the conversation. The app invites questions about how this technology might be applied in the background without prior knowledge. Artistic work has focused on how algorithms collect and interpret personal data, and there is an opportunity for work to be made that specifically focuses on behavioral advertising algorithms and commenting on how they shape human behavior.

2.6.5 Visualizing and Disclosing Personal Data

Exploration of data generated in everyday life is a topic that has fascinated artists even before the existence of ubiquitous computing. In his *Today Series* (1966-2007), conceptual artist On Kawara created a painting of each date he was alive for forty-one years straight, each with a cardboard box containing the day's newspaper [46]. This work is an impressive archive of the simple act of living, seemingly banal data that takes on a grander significance when rendered in the form of thousands of carefully-made paintings. In her series "Pathways" (2015), artist Mimi Onuoha takes this biographical interest in data into the digital world [24].

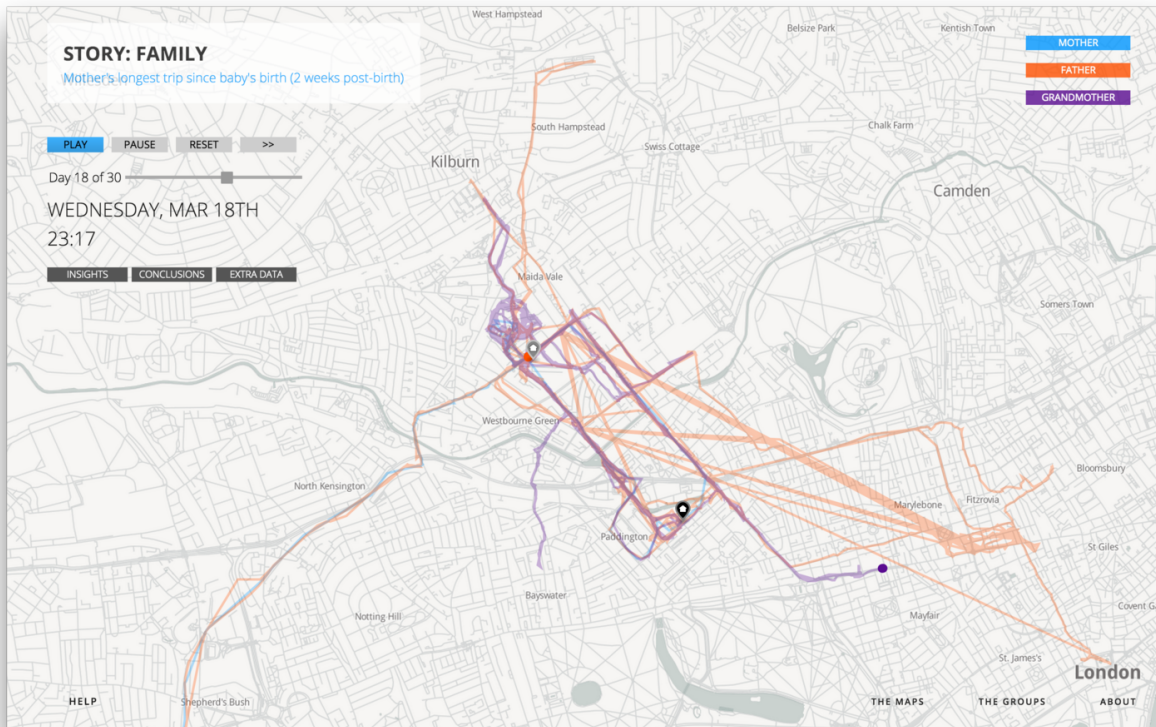


Fig 2.9: “Story: Family” from Mimi Onuoha’s *Pathways* (2015) shows how a family travels through London. Downloaded from <https://mimionuoha.com/pathways> in April 2021.

Onuoha helped participants extract and visualize personal data from mobile devices, giving them new insights about their habits, life-changes, and activities. Similar projects like Laurie Frick’s “Floating Data” (2021) transform the artist’s daily walks into a physical map recording the experience [47].

Though this personal mode of data visualization and disclosure has been applied to multiple contexts, there is surprisingly no work on the Facebook data download. Existing work on this data download can mostly be found on GitHub and use “out of the box” data visualization methods like bar graphs, scatter plots, and tables to display Facebook data [48]. Generally, the focus of these projects is less about provocative data transformation than standard data visualization using popular visualization libraries

like Matplotlib. In contrast, my work uses a more transformative approach to impact user understandings of this personal data.

2.6.6 Art as Resistance to Tracking and Surveillance

Artists commenting on the privacy implications of technologies are often interested in intervening in surveillance or data collection activities, using a variety of strategies to resist tracking. In a website called trackingtranscience.net (no longer active), Hasan Elahi documented his struggle to respond to FBI surveillance of his life after he is investigated for potential terrorist activities [17]. After the FBI requested to know when he was traveling, Elahi attempted to overwhelm the FBI with banal data: photos of every meal he ate, receipts from stores, location data from a GPS-enabled bracelet, and calling them when he was traveling (see Figure 3 on the next page).

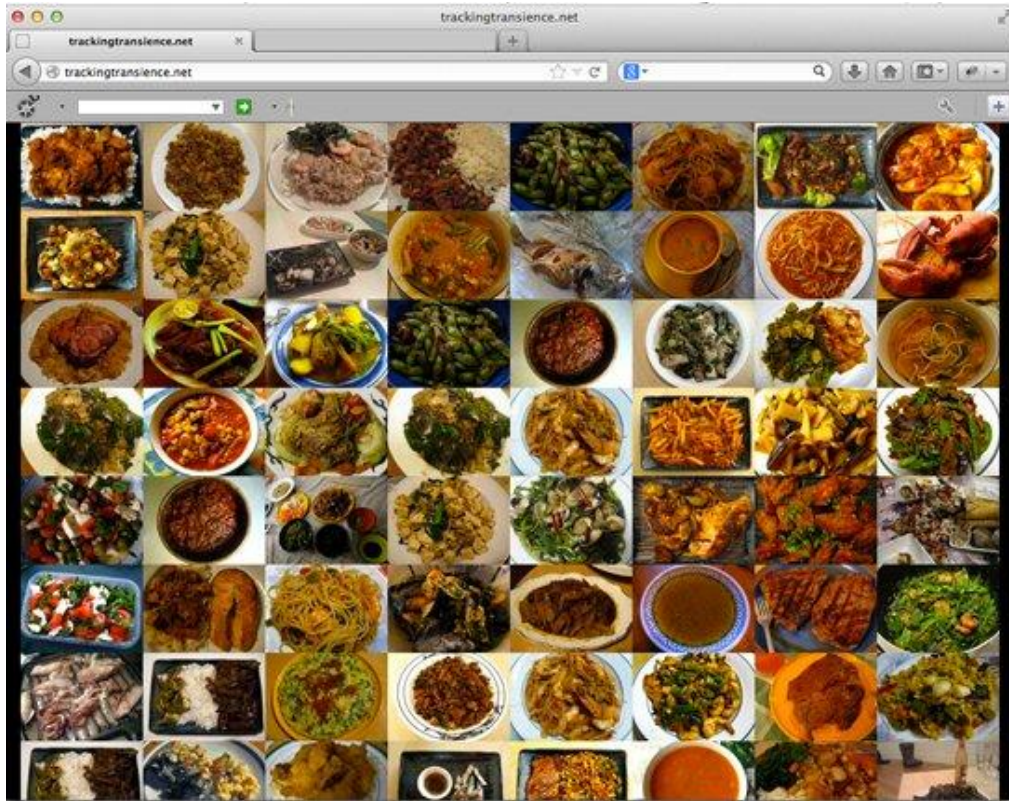


Figure 3: Images of Elahi's meals made public on trackingtranscience.net.
Image downloaded from <http://hasanelahi.org/> in April 2021.

Employing a strategy of obfuscation, Ben Grosser's *Go Rando* (2017) is a browser extension that randomly selects emotional reactions for a user on Facebook posts, preventing Facebook from knowing the user's true feelings [49]. Similarly, CV Dazzle is a speculative fashion concept that uses bold hairstyles and makeup to confuse facial recognition algorithms, addressing the surveillance of bodies in public spaces [50]. These examples of artwork as an act of resistance to surveillance uncover an opportunity for work that serves as a hybrid of an artistic experience and a privacy tool that provides participants with actionable steps.

2.7 Open Research Challenges

While privacy research shows that awareness about behavioral advertising is pervasive, users are resigned to having no control over the privacy of their data. There is little research focused on how to motivate a resigned user to learn and take action. Research on mental models of data privacy and behavioral advertising reveals opportunities to address this. What might framing behavioral advertising in terms of social privacy and creating disclosures with a deliberately “creepy” tone do to raise awareness and create urgency? Privacy tools provide alternatives to the choice architectures controlled by behavioral advertisers, but often confuse their users due to lack of clear explanation of what data is collected and how it is used by advertisers, and do not create urgency to act.

Though artists have surfaced and transformed data related to both personal digital activity and institutional surveillance, there is surprisingly little work that seeks to reveal behavioral advertisers’ data collection practices through surfacing and transforming personal data collected by behavioral advertisers and making behavioral advertising algorithms transparent. While some artwork have centered pro-privacy actions in their work, there is an opportunity to integrate nudges and privacy interventions that are more applicable to an individual’s digital life.

To address these gaps, I carried out a conceptual design process to create an experience designed to provoke users into a higher level of awareness of behavioral advertising, and encourage them to take action. This approach to design offers a new perspective on engaging users in issues related to data privacy and behavioral

advertising, drawing upon privacy research from HCI on mental models of behavioral advertisement, conceptual design strategies from privacy and technology-related conceptual artworks, and privacy research on best practices to encourage user action. In the following chapter, I detail how I conceptualized, designed, and implemented a prototype for a piece called Upside Down Facebook.

Chapter III

Conceptual Design Process

3.1 Introduction

I created a prototype for a piece I call Upside Down Facebook. This website visualizes data, creating a version of the Facebook profile page that displays data collected and inferred by Facebook for behavioral advertising. This website personifies Facebook as a friend who posts on the user's profile, commenting on all the interesting facts Facebook has learned about them. This design is a provocation that urges Facebook users to see Facebook as a platform for data mining and advertising in which advertisers and Facebook analyze and use their data for profit. Importantly, this piece does not leave the user without a route for action; unique among artworks dealing with data privacy, there are disclosures built into the UI that show people how each type of data can be used by Facebook and advertisers, why Facebook wants it, and further steps users can take to protect their privacy.

In this chapter, I discuss the design approach taken to create Upside Down Facebook. This chapter will include a discussion of the research used to direct the design process, a discussion of different design prototypes created, and key lessons learned during implementation. Later, in Chapter IV, I discuss Upside Down Facebook in greater detail. The goal of this chapter is to illustrate a design process that I hope may

be useful to others interested in using artistic ideas to engage and raise awareness about behavioral advertising, or any issue related to digital privacy.

3.2 Conceptual Goals

The conceptual goals for this privacy experience and tool were shaped by my interpretation of the privacy literature and art about privacy and technology. As I read the literature on mental models of privacy, I became interested in why people were more familiar with social privacy than institutional privacy, and wanted to design a piece that deliberately blurred this boundary to clarify how behavioral advertising works. I also wanted to apply findings from Eslami et al. and Rao et al. about behavioral profiles and behavioral advertising algorithm disclosures. As this research indicates, any privacy disclosure must provide more honest disclosures about how data was acquired [12,30]. Inspired by Rao et al.'s research, I wanted to create not just honest disclosures, but deliberately “creepy” and highly specific explanations of data collection that make users less complacent about privacy and second-guess their comfort level with using Facebook. Finally, I wanted to improve the privacy interventions available to people experiencing the piece, drawing upon best practices for encouraging action from the HCI privacy literature.

Aesthetically, I knew I wanted to appropriate another user interface or visual artefact to comment on behavioral advertising on Facebook. I was compelled by how *Flopstarter* (2018) and *us+* (2020) use appropriation satirically, questioning the visual

language technology companies use to persuade people to view their products in the best possible light [15,39]. I also was interested in creating a data visualization that is tailored to a person's own data and deepens appreciation of how an individual is implicated in broader systems, like Mimi Onouha's approach in *Pathways* (2015) [24]. With these conceptual goals in mind, I began the design process.

3.3 Process Overview

My process was a research-based approach to design that used concepts from art, privacy research in HCI, and analysis of data available to users from Facebook to drive concept creation. The design process began with lower-fidelity, wireframe-style ideation to quickly test multiple concepts. During this early conceptualization process, I sought out feedback from peers to critique the design, and continued to read privacy research in HCI and re-analyze and re-combine the data to refine the goals of the work and improve ideas. After choosing to develop Upside Down Facebook, I worked towards a minimum viable product. This final stage of the design process was focused on development and technical considerations: writing algorithms for data manipulation and analysis, as well as front-end web development. During development, the concept did not change dramatically; rather, smaller refinements were made to the data and content displayed, as well as how disclosures would be opened in the user interface.

To provide a grounding for a description of the design process, I will first detail the source of the Facebook data, and how I analyzed and made decisions about the data I would display.

3.4 Exploration of Facebook Data

Facebook currently allows users to download their data, grouping it into two general categories: “Your Information” and “Information About You” [51]. Facebook describes “Your Information” as “Information you’ve entered, uploaded, and shared” [51]. Facebook describes the “Information About You” data as “Information associated with your Facebook account”, detailing information like ad interests Facebook has associated with a user, login history, and address books uploaded to Facebook. This data is both available to view as an interactive webpage, and is downloadable in either .html or .json formats. It is unclear whether this reflects all the data Facebook has on users and utilizes for behavioral advertising; indeed, prior research suggests behavioral advertising profiles available to users are likely incomplete [30]. In this section, I describe why I decided to focus on the “Information About You” download, provide an overview of the categories and types of data found in the “Information About You” download, explain how I made decisions about which data to visualize, and describe and provide a rationale for why the final data was selected.

3.4.1 The "Information About You" Data

The "Information About You" data includes information posts a user has shared, likes, and groups the user belongs to. While information in both "Your Information" and "Information About You" can be used by Facebook to understand and advertise to users, I focused on the "Information About You" download. The "Information About You" category contains inferences Facebook has made about a individual's interests, information about the devices they use and when they login, voice recordings and transcriptions (if available), facial recognition data (if available), Facebook search history, locations associated with the account, information uploaded by advertisers, and inferences made about a person's advertising interests. Below, I provide an overview of each category of data within the "Information About You" category (see figure 3.1 on the next page).

Data category	Number of Files	Description
Your topics	1	A list of inferred topics Facebook thinks a person is interested in. These interests are used to recommend content in the Newsfeed, News and Watch sections.
Security and Login Information	12	Data on log-in times, used ip addresses, locations logged in from, devices and browsers used, estimated locations from IP addresses, and administrative records like account deactivations and password changes.
About You	8	Information like address books uploaded to Facebook, Facebook pages visited, videos viewed, pages from which user wants to see less information, notifications (content and viewed or not viewed), messenger information, lifestage, and facial recognition data.
Voice Recording and Transcription	1	Records of voice recordings and transcriptions.
Search History	1	History of searches entered into Facebook search box.
Location	3	Timezone, primary location, and provided location.
Ads and Businesses	3	Off-Facebook activities like purchases and page views uploaded by advertisers, contact information uploaded by advertisers, and ad interests inferred by Facebook.

Figure 3.1: Description of file categories available from "Information About You" download.

While individuals are familiar with how user-provided information like posts or likes can influence what they see and how they are advertised to, they might not know about the specific inferences Facebook has made about them and about data flows like tracking login history [28,29]. I speculated that revealing "Information About You" could show the extent to which behavioral advertising invades an individual's privacy without their knowledge.

3.4.2 Selecting Data to Visualize

After reviewing files in each category from the “Information About You” download, I identified candidates for data disclosure. There was a very wide range of data in the “Information About You” data download I could create disclosures for; the data download contains twenty-two .json files, each with multiple sub-categories of data. This data also required processing, which could be as simple as iterating through lists of dictionaries and string matching, to more complex needs that required integration of multiple APIs and libraries, along with developing algorithms to make inferences about this data. Due to limitations on time available to develop the disclosures, I developed a set of questions that helped me select data to visualize in design concepts and later, in my final prototype, Upside Down Facebook (see below).

1. Will the data chosen help demonstrate and test the Upside Down Facebook concept?
2. Would it be surprising and informative for people to see? What does the literature say? What do I think?
3. Is there a clear action people can take to prevent data from being collected?
4. Would the work and time it take to develop data analysis to visualize this data type be worthwhile

I used these criteria to think through my project in the data spreadsheet, noting how Facebook describes the data, the structure of the .json file, information about a user’s potential awareness of the data type based on the literature, a description of why it would be interesting to show, and a subjective rating of my sense of how shocking users might find this information. I used this file as a living document that helped inform the final decisions about data (see Figure 3.11 below for its final iteration). I will describe further how I used and made decisions about data in section 3.5 “Concept Ideation” and Chapter IV “Upside Down Facebook”.

File name	Information About You Sub-category	What kind of data?	Do people know about it?	Data transformation needs	Privacy setting?
friend_peer_group.json	About you	contains description of what life stage a user is at (according to Facebook)	No literature on this	no	none
your_address_books.json	About You	contact name, date uploaded, phone number	Users probably do not know about offline contacts.	Extract phone number and format	Option to stop. unclear if it deletes other contacts: https://www.facebook.com/mobile/messenger/contacts/
ads_interests.json	Ads and businesses	list of ad topics facebook thinks you're interested in	People understand this, but not the full extent of what Facebook does (Kennedy et al. 2017). What happens when this is personalized?	Suggest advertisers based on interests	Can delete one by one; limit with browser extension (Facebook container)
advertisers_who_have_uploaded_a_contact_list_with_your_information.json	Ads and businesses	list of ad topics facebook thinks you're interested in	People likely do not know about it because no explicitly given permission (see Nissenbaum).	Count how many have uploaded information	Must opt out one at a time
your_off_facebook_activity.json	Ads and businesses	name of uploader, events they uploaded	May suspect, but don't know much about how it works because of low knowledge about cookies (Rader 2014; McDonald and Cranor, 2010)	Check for "PURCHASE"; disclose purchase in post.	Cannot fully opt out, but settings available: https://www.facebook.com/adpreferences/ad_settings
account_activity.json	Security and Login Information	tracks when users have logged in and logged out	yes (Rader, 2014), but might not understand usefulness or; also may be less comfortable based on how its visualized (Bucenschein et al. 2014)	Count log-ins, categorize by time of day, surface most popular time.	None. Can try logging in at random times to obfuscate
login_protection_data.json	Security and Login Information	allows you to see all ip addresses (aka locations) you've logged in from	Likely low likelihood of knowing about ip address and physical address association.	IP address/ physical address look-up via API	None on Facebook. (use a VPN like Mozilla)

Figure 3.11: Table of final "Information About You" .json files chosen for project.

Working from the spreadsheet (see Figure 3.11), I combined different types of data, using them as building blocks that could generate ideas for visualizations and interaction models. I also investigated practical consequences for development in more detail, projecting what the most complete technical realization of making each data point would be, along with a minimum viable product. In the following section, I share my approach to concept ideation, what I learned from each concept, and how it helped develop ideas that eventually led to Upside Down Facebook.

3.5 Concept Ideation

In this section, I describe how I apply the findings from my exploration of Facebook data to explore the conceptual goals of the project through creating different design concepts. Through this ideation process, I made discoveries about the usefulness of visual metaphors and interaction models to visualize the Facebook data. This process eventually led me to create a prototype for Upside Down Facebook, one that allowed me to comment effectively on behavioral advertising as a system through appropriating the Facebook profile. I provide more detail regarding this final prototype in Chapter IV.

3.5.1 Brand & Me Dating Website

My first attempt at designing a concept aimed at creating a reflection on behavioral advertising on Facebook through provocatively comparing it to another type of platform: a dating website called Brand & Me. I wanted to personify a user's

relationship with Facebook, making user interactions with advertisers a social relationship between individuals rather than faceless institutions. In this concept, users upload their Facebook data and are matched up with advertiser-suitors by Facebook based on their interests. This concept further explored this idea of the advertiser-suitor through a Facebook-like profile page in which users would see Facebook-style posts about their relationships with advertisers, the number of years they have been friends with a brand, and memories the brand shared of the last time the user shopped at their online store and how much they bought.

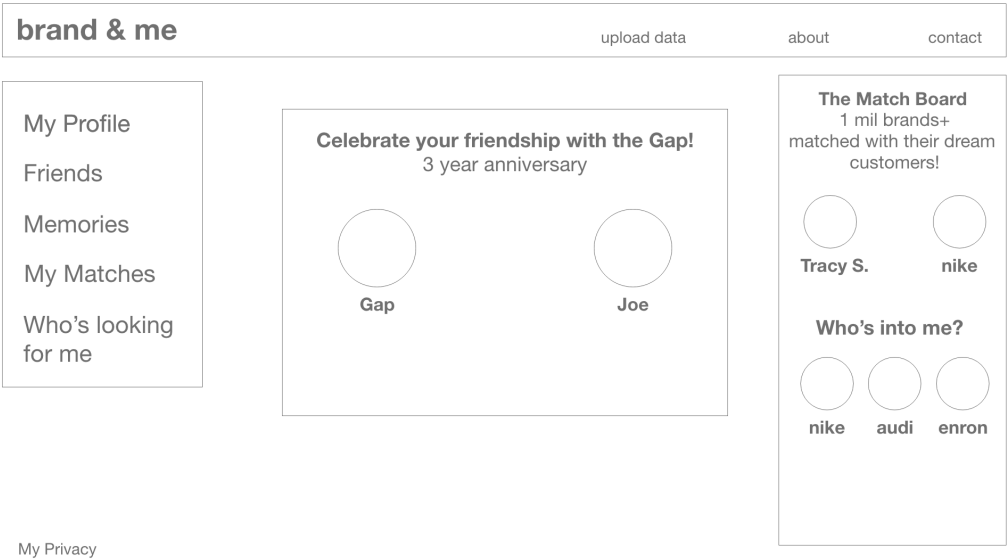


Figure 3.2: Brand & me wireframe.

While this idea was interesting, the data needs of this process were less clear: how could transactions be obtained for the brands a user is associated with on Facebook? Could an exact date be put on a user's relationship with a brand on Facebook? How would the matching up of users to advertisers work? At this point in the

process, my ideas were not rooted in thinking about the data available and data processing needed to execute them. I adjusted the approach to be more clearly based on my analysis of each type of data I could obtain from the Facebook "Information About You" data download.

3.5.2 Visualizing Data Through Unexpected Visual Metaphor

I wanted to push users to think about their interactions with advertisers on Facebook through cultural and artistic references that would cause people to think of the data Facebook collects on them as tangible, worthy of attention, and absurd in its detail. Ad clicks and views are ephemeral, but what if they were given outsized importance and preserved in something akin to an art museum for advertisements? What if the lengthy list of advertisers who have uploaded a user's contact information was given the pomp and circumstance of the Star Wars opening crawl? These concepts aimed to use visual grammar and cultural references to create a new perception of advertising and also seemed possible to execute from a technical standpoint.

I designed a prototype for a gallery of ad clicks, which transforms a .json file of all ads a user has interacted with into an art gallery in which the copy for each ad is framed in an ornate picture frame accompanied with a placard describing when they clicked on the ad.

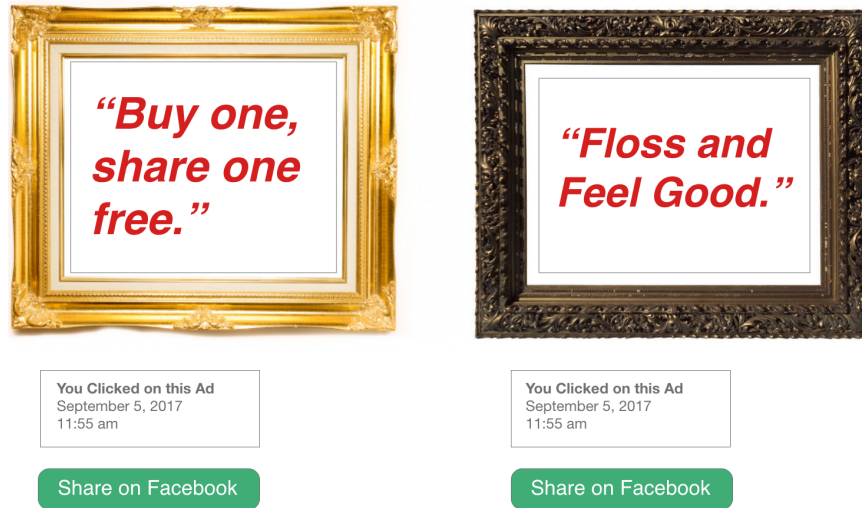


Figure 3.3: My Ad Clicks Low Fidelity Prototype

The goal was to show users the extent to which they interact with ads and Facebook tracks these interactions, memorializing them in a gallery. The user would be able to share these ad memories to their social media page, which would both surface this data and potentially spur larger conversations about the role of tracking and advertising on Facebook. However, I decided not to move forward with this idea. I imagined it would be possible for people visiting the website to look at everything, but not learn about the full extent of Facebook’s data collection and inferences. The potential for developing a systemic understanding was not there. Secondly, I did not think the action of sharing did enough to help a user prevent this process from happening.

My second idea in this round of prototyping was listing all of the advertisers who have uploaded a user’s contact information in a Star Wars opening crawl-style video, complete with epic music. As this list can number in the thousands, I thought this bombastic use of a visual metaphor would certainly shock users. At the end of the video, I wanted to present them with an option to tell advertisers to stop, but had not

fully developed an idea about how this would be done. This, however, was not why I decided to reject the idea. The primary problem I saw was that users may not choose to sit through five minutes of reading the names of thousands of advertisers; it would likely take less than a minute for them to get the point and get bored. Additionally, the video did not provide opportunities for interaction with each data point, which eliminated an opportunity for users to learn more about their data.

Ultimately, I did not want to move forward with these ideas because they were too limited in their ability to provide insight into Facebook's behavioral advertising practices as a whole, did not allow for much exploration of disclosures, and did not provide compelling opportunities to act. In the next phase of ideation, I focused on using common user interface tropes to visualize the "Information About You" data.

3.5.3 Visualizing Data Through Familiar User Interfaces

I created prototypes which used familiar application user interfaces like an interactive map, a calendar, and a receipt to visualize time-based data, geolocation-based data, and transactions uploaded by advertisers. These prototypes aimed to show users Facebook's tracking and collection of their data as inherently personal. Using familiar applications as references is meant to cause users to think about Facebook in terms of digital products they are familiar with. My goal was to give the user an impression that Facebook has a map or a calendar for everyone on Facebook.

In the "Calendar of Facebook Activities" prototype, a user would upload five files from the Facebook data export that include time-related meta-data. The calendar would

allow users to visualize how often Facebook tracks their activity, using an interface they would be familiar with.

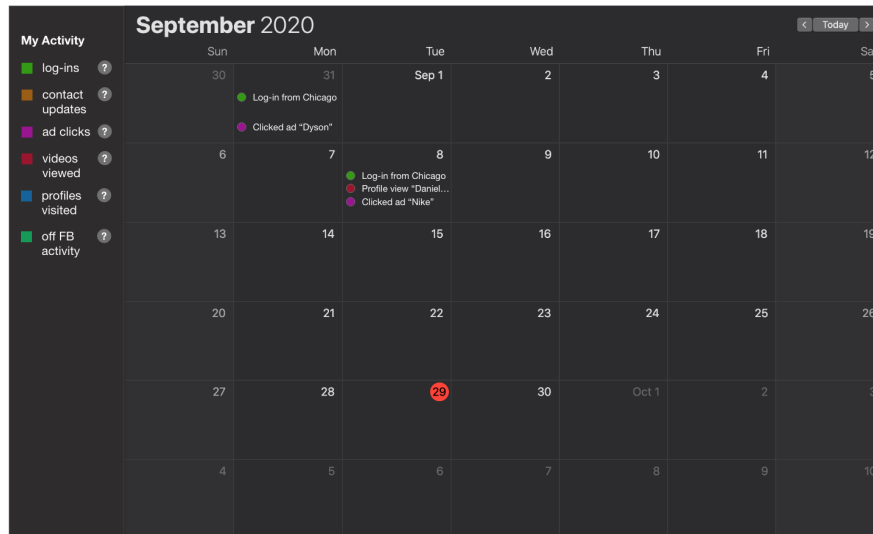


Figure 3.4: Calendar of Facebook Activities Prototype.

In the “Log-in Locations” prototype, a user would upload data on their account activity (log-ins and log-outs), and the map would be populated with pins of each location they logged in from. When users click, they would be able to view more information about the location and device they used.

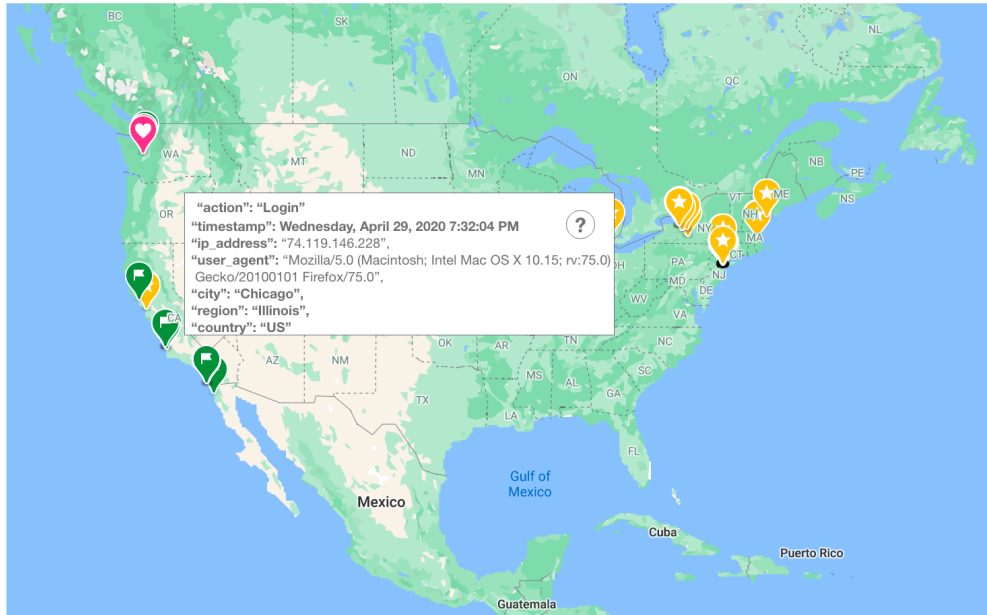


Figure 3.5: Log In Locations Prototype.

In the “Your Off-Facebook Activity” prototype, I imagined a user would upload a file containing information provided by advertisers to Facebook about everything the user had done. Formatted like a receipt, the user would be able to see a complete record of their activities, print out their receipt, and contact information for each company to stop the tracking (see Figure 3.6: “Your Off-Facebook Activity Prototype”). Question marks next to each item would allow users to click and learn more about each activity. Finally, they would also be able to print their receipt if they wanted to mail it to each company.

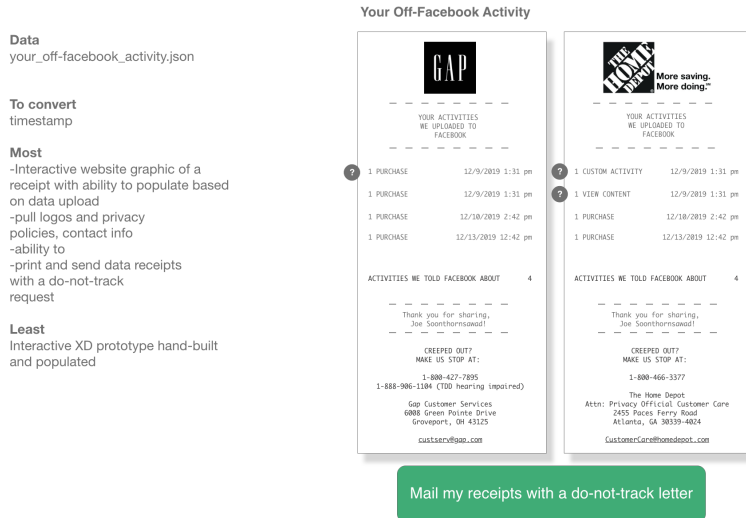


Figure 3.6: Your Off-Facebook Activity Prototype

These approaches seemed very possible to execute and the visual metaphor would be recognizable to users. However, further reflection made me realize these visual metaphors were perhaps too neutral and the quantity of information was too great. I imagined viewers would be shocked by the extent of the data collected, and begin exploring each event; however, even if information was provided about the origin of the data, the interaction models and visual metaphors could create a serial experience of learning about each data point rather than an experience of learning about a system. There was a risk of users trying to sift through a deluge of data from Facebook and its partners: the exact approach the platform uses to prevent users from better understanding how their data is collected and used [11,37]. The privacy protective actions were also not clearly realized, nor were they tied to the experience of interacting with these prototypes. With these discoveries in mind, I focused on designing a prototype that addressed these deficiencies.

3.5.4 Visualization to Illustrate a System

Further ideation revealed more promising approaches that included more data types, and commented more directed on processes of data mining and surveillance capitalism on Facebook.

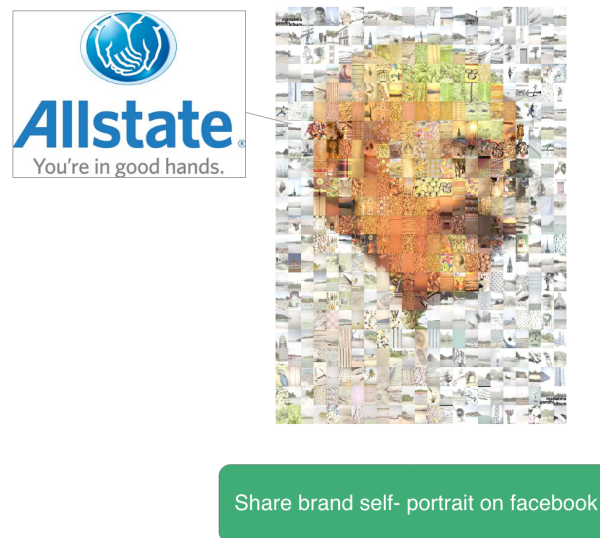


Figure 3.7: Artboard for Brand Self-Portrait Photomosaic

I designed a prototype for a photomosaic that used images of brands users have interacted with as tiles in a mosaic image of themselves. The idea was to show users a portrait they recognize but have not created, a visual metaphor that provokes users to think about how Facebook and advertisers might actually “see” them. The more data advertisers have uploaded on users or the more data Facebook has on the users interests, the greater the resolution of the portrait is. Each tile would be interactive, allowing users to click and see all the data flows that connect them to advertisers and vice versa, like ads viewed and transactions uploaded. The action I proposed was for

users to share this self-portrait on Facebook, creating a direct way for users to surface Facebook's advertising practices with their network.

I initially chose to move forward with this prototype because the idea was visually interesting, it matched the criteria I had for interaction, information, and action, and finally, there was plenty of documentation and project examples that laid out ways for me to create computationally generated photomosaics. However, once I started creating a photomosaic, I started to realize that the mosaic was not provocative enough. I wanted users to see how their continued use of Facebook makes them willing (and unwitting) participants in Facebook's behavioral advertising practices. I wanted to make an experience that had little risk of being seen as just another pretty image to share; rather, I wanted to create one that felt deeply intrusive and non-consensual. In the next chapter, I provide a conceptual description and feature walkthrough of Upside Down Facebook, the concept that I chose to develop.

Chapter IV

Upside Down Facebook

4.1 Introduction

In this chapter, I describe the Upside Down Facebook, providing a general overview of the prototype, discussing its conceptual features, and a description of the visualizations and disclosures created for each data type. Finally, I describe how I developed the Upside Down Facebook website's data processing and interface, as well as lessons I learned during the development process.

4.2 Overview

I arrived at a design for Upside Down Facebook at the end of my concept ideation process. This prototype uses three main strategies to engage the user in thinking about behavioral advertising and their data:

- Appropriation of the Facebook user interface
- Facebook talking to the user through posts about the users' data
- Disclosures and related privacy actions for each data type

Upside Down Facebook is designed to remind viewers of the user interface for a user's Facebook profile page, imitating the overall structure, color palette, typefaces, and

design of Facebook posts. An example of an Upside Down Facebook profile page is included on the next page in Figure 3.9. On page 64, an example of the Facebook profile page as of April 2021 is shared for comparison.

Intro

- Starting Adult Life
- 377 Contacts uploaded to Facebook
- 186 Ad Interests
- 27 Estimated Log-in Locations
- 2633 Advertisers have uploaded my information

Facebook • Joe Soonthornsawad

You're super popular! 404 Property Search and 2632 other advertisers want to find you on Facebook.
[Learn more](#) | [Stop this now](#)

Facebook • Joe Soonthornsawad

We uploaded Katie ██████████ (██████████) and 376 other contacts to Facebook. Thanks for sharing!
[Learn more](#) | [Stop this now](#)

Facebook • Joe Soonthornsawad

Your most frequent login time in 2019 was evening. You logged in 22 times that year at that time of day. Nothing like winding down after a long day with a little Facebook. Thanks for hanging out with us!
[Learn more](#)

Facebook • Joe Soonthornsawad

Nice to see you Facebooking from ██████████, West Chicago Avenue, West Town, Chicago, Cook County, Illinois, 60622, United States. We love being a part of your travels!
[Learn more](#) | [Mask your location with a VPN](#)

Facebook • Joe Soonthornsawad

We've been watching you, and we know one of your interests is "Chinese cuisine"! Hey advertisers, any deals for our friend?
[Learn more](#) | [Stop this from happening](#)

Comments

- GrubHub**
We have some great deals on delivery for someone like you!
- Seamless**
Order out with us! \$15 off your first order of \$50
- UberEats**
Thanks for connecting us, Facebook. This is the beginning of a delicious friendship.
- Panera Bread**
Hey, you're looking hungry! Try a classic You Pick Two special.

Facebook • Joe Soonthornsawad

Looks like you're having some fun with our friends at J. Crew Inc.! Shop 'til you drop, am I right?
[Learn more](#) | [Stop this from happening](#)

Figure 3.9: Example of an Upside Down Facebook page (private information redacted in black)

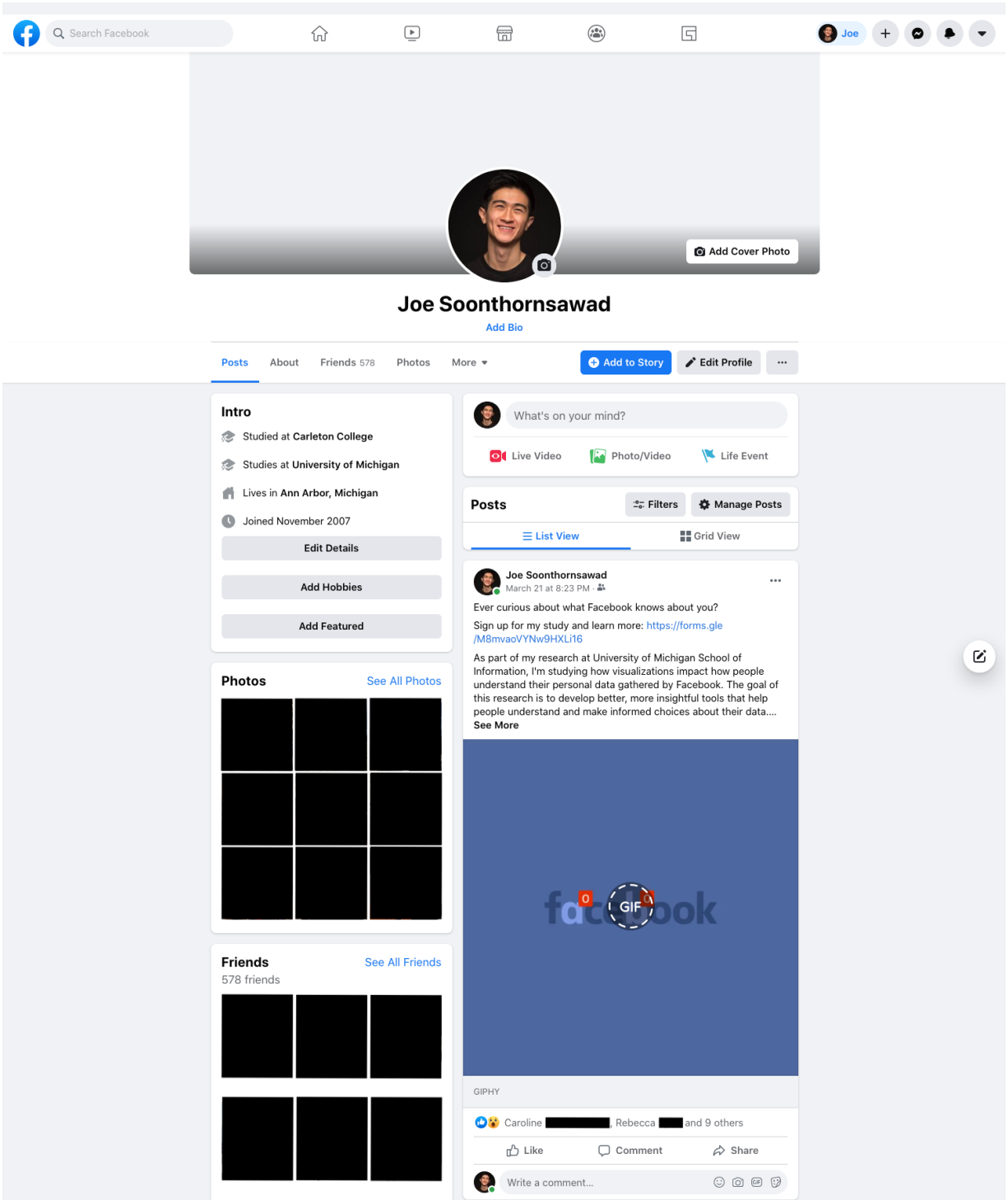


Figure 4: Example of a Facebook Profile from April 2021 (information redacted in black). Image downloaded from Facebook.com in April 2021.

In Upside Down Facebook, Facebook talks to the user through posts written in an uncomfortably positive tone. In each post, Facebook discusses a piece of information from Facebook's "Information About You" download, delighting that the user has shared information like their mobile contacts. In one post, Facebook goes so far as to connect advertiser friends to the user based on their interests, a metaphor for how Facebook creates ad connections (see figure 4.1) below.

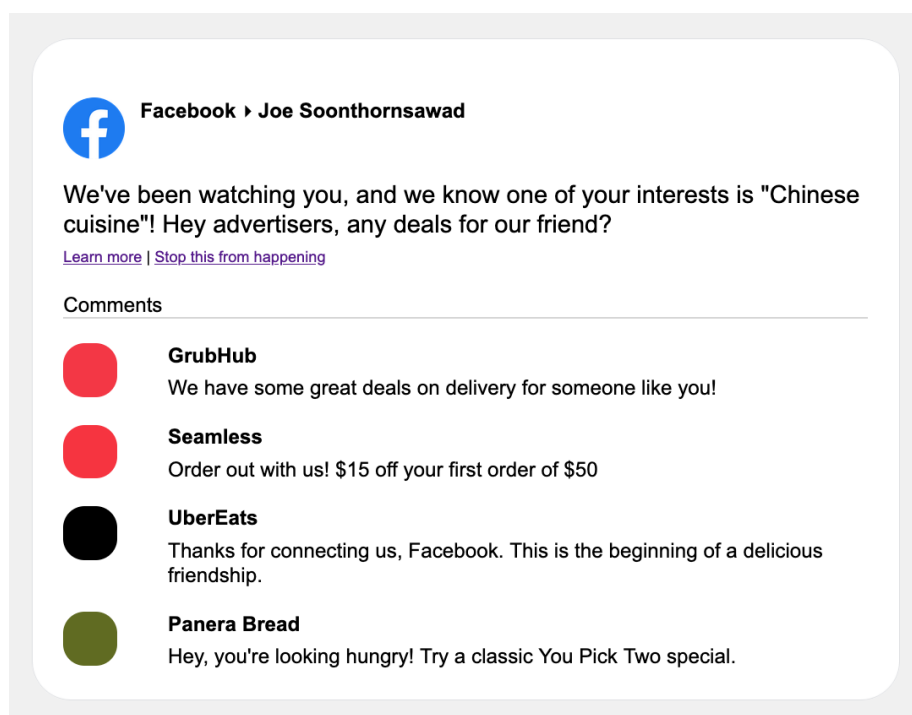


Figure 4.1: Ad interests post with advertiser comments.

The intent is to make user's feel Facebook is a stalker that knows too much about them, is trying to figure out as much about them as possible, and is sharing their data indiscriminately.

The “Intro” section replaces a user’s chosen biographical sketch with Facebook’s internal summaries of who they are, including their life stage and how many ad interests Facebook has determined they have.

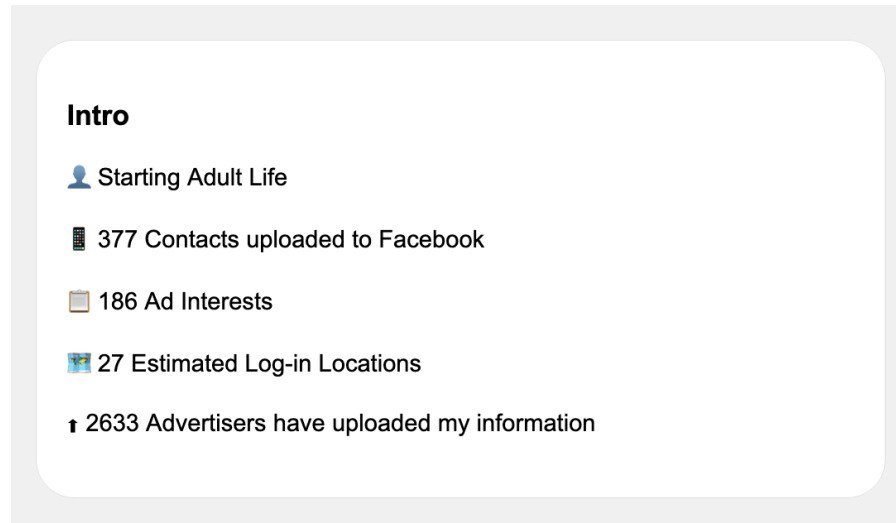


Figure 4.2: Intro section of Upside Down Facebook.

Finally, disclosures share key takeaways about why Facebook wants the data, and what the user can do to stop the data collection or inference practice from happening. Disclosures are placed within modal pop-ups that can be accessed from subtle hyperlinks labeled “learn more” and “stop this now”. This design choice allows users to discover the disclosures without distracting from the overall experience of seeing their Upside Down Facebook profile.

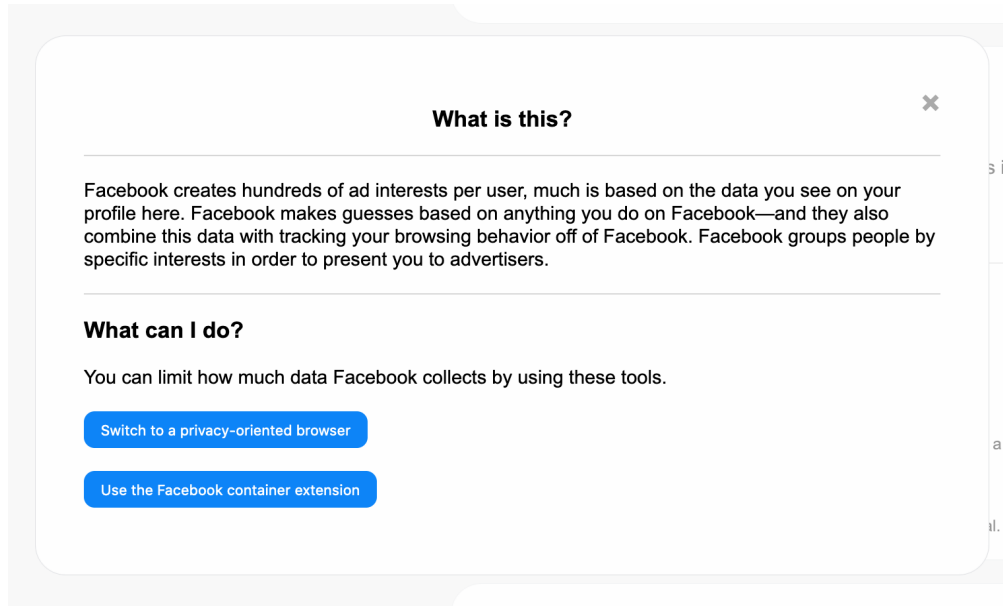


Figure 4.3: An example of a disclosure (explaining ads interests) in a modal pop-up.

These disclosures were written neutrally and clearly, using information from the literature on behavioral advertising and Facebook for accuracy. Where relevant, actions directly link users to hard-to-find Facebook settings to alter their preferences, or share tools like browser extensions or VPNs that can help limit the data collection.

4.3 Appropriation of the Facebook Interface

Upside Down Facebook appropriates the visual language of the Facebook interface. The goal was to estrange the user from their experience of using Facebook everyday, and push them to see similarities between Upside Down Facebook's behavioral advertising-oriented social network and the Facebook they know. Behavioral advertisers control the interfaces people use to access privacy information, creating websites to access behavioral advertising profiles that many have not seen, and are difficult to use and understand [1,30]. If data disclosures are presented with user

interface design that looks and feels “like Facebook”, it is hard to ignore evidence of unwanted data collection and use that would otherwise be out of sight.

Artistically, this approach was inspired in part by Oli Frost’s *Flopstarter* (2018), which uses the user interface of Kickstarter to present comically bad product ideas seeking funding [15]. This strategy of appropriation, hyperbole, and satire causes the user to reflect about what a website is, what it is trying to convince the user to do, and how it uses visual strategies to persuade them. In the case of Upside Down Facebook, I use appropriation of the user interface to show how Facebook wants users to think about the experience as social and make behavioral advertising feel completely unrelated to keeping up with friends and family.

4.4 Facebook Talks to the User

Upside Down Facebook creates a relationship between the user and Facebook through dialogue. I developed this strategy based on two ideas that emerged while reading research on awareness of behavioral advertising. Kennedy et al.’s study on user perspectives on social media data mining finds that a user’s comfort with data mining for behavioral advertising on social media is connected with whether they see social media as a personal private space [20]. Similarly, Rader’s finding that users may conflate social privacy settings with institutional privacy settings motivated this design choice [28].

Upside Down Facebook makes Facebook the institution a part of the user’s friends. This makes it difficult for a user to see their social media activity as private to

Facebook, now that Facebook is an unwanted friend that is ignoring the social privacy settings they may have selected. Facebook posts on the timeline, making actual Facebook data practices visible as social sharing done without consent. The approach to writing these posts takes inspiration from Lauren Lee McCarthy's parody of the language of tech start-up marketing in *pplkpr* (2020) [39]. Facebook uses cheerful and conversational language as it inappropriately accesses, comments on, and discloses data (see figure 4.31 below).



Figure 4.31: Example of friendly language used by Upside Down Facebook in Location Inferred from IP Address post (address number redacted).

My goal was to help the user reflect on how Facebook uses language to humanize the platform and cast its behavior in the best light possible, even when that behavior is questionable.

4.5 Use of Data Disclosures and Actions

Upside Down Facebook uses disclosure design and actions inspired by privacy nudging tools to encourage users to address specific data privacy violations. Privacy

research on nudging finds that presenting privacy risks in a way that contextualizes them and increases saliency creates an opportunity to nudge users to act to protect their privacy [4,32]. The presentation of Facebook behavioral advertising-related inferences and data collection in a way that looks and feels like Facebook is an ideal opportunity.

In order to maintain a balance between creating a convincingly “upside down” experience of Facebook and helping users take action, opportunities to “learn more” and “stop this now” are hyperlinked. Within disclosures, I use an interface that looks like Facebook’s modal pop-ups for more ad information, but use simpler language and provide clear “call-to-action” buttons that make it clear what users can do. The use of disclosures helps tie the Upside Down Facebook experience to research, encouraging users to be curious about how their data is being used, and helping them realize they can do something to protect their privacy.

4.6 Final Data Sources and Visualization

My prototype for Upside Down Facebook uses seven .json files from the “Information About You” data download. I used the decision criteria detailed in section 3.4 “Analysis of Facebook Data” to make choices about data, based on whether they would be surprising, informative, actionable, and feasible to develop. In this section, I detail each data type, the design of the post and disclosure, and the rationale for the design.

4.6.1 Intro Box

In the Intro box, I created at a glance disclosures of the information used in Upside Down Facebook. I used information about what lifestage Facebook assigns to a user (friend_peer_group.json), number of contact uploads (your_address_books.json), number of ad interests (ads_interests.json), number of estimated log-in locations (account_activity.json), and number of advertisers who have uploaded the user's contact information (advertisers_who_have_uploaded_a_contact_list_with_your_information.json). It is unlikely anyone would self-identify as "starting adult life" openly on Facebook, and I surfaced this data in order to surprise the user with how Facebook sees them.

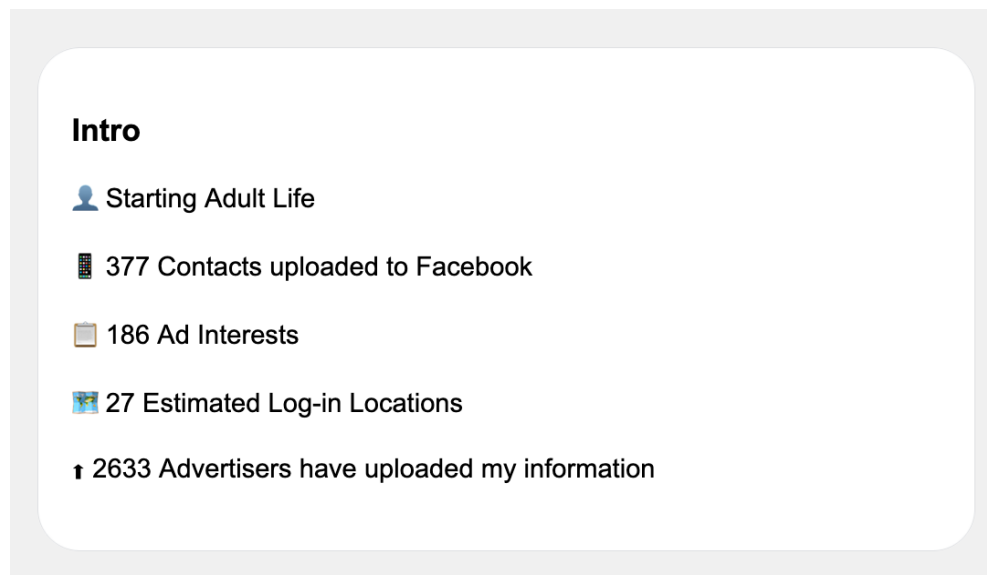


Figure 4.4: Intro information.

4.6.2 Address Book Uploads

Based on research about awareness of behavioral advertising data collection, I speculated that users would be unaware that Facebook collects and retains their address books [18,28]. This information would have been obtained either through use of the “Find My Friends” feature, via a user giving Facebook permission through a quick interaction, or leaving their Facebook mobile app on default settings. To show this information, I pulled the first contact found in the `your_address_books.json` file and had Facebook thank the user for sharing their friends with it. The goal was to use a contact and their phone number to provide creepy specificity and make the user curious.

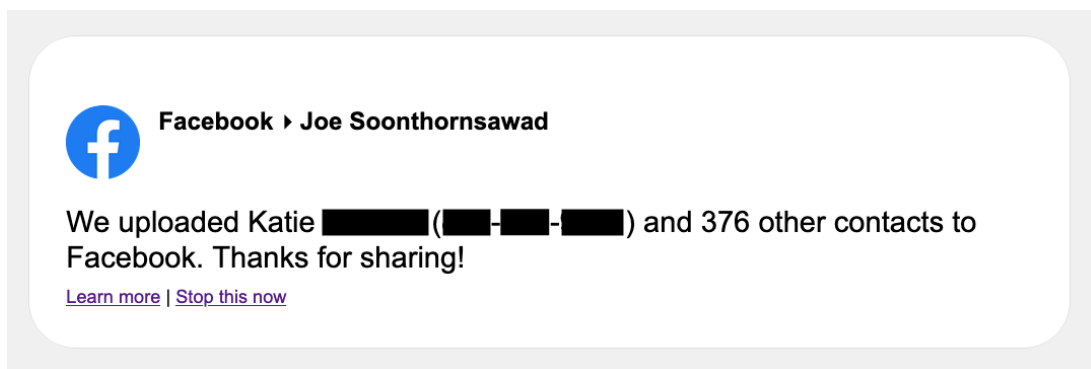


Figure 4.5: Address Book Uploads post (last name and phone number redacted).

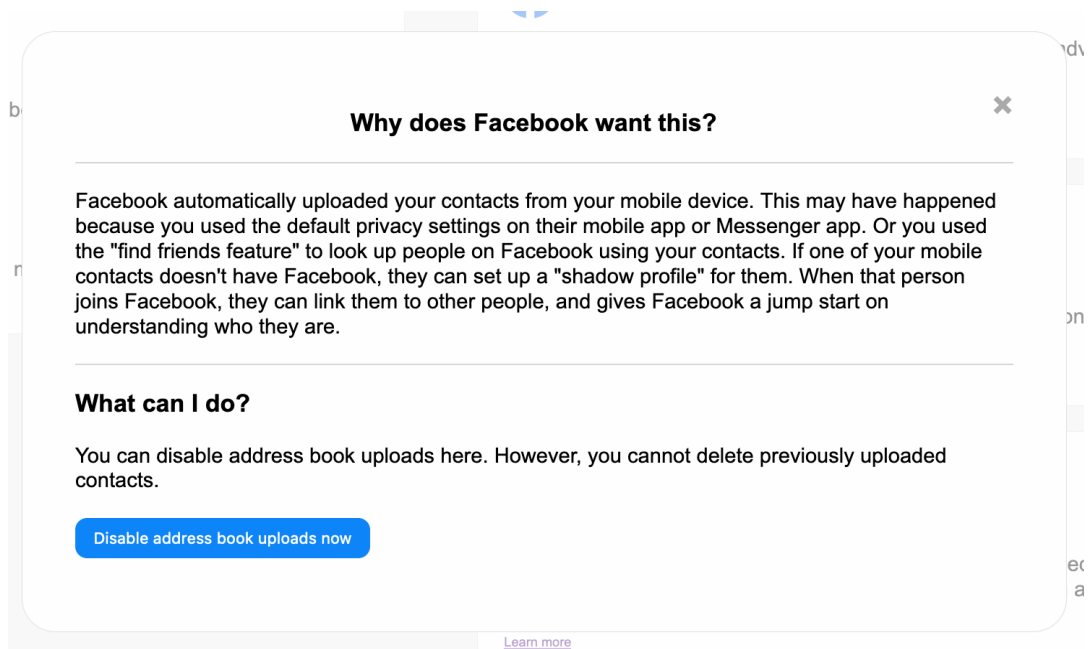


Figure 4.6: Address Book Uploads disclosure.

In the more information window, I describe how Facebook uses this information: it is used to help quickly connect other users with friends, start a profile for a non-Facebook user, and learn more about a user's potential interests through understanding their social network outside of Facebook. There is a direct link to this setting on Facebook, which is ordinarily difficult to reach.

4.4.3 Ads Interests

Facebook keeps a list of user "ads interests", a catalogue of inferences about what a user might like based on their activity on and off of Facebook. Though research shows that Facebook users likely know Facebook is keeping track of their interests, few have likely seen this list [26]. Previous research shows, however, that people often have negative reactions to inferences, especially highly specific ones [12,30]. I wanted to harness this reaction to make the user think about how Facebook might view them as

not a person but as a consumer with measurable interests, blurring boundaries between the social and institutional functions of Facebook. Facebook also calls upon its advertiser friends to start selling to the user, all done without a user's consent on Upside Down Facebook. Personifying the actions of data inference and sharing inferences makes the process real. Would a person want this to happen in real life?

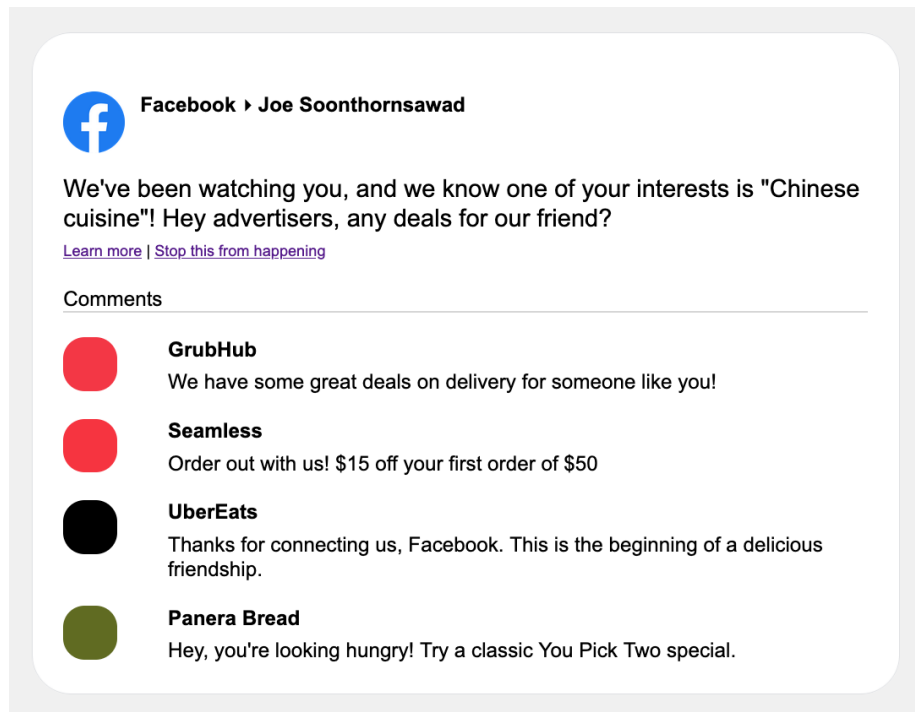


Figure 4.7: Ads Interests post.

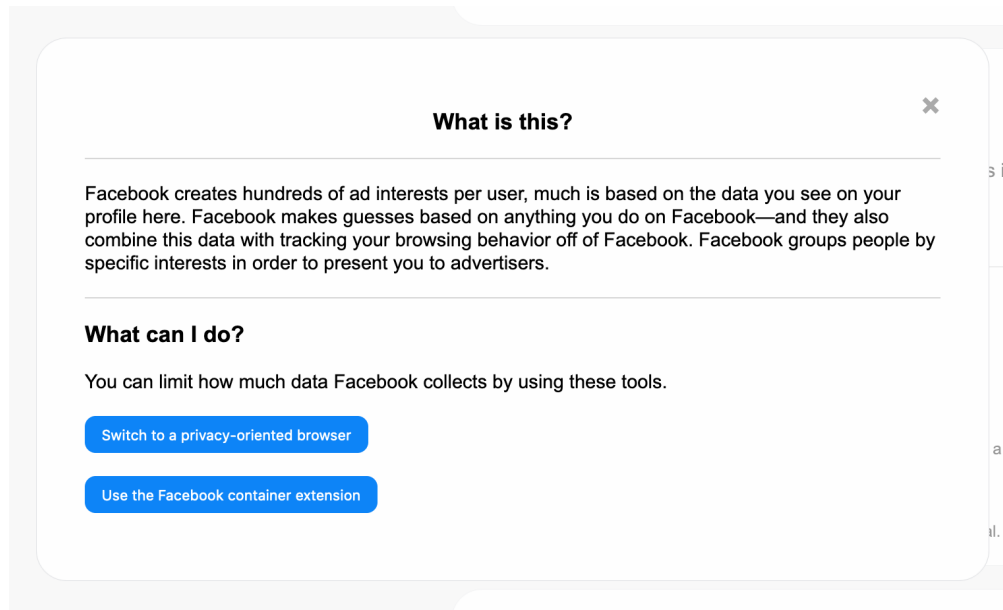


Figure 4.8: Ads Interests disclosure.

The disclosure tells the user, quite simply, that everything they do on or off-Facebook might be used to help Facebook learn more about them and advertise. Actions give users multiple options to limit how much Facebook can learn about them, whether through adjusting settings to limit monitoring of off-Facebook activity, or installing a more privacy-oriented browser like Firefox, plus a Facebook container extension to limit this tracking.

4.4.4 Uploaded Contacts from Advertisers

I thought that many users would be alarmed by the fact that advertisers are able to upload their contact information to Facebook. This feature, built by Facebook for advertisers, allows advertisers to upload information to target customers and leads with ads [52,53]. This data could be obtained originally from a purchase, a customer signing up for a rewards program, or from buying a list of contacts from a data broker. Indeed,

research by Kennedy et al. on perceptions of behavioral advertising on social media suggests that users feel a sense of privacy violation when their data has been used outside the original context they shared without their consent [20]. I looked at my own data and counted the length of the list. To my surprise, my contact information had been uploaded over five thousand times to Facebook by advertisers. Taking inspiration from Almuhimedi et al.'s finding that users will take action to change a setting after seeing frequency of data access, I decided to display this contact upload data as a number in the Info section [4]. I also displayed it as a post from Facebook, cheerily informing the user that an advertiser (for example, Best Buy) and n other advertisers wanted to find them on Facebook.

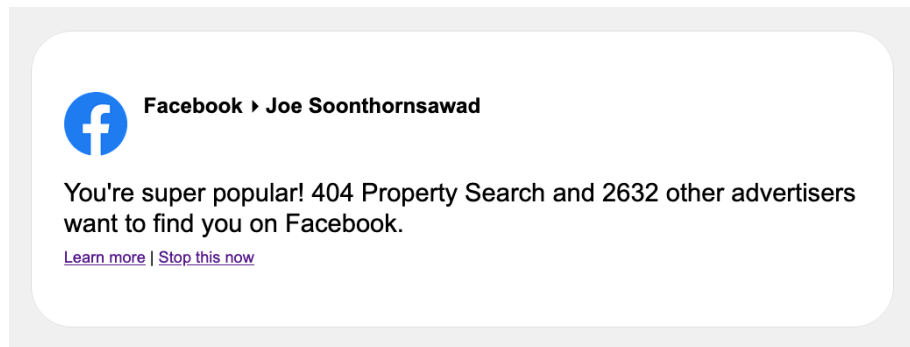


Figure 4.9: Contact Information Uploaded By Advertisers Post.

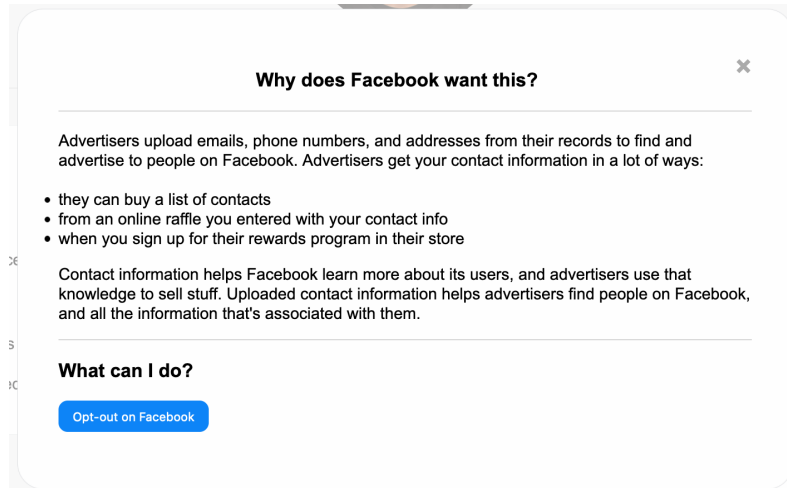


Figure 5: Contact Information Uploaded By Advertisers Disclosure.

In the disclosure, I describe to users a few examples of how their data could have been acquired, how contacts can be used to associate users with other data the advertiser has, and how it also allows Facebook to learn more about its users. The information in this disclosure was based on descriptions from Facebook's business page.

4.4.5 Advertisers Uploading Off-Facebook Activity

I thought it was likely that users would not know that advertisers are tracking their behavior off of Facebook and uploading it to Facebook. Through the Facebook Pixel tracking code, businesses can record when a customer performs a certain activity like a purchase [54]. This tracking code allows advertisers to re-target customers based on their previous behaviors (for example, people who have a history of buying certain products), and also gives Facebook more information about a person's behaviors. I extracted an example of a "purchase" action from the data along with the advertisers name, and had Facebook comment on their love of the user's shopping habit. This way,

both Facebook and advertisers are parties in this collection and exchange of data, and the user would start to imagine how both parties benefit from behavioral advertising.

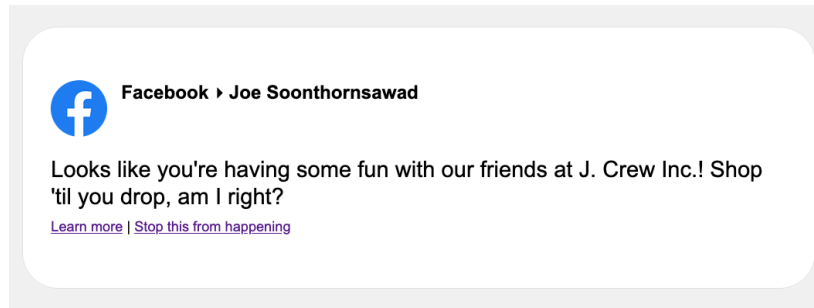


Figure 5.1: Advertisers Uploading Off-Facebook Activity Post.

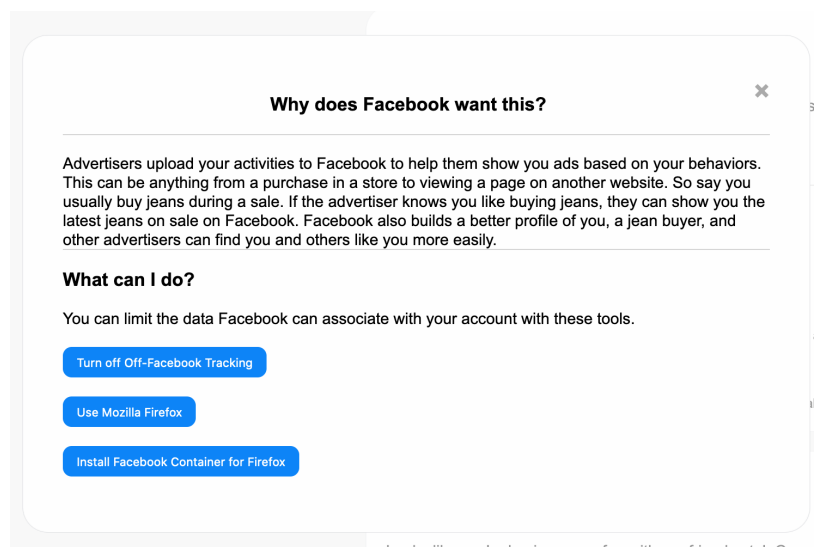


Figure 5.2: Advertisers Uploading Off-Facebook Activity Disclosure.

The disclosure explains ways that companies users transact with gathering data and how it helps them better advertise based on actual behavior. Actions listed at the bottom direct them to the Facebook settings page where the user can adjust settings about off-Facebook activity uploads, as well as suggesting Mozilla Firefox and the Facebook Container Extension to help prevent related off-Facebook tracking by advertisers.

4.4.6 Inferences About Log-In Times

Users are likely familiar with data they provide to Facebook through an explicit interaction like logging in. However, prior research by Buchenscheit et al. suggests that users may not have imagined log-in records can reveal intimate information about their behaviors, much less how this data could be used for behavioral advertising [9]. I created an algorithm that, for a given year, determines what time of day a user logged in most often. Facebook gleefully shares the insight with the user and comments on their behavior, whether they're a "night owl", "early bird", Facebooking to pass the time during a "slow afternoon", or "checking up on an ex" and "doomscrolling" late at night.

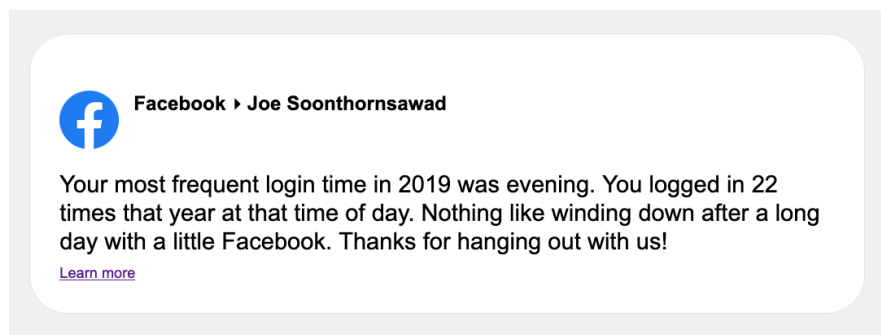


Figure 5.3: Log-in Times Post.

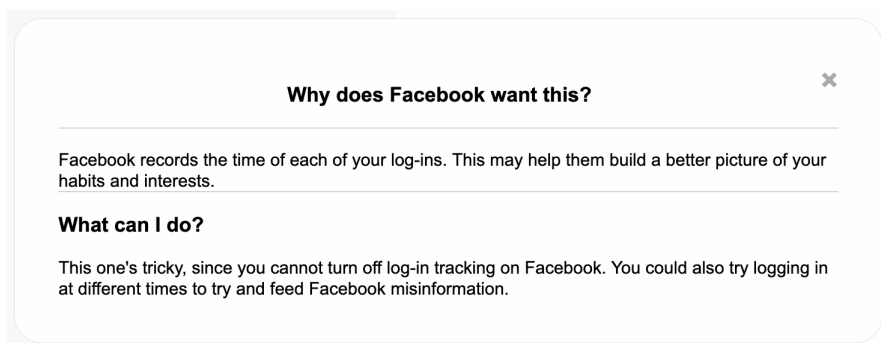


Figure 5.4: Log-in Times Disclosure.

The disclosure describes how seemingly innocuous data can be used to understand a user's intimate behaviors and how everything they do tells Facebook more about them. There is no action a user can take to limit collection of log-in times and inferences, but the disclosure suggests obfuscating their actual behavior through logging in at random times. According to Brunton and Nissenbaum, obfuscatory approaches can be utilized alongside other privacy protective techniques to help individuals exercise agency in situations where information asymmetries are present [14].

4.4.7 Inferences About User Locations Based on IP Address

People may know about tracking location via GPS and how to turn it off, but may not know about how location can be inferred through IP addresses. I wanted to show how disabling a setting, like GPS location, might not actually protect a user completely. Also, I wanted to show people the precision with which Facebook could understand them, and location is a particularly sensitive type of data. I use an API to reverse look up IP addresses and convert them to physical addresses. In the post, Facebook comments with a specific address, and tells the user they are happy to be a part of their travels.



Figure 5.5: Inferring Address from IP Address Post (address number redacted).

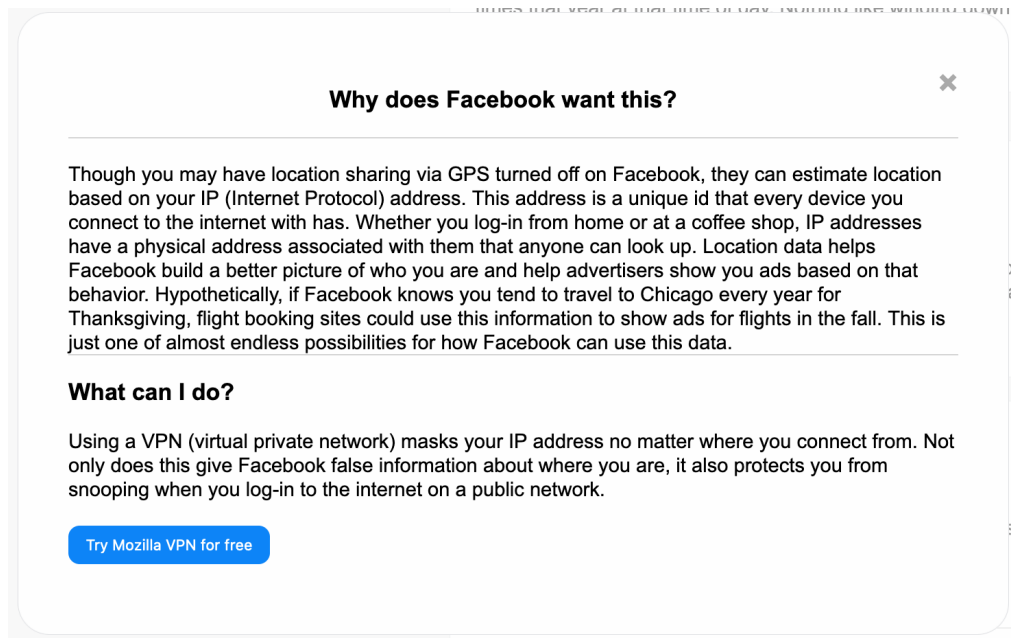


Figure 5.6: Inferring Address from IP Address Disclosure.

The disclosure describes how an IP address can be associated with a physical address, as well as how location data might help Facebook advertise to them based on their behaviors, using an annual holiday trip to another city as an example. Finally, the disclosure suggests the user connects to the internet via a virtual private network, and explains how it masks their current location through logging into a different server.

4.4.8 Development Process

In this section, I will detail some of the discoveries made during the development process, and implications for those interested in creating a similar privacy experience.

In terms of the overall implementation of the Upside Down Facebook prototype, I used the Flask web framework, using two main html templates, an upload page, and a homepage that uses template inheritance and Jinja logical operators to call up post templates based on the data a user uploads. This prototype was hosted on pythonanywhere.com. I also created a data upload process that allowed users to drag and drop “Information About You Files” into a webpage, input their name, and upload a picture of themselves.

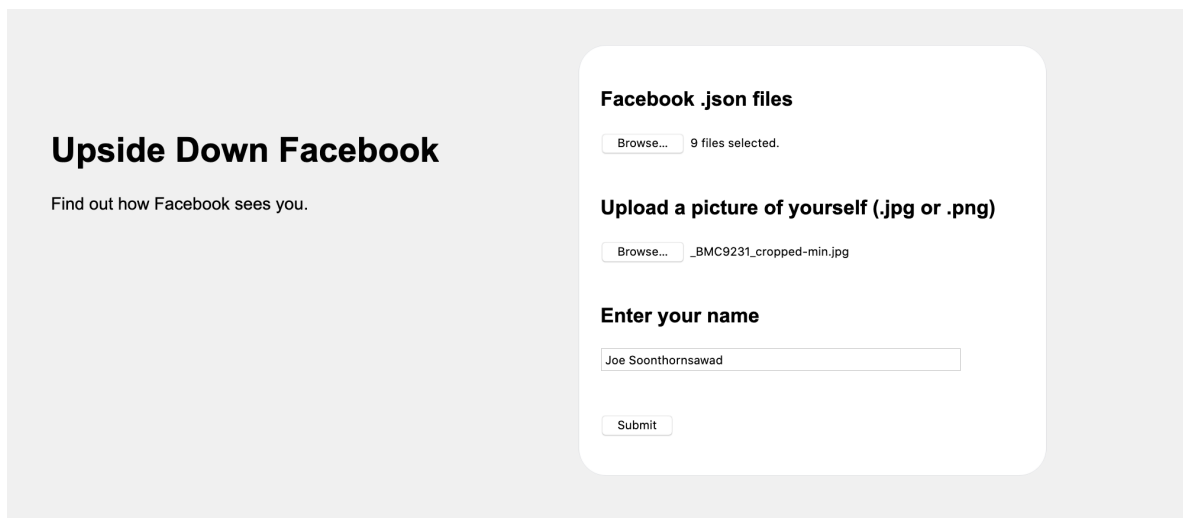


Figure 5.61: Upside Down Facebook data upload page

This process checked if .json files uploaded can be visualized, converted information the prototype was prepared to visualize into dictionaries, sent information to be

processed in separate functions, and finally was sent to the homepage to visualize information.

While working on algorithms to infer information about how a user's particular ad interests might make them suitable to be paired with certain advertisers, I learned that it may not be necessarily or efficient to simulate this process for all of a user's data. Originally, I used Facebook's Graph API to recreate the process of identifying and categorizing user interests in order to connect them with relevant advertisers in the comments section of the post.¹ In early versions of this algorithm, I looked up a user's ad interests (for example, "Museums" or "Nike"), tried to determine whether the interest was a publicly-traded company or not by looking it up in via the Securities and Exchange Commission's EDGAR database API, and finally finding advertisers from that industry using the EDGAR database [55]. This algorithm took a long time to run, and when it returned results, often surfaced somewhat obscure companies. Rather than continuing to develop this more precise approach, I narrowed the scope of the problem. The algorithm determines whether an interest was related to music or food (interests many people have), and returns a dictionary pre-loaded with pre-selected advertisers in the given industry along with advertiser comments. It was simplified and still achieved the intended result: showing a user an ad interest and representing how Facebook gets advertisers to clamor for a user's attention.

Broadly, I came to realize during the development process that there is a real cost in terms of time and effort for any decision made about implementing a feature or

¹ Facebook describes how advertisers use ads interests as the following: "Advertisers can reach you based on interest categories and other categories that we associate with you. We add you to these categories based on information you've provided on Facebook and your activity. You can decide to remove yourself from these specific categories" [51]. I used this basic description of how interests work to create my inference algorithm.

interaction. Thinking about the project's goal and continually asking what the true minimum I needed to do to bring the Upside Down Facebook concept to life helped me make informed decisions about how to spend my time. Of course, this resulted in some trade-offs that are mostly stylistic in nature, excluding user-interface elements, icons, animations, and images that would further heighten Upside Down Facebook's similarity to Facebook. Importantly, by the end of this process, I was able to create a live web prototype of Upside Down Facebook that was ready to be tested.

Chapter V

Evaluation

5.1 Introduction

In this chapter, I discuss the evaluation study I conducted to assess the Upside Down Facebook prototype's success in provoking users to learn about and take action on data privacy issues.. I used a combination of semi-structured interviews and asking interviewees to "think aloud" as they used the prototype. This study's goal was to validate the basic concept of Upside Down Facebook, focused on understanding whether the experience provoked people to be more concerned about behavioral advertising, made them want to learn more about how their data is being used, and whether they took or planned to take privacy protective actions suggested by the prototype. Additionally, to inform further development of Upside Down Facebook, the evaluation study was designed to uncover general usability problems, as well as comprehension issues with the different posts and disclosures in the prototype. This initial study found that Upside Down Facebook surprised many participants, provoking them to learn more about Facebook's behavioral advertising, and adjust their settings. However, further work must be done to refine the concept, including improvements to the design of disclosures, better contextualizing Facebook privacy settings, and providing alternative privacy actions.

5.2 Research Questions

The study's primary goal was to validate the of artistic provocation in privacy as it relates to the core research questions of this thesis:

- RQ1: How can design approaches from conceptual art and Human-Computer Interaction be brought together to design an experience that provokes people to learn more about behavioral advertiser's use of their data and encourages them to take action to protect their privacy?
- RQ2: How effective can this type of experience be in raising user awareness, comprehension, and action related to data collection practices

Particularly, this evaluation focuses on understanding the efficacy of Upside Down Facebook as a realization of the conceptual design goals of artistic provocation. In order to test this, I sought to answer the following questions through the evaluation study:

- RQ1: Are people provoked by seeing their data displayed on Upside Down Facebook? What emotions do they express?
- RQ2: Does Upside Down Facebook's provocation affect how people understand how Facebook collects and uses their data?
- RQ3: Does Upside Down Facebook motivate people to take action to protect their privacy?

Additionally, I used the study to look for potential usability issues that prevented the website from accomplishing its goals.

5.3 Study Protocol

Using the video conferencing application Zoom, I conducted seven interviews in March 2021. Prior to conducting these interviews, I worked to protect participant privacy throughout all aspects of the study. The Upside Down Facebook website was designed to store data temporarily in the server's memory; once a participant left the website, all uploaded data was removed. I also built in protections for data generated by the interview, storing all interview data on University of Michigan approved services, and omitting personally identifying information from all interview recordings and final presentation of the data. The study was reviewed and exempted by the University of Michigan Institutional Review Board.

The evaluation study used a combination of semi-structured interviewing with usability testing of the prototype. This combination of methods allowed me to ask users about their perceptions of behavioral advertising on Facebook in a way that allowed them to elaborate on their thoughts, feelings, and understandings of this system [6]. The study also had users upload their data to the Upside Down Facebook website prototype, and asked them to think aloud as they freely explored the website. This method is ideal for evaluating early stage prototypes, allowing users to freely express thoughts and feelings about their experience in the moment, which contributes rich data alongside

researcher's observations of their behavior and emotional reactions [21]. I use semi-structured interviewing techniques to allow participants to elaborate on their knowledge, beliefs, and feelings about Facebook's collection and use of their data for behavioral advertising. In terms of the think aloud exercise, participants can express their reactions in real time as they freely explore the website, allowing me to gather data on where the website was successfully provoking engagement with a particular data type or not, as well as identity usability and disclosure comprehension issues [21].

5.3.1 Procedure

Prospective participants first completed a screener survey asking them to provide basic demographic information and share their experiences and comfort level with technology. In this survey, participants also received information about the study's procedures, and agreed to the consent form digitally. Interviewees were then invited to a recorded Zoom interview, and given a set of instructions to download their Facebook "Information About You" data as .json files ahead of the interview. Once the interview began, interviewees were asked questions about Facebook's collection and use of their data to understand what they knew and how they felt about this practice. Following this, interviewees were asked to share their screens and access the Upside Down Facebook site, upload their data, and think aloud as they freely explore the website. Finally, interviewees were asked about their general reactions to using the website, specific posts about data; additional questions were designed to understand if a user's

comprehension and sentiments about Facebook’s collection and use of their data has changed.

5.3.2 Recruitment

The study used convenience sampling, recruiting participants via a Facebook post. This post was shared on my personal Facebook page. Seven participants were interviewed, and had the the following characteristics:

Gender	Age	Education	Worked in the technology industry or studied technology?	Internet Browser
Man	70	Master’s	no	Chrome
Woman	74	Bachelor’s	no	Safari
Woman	62	Master’s	no	Safari
Man	38	Bachelor’s	no	Chrome
Man	28	Master’s	yes	Chrome
Woman	26	Bachelor’s	yes	Chrome
Woman	28	Bachelor’s	no	Chrome

Fig 5.7: Description of interviewee demographic information

5.4 Analysis Approach

After each interview, I wrote a memo detailing a summary of my impressions, directly relating them to the research questions posed in section 4.2. After editing interview transcripts for errors, I conducted a preliminary thematic analysis of the

interviews [8]. This analysis consisted of comparing responses to individual questions, reactions and actions related to different Upside Down Facebook posts and disclosures, as well as comparison of post-interview memos. Through this analysis, themes were developed iteratively and quotations were selected that correspond to each theme. As this analysis is preliminary, this process was limited to a condensed, one-week timeframe.

5.4.1 Limitations

This study and analysis is limited by its small number of participants (7), which limits the generalizability of the findings. Additionally, the use of convenience sampling during a two-week sampling window and recruiting from my Facebook social network may result in increased acquiescence bias compared to if the study was conducted with strangers. Thus in this preliminary analysis, findings from this study focus on assessing a general response to the Upside Down Facebook concept in order to inform future development for evaluation, as well as to inform a discussion of the potential relevance of artistic provocation for increasing privacy awareness. In order to conduct research that can make broader claims about the impact of Upside Down Facebook and people's interest in the concept, further evaluation without the use of a convenience sample must be conducted. I detail how such a study might be designed in Chapter V.

5.5 Results

In this section, I detail themes that emerged from a preliminary analysis of the interviews. The results of this analysis center around general responses to Upside Down Facebook's conceptual strategies, if and how participants interacted with disclosures and privacy actions, how participants perceived different categories of data, and takeaways from the experience. Though most were generally provoked by the experience to reflect upon behavioral advertising on Facebook and often took action to learn more and change their settings, their final takeaways about the experience varied.

5.5.1 People provoked by personification of Facebook and “creepy” posts

The participants reacted to personification of Facebook, responding to each post Facebook was actually addressing them. Though most were provoked as hoped and urgently took action (see the next finding), one person was unsurprised by what they saw, suggesting that the concept may not be able to shock people who are very comfortable with behavioral advertising.

After seeing the Advertisers Uploading Off-Facebook Activity post, Participant 3 exclaimed, *“Shop ‘til you drop, am I right?’ That’s so disrespectful!”* Similarly, Participant 5, who had studied privacy in a Human-Computer Interaction class, accepted that Facebook was “talking” to him. After seeing the Ads Interests post from Facebook about his interest in photography, Participant 5 commented, *“That’s a bit creepy here. And they know I’m kind of interested in photography, which is kind of ok, sometimes. But then asking advertisers for any deals, that’s kind of creepy, I guess.”* Participant 2,

looking over the number of times advertisers uploaded her contact information, said, *“It’s a little frightening. It’s like I’m being stalked. I don’t want to see all that stuff.”*

Participant 7 said that she felt she was seeing her “real” Facebook page, saying, *“I feel angry that so much information, so much of my online activity is being used by Facebook to curate this profile page—which is actually my real Facebook profile. Because that’s Facebook’s purpose now, to make money off of advertisements. It’s not to connect people. I’m just mad this doesn’t reflect who I am at all.”*

Among those interviewed, Participant 4 was the most comfortable with behavioral advertising. No post about data was offending to Participant 4, and he perceived the “learn more” disclosures as positive, saying, *“It’s just kind of conversational and non-threatening.”* Reflecting on the entire experience, Participant 4 was not disturbed by any of the data surfaced by Upside Down Facebook. *“There’s nothing in here that I think is an invasion of my privacy”,* he remarked. *“It’s all stuff I’m choosing to click on to see. I’m using a business. If I go browse in a store to see something, they’re monitoring what I’m looking at.”*

5.5.2 Reactions to posts can lead to clicking learn more or stop this now

The majority of participants (5 out of 7) clicked on disclosures to learn more about the posts they saw on Upside Down Facebook. In many cases, alarm at the content of posts led directly to action, mirroring findings from Almuhimedi et al. showing that disclosures showing specific and frequent data access can urge individuals to act [4]. In this study, participants interacted with the “learn more” and “stop this now” buttons to different degrees of frequency and in different orders. When Participant 6 saw

the post that inferred a location she had visited from an IP address, she exclaimed, “*Oh my god!*” and promptly went to click on the “learn more” button, read the additional information, and clicked on the call-to-action buttons in the disclosure, repeating this pattern of interaction throughout the think aloud exercise. Participants 4 and 5 followed a similar procedure.

Participant 1 was bothered by each post on the interface, but did not notice the options available to “learn more” and “stop this now” throughout the think aloud test. When I pointed this out to them in the interview, Participant 1 mentioned he did not notice the buttons, and after being informed about the buttons during the interview portion of the study, expressed interest in looking at the disclosures. Participant 2, after reading the post on advertisers uploading contact information clicked on “learn more” and read the disclosure, but did not read the others.

Participants 3 and 7 did not click on the learn more button at all, but as they went through every post, they expressed dissatisfaction with the data in the posts, clicking on “stop this now” to explore each intervention. After looking at all of the posts and clicking each “stop this now” button, Participant 3 went back through the experience to explore the “learn more” windows. Participant 7 behaved similarly.

Though the “learn more” and “stop this now” buttons were designed to be minimal and unobtrusive, using a rectangular button style rather than underlined hyperlinked text may make disclosures and actions more visible.

5.5.3 User-provided information is not as alarming

While participants were universally surprised when they saw advertising-related posts, posts sharing Facebook's inferences about their log-in behavior was not always perceived as "creepy"; in fact, only 2 out of 7 participants reported feeling it was "creepy". Responding to the Login Times post, Participant 1 said, *"Doesn't bother me that much. I care about what they're taking, what they're monitoring. Probably they use it for vendors. Not really sure, probably telling people when they could reach out to you."* Interestingly, though Participant 1 acknowledges inferences about times he uses Facebook can be used for advertising, it did not feel like a violation of privacy. Similarly, Participant 6 stated, *"I'm not that surprised that they know that."* This aligns with research showing users generally expect data collected via direct interactions to be used by companies [18,28]. However, Participant 7 felt it was troubling, saying, *"Anything really specific like that makes you susceptible to behavioral advertising."* *"When I'm logging in, that seems like one of the most intimate things...it just feels invasive in a way that the other things don't because I clicked in a search bar and said I was interested in it. It's the closest thing to 'We're watching you. Our camera is on.'"*

5.5.4 Participants unaware of specific Advertising-Related Data and Interests

Reading the posts seemed to give participants a more specific and personalized awareness of how behavioral advertising impacts their lives. Participants seemed most interested in posts that disclosed advertising data: Uploaded Contact Information from Advertisers, Ads Interests, and Advertisers Uploading Off-Facebook Activity. Surprise at the "creepy" specificity of these disclosures led all participants to want to change their

settings and learn more. Once participants arrived on the “Ad Preferences” page (see figure 5.6 below), all looked closely at all of the “Categories used to reach you” information.

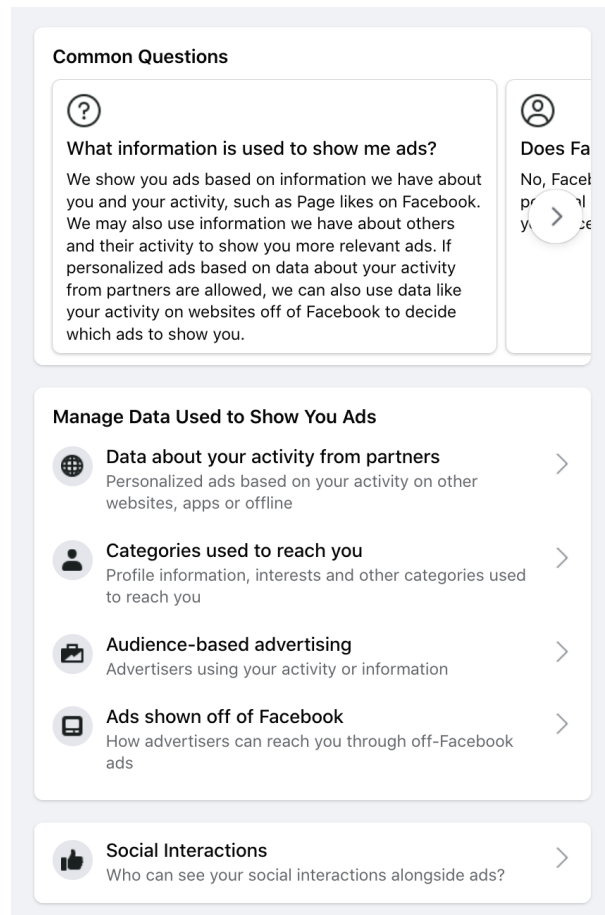


Figure 5.8: Ad preferences settings page on Facebook.
Image downloaded from https://www.facebook.com/adpreferences/ad_settings in April 2021.

Most participants were curious about how this information was inferred and used, which led them to explore Facebook’s lists of their interests for several minutes, removing ones they found irrelevant and speculating about why those interests were there. As Participant 7 said, *“One said I was a liberal and the other said I was a Republican. This list of interests—it doesn’t even make sense to me.”* Prior research on reactions to inferred interests shows people may feel relieved to see inferred interests can be

inaccurate and imprecise, a feeling Participant 7 seemed to share [30]. *“I guess it’s not that bad if all Facebook knows is that I like life.”*

Additionally, some users were confused by what these settings did as they got lost in reading Facebook’s descriptions. While browsing through these sub-pages, Participant 7 briefly forgot that they had turned off certain settings and turned them back on. While this exploration is not necessarily undesirable, future versions of Upside Down Facebook might provide more detailed information about how to turn off settings. Reminding users that Facebook will use dense language to distract them will help keep users on track.

5.5.5 Developing folk models independent of disclosures

Participants would sometimes ignore the “learn more” button entirely and form their own conclusions about how Facebook obtained and uses their data. For example, after Participant 3 looked at a post about Uploaded Contacts from Advertisers (see figure 4.7), went directly to the “stop this now” button to change her settings. When probed about how she thought Facebook got this information, Participant 3 responded, *“I think Facebook took my profile and they sold that. There are a lot of people who want white women for whatever age. Facebook took where I lived, if they could tell my race, and made assumptions about me. And sold my name, told advertisers we have this person and for this much money, we can give you access to her.”* It seems more clarity is needed in describing how Facebook monetizes data and creates ads. The misunderstanding that Facebook “sold” the data, rather than sold ads based on inferences about the data, is likely due to the fact Participant 3 did not read the

disclosure. This type of interaction should be taken into account to better design this post to clarify this data flow and its eventual use.

Similarly, Participant 7 read the information in the “Intro” box, and came to the conclusion that advertisers who were uploading contact information to Facebook might also be spam calling her. *“2911 Advertisers have uploaded my information?!”,* exclaimed Participant 7. *“That’s why I get so many spam calls!”* Participant 7 also came to an conclusion about how Facebook had inferred her location without reading the disclosure that stated this data was inferred through an IP address, saying that *“Oh, I probably downloaded an app and gave them permission to access my location.”* This explanation has merit, considering the post text did not specifically mention an IP address.

These conclusions that were arrived at without reading disclosures can be better anticipated by Upside Down Facebook. Additionally, future versions of Upside Down Facebook should keep in mind the fact that people may not read the disclosures, and add additional information within the posts to more completely describe the data was obtained, like in the Inferring Address from IP Address post.

5.5.6 Installing privacy tools can be undesirable

Despite the fact that interviewees were alarmed enough by posts to change their privacy settings on Facebook, interviewees were not enthusiastic about adopting the privacy protective tools suggested by Upside Down Facebook. For example, though several interviewees did not like that Facebook could infer their location through their IP address, many saw installing a VPN as either unnecessary or potentially risky. As Participant 1, a person who is hesitant to make changes to their computer’s

configurations notes, *“Don’t know what Mozilla VPN is. I’m afraid to click on lots of things on the computer. Open yourself up to more people.”* Similarly, participants seemed to have a desire to maintain their current computer configurations, or more broadly, their current approach to privacy management. After clicking on a button to get a more privacy-oriented browser, Participant 3 said, quite simply, *“It’s taking me to Mozilla Firefox. I don’t have Firefox on this computer.”* When looking at suggestions to use browser extensions, participants like Participant 4 shared similar concerns — and perhaps some dismissiveness — about using browser extensions that limit tracking: *“Extensions always break my computer—I’m not gonna. Firefox! Is that even still a thing?”*

5.5.7 Reflections: disturbing, fascinating, empowering, sometimes expected

Reflecting on their experiences using Upside Down Facebook, interviewees were generally provoked by seeing their data visualized. Many were generally surprised and “creeped out” by what they saw, were fascinated by seeing the data Facebook has on them, and felt the actions and data surfaced were useful.

Participant 1 commented, *“I don’t like the fact I’m being watched...I felt disturbed that [Facebook] goes to the depths they do to track the things you do.”* When asked about how she would describe how Facebook collects and uses her data at the end of the interview, Participant 3 used much stronger language. *“It’s exploitative. It looks like they’re looking at every aspect: your time, your location, your music, your contacts. They’re trying to sell every aspect of your person for money. They’re mining all of your who, what, when, where, why.”* Participant 5 said, *“Very aggressively. They literally try*

anything to create this advanced profile of yours in any way possible they can and they can get away with, and if the laws don't change, they will keep doing it."

Some participants also seemed to feel the experience of seeing their Facebook data visualized by Upside Down Facebook. For Participant 6, it was fascinating to learn about how one is implicated in Facebook's behavioral advertising practices, despite (or in spite of) the troubling questions it might raise. Participant 6 articulated experiencing many different emotions while using Upside Down Facebook: *"It's just interesting. All of it is surprising and a little bit shocking in kind of a click-baity way about, 'Ooo, I want to see more so I can say that's crazy! How do they know that?' Well there's this secondary reaction that's like, 'Oh this could be used for harm and this has, and I don't overall agree with this.' On a personal level it's like, 'Oh, interesting.' It's like a personality test. A little capsule of who I am, I guess."*

Interviewees with more knowledge of Facebook's behavioral advertising practices were not surprised by the extensiveness of Facebook's data collection and mining; however, the experience seemed to enhance feelings of being treated unfairly. As Participant 5 noted, *"I'm not really surprised because I kind of suspected that they do this. Yeah, it's just a little bit infuriating sometimes, especially that part I was talking about, where they showed all those sites I had been to even though I knew for sure I didn't have Facebook open. It's a combination of sometimes a bit surprised, a bit infuriated."*

Not all participants were surprised by the experience. Participant 4, who accepted behavioral advertising and found it useful said, *"I mean, it's not surprising, like*

'Oh my god.' It's all stuff you expect if you understand. Businesses, you know, find any way to get your ads across."

As Participant 3 read an example of a contact uploaded by Facebook, they remarked, *"[Upside Down Facebook] made me feel empowered. This was giving me a way to easily see what Facebook does and making clear some of the stuff behind it. Like this 3,768 advertisers uploaded my information. That was shocking to me."*

Participant 5 remarked about the usefulness of the information and liked that there were options that helped him take control: *"In general they know so much, but I didn't know you could prevent so many things. That's a mind blower for me. For the advertisers options, I didn't know that, so that's really helpful for me and also the information that's shown here for each of these different examples."* Participant 1 said, *"It's been helpful to see where they've led me down the wrong path, or where I've opened myself to tracking in some other shape or form."* Participant 4 remarked about the style of writing in the posts and disclosures, saying, *"It felt conversational, which was nice. It wasn't over-wordy, but it told you more. I think it gives you information without being technical or throwing legalese."*

5.5.8 Plans for future actions

Respondents had a wide range of plans after using Upside Down Facebook. A few questioned whether they wanted to continue using Facebook. Participant 1 said he intended to delete his Facebook account. *"I think there are other ways I can keep track of friends without relying on a service that is sharing my information"*, he remarked.

Participant 3 stated she would look into her browser settings, and felt less sure about whether she wanted to continue using Facebook. *“It emphasized to me that I’m doing a quid pro quo. I have to regularly ask myself, is it worth the connection [to others]? If it is, I should continue.”* Much like Participant 3, Participant 7 had a desire to limit Facebook while still being able to easily keep in touch with friends and family. *“I didn’t know about all these privacy tools”,* said Participant 7. *“I might honestly start using Firefox, I might look into it more and decide if that’s really how I would stop Facebook from watching all of these things. More than anything, I think I’ll notice the ads that I see off of Facebook more, because I don’t go on Facebook much, but I’ll notice those ads more and try to ignore them.”* Despite Participant 7 and 3’s critical comments regarding Facebook’s data collection practices throughout the interview, it appears Facebook’s ability to provide an individual easy access to information about wide-array of people in their social network creates powerful “lock-in” effects [5,13]. These benefits may still win the day, even among those who are critical of Facebook’s behavioral advertising practices.

Participant 5, who lives in Europe, is a citizen of a European Union member state, and studied Human-Computer Interaction, was the only participant who mentioned political advocacy. When asked if he planned to do anything to limit data collection and use, Participant 5 replied, *“Commenting in the European Parliament and voting for people who support [privacy rights] policies.”*

Participant 4 did not plan to do anything in addition to using Upside Down Facebook saying, *“There’s nothing on there I feel is compromising”,* indicating a comfort with institutions having information, so long as the data is not too “sensitive” or revealed to social contacts.

5.5.9 Resignation and a desire for systemic change

Participants, either as they used Upside Down Facebook or reflected on their experience, seemed to bring up frustrations with how limited their control over their data privacy feels on Facebook. Upon reflecting on her reaction to the Ads Interests post, Participant 3 lamented the lack of clear systemic solutions to the privacy violations she had become aware of on Upside Down Facebook: *“I hate this phrase, we’ve been watching you, and then you just get taken to Firefox to stop it. I don’t know how that’s going to help. How would that help to do something on Firefox if that’s a Facebook issue?”* Participant 7 was frustrated by the uncertainty of whether changing settings on Facebook would have any lasting effect. *“I’m not sure if the things that I unchecked will keep Facebook from collecting information in the future or if this is going to be something that I have to maintain.”*

Participant 5 felt that the Upside Down Facebook experience could benefit from guiding people to more structural changes. *“What I maybe would like to see is how I can change this behavior in the appropriate channel, but also direct me towards people who generally advocate for privacy rights, more information people can read through. That’s for me, personally, stuff I find interesting to read through.”*

5.5.91 Difficulty of file sorting and upload

There were difficulties caused by the file upload process. The "Information About You" is available as a .zip file with sub-folders of .json files, and the prototype was not built to handle unzipping. For a few interviewees, the task of unzipping files and pulling out certain files within subfolders was difficult, as this was a task they had not done before on their computers. Future versions of the Upside Down Facebook site will need to be able to handle .zip file uploads so people can use the site more easily.

Though the prototype was tested thoroughly with "Information About You" data from two different users, unforeseen variations in .json file structures caused the program to throw errors. To allow interviewees to engage with the prototype, I tested all data with the prototype before interviews and altered the program accordingly to make sure it handled their data properly. For one participant from the Netherlands, there were several errors likely caused by a different file structure and the fact that dictionary keys were written in Dutch. Future versions of Upside Down Facebook will need to account for differences in the structure of the data and incorporate more extensive handling of errors and exceptions.

5.5.92 Desired Features

Participants had interesting suggestions for what they would like to see from future versions of Upside Down Facebook. Three participants had a desire to share their Upside Down Facebook profiles and posts on Facebook, and have their friends upload their data, features that were put forth in earlier concepts, but ultimately were not prioritized due to limitations on time. Many participants wanted to see even more data, especially as it related to learning about what advertisers had uploaded their information and what ads interests they had. Participant 3 was interested in receiving constant updates from Upside Down Facebook. *“If I was to have this as an app on my computer, I would want it to say ‘Hey, there’s new information about how Facebook is using you, do you want to look at that?’ To remind me that I need to pay attention to that, it would say ‘click here to see’ and ‘stop this now.’”* Participant 5 suggested adding ways to help people get involved in advocacy for stronger data privacy laws.

Chapter VI

Discussion

6.1 Summary of Findings

In this section, I provide a summary of findings from this research, dividing these findings into findings related to the conceptual design process and preliminary analysis of the evaluation study, linking back to the core questions I pose in Chapter I. I found that there is value in bringing conceptual art approaches in dialogue with privacy research to raise awareness of behavioral advertising, so long as approaches are rooted in data available, strong visual metaphor, and the literature. I found that participants who experienced Upside Down Facebook reacted emotionally to these conceptual strategies, but refinement of disclosures and actions available to individuals is needed to improve the experience.

6.1.1 Conceptual Design Process Findings

In this thesis, I use social privacy framing to clarify institutional privacy data flows, deliberately pushing the limits of user comfort with specific ad disclosures, and taking inspiration from data visualization approaches by contemporary artists. I found that a conceptual design process that incorporates inspirations from art and human-computer interaction research opened up fruitful approaches to design of

privacy tools and disclosures. Engaging with conceptual art helped me identify unexpected visual strategies that I would not have otherwise discovered if I was solely using examples of privacy tools from human-computer interaction research.

In terms of the design process itself, I explored data available from Facebook's "Information About You" can be transformed and made legible through visual metaphors, borrowing from familiar user interfaces, film, museums, and physical media like receipts, finding that the most successful prototypes are both richly interactive and able to serve as effective metaphors for behavioral advertising systems and data flows. Starting from a detailed understanding of available data and making choices based on privacy research provided a foundation for this process.

I also discovered that artistic inspirations and conceptual approaches to art may help privacy researchers address problems with the design of data disclosures and the design of privacy nudging tools. In the case of Upside Down Facebook, appropriation of the Facebook interface provided a new way to display behavioral advertising-related data, which may help individuals see that social privacy and institutional privacy concerns are one in the same on Facebook. Additionally, this approach to privacy tool design alerted me to opportunities I had not anticipated; for example, I used Eslami et al.'s finding that users do not prefer advertising algorithm disclosures that are too specific as inspiration to write disclosures that deliberately "creeped out" people and attempt to raise their awareness [12].

6.1.2 Findings from Preliminary Evaluation Study

In the evaluation study, I found that Upside Down Facebook's use of a Facebook-like interface to display behavioral advertising related data, and personification of Facebook can surprise and even upset people. I found that Upside Down Facebook led participants' to become interested in behavioral advertising works on Facebook, and explore disclosures on Facebook and the Upside Down Facebook interface about data use and collection. However, not all participants were offended or provoked by Upside Down Facebook. A person's reaction to the experience may depend on multiple factors including a person's existing comfort with behavioral advertising, whether they view the data as a social or institutional privacy threat, and whether they felt they had explicitly provided the information to Facebook, to name a few.

In all cases, participants in the study were interested in changing their privacy preferences for advertising-related tracking and uploaded data on Facebook, but sometimes got confused by Facebook's description of privacy settings. Participants generally met actions that required installing a privacy browser or tool with skepticism, and saw them as undesirable. Participants liked that Upside Down Facebook surfaced data they were not aware of and liked the conversational format and interface. However, many lamented the fact that they had to choose between keeping up with friends and family on Facebook and feeling greater privacy, and seemed to indicate they would still use the platform. Companies like Facebook use these lock-in effects to keep their customer base, but clearly these effects produce customer dissatisfaction that make many feel they want to discontinue the relationship [5,13]. Participants also detailed a

number of future actions they planned to take; however, the evaluation study was not designed to measure future uptake of privacy tools or other actions. Participants also reported wanting to see more types of data, being able to share the experience with others, and having Upside Down Facebook function as a nudging-style tool that informs them of changes to their data privacy situation.

The evaluation study also uncovered bugs and exceptions that were not accounted for in the data processing code, as well as a challenging data upload process for those less comfortable with technology.

6.2 Implications

In this section, I detail implications of this research for design practice and future directions for privacy research.

6.2.1 Design Practice

This thesis details a conceptual design process for creating a privacy awareness experience that engages with prior work and conceptual approaches from privacy-related art. Using Facebook as a test bed, this design process offers new strategies for privacy researchers to engage people emotionally in data privacy issues and the topic of behavioral advertising, surface information in an engaging and accessible way, and help people transcend limitations in processing complex data disclosures. The account of my conceptual design process also shows how key

findings, like differences in comprehension of social versus institutional privacy, can be surfaced from the privacy literature and be transformed into a visual instantiation that elicits an emotional response and triggers action. This thesis also offers artists working in privacy and technology connections to human-computer interaction research in privacy. This connection may show artists new ways to integrate privacy research into their practice, from motivating the creation of artwork to helping artists imagine different types of change and action an artwork can inspire.

6.2.2 Research on Behavioral Advertising and Privacy Tools

This thesis centers digital resignation as a theoretical framework for understanding individual perspectives on corporate tracking and data mining, while also integrating perspectives from behavioral economics centering privacy in terms of human decision making and available choice architectures [2,11]. Though this research uses both theoretical frameworks as grounding, initial findings from the evaluation suggest that breaking through digital resignation is a crucial first step before a privacy tool can convince users to take action to protect their privacy.

To reach the digitally resigned individual, this research suggests artistic provocation as a framework for the design of disclosures and privacy tools. Early findings from the evaluation study of Upside Down Facebook suggests this approach may be a fruitful new perspective for privacy researchers to draw upon when thinking about public engagement with privacy issues. Centering artistic provocation as a design approach suggests focusing usable privacy research on making data flows and systems legible and provoking people to think critically about their involvement in them. Though

further research must be done to test this design approach and the Upside Down Facebook concept, a focus on illustrating systems and digital resignation may also suggest a necessity to shift from optimizing individual privacy outcomes to connecting individuals to opportunities to enact privacy change socially, politically, and legally.

6.3 Future Work

In this section, I outline opportunities for future directions for this thesis project. I describe future directions for the development and testing of Upside Down Facebook, and speculate about how the conceptual approach of artistic provocation can be applied to designing privacy tools and experiences related to other technological services and platforms.

6.3.1 Further Developing Upside Down Facebook

Upside Down Facebook was built to allow for initial testing of the concept, and further development must be done to prepare it for wider release. Future work on Upside Down Facebook must involve testing the program with more data and accounting for as many differences between individual data as possible. Secondly, the file upload process must accept .zip files, which would eliminate the need for people to extract files manually. Improving the efficiency of the data processing program will help prepare Upside Down Facebook for a wider audience. As there will not be a moderator present as visitors access the site, future versions of Upside Down Facebook must

include on-boarding information that discloses the privacy protections built into Upside Down Facebook and walks participants through the Facebook data download and upload process.

Upside Down Facebook can better accommodate and educate other users by writing posts that provide more information about the data used, and do not rely upon people to open the disclosure pop-up windows. Early improvements can be made to posts that were not specific enough about the data disclosed, like the Advertiser Contact Uploads post and the Location Inferred from IP Address post. Disclosures can be improved through testing interactions and designs that are easier for people to discover and offer shorter descriptions; for example, a person might hover over an icon to quickly see information. Additionally, more specific guidance on where a user must go to change a specific advertising preference on Facebook before a user follows a link to Facebook settings may improve the experience. This may help prevent users from getting lost in Facebook's confusing settings, as well as preparing them for how Facebook discusses privacy settings.

Further evaluation of the prototype could allow for better validation of the impact of Upside Down Facebook. Hypothetically, a study could compare two conditions: using Upside Down Facebook and viewing Facebook's "Information About You" pages on Facebook's website. Such a study may provide additional insight about whether Upside Down Facebook makes users more aware of data collection and use for behavioral advertising, understand how it could change their sentiments compared to Facebook's interface, and assess to what degree Upside Down Facebook users end up taking privacy actions. To this point, there may be value in studying what privacy decisions

participants make days or weeks after using either tool, seeing if they have adopted any new privacy tools, made other changes to settings on Facebook, or even deleted their Facebook accounts.

6.3.2 Creating More Privacy Provocations

This thesis also suggests possibilities to bring its conceptual design approaches to bear on other behavioral advertising platforms and data privacy scenarios. Future practitioners might use artistic provocation to create experiences that teach people about behavioral advertising in product ecosystems like the Google Docs Suite, or make the persistent data collection practices of home assistants like Amazon Echo more intelligible. What if you could access a Google Drive folder full of vivid slideshows about who Google thinks you are and what it thinks of your writing? How would a person feel if Alexa told them what Amazon products they might like based on the arguments they have been having with their spouse? There are numerous directions a privacy researcher or artist could take the approaches to data transformation and applications of privacy research and artistic perspectives outlined in this research.

Chapter VII

Conclusion

7.1 Revisiting Art as Privacy Provocation

There are similarities between how participants in the initial evaluation study for Upside Down Facebook experienced the work, and responses people had to “The Social Dilemma” (2020) documentary on Twitter. The experience study participants had was unsettling. It caused them to question their relationship with Facebook and their understanding of what occurs on the platform. Many of the participants made changes or said they planned to change privacy settings, install privacy tools, or even delete Facebook. Though this experience seemed to have an effect on people’s awareness, it is still worth asking whether these participants will continue to use Facebook. Will they feel uneasy when they log-in and comment on a friend’s post? What will they really do with the knowledge they have about Facebook’s behavioral advertising practices?

This thesis’s goal was to bridge the gap between awareness and action in privacy art and tools, integrating actions within an experience of interacting with an artwork. In striving to promote both awareness and action through artistic means, Upside Down Facebook ended up operating in a space between both art and design, re-raising a crucial question: how do we assess whether Upside Down Facebook was successful or not?

In the words of digital artist Marc Downie, the difference between art and design is the fact that “design is done for you; art is done to you.” Viewed as a piece of design, Upside Down Facebook requires improvements to its user interface, disclosures, and more desirable privacy actions in order to be better “for” people. If Upside Down Facebook is viewed as art, it becomes more complicated to evaluate its impact and success. Perhaps success is the fact that a participant might still be thinking about the work, talking about it, and imagining what more must be done. Perhaps success is a reader of this thesis seeing how art and research can work as partners in creating social change, and deciding to use these strategies in their own work.

7.2 Summary

It is difficult for people to understand how behavioral advertising impacts their privacy, how concerned they should be, and what they should do about it. Through designing, developing, and testing a prototype for Upside Down Facebook, I show how conceptual design approaches from conceptual art can be put in conversation with insights from privacy research to address this problem. I use Upside Down Facebook to re-frame institutional privacy issues as social privacy issues through deliberately “creepy” posts about data made by a personified version of Facebook. The results of this preliminary evaluation show this approach has the potential to create new forms of privacy tools and experiences that can elicit strong emotional reactions that lead people to engage with how behavioral advertising businesses collect and use their personal data. This thesis proposes a new perspective on privacy research that centers an individual’s digital resignation as a core problem, one that can be effectively addressed through acts of artistic provocation.

Appendix
Evaluation Study Materials

Assessing the Impact of Visualizing Facebook Data on User Perceptions of Privacy

Principal Investigator: Joe Soonthornsawad, Master's Student, University of Michigan School of Information

Faculty Advisor: Florian Schaub, Assistant Professor, University of Michigan School of Information

* Required

1. Email address *

Welcome!

Thank you for your interest in this study. If you are interested in participating, please take the time to look over details about the study and how you'll be involved.

Skip to section 3 (What is this study?)

What is this study?

You are invited to participate in a research study about how people understand how Facebook uses their data.

If you agree to be part of the research study, you will be asked to participate in an interview on Zoom in which your screen and video feed will be shared and recorded. This interview will involve downloading your data from Facebook, viewing your Facebook data on a website, talking about what you see as you look at and use the website, and finally, talking about your experiences with the website and Facebook afterwards.

Benefits, risks, compensation

Benefits of the research

- Learn more about the data Facebook collects on you
- Learn more about how Facebook uses the data it collects about you
- Opportunity to reflect on your experiences using Facebook

Risks and discomforts

- Having your video and screen recorded while you share:
 - Personal Facebook data with the interviewer
 - Personal reactions to seeing your data
 - Information about your perceptions of Facebook and data privacy with the interviewer

Compensation

- No compensation is provided

Participation is completely voluntary

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer any interview question, share your screen, share visualizations of your Facebook data, or continue with the interview for any reason.

We will protect the confidentiality of your research records

1. During and after this interview, all identifying information will be removed or obscured during data analysis and use in the final write up and presentation of this research.

2. Your Facebook data will be uploaded to the website run by the researcher and processed on a secure server. This data will be stored temporarily in the server's memory in order to display visualizations on your web browser. Once you leave this webpage, this data will no longer be stored in the server's memory; the only record of your data kept by the researcher will be contained within the interview screen recordings.

3. After this interview, personally identifying information will be edited out of video recordings.

The original raw video recordings of the interview will be deleted.

Transcripts will be produced for this interview; identifying information will be removed from all interview transcripts.

4. All records related to the interview will be kept confidential and stored on University of Michigan's secure cloud services certified for human subjects research data.

5. Personally identifying information will not be included in any write-up or presentation of this study. This will be accomplished through the use of pseudonyms, and reference to reactions to seeing general categories of data rather than specific personal data that may identify you.

6. You have the right to request the final write-up of this study.

Information collected in this project may be shared with other researchers, but we will not share any information that could identify you.

Contact us if you have any questions

If you have questions about this research study, please contact Joe Soonthornsawad, joesoon@umich.edu or faculty advisor (Florian Schaub, fschaub@umich.edu).

University of Michigan Institutional Review Board Exemption

As part of their review, the University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is no more than minimal risk and exempt from on-going IRB oversight.

2. By clicking I agree, you indicate you consent to the benefits, risks, compensation terms, and confidentiality protections detailed in this document. *

Mark only one oval.

- I agree
 I do not agree

Information about you

3. What is your name? *

4. What is your age?

5. What is your highest level of education?

Mark only one oval.

- High school diploma
 Associate's degree
 Bachelor's degree
 Master's degree / graduate degree
 Doctorate
 Other: _____

6. Has your education included studies in computer science or a technology-related subject?

Mark only one oval.

Yes

No

7. Have you ever worked in the technology industry?

Mark only one oval.

Yes

No

8. How comfortable do you feel with using technology?

Mark only one oval.

1 2 3 4 5

Not at all comfortable Very comfortable

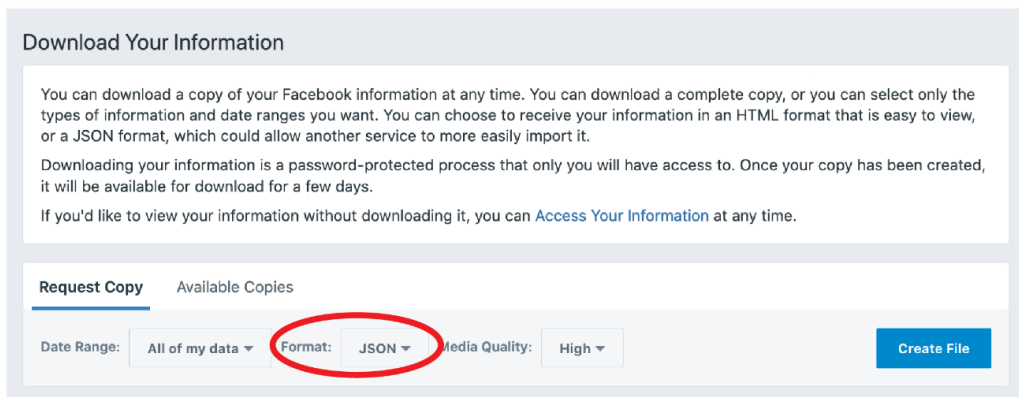
9. Please list a few times you'd be free for an interview this month.

Thank you! We'll reach out to schedule a time with you.

How to Download Your Facebook Data

Your privacy is our priority. Your information will be stored securely and used only for the purposes of this research project. Personally identifying information will not be shared with anyone at any time.

1. Log in to Facebook.
2. Go to the **Download Your Information** page: https://www.facebook.com/dyi/?referrer=yfi_settings
3. Once you're on the **Download Your Information** page, change the **Format** to JSON by clicking the dropdown.



Download Your Information

You can download a copy of your Facebook information at any time. You can download a complete copy, or you can select only the types of information and date ranges you want. You can choose to receive your information in an HTML format that is easy to view, or a JSON format, which could allow another service to more easily import it.

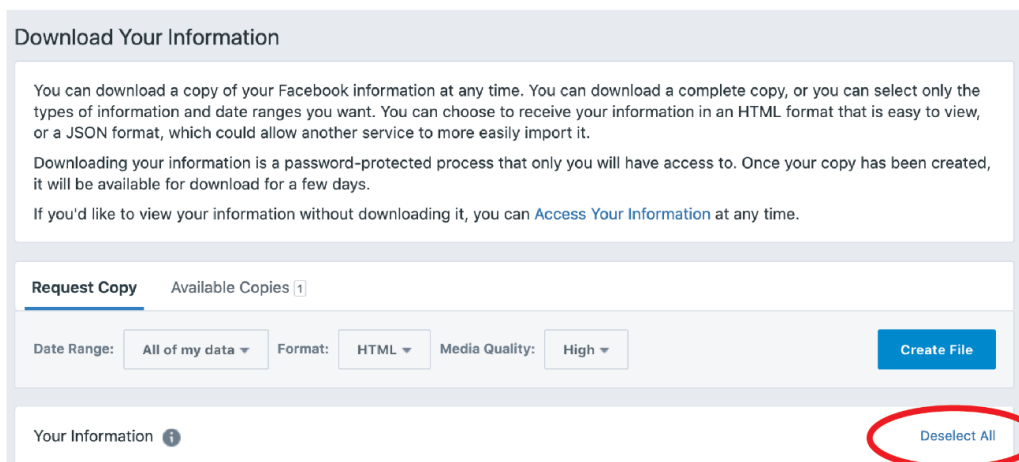
Downloading your information is a password-protected process that only you will have access to. Once your copy has been created, it will be available for download for a few days.

If you'd like to view your information without downloading it, you can [Access Your Information](#) at any time.

Request Copy Available Copies

Date Range: All of my data ▼ **Format: JSON ▼** Media Quality: High ▼ [Create File](#)

4. Click **Deselect All**.



Download Your Information

You can download a copy of your Facebook information at any time. You can download a complete copy, or you can select only the types of information and date ranges you want. You can choose to receive your information in an HTML format that is easy to view, or a JSON format, which could allow another service to more easily import it.

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If you'd like to view your information without downloading it, you can [Access Your Information](#) at any time.

Request Copy Available Copies 1

Date Range: All of my data ▼ Format: HTML ▼ Media Quality: High ▼ [Create File](#)

Your Information ⓘ [Deselect All](#)

5. Scroll to **Information About You**. Try not to look too closely, and check all the boxes. Scroll back up.

Information About You ⓘ

- Ads and Businesses**
Ad topics that are relevant to you, advertisers who have collected information directly from you, information you've submitted to advertisers and your interactions with businesses and organizations you visit off of Facebook.
- Search History**
A history of your searches on Facebook.
- Location**
Information related to your location.
- About You**
Information associated with your Facebook account.
- Security and Login Information**
A history of your logins, logouts, periods of time that you've been active on Facebook and the devices you use to access Facebook.
- Your Topics**
A collection of topics determined by your activity on Facebook that is used to create recommendations for you in different areas of Facebook such as News Feed, News and Watch.
- Voice Recording and Transcription**
A history of your voice recording and transcription on Facebook.

6. Click **Create File**.

Download Your Information

You can download a copy of your Facebook information at any time. You can download a complete copy, or you can select only the types of information and date ranges you want. You can choose to receive your information in an HTML format that is easy to view, or a JSON format, which could allow another service to more easily import it.

Downloading your information is a password-protected process that only you will have access to. Once your copy has been created, it will be available for download for a few days.

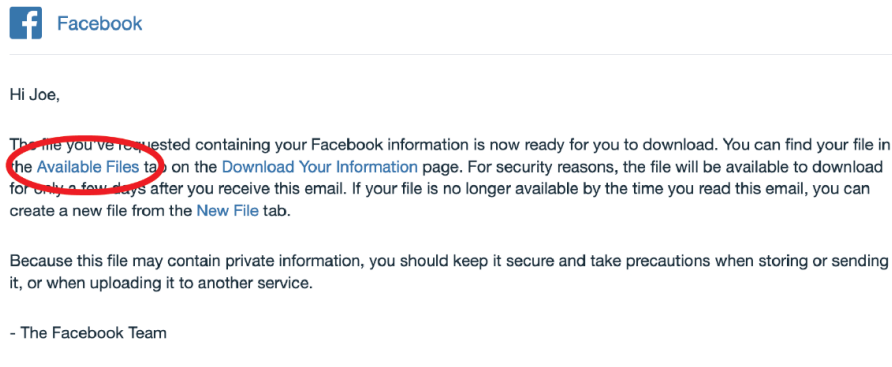
If you'd like to view your information without downloading it, you can [Access Your Information](#) at any time.

Request Copy Available Copies

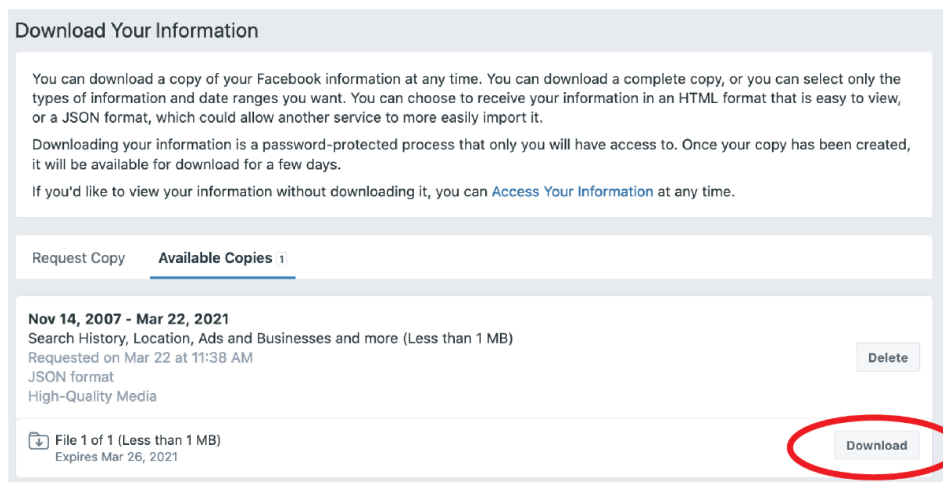
Date Range: Format: Media Quality:

7. You will get an email from Facebook confirming your request. **Wait for a second email in a few minutes.**

8. In the **second email**, click the **Available Files** link to download your information.



9. Your file will be under the **Available Copies** tab. Click download.



10. When you've downloaded the file, attach it in an email to joesoon@umich.edu. I will use it to check the tool, and will send back a copy you'll upload during the interview. Thanks!

User Study/Interview Protocol

Introduction

Hi, thank you again for being a part of this study. As you know this, study's goal is to learn about how data visualization influences how people see the way Facebook collects their data, and today you're going to see your own.

Today, you'll be (downloading your data from Facebook), viewing your Facebook data on a website, talking about what you see as you look at and use the website, and finally, we'll talk about your experience using the website afterwards.

I want to reassure you that your data will be kept private.

(If not downloaded: You'll download your Facebook data to your computer first.)

You'll be uploading the Facebook data you've downloaded and a picture. When you upload the Facebook data to the website, it'll be sent to a secure server to be processed and visualized. This data will only be stored temporarily to allow you to use it on the website. After you leave the website, the data is automatically removed. I'll also delete the picture you upload from the server when we're done.

I mentioned this in the form, but part of this project means our interview on Zoom is going to be recorded. Just so you know, all recordings and transcripts from today will be edited to remove identifying information, and original video recordings will be deleted. Of course, nothing that identifies you will be shared with anyone.

Do you have any questions or concerns about any of this?

Can we start recording?

Press record, but no screen recording

If downloaded already,

By the way, have you looked at this data before?

If not...

1. Did you know that Facebook collects and uses your data?

- a. If so, what do you know about it?
- b. If so, how do you feel about it?
- c. If so, do you know about any privacy options? Which ones?
- d. If so, can you remember any actions you've taken to limit data collection and use? Why? Why not?

Unpacking the data

Now I'll ask you webpage, upload the data, and see your data visualized. Again, the website will open your data, send it to the server to be processed and visualized, but it won't be stored after you leave the website today. No information about you will be put at risk.

Start screen recording

Uploading the data

Please go ahead and open your browser and the webpage.

Go to: <https://soonthoj.pythonanywhere.com>

Share username and password

username: soonthoj

Password: Cx19m

There is a select files button in the middle of the page. Please click on this button and select all of the files from the folder I sent to you.

Also, choose a picture, like one you'd use as a profile picture.

Once you press submit, you will see a new webpage pop up with your data visualized.

Check to see if meeting is being recorded

Think aloud

Now, I'm going to ask you to think-aloud again while you look at this webpage. So just as a reminder, you'll just tell me what you think, what you're doing, what you're noticing. Imagine it's like you're narrating using the website.

Encourage them to explore the information button if they have looked at all data, but haven't opened this yet.

Wait until it seems they are not saying anything new about the experience

Encourage them to explore the information button if they have looked at all data, but haven't opened this yet.

Data type	Reaction notes	If more info clicked, reactions?

Interview questions

When they are finished:

Ok, thanks. Let's talk a little more about this.

Reaction to use of website

1. What did you think of this experience?

Use notes from think aloud observations to generate ideas for follow-ups

Did you linger on any post in particular?

Did you react to anything?

2. How did you feel when you were using this?

3. Did anything surprise you?

Probes:

What surprised you most?

Any specific types of data that surprised you?

- Why do you think Facebook wants to know this?
- How do you think Facebook got this information?
- How do you think they use this data?
- Did you know about this before?
- How do you feel about this?
- Do you want to do something about this?

4. What was kind of expected?

5. Questions about Data use

Follow-up with certain cards displayed that were not mentioned earlier

1. How do you think Facebook got this information?

2. How do you think they use this data

3. Did you know about this before?

4. How do you feel about this?

5. Do you want to do something about this?

Usability and Experience

1. What did you think of the information behind the cards?
 - a. Did they help you understand...
 - i. ...what data was collected?
 - ii. ...Why it was collected?
 - iii. ...What you can do?
1. Were there posts that were more surprising? Less?
2. Were there any posts that were confusing?

Did the website change their attitudes?

6. Now that you've used the site, how would you describe how Facebook collects and uses your data?
 - a. What do you know about it?
 - i. How does Facebook get your data?
 - ii. How do you think Facebook uses your data?
 1. How do you think Facebook determines and utilizes your interests?
 - b. How do you feel about it?
 - c. What are your privacy options?
 - d. Do you plan to do anything to limit data collection and use?
 - i. Which actions do you think you'll take? Why?
 - ii. Which actions do you think you will not take? Why?

Overall assessment

1. Is this website
If they don't know how to answer...
 - a. Did you find it to be informative?
Very.
 - b. Useful?
 - c. Surprising?
2. Any features you'd like to see?
3. What's your overall take away from this?
 - a. Did you find it informative? Why?
 - b. Useful? Why?
 - c. Surprising? Why?
4. Any other thoughts?

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