

# **Data Scrambler**

## **Project Part 1: Proposal**

### **Team 8**

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## **Abstract**

By: A//

As large tech companies like Google and Facebook continue to dominate the Internet through running targeted ads, privacy becomes a growing concern. To address this issue, Team 8 will build a browser extension that randomizes user interests to allow for complete anonymity. The team plans to use HTML, CSS and JavaScript to write the extension which will utilize the concept of a rotating library of user profiles and a whitelist of recommendations approved by the user. The advantage this software has over competitors is the utilization of a blockchain network which will disassociate and distribute user browsing habits with other users over a peer-to-peer network. It will also increase the users ability to actively mitigate and control their preferences with forced recommendations. With the help of Jay, Maxwell, and Nathan, Team 8 aims to release this product on the Google Chrome Web Store for general use of the public.

## **Project Description**

By: *Sarah Cooper, Matthew Deagen, Leo Galang*

With the rapid advancement of technology in the past two decades, privacy has gone unregulated. Companies such as Google and Facebook use personal data to build individual profiles that let advertisers target groups based on their interests. Although users may agree to this when they check off the terms and conditions, many are largely unaware of this practice. To remediate this issue, Team 8 will create a browser extension that randomizes user preferences/interests in an effort to promote privacy. The goal of this project is to allow users to be anonymous and prevent their data from being sold to advertisers. If corporations could no longer build individual profiles, advertisers would be forced to find another way to target users. The intended audience for Team 8's extension are users looking to remain anonymous on the Internet.

Team 8's project will collect preferences and create a log in the background. When the extension is used, it will randomly select preferences from other logs to form an anonymous profile. Team 8's extension will also allow users to be able to force recommendations. This will provide the users the ability to actively mitigate certain preferences on their fake profile. This software will be implemented as an extension on the Google Chrome Web Store.

Team 8's project will bring some significant benefits to its users. Through its data pollution algorithm, a user's internet habits are protected from the types of data collection done by advertising companies or Internet Service Providers (ISPs). This ensures that the user's data is more private. Additionally, through the program's whitelist functionality, the user can force specific recommendations being made, only allowing advertisers to see a small segment of the users browsing habits, further enhancing the user's privacy. The extension will include a rotating library of user profiles, which allows each user to build a fake profile based on the browsing habits of other users, further confusing advertising trackers. Since this project will be implemented as a Chrome extension, anyone with the chrome browser can download and use it.

One of the most exciting parts about this project is the opportunity to improve the online privacy of its users. However, Chrome extensions currently are very limited on mobile devices, especially those that are running iOS. This project could be further developed to become its own browsing app. This app would allow users to visit their favorite online sites on a mobile-friendly interface while still incorporating the privacy protecting features of this extension. Since more companies are moving towards creating progressive web apps, this could become a viable solution in the future.

Although members of the team have some experience with languages such as HTML, CSS, and JavaScript, none of us have built a chrome extension before. This could introduce a learning curve. Additionally, incorporating a blockchain network and fake profile generation will add a lot of complexity to the project, however nothing that is infeasible. One obstacle could be trying to persuade potential users why this is better than other solutions such as VPN services.

Team 8 aims to use the Google Chrome Web Store as our platform for the browser extension to provide service for Google Chrome users to reduce website tracking and targeted advertisements. This extension will require HTML, CSS and JavaScript as the main languages as well as the API for chrome applications. The team plans on using tools such as StackOverflow for issues they may run into, an interpreter for JavaScript as well as any application each member decided to use for coding, e.g., VScode, Sublime, Vim, etc. All members will be using either a laptop or desktop to complete these extensions. Furthermore, the extension will only be available for desktops or laptops.

Team 8's members include Sarah Cooper, Matthew Deagen, Leo Galang and Marc Montesa. All members are Computer Science Majors and Cybersecurity Minors. Most of the members have worked on outside of school computer science projects or jobs as well as have an understanding in one or more languages not taught in school. This will help us when trying to learn HTML, CSS,

and JavaScript as well as have a better understanding of working on coding projects with team members. We all plan to work together to ensure the best product and have thus assigned general roles for each person. Marc is the meeting leader, Sarah is the minutes keeper, Leo is the facilitator, and Matthew is the resource and problem coordinator. The extension will have two different sections that will be implemented in two different ways which will later be combined to produce the final product. Team 8 plans to delegate two team members to one method and two to the second method, however this is not a set position. The positions are to ensure a minimum of two members working on either method at any given time. The first implementation will be the rotating advertisement and recommendations starting with Marc and Sarah. The second implementation is a forced recommendation idea which will start with Leo and Matthew.

Our current advisors are Jay, Maxwell, and Nathan Thom who all have computer science degrees and work in the field of computer science or cybersecurity. Two of them have taken this course before, including our main advisor, Jay, who is the IT specialist for the Computer Science Department and currently working on getting his Master's in Cybersecurity. Maxwell works for NVEnergy as a software engineer and Nathan works as a Graduate Research Assistant in the Machine Perception Laboratory at UNR under Dr. Emily Hand. All three advisors offer a range of expertise from cybersecurity to software engineer to machine learning.

This project will help Team 8's professional growth as it will enhance our ability to work on a team, communicate efficiently and time management with a project that can be later shown off to employers.

## **Market Potential**

*By: Marc Montesa*

The market analysis for the software demonstrates a push to produce the application as a free web extension rather than a commercially licensed product. While it is considered free the extension will not be open-sourced due to a potential risk of advertisement companies being able to find backdoors in the code. Considering this, the extension would be marketed in compliance with the Google Chrome Web Store publishing policies. A survey by RSA Security LLC. shows an increase in user interest and concern for data privacy, as well as a decrease in user comfort for data sharing, since 2017, (RSA Security, journal).

A competitive analysis shows that similar products have existed in the past, including two freeware applications, both of which are implemented in similar ways. The first is a general "ISP Data Pollution" software pushed onto Github. This software is a web crawler application that utilizes user bandwidth and pollutes his/her overall browsing habits with random, yet realistic,

web traffic ("ISP Data Pollution, website). The second software is an extension called "AdNauseam" which provides a similar service to the Github software; however, specifically focused on user advertisements. The idea of this web crawler is built on top of an existing adblock service called uBlock. Here, the extension quietly clicks advertisements initially blocked by uBlock and sends out that information to advertisers in an effort to obfuscate user interests (AdNauseam, website). Otherwise, additional indirect competitors include various freeware adblock services, such as uBlock above, as well as anti-virus software companies that tend to compile a lot of the services listed above into a subscription-based software suite.

Over team 8's planning process, one of the biggest concerns brought forward was if user preferences can still be inferred based on a user's overall browsing habits, and whether or not that will inevitably make the previously stated software irrelevant over time. The advantage this software has over competitors is the utilization of a blockchain network to create a rotating user profile. This essentially will disassociate and distribute user browsing habits with other users over a peer-to-peer network, potentially creating "fabricated user" out of mix-and-matched information on this network. In addition to this, the implementation of a whitelist to allow for specific user preferences differs from other companies' software that act as a general data obfuscator, versus an active mitigation against data collection.

### **Time Worked on Project Concept**

By: All

For this part of the project we split the Project description between Sarah, Matthew and Leo and Marc worked on the market potential. Leo worked on the main goals and objectives of our project, the main functionality and characteristics, and the intended audience. Leo spent about an hour and a half on this section. Matthew worked for a little over an hour on the key goals for usability, potential for future development, and the challenges and obstacles we might face. Sarah worked on the technological description, the team overview, and advisory overview for about two hours. Marc worked on the market analysis for roughly an hour and a half. We all worked on the note on how this project will help us grow.

### **Works Cited**

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