UX at Tor: an open approach
0. Intro

1. Methodology

2. In Practice: Tor Browser 8 UX Improvements

3. How to Contribute
Ethical Design
Technology that respects human rights is decentralised, peer-to-peer, zero-knowledge, end-to-end encrypted, free and open source, interoperable, accessible, and sustainable. It respects and protects your civil liberties, reduces inequality, and benefits democracy.

Technology that respects human effort is functional, convenient, and reliable. It is thoughtful and accommodating; not arrogant or demanding. It understands that you might be distracted or differently-abled. It respects the limited time you have on this planet.

Technology that respects human experience is beautiful, magical, and delightful. It just works. It's intuitive. It's invisible. It recedes into the background of your life. It gives you joy. It empowers you with superpowers. It puts a smile on your face and makes your life better.
Technology that respects
Open Design
Open Design
Open Design
Validate
DIVERSIDAD
ES
IMPACTO

DIVERSIDAD
ES
IMPACTO
Academic Research
Peeling the Onion’s User Experience Layer: Examining Naturalistic Use of the Tor Browser

Kevin Gallagher
New York University
kevin.gallagher@nyu.edu

Sameer Patil
Indiana University Bloomington
sameer@indiana.edu

Brendan Dolan-Gavitt
New York University
dolan@cs.nyu.edu

Nasir Memon
New York University
nmonen@nyu.edu

Abstract

The strength of an anonymity system depends on the number of users. Therefore, User Experience (UX) and usability of anonymity mechanisms are of critical importance to boost adoption and use. In this paper, we carried out a study with 18 non-expert participants to investigate how users experience routine Web browsing when using the Tor Browser, focusing particularly on encountered problems and frustrations. Using a mixed-methods quantitative and qualitative approach to study one week of naturalistic use of the Tor Browser, we uncovered a variety of UX issues, such as broken Web sites, a mixed-methods quantitative and qualitative approach to study one week of naturalistic use of the Tor Browser, we uncovered a variety of UX issues, such as broken Web sites, latency, lack of common browsing conveniences, disorienting treatment of Tor traffic, insecure verification, operational opacity, etc. We applied this insight to suggest a number of UX improvements that could mitigate the issues and reduce frustration when using the Tor Browser.

CCS CONCEPTS
• Security and privacy → Usability in security and privacy.

KEYWORDS
privacy • user frustration when using the Tor Browser.

1 INTRODUCTION

Anonymity plays a vital role in modern societies. Using the protection cloak of anonymity, individuals can participate in the public domain of the Internet with less risk of unwanted attention, prosecution, or prejudice from governments and corporations. People are able to contact activists and perform research on subjects of interest, whom, all other things being equal, are able to work, help, and communicate, and citizens are able to maintain privacy and express ideas without fear. Anonymity helps people protect their rights or keep themselves safe from embarrassment, physical danger, or in some cases, even death. Achieving anonymity in the Internet age is becoming increasingly difficult due to the prevalence of tracking mechanisms and metadata collection and requires more advanced tools [21]. One such tool is Tor (T), an overlay network that provides metadata-obfuscating by routing Internet traffic through randomly selected, volunteer-run relays, with each relay providing a layer of encryption.

The strength of an anonymity system such as Tor depends on the number of indistinguishable users, known as anonymity set size. In an effort to strengthen the network and expand the set of indistinguishable Tor users, the Tor Project provides the Tor Browser that makes users less distinguishable by combining some application-layer tunneling techniques, such as domain-oblivious strings, or feature fingerprinting mechanisms. Since the extent of anonymity is dependent on the number of indistinguishable users, it is important to understand the UX associated with Tor. This paper presents results from a recent study of 18 participants on 15 Tor users and the quality of anonymity provided by the Tor Network. Further, the more diverse the Tor user set is, the less an adversary can learn about any individual user. These anonymity mechanisms may be enough to tolerate UX frustrations and inconveniences and may still be willing to use the Tor Browser if the UX is improved, thus diversifying the Tor user base.

Yet, there has been little research on the Tor UX Browser. Existing work related to the topic is simplistic [7]; surveys in focus [28] or limited to lab settings and specific tasks [10, 31], thus limiting the utility and impact of the findings. We do not fill this gap in the following research questions:

How do users experience routine Web browsing when using the Tor Browser?

Introduction

Through many philosophical theories of privacy have been proposed, there has been little focus on everyday conceptions of privacy. A formal key theory of privacy could provide a pathway for a set of privacy metaphors that model behavior of everyday people. We performed an exploratory analysis of a set of 36 open-ended drawings solicited from both children and adults responding to the prompt, “What does privacy mean to you?” We explored both privacy experts (i.e., privacy scholars, students, and professionals) and non-experts concepts and visualize privacy with the hope of informing informed communication, privacy tool design, and policy-making. Our process of qualitatively coding is detailed at length, and constructs a productive contribution to privacy policy and allowed for defining a framework to codify the visual language of privacy.

Privacy scholars have wrestled with the challenge of defining and conceptualizing privacy. Drama of theories and models of privacy have been formed, from the seminal “right to be let alone” to the common notions of privacy control over information [9]. As information and technology advance, “The meaning of Privacy” [5] reject the need for a single definition and compellingly defines a taxonomy of privacy concepts that encompasses key elements of previous definitions. Despite so many philosophical and legal perspectives, there has never been a comprehensive study of laypeople-conceptual models of privacy in general. A models that metaphor has been used around the issue of understanding laypeople-conceptual a taxonomy, process, or technology. While these models are not “ground truth,” and often implicitly or explicitly include misunderstandings or mis-
In Practice: TB8 UX Improvements
Security expectations for .onion services

Problem

Tor Browser doesn't communicate ideally to users that visit onion sites--i.e. http + onion looks scary with lots of warnings.

Hypothesis

Adding an onion icon will help users to identify onion services.

Keeping our security indicator icons close to default indicators will help users to react accordingly to their past experiences.
## Security expectations for .onion services

https://trac.torproject.org/23247

### 7.5

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>🔄</td>
<td><a href="https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion">https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion</a></td>
</tr>
</tbody>
</table>

### 8.0

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>🔄 Secure</td>
<td><a href="https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion">https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion</a></td>
</tr>
<tr>
<td>🔄 Cloudflare, Inc. (US)</td>
<td><a href="https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion">https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion</a></td>
</tr>
<tr>
<td>🔄 Cloudflare, Inc. (US)</td>
<td><a href="https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion">https://dns4torpnfs2ifuz2s2yf3fc7rdmsbhm6rw75euj35pac6ap25zgqad.onion</a></td>
</tr>
</tbody>
</table>
Security expectations for .onion services

- Onion over HTTP - Onion with Self-Signed HTTPS
- Onion with CA-Issued DV Cert - Onion with CA-Issued EV Cert
- HTTPS Onion with HTTPS Subresources
- CA-HTTPS Onion with HTTP Subresources - HTTPS Self Signed Onion with HTTP Subresources
Circuit Display

https://trac.torproject.org/24309

Problems

Users don’t know if circuits works per tab or globally (Tor Browser has first party isolation by default).

Many users expect the guard node to change when asking for a new circuit.

There is nothing on circuit display that tells the user the first node is a guard, what guards are, and how it works when Tor creates new circuits for the user.

Hypothesis

If we highlight the Guard node label at the UI, users will be able to identify it easier and faster.

Updating Tor Browser Manual with more information about Guard nodes for users who want to [Learn More].

We are moving site specific settings into the URL bar. Moving the circuit display to the URL bar area will help users to relate the circuit and the domain. Improve the comprehension of how Tor has been building the circuit is also part of it project scope.
About

We are making Tor usable for everyone.

The visual identity of software is an integral part of its user experience. Correctly using a consistent and attractive style is important to the Tor Project to build user trust in our work. This guide can help you create materials and answer questions you might have about using the Tor brand.

Conventions

This guide aims to show by doing. The main body of each page contains examples of graphic elements that are (and, in some cases, are not) conformant with the style being described. The column on the left specifies the details of each style and offers guidance on when and how to use it.

Contact

Please reach out to the UX team if you encounter a situation this guide does not cover. We will work with you to help you find a solution for your design problem, and your feedback will also help us expand and refine the guide to help it better meet the Tor Community’s needs. You can also reach out to the UX team for any other styleguide related questions or inquiries.

Tor UX Team

ux@lists.torproject.org
about:tor - Onboarding

START BROWSER

Existing User?

Existing Update?

NEW USER

ONBOARDING #A

RETURNING USER

ABOUT:TOR

1ST TIME UPDATE USER

ONBOARDING + NEW FEATURES HIGHLIGHT

RETURNING USER

ONBOARDING #1

NEW FEATURES HIGHLIGHT

Existing Update?

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #A

RETURNING USER

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?

ONBOARDING #3

ABOUT:TOR

1ST TIME UPDATE USER

NEW FEATURES HIGHLIGHT

NEW USER

ONBOARDING #2

NEW FEATURES HIGHLIGHT

Existing User?
Explore. Privately.

You're ready for the world's most private browsing experience.
Tor Browser offers the highest standard of privacy and security while browsing the web. You are now protected against tracking, surveillance, and censorship. Learn how we are doing it by following this quick onboarding.
Explore. Privately.

You’re ready.
Tor Browser offers the highest standard of privacy and security while browsing the web. You’re now protected against tracking, surveillance, and censorship. This quick onboarding will show you how.

START NOW

Travel a decentralized network.
Tor Browser connects you to the Tor network, a network of servers we call “relays,” run by thousands of volunteers around the world. Unlike a VPN, there’s no one point of failure or centralized entity you need to trust in order to
Explore. Privately.

You're ready for the world's most private browsing experience.

Questions? Check our Tor Browser Manual ➔

The Tor Project is a US 501(c)(3) non-profit organization advancing human rights and freedoms by creating and deploying free and open source anonymity and privacy technologies, supporting their unrestricted availability and use, and furthering their scientific and popular understanding. Get Involved ➔
How to contribute
Gracias

antonela@torproject.org