

Lecture 18:
Special Guests;
Tracking Architectures;
Blame and Responsibility

CMSC 25900 / DATA 25900

Spring 2021

The University of Chicago



Examining Two Alternative Approaches to Tracking/Targeting

Mozilla Pocket: Customization With Only Local Tracking

The image shows a screenshot of the Mozilla Pocket website. At the top, there is a navigation bar with the Mozilla logo (moz://a) and links for Firefox Browsers, Products, Who We Are, and Innovation. A button for "Get a Firefox Account" is located on the right. The main content area features the Pocket logo and the headline "An Award-Winning App From Firefox". Below this, a paragraph states: "Over 10 million users rely on Pocket to discover and savor the best articles, news, stories and videos. And as a member of the Firefox family, privacy is paramount." A blue button labeled "Try Pocket Now" is positioned at the bottom left. On the right side, there are two overlapping device screens displaying the Pocket app interface. The desktop screen shows a "My List" of articles, including "Baby Boomers Reach the End of Their To-Do List" from nytimes.com and "There is no such thing as past or fut changing how we think about time" from theguardian.com. The mobile screen shows a similar list with articles like "7 Behaviors That Will Make You Insanely Productive" and "The 5 Essentials of a Well-Run Meeting".

moz://a Firefox Browsers Products Who We Are Innovation [Get a Firefox Account](#)

✓ pocket

An Award-Winning App From Firefox

Over 10 million users rely on Pocket to discover and savor the best articles, news, stories and videos. And as a member of the Firefox family, privacy is paramount.

[Try Pocket Now](#)

My List

- Baby Boomers Reach the End of Their To-Do List nytimes.com
- 'There is no such thing as past or fut changing how we think about time theguardian.com
- Alexa Is a Revelation for the Blind theatlantic.com
- Columbia SPONSORED
- The Ultimate Guide to Winter outsideonline.com
- 6 Ways to Welcome Employees on Their First Day blog.asana.com 8 likes 1 repost
- How to Travel With Children nytimes.com - 19 min
- How the Meaning of Digital Transformation Has Evolved hbr.org - 3 min
- 7 Behaviors That Will Make You Insanely Productive inc.com - 3 min
- The 5 Essentials of a Well-Run Meeting inc.com - 5 min

Mozilla Pocket: Customization With Only Local Tracking

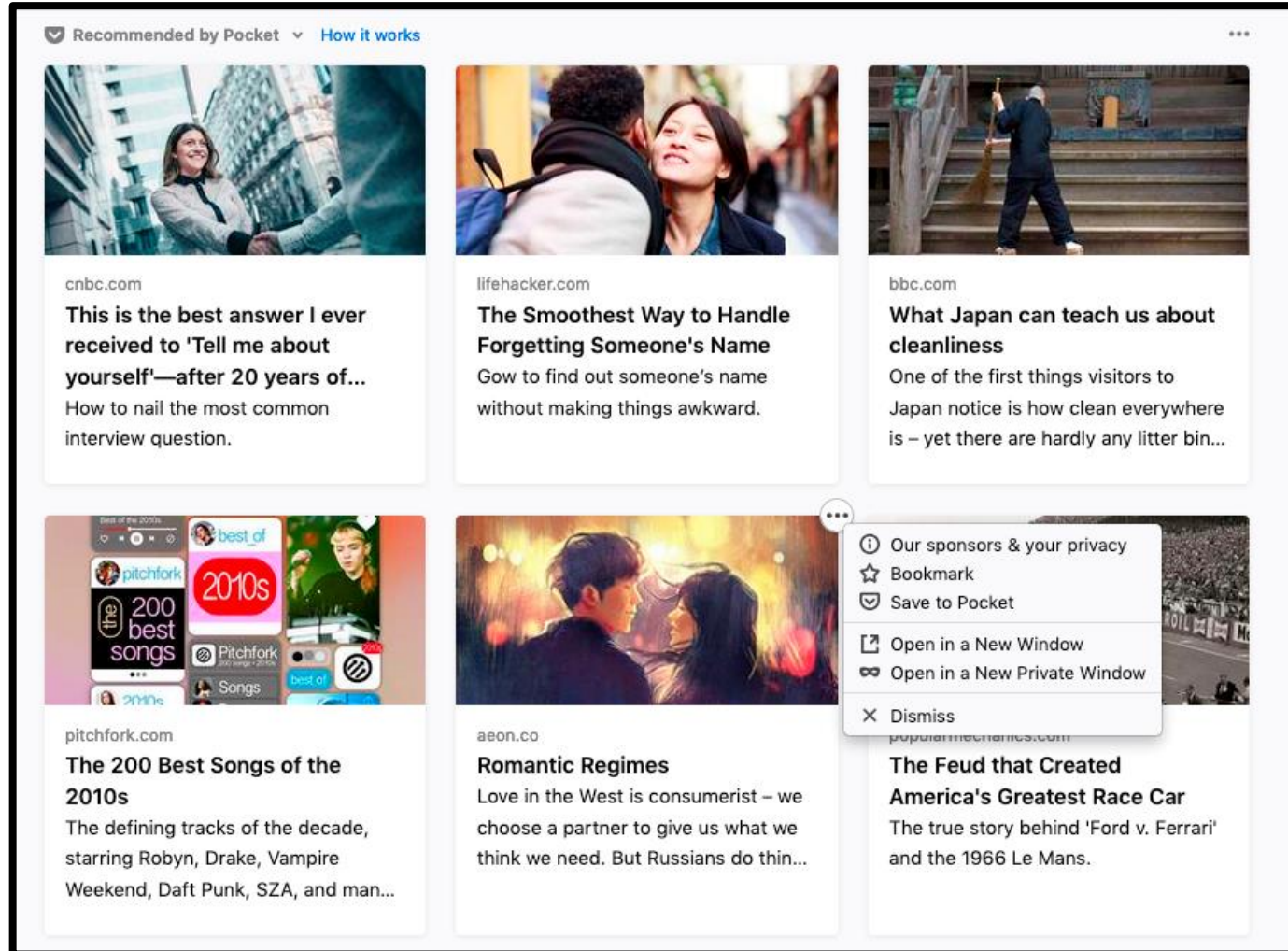
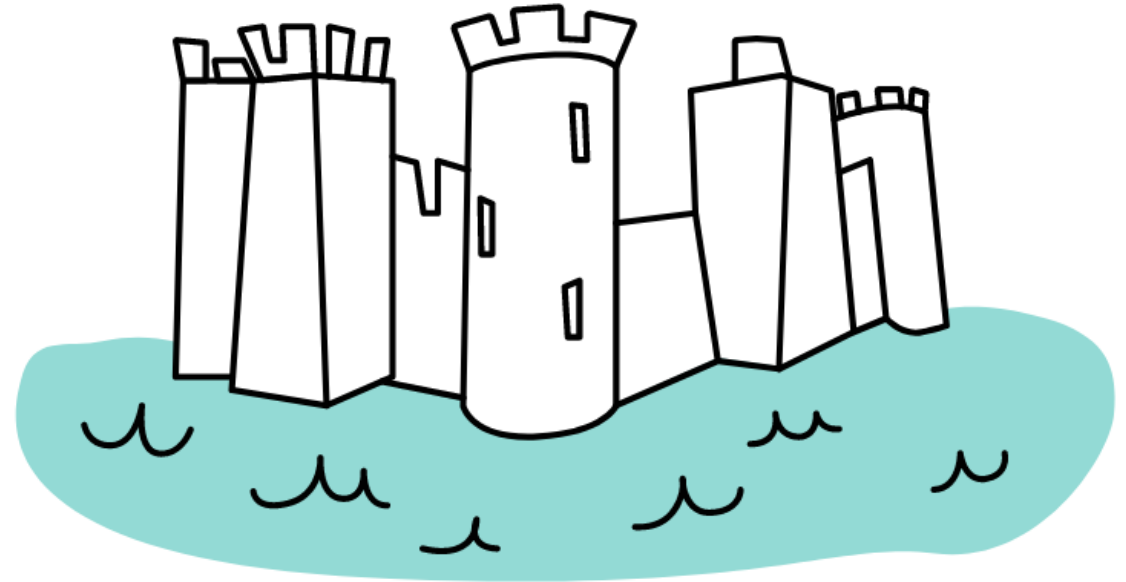


Image taken from <https://blog.mozilla.org/en/products/firefox/pocket-in-firefox/>

Mozilla Pocket: Customization With Only Local Tracking

Your data stays private. Always.

In addition to dishing up captivating stories, we also show you relevant, highly-vetted content from select sponsors. Rest assured, your browsing data never leaves your personal copy of Firefox—we don't see it, and our sponsors don't either. Want more details? Here's the full scoop on [how privacy works in Pocket](#).



Mozilla Pocket: Customization With Only Local Tracking

Are these stories in the new tab personalized to me?

For the most part, no. Most recommendations on your new tab come from a general list of the best of stories on the web. But Pocket is actively exploring ways to deliver personalized recommendations in a way that vigorously protects users' privacy. Importantly, **neither Mozilla nor Pocket ever receives a copy of your browser history**. When personalization does occur, recommendations rely on a process of story sorting and filtering that happens locally in your personal copy of Firefox.

Is information collected when I interact with these new tab recommendations? What information is collected and what controls do I have?

By default, when recommendations from Pocket are displayed on your new tab, we collect information about how many times they appear and how many times they are clicked. However, this information is not associated with any of the technical and interaction information about you or your copy of Firefox. You can learn more about [the data we collect](#) and you can [opt out of data collection](#).

Google FLoC (Google's Perspective)

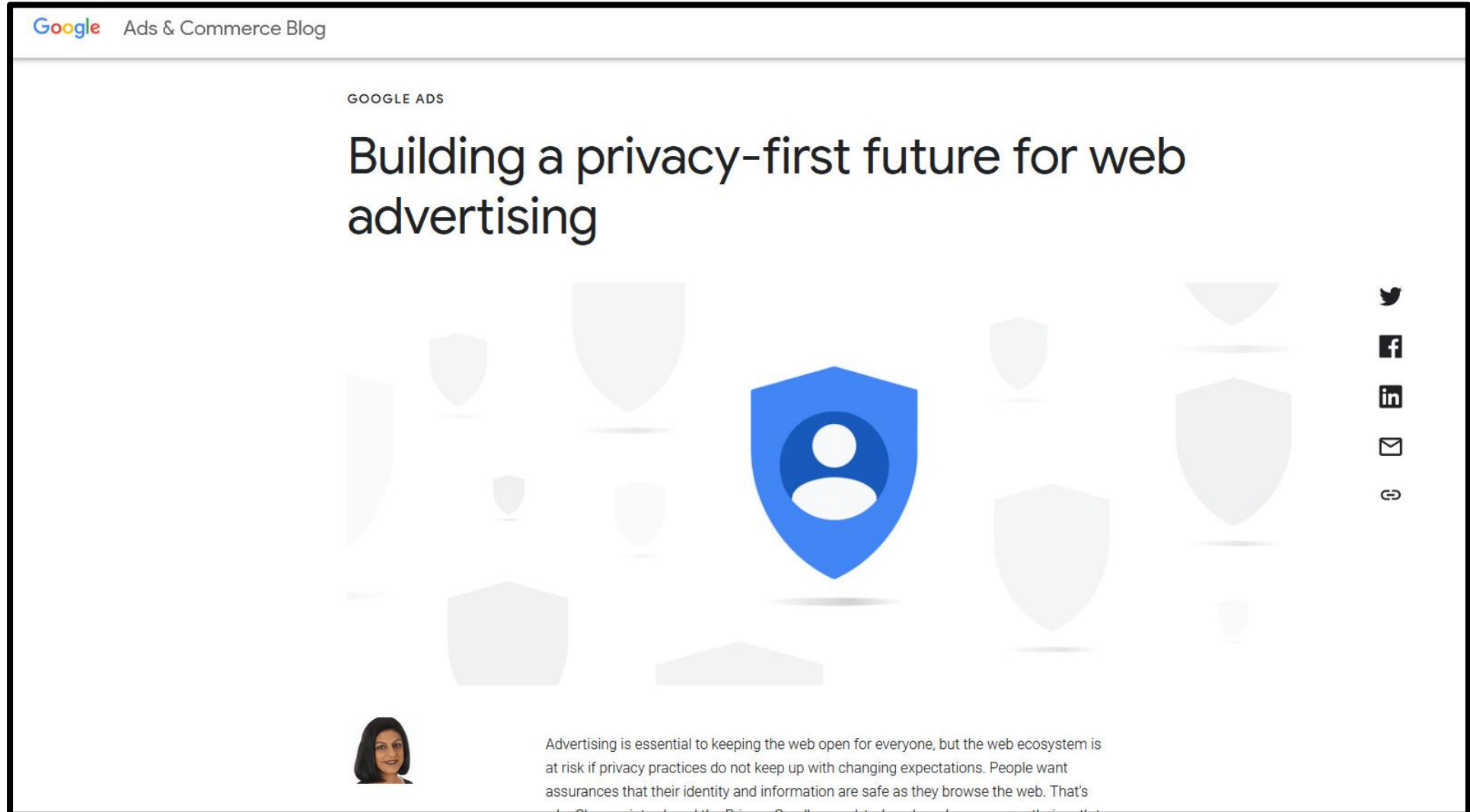


Image taken from <https://blog.google/products/ads-commerce/2021-01-privacy-sandbox/>

Google FLoC (EFF's Perspective)



EFF
ELECTRONIC
FRONTIER
FOUNDATION

About Issues Our Work Take Action Tools Donate Q

Google's FLoC Is a Terrible Idea

BY BENNETT CYPHERS | MARCH 3, 2021



Update, April 9, 2021: We've launched [Am I FLoCed](#), a new site that will tell you whether your Chrome browser has been turned into a guinea pig for Federated Learning of Cohorts or FLoC, Google's latest targeted advertising experiment.

The third-party cookie is dying, and Google is trying to create its replacement.

No one should mourn the death of the cookie as we know it. For more than two decades, the third-party cookie has been the lynchpin in a shadowy, seedy, **multi-billion dollar advertising-surveillance industry on the Web**; phasing out

Join Our Newsletter!

Email updates on news, actions, events in your area, and more.

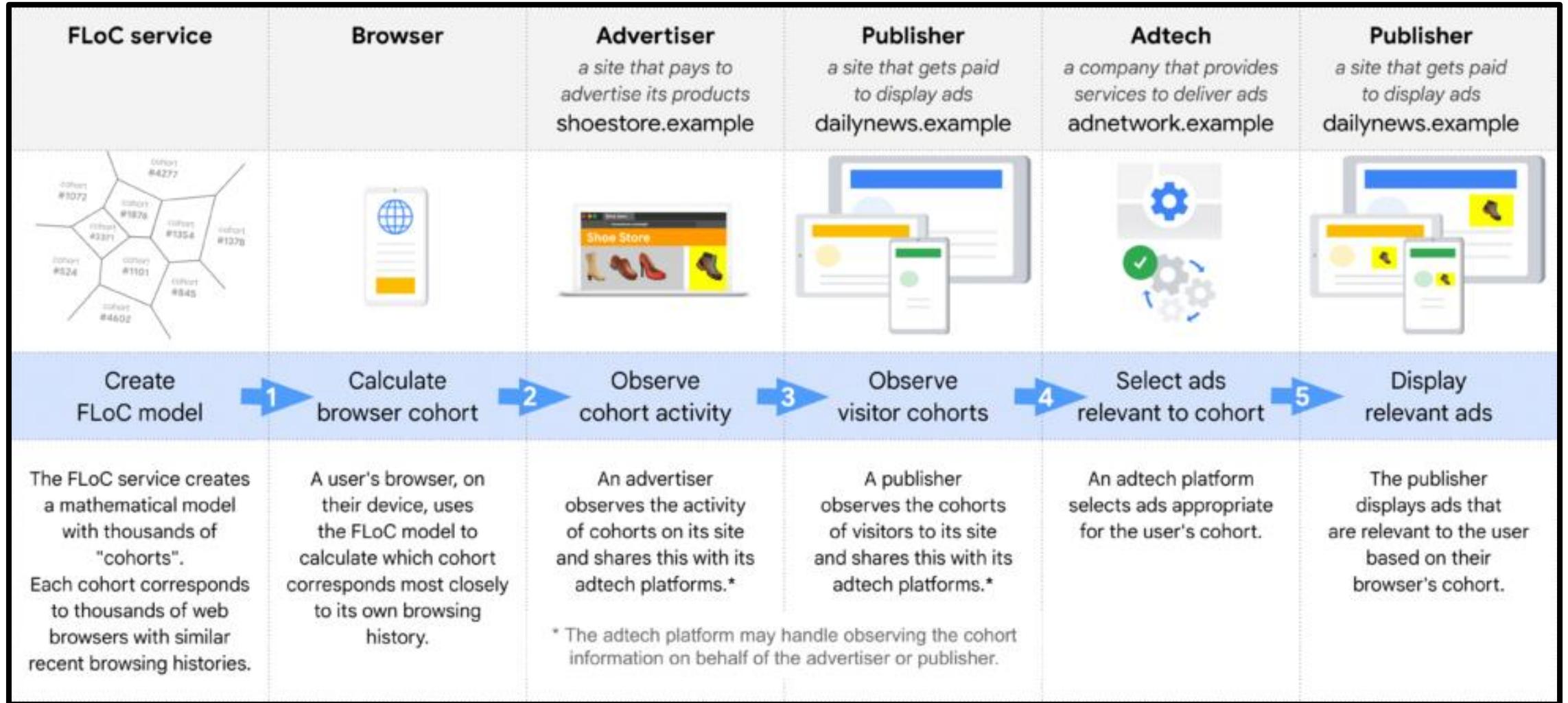
Email Address

Postal Code (optional)

Anti-spam question: Enter the three-letter abbreviation for Electronic Frontier Foundation:

Image taken from <https://www.eff.org/deeplinks/2021/03/googles-floc-terrible-idea>

Google FLoC: Architecture



Google FLoC (Brave Browser's Perspective)

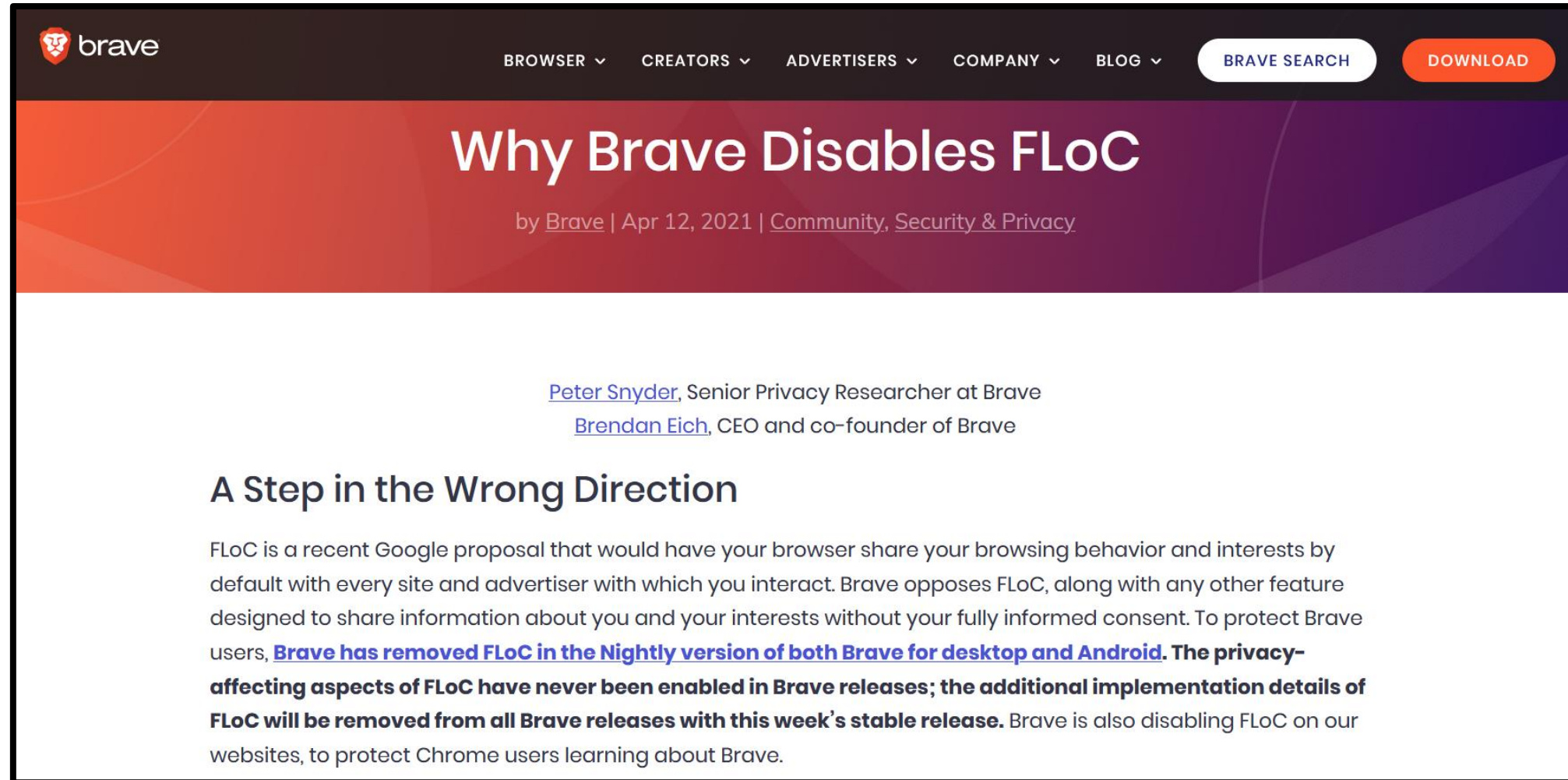


Image taken from <https://brave.com/why-brave-disables-floc/>

Legal Considerations in Computer Systems

Software Licensing

	Free and open (software must have source code provided)			Non-free		
	Public domain	Permissive license	Copyleft (protective license)	Noncommercial license	Proprietary license	Trade secret
Description	Grants all rights	Grants use rights, including right to relicense (allows proprietization , license compatibility)	Grants use rights, forbids proprietization	Grants rights for noncommercial use only. May be combined with copyleft.	Traditional use of copyright ; no rights need be granted	No information made public
Software	PD, CC0	MIT, Apache, MPL	GPL, AGPL	JRL, AFPL	Proprietary software, no public license	Private, internal software
Other creative works	PD, CC0	CC-BY	CC-BY-SA	CC-BY-NC	Copyright, no public license	Unpublished

Table taken from https://en.wikipedia.org/wiki/Software_license

Computer Fraud and Abuse Act (1986)

- Prohibits unauthorized access to a computer system
- “Creates new Federal criminal offenses of: (1) property theft by computer occurring as part of a scheme to defraud; (2) altering, damaging, or destroying information in, or preventing the authorized use of, a Federal interest computer; and (3) trafficking in computer access passwords.”
- First felony conviction: Morris Worm of 1988
- Used to prosecute Aaron Swartz for downloading JSTOR articles en masse
- Used to prosecute George Hotz (*geohot*) for jailbreaking the PS3 → settlement

Bug Bounties

PUBLIC BUG BOUNTY PROGRAM LIST
The most comprehensive, up to date crowdsourced list of bug bounty and security vulnerability disclosure programs from across the web curated by the hacker community.

This list is maintained as part of the [Disclose.io](#) Safe Harbor project.
Have a suggestion for an addition, removal, or change? Open a Pull Request to [disclose](#) on Github. Special thanks to all [contributors](#).

Type here Filters

Program Name	New	Bug Bounty	Swag	Hall of Fame	Submission URL	Safeharbor
(ISC) ²				✓	📧	🔒
.nz Registry				✓	📧	🔒
0x Project		✓			📧	
123 Contact Form				✓	📧	
18F					📧	🔒
1Password Game		✓		✓	📧	🔒
21 Century Fox					📧	🔒

Table taken from <https://www.bugcrowd.com/bug-bounty-list/>

The Difficulty of Managing Data Rights

Data Access Rights / Data Management / Data Freedom



Data Rights Management (DRM) Tech

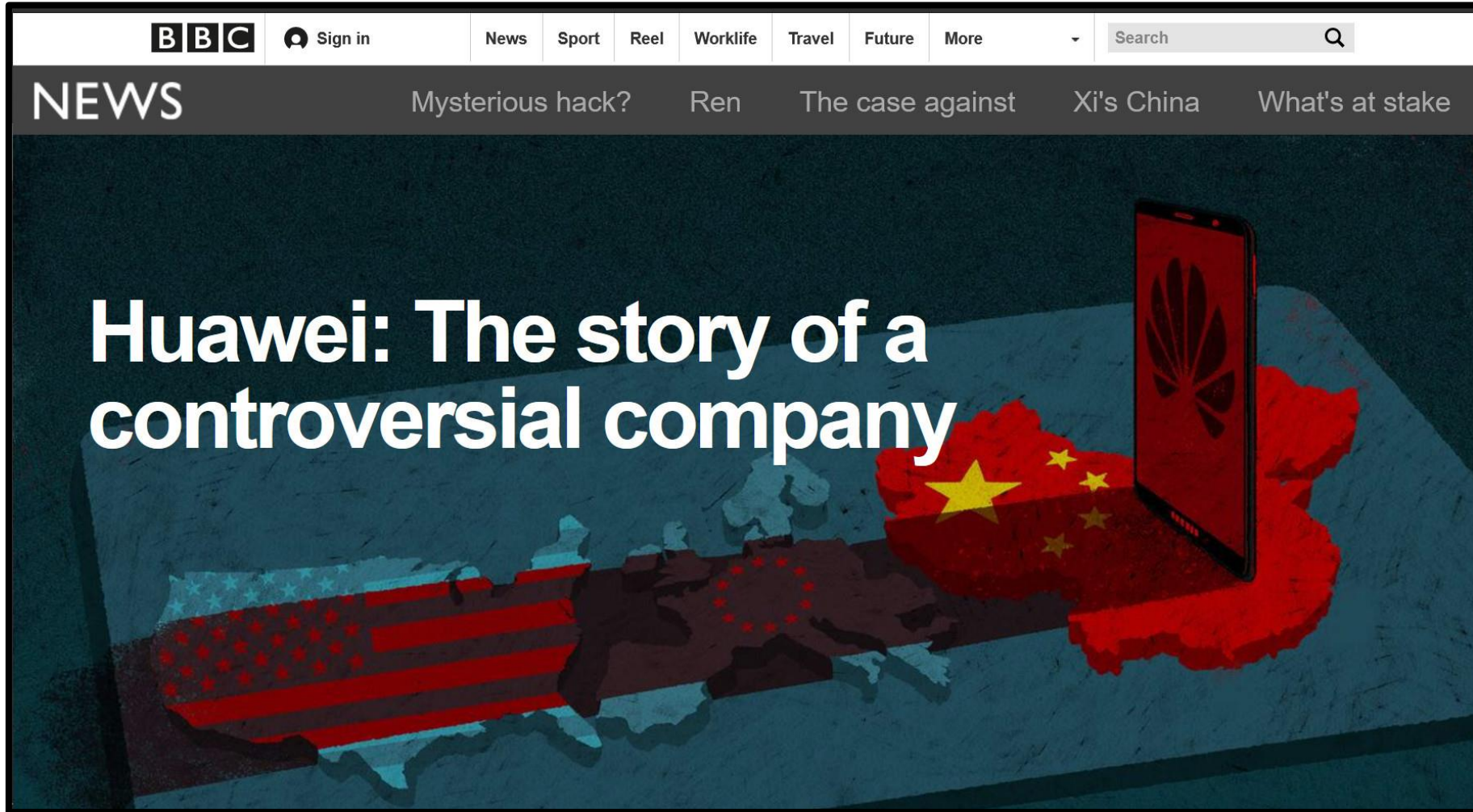
- The use of technical mechanisms to enforce rights
 - Pretty much an arms race
- Example from the 1990s: DVD Content Scrambling System (CSS)
 - DeCSS from Jon Lech Johansen and others

DMCA Safe Harbor

- Digital Millennium Copyright Act (DMCA) of 1998
 - Criminalizes circumvention of DRM
 - Criminalizes circumvention of access control (regardless of intent or subsequent actions)
 - Raises penalties for copyright infringement on the internet
- Creates safe harbor for online service providers, including ISPs
 - Copyright holders submit DMCA takedown notices
 - Takedown notices are now often automated or semi-automated

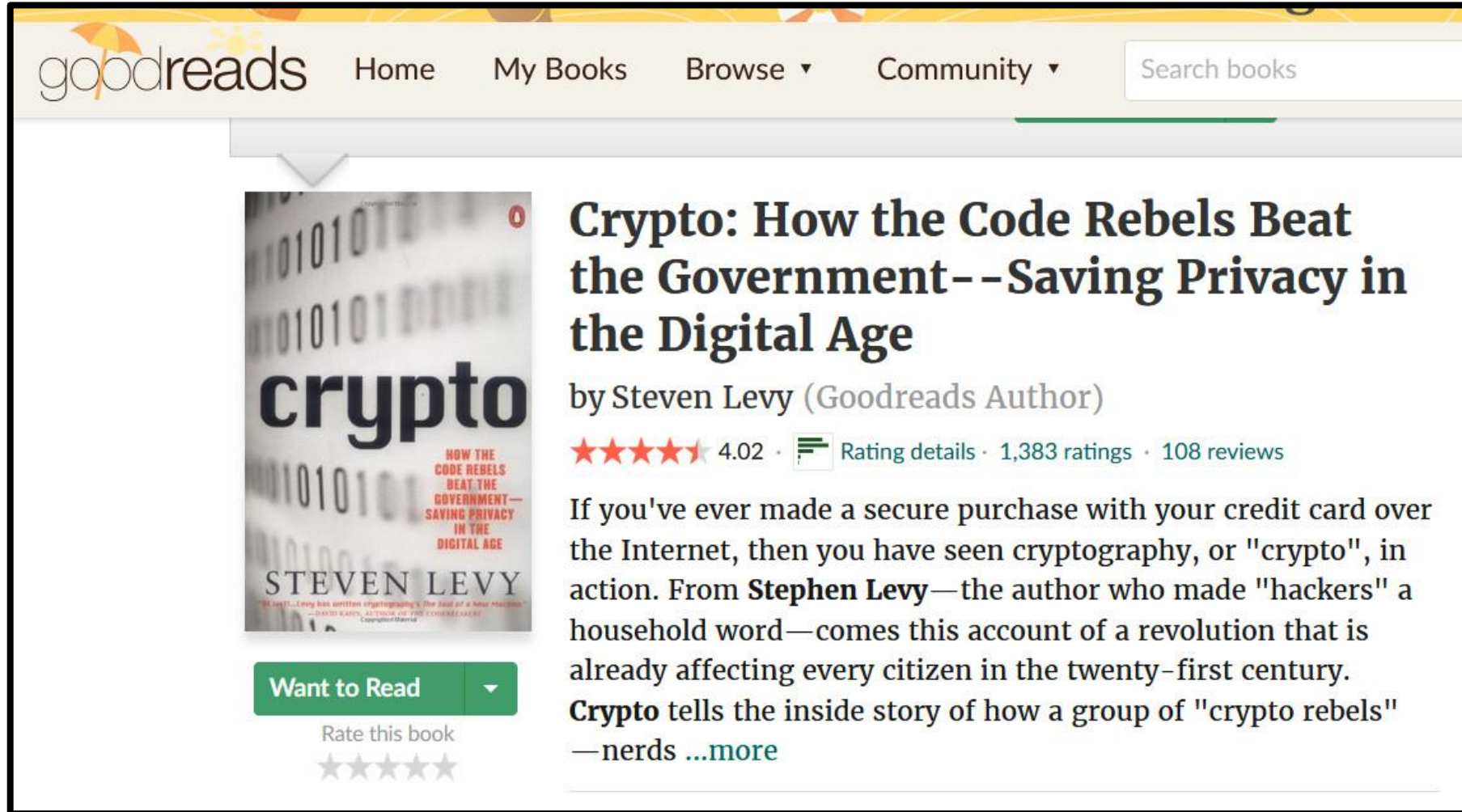
The Politicization of Technology

Huawei and 5G Politics



See <https://www.bbc.co.uk/news/resources/idt-sh/Huawei>

The Crypto Wars (of the 1990s)



The screenshot shows the Goodreads website interface. At the top, there is a navigation bar with the Goodreads logo, links for Home, My Books, Browse, and Community, and a search bar labeled "Search books". Below the navigation bar, the book "Crypto: How the Code Rebels Beat the Government--Saving Privacy in the Digital Age" by Steven Levy is featured. The book cover is on the left, showing the title "crypto" in large letters and the subtitle "HOW THE CODE REBELS BEAT THE GOVERNMENT--SAVING PRIVACY IN THE DIGITAL AGE" in smaller red text. The author's name "STEVEN LEVY" is at the bottom. To the right of the cover, the book title is displayed in a large, bold font, followed by the author's name "by Steven Levy (Goodreads Author)". Below the author's name, there is a star rating of 4.02, a "Rating details" link, and information about "1,383 ratings" and "108 reviews". A green button labeled "Want to Read" is positioned below the cover. Underneath the button, there is a "Rate this book" prompt and a five-star rating icon. A short description of the book is provided, starting with "If you've ever made a secure purchase with your credit card over the Internet, then you have seen cryptography, or 'crypto', in action. From **Stephen Levy**—the author who made 'hackers' a household word—comes this account of a revolution that is already affecting every citizen in the twenty-first century. **Crypto** tells the inside story of how a group of 'crypto rebels' —nerds [...more](#)".

See <https://www.bbc.co.uk/news/resources/idt-sh/Huawei>

The Crypto Wars (of the 2010s)

San Bernardino iPhone: US ends Apple case after accessing data without assistance

With the court filing, Silicon Valley and Washington are poised to return to a cold war over the balance between privacy and law enforcement in the age of apps



▲ Justice Department lawyers wrote in a court filing Monday evening that they no longer needed Apple's help in getting around the security countermeasures on Syed Farook's device. Photograph: Mark Lennihan/AP

The US government dropped its court fight against Apple after the FBI successfully pulled data from the iPhone of San Bernardino gunman Syed

See <https://www.theguardian.com/technology/2016/mar/28/apple-fbi-case-dropped-san-bernardino-iphone>

The Crypto Wars (of the 2010s)

Here's how the FBI managed to get into the San Bernardino shooter's iPhone

An Australian firm helped hack into the device, starting with a Lightning port exploit

By [Mitchell Clark](#) | Apr 14, 2021, 3:58pm EDT

[f](#) [t](#) [SHARE](#)

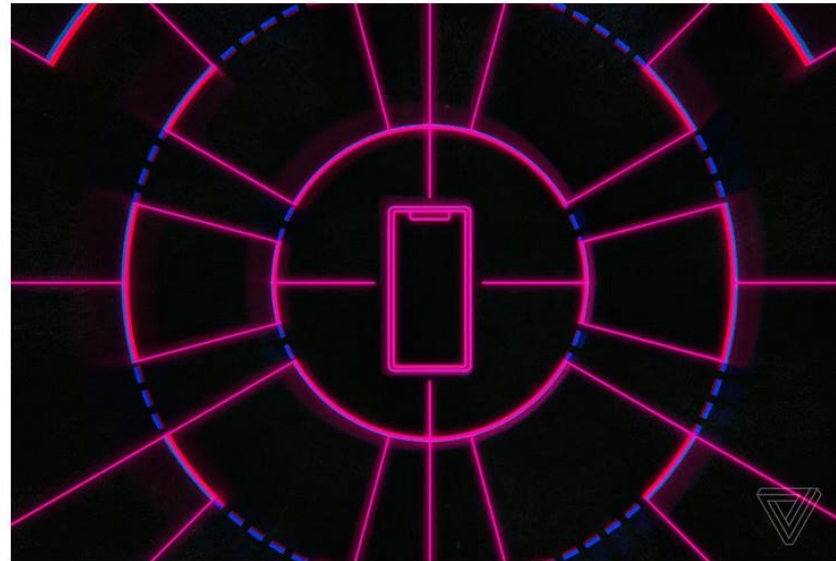


Illustration by Alex Castro / The Verge

The FBI partnered with an Australian security firm called Azimuth Security to gain access to an iPhone linked to the 2015 [San Bernardino shooting](#), a [new report from The Washington Post](#) reveals. Before now, the methods the FBI used to get into the iPhone [were kept secret](#).

See <https://www.theverge.com/2021/4/14/22383957/fbi-san-bernadino-iphone-hack-shooting-investigation>

Funding Models for Technology

- Who is funding technology?
- What are their goals?
- Who will benefit?
- How will the workforce be affected?

Course Wrap-up:
Engineering for Ethics,
Privacy, and Fairness in
Computer Systems

Course Description

This course takes a **technical approach to understanding ethical issues** in the design and implementation of **computer systems**. Tensions often arise between a computer system's utility and its privacy-invasiveness, between its robustness and its flexibility, and between its ability to leverage existing data and existing data's tendency to encode biases. The course will demonstrate how computer systems can violate individuals' privacy and agency, impact sub-populations in disparate ways, and harm both society and the environment. It will also introduce algorithmic approaches to fairness, privacy, transparency, and explainability in machine learning systems. Through hands-on programming assignments and projects, students will design and implement computer systems that reflect both ethics and privacy by design. They will also wrestle with fundamental questions about who bears responsibility for a system's shortcomings, how to balance different stakeholders' goals, and what societal values computer systems should embed.

Topics Covered

- User Interfaces (1 lecture)
- Data (3 lectures)
- World (2 lectures)
- Machine Learning (4 lectures)
- Privacy (4 lectures)
- Lifecycles (1 lecture)
- Tracking & Surveillance (2 lectures)
- Politicized Ecosystems (1 lecture)

THANK YOU!

Instructors

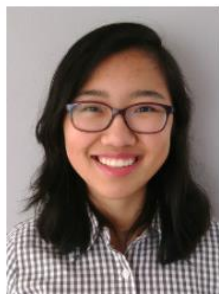


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