Lecture 4: Responsible Data Lifecycles

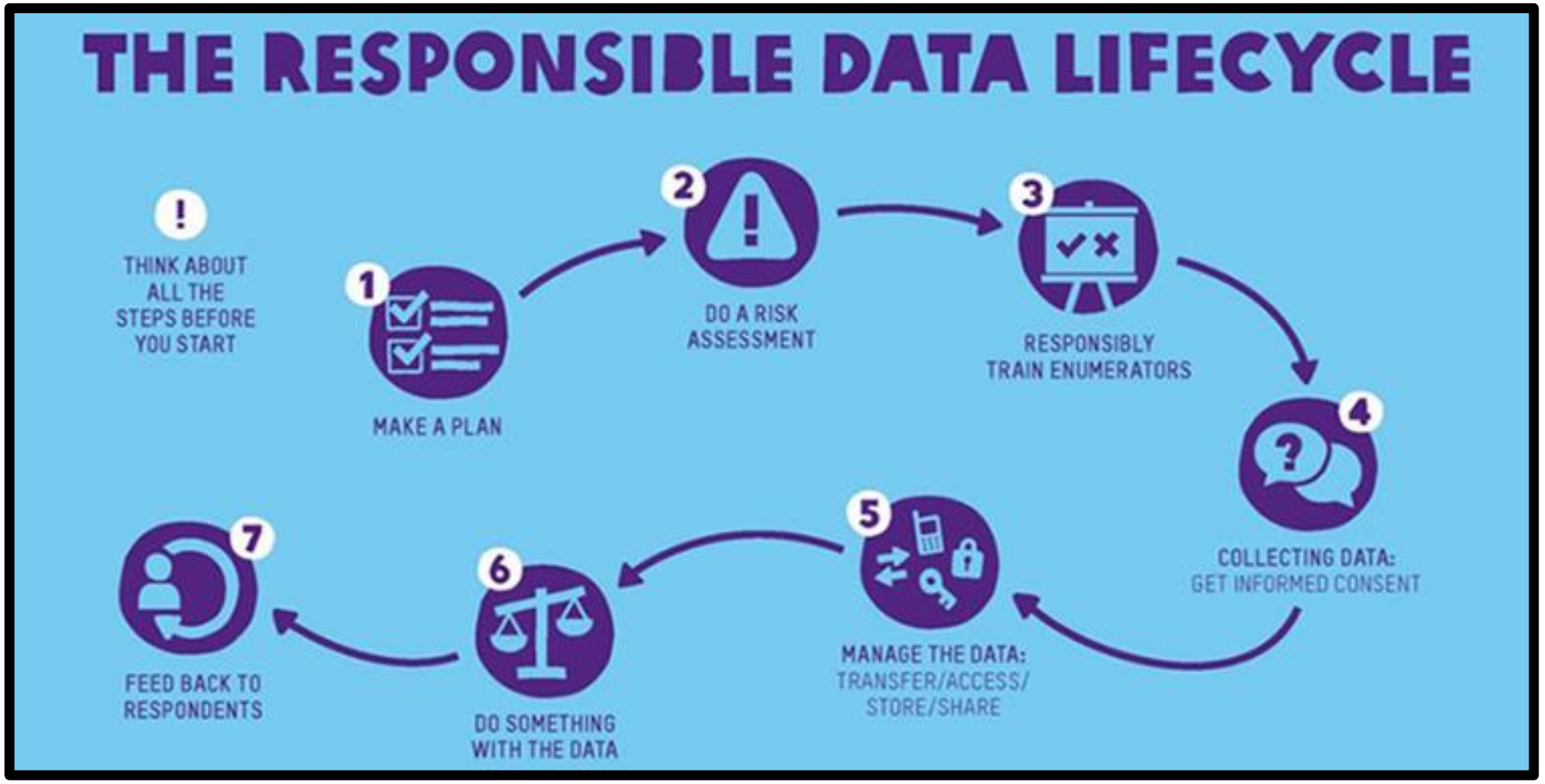
CMSC 25910

Spring 2022

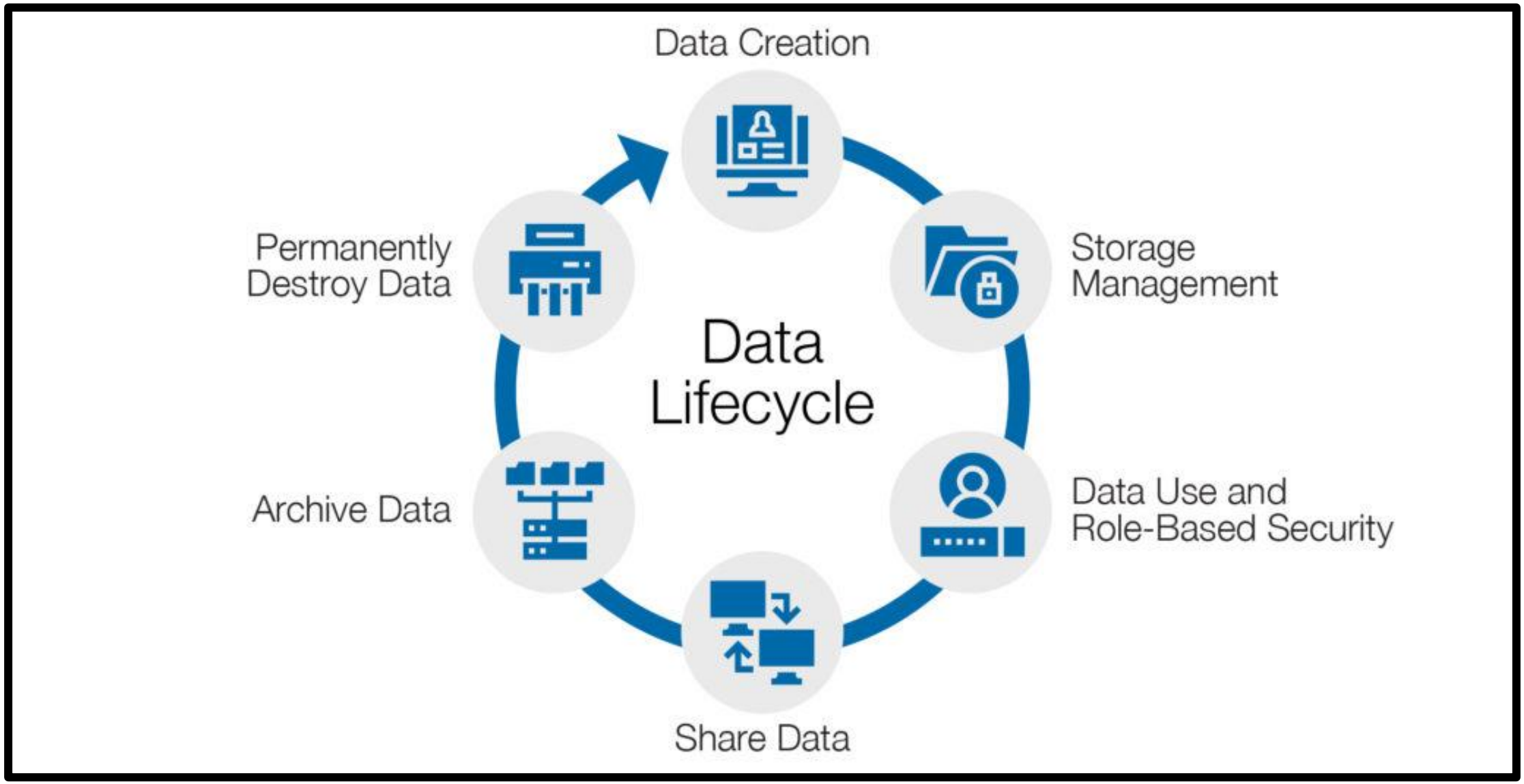
The University of Chicago

THE UNIVERSITY OF CHICAGO

“90% of the data in the world today has been created in the last two years. Possibly the greatest challenge of the information age is how to manage data properly. As data is increasingly used for needs assessments, feedback, accountability and monitoring; management of data is a particularly crucial challenge in humanitarian response.”



Graphic and quote from Oxfam: https://views-voices.oxfam.org.uk/2017/04/putting-responsible-data-into-practice/

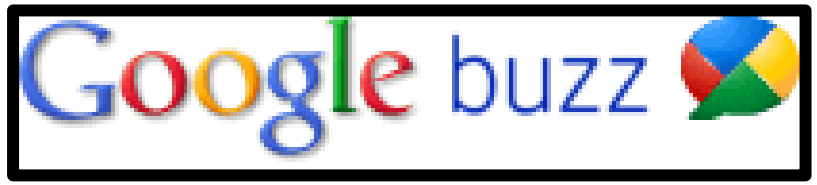


Graphic from https://www.spirion.com/data-lifecycle-management/

Data Repurposing

Repurposing Google data

- Google Buzz was a social network that replaced Google Wave
- Users automatically opted into Buzz, with weak privacy settings, based on Gmail data
- Automatically add as friends people you talk to frequently on Google Chat (Gchat)



Repurposing data

- Food delivery services have added restaurants to their site using their public menus (but without permission)

Banner ads

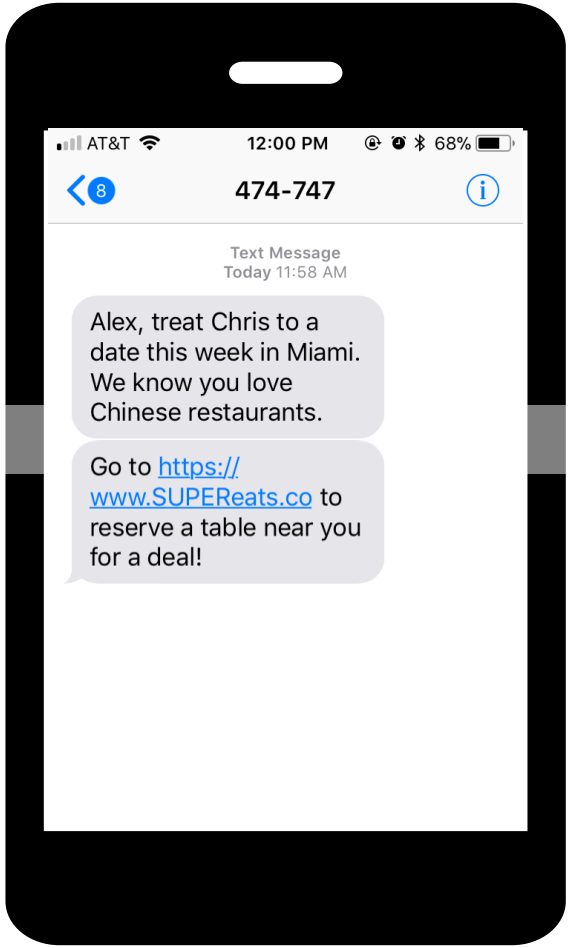
Personalized

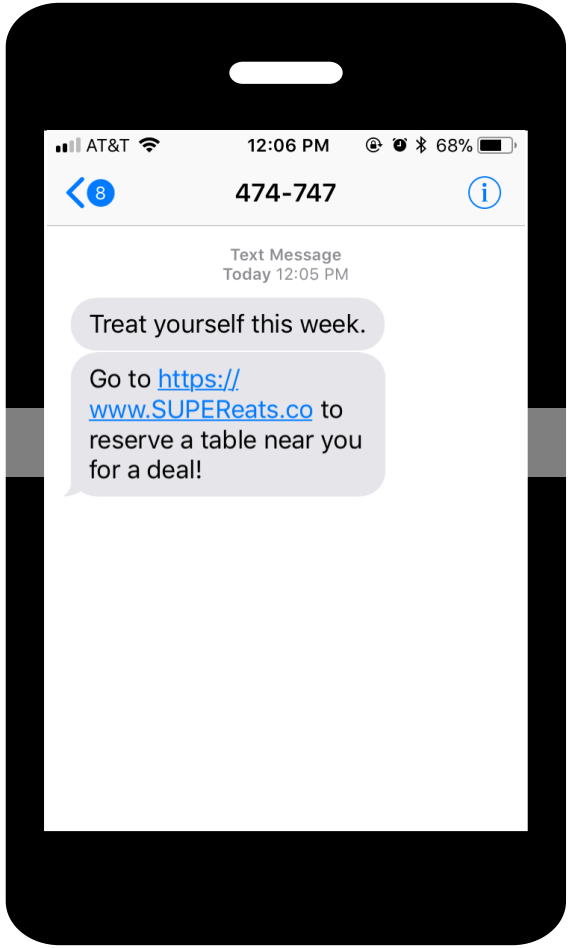
Generic

See https://www.blaseur.com/papers/robotext-full.pdf

Robotext ads

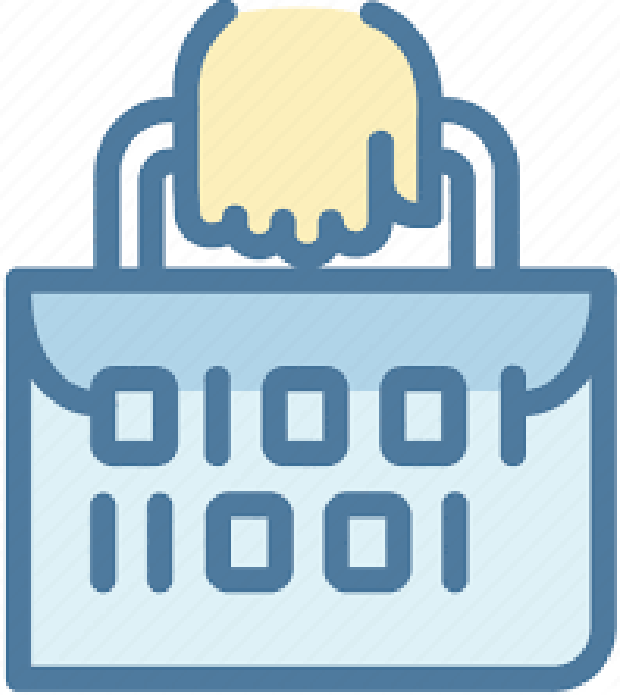
Personalized





Generic

See https://www.blaseur.com/papers/robotext-full.pdf



Data Portability

Art. 20 GDPR

Right to data portability

1. The data subject shall have the right to receive the personal data concerning him or her, which he or she has provided to a controller, in a structured, commonly used and machine-readable format and have the right to transmit those data to another controller without hindrance from the controller to which the personal data have been provided, where:

Data Access

Art. 15 GDPR

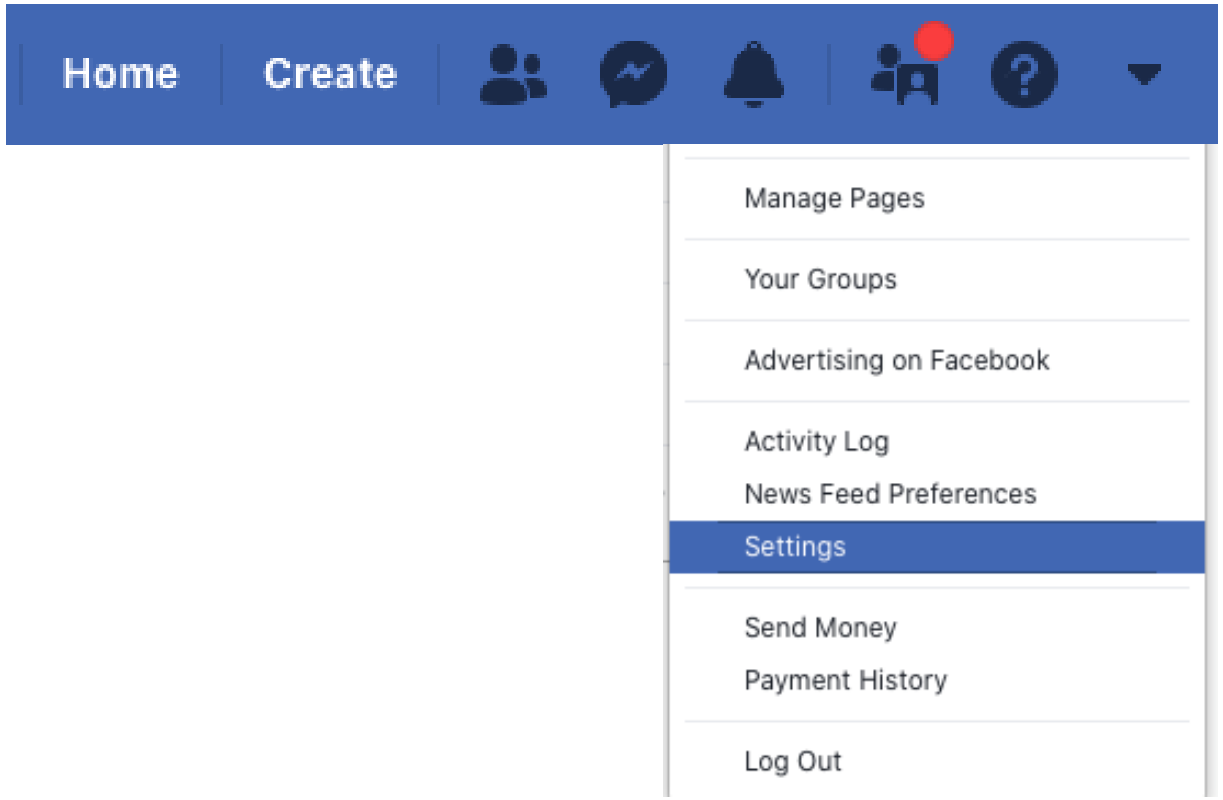
Right of access by the data subject

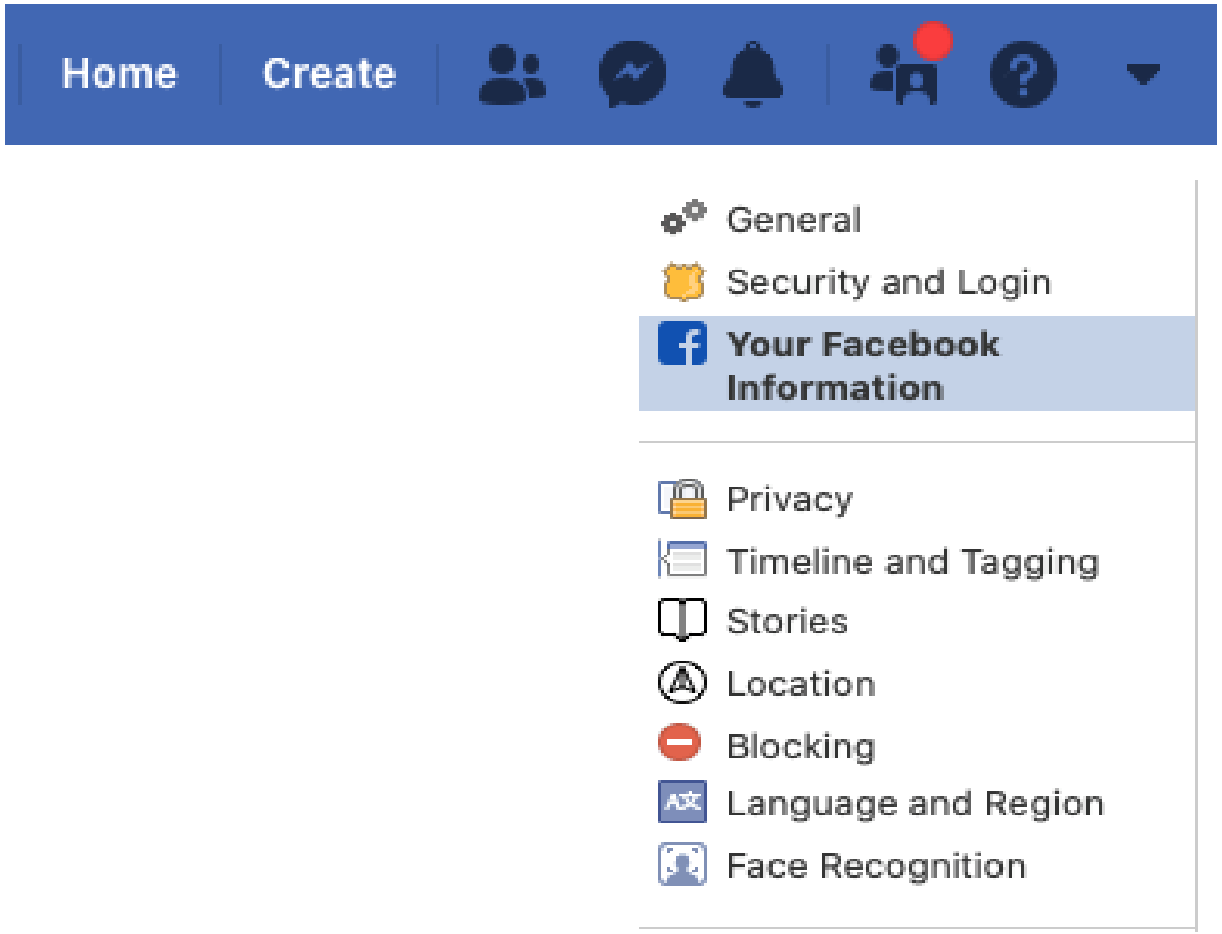
The data subject shall have the right to obtain from the controller confirmation as to whether or not personal data concerning him or her are being processed, and, where that is the case, access to the personal data and the following information:

[1]The controller shall take appropriate measures to provide any information referred to in Articles 13 and 14 and any communication under Articles 15 to 22 and 34 relating to processing to the data subject in a concise, transparent, intelligible and easily accessible form, using clear and plain language, in particular for any information addressed specifically to a child. [2]The information shall be provided in writing, or by other means, including, where appropriate, by electronic means. [3]When requested by the data subject, the information may be provided orally, provided that the identity of the data subject is proven by other means.

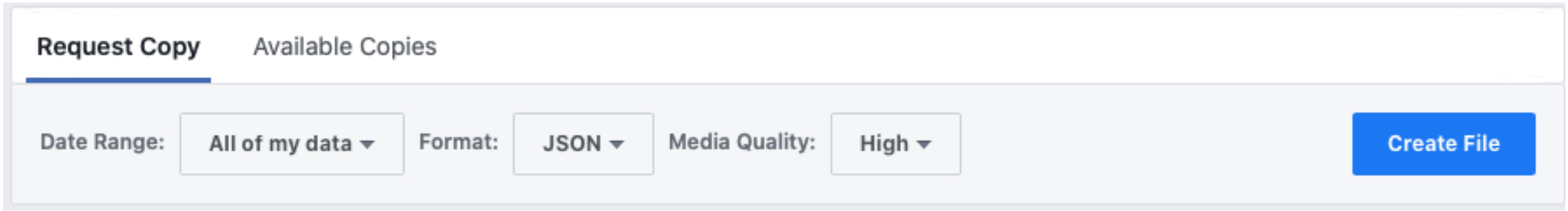
14.3 How to exercise your rights

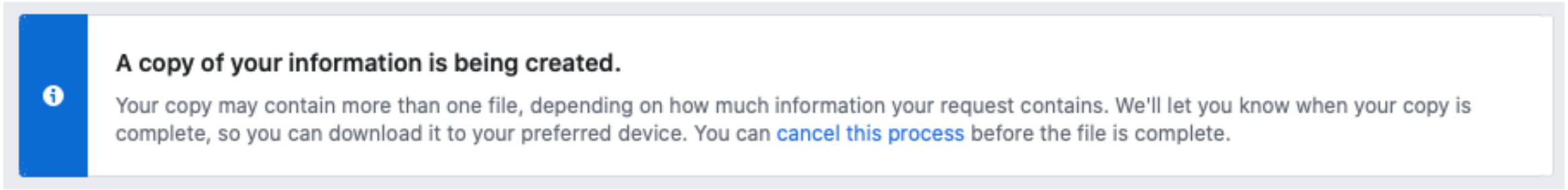
To exercise your rights, email data-privacy@buzzfeed.com. In order to protect your privacy and that of others, we will ask you to prove your identity before we take any steps in response to a request you have made. If a third party is making a request on your behalf, we will ask them to prove that they have your permission to act for you.

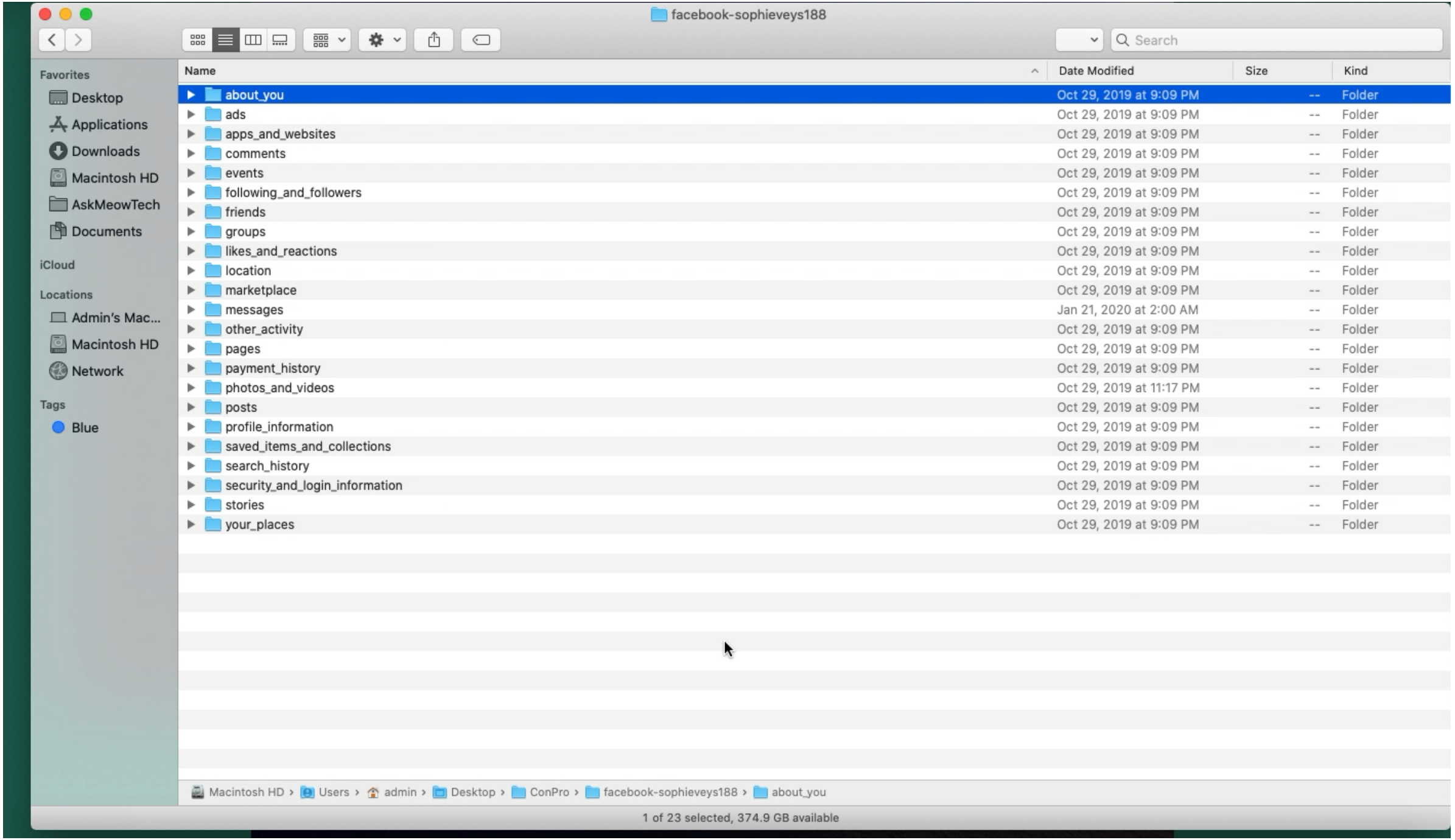

Home
Create
Manage Pages
Your Groups
Advertising on Facebook
Activity Log
News Feed Preferences
Settings
Send Money
Payment History
Log Out

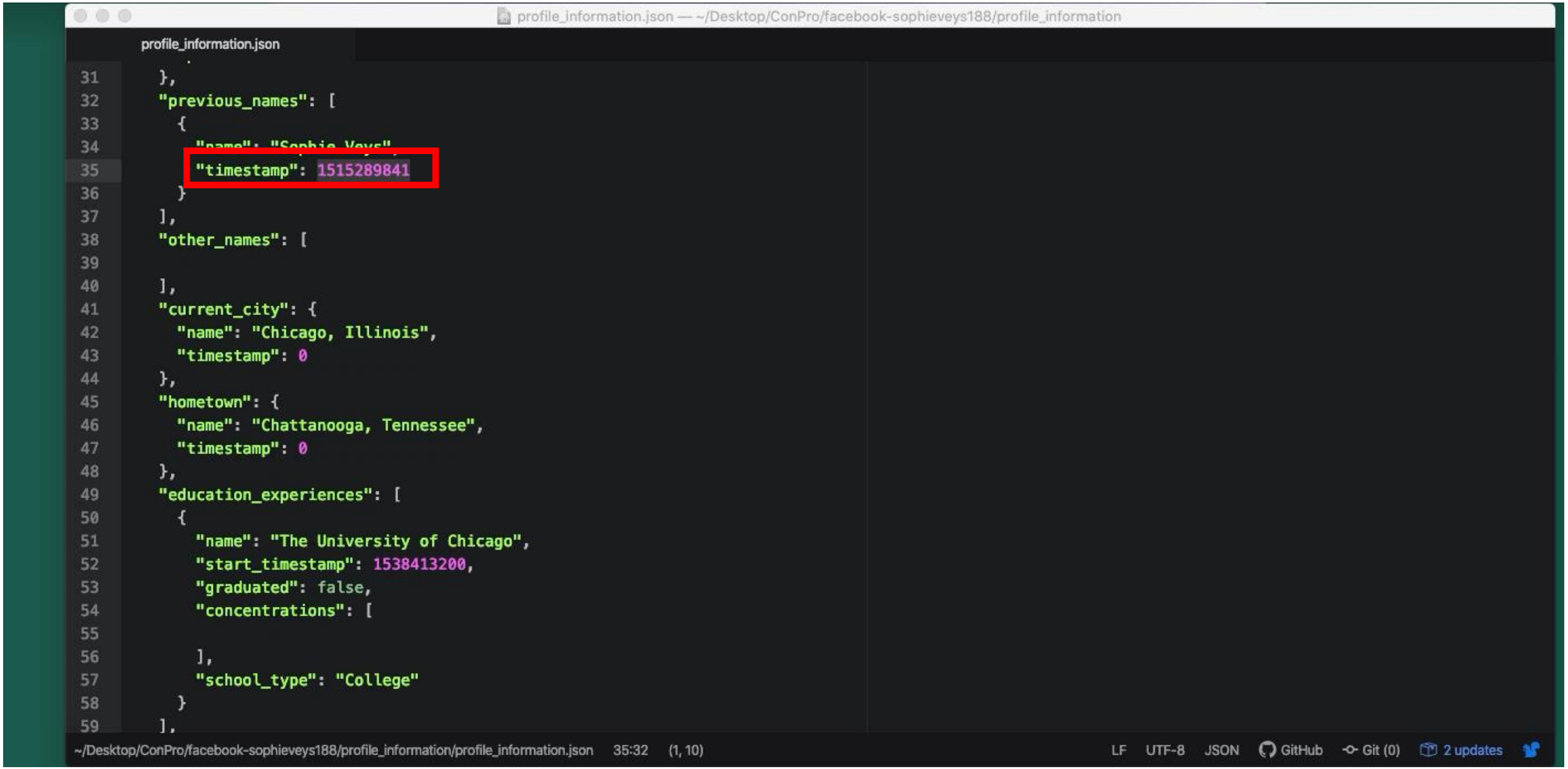

Home
Create
General
Security and Login
Your Facebook Information
Privacy
Timeline and Tagging
Stories
Location
Blocking
Language and Region
Face Recognition

Access Your Information	View your information by category.	View
Download Your Information	Download a copy of your information to keep, or to transfer to another service.	View
Activity Log	View and manage your information and some settings.	View
Off-Facebook Activity	View or clear activity from businesses and organizations you visit off of Facebook.	View
Managing Your Information	Learn more about how you can manage your information.	View
Deactivation and Deletion	Temporarily deactivate or permanently delete your account.	View


Request Copy
Available Copies
Date Range:
All of my data
Format:
JSON
Media Quality:
High
Create File


A copy of your information is being created.
Your copy may contain more than one file, depending on how much information your request contains. We'll let you know when your copy is complete, so you can download it to your preferred device. You can cancel this process before the file is complete.


facebook-sophieveys188
Search
Favorites
Desktop
Applications
Downloads
Macintosh HD
AskMeowTech
Documents
iCloud
Locations
Admin's Mac...
Macintosh HD
Network
Tags
Blue
Name
Date Modified
Size
Kind
about_you Oct 29, 2019 at 9:09 PM -- Folder
ads Oct 29, 2019 at 9:09 PM -- Folder
apps_and_websites Oct 29, 2019 at 9:09 PM -- Folder
comments Oct 29, 2019 at 9:09 PM -- Folder
events Oct 29, 2019 at 9:09 PM -- Folder
following_and_followers Oct 29, 2019 at 9:09 PM -- Folder
friends Oct 29, 2019 at 9:09 PM -- Folder
groups Oct 29, 2019 at 9:09 PM -- Folder
likes_and_reactions Oct 29, 2019 at 9:09 PM -- Folder
location Oct 29, 2019 at 9:09 PM -- Folder
marketplace Oct 29, 2019 at 9:09 PM -- Folder
messages Jan 21, 2020 at 2:00 AM -- Folder
other_activity Oct 29, 2019 at 9:09 PM -- Folder
pages Oct 29, 2019 at 9:09 PM -- Folder
payment_history Oct 29, 2019 at 9:09 PM -- Folder
photos_and_videos Oct 29, 2019 at 11:17 PM -- Folder
posts Oct 29, 2019 at 9:09 PM -- Folder
profile_information Oct 29, 2019 at 9:09 PM -- Folder
saved_items_and_collections Oct 29, 2019 at 9:09 PM -- Folder
search_history Oct 29, 2019 at 9:09 PM -- Folder
security_and_login_information Oct 29, 2019 at 9:09 PM -- Folder
stories Oct 29, 2019 at 9:09 PM -- Folder
your_places Oct 29, 2019 at 9:09 PM -- Folder
Macintosh HD › Users › admin › Desktop › ConPro › facebook-sophieveys188 › about_you
1 of 23 selected, 374.9 GB available


profile_information.json — ~/Desktop/ConPro/facebook-sophieveys188/profile_information
profile_information.json
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"previous_names": [
{
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"timestamp": 1515289841
}
],
"other_names": [
],
"current_city": {
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"start_timestamp": 1538413200,
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"concentrations": [
],
"school_type": "College"
}
],
~/Desktop/ConPro/facebook-sophieveys188/profile_information/profile_information.json 35:32 (1, 10)
LF UTF-8 JSON GitHub Git (0) 2 updates

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"advertiserInfo" : {
  "advertiserName" : "Foundation Medicine",
  "screenName" : "@FoundationATCG"
},
"matchedTargetingCriteria" : [ {
  "targetingType" : "Keywords",
  "targetingValue" : "#ASCO19"
}, {
  "targetingType" : "Locations",
  "targetingValue" : "United States"
} ],
"impressionTime" : "2019-06-01 08:21:18"
```

```
{
  "sender_name": "Bob",
  "timestamp_ms": 1569679976090,
  "content": "Video call DND session?",
  "type": "Generic"
},
```

Data Portability ☑

Right to Access ☐

Challenges of data access

- Authenticating data subject access requests (SARs)
- Deciding what data should be included (e.g., derived data?)
- Finding all data that is included
- What should the format of the response be?
  - What definitions are needed?
- What should the user experience be?

Right to Erasure

GDPR Article 17

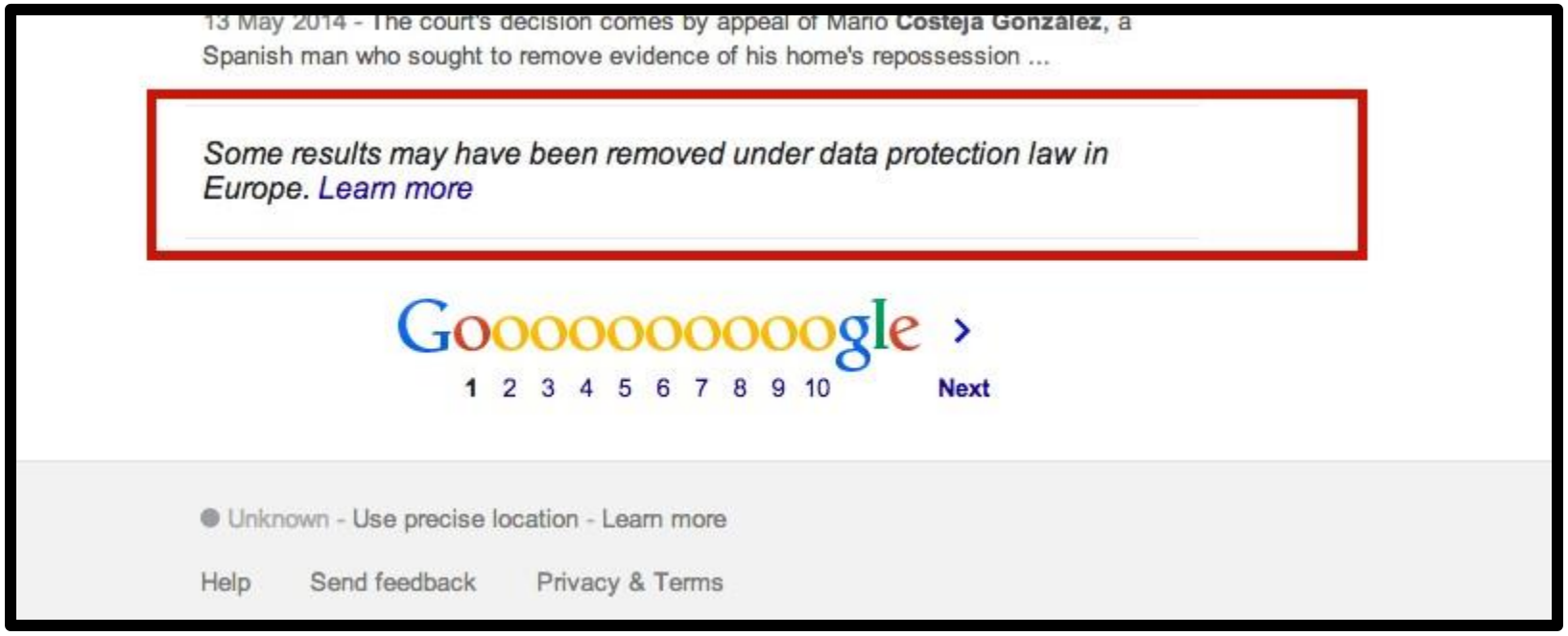
- **Right to erasure (‘right to be forgotten’):**
- The data subject shall have the right to obtain from the controller the **erasure of personal data concerning him or her** without undue delay and the controller shall have the obligation to erase personal data without undue delay where one of the following grounds applies:
  - the **personal data are no longer necessary in relation to the purposes for which they were collected** or otherwise processed;
  - the data subject **withdraws consent** on which the processing is based according to point (a) of Article 6(1), or point (a) of Article 9(2), and where there is no other legal ground for the processing;
  - the **data subject objects to the processing** pursuant to Article 21(1) and there are no overriding legitimate grounds for the processing, or the data subject objects to the processing pursuant to Article 21(2);

CCPA (California Civic Code 1798.105)

- (a) A consumer shall have the **right to request that a business delete any personal information about the consumer which the business has collected from the consumer**…
- (c) A business that receives a verifiable consumer request from a consumer to delete the consumer's personal information pursuant to subdivision (a) of this section shall delete the consumer's personal information from its records and direct any service providers to delete the consumer's personal information from their records.
- (d) A business or a service provider shall not be required to comply with a consumer's request to delete the consumer's personal information if it is necessary for the business or service provider to maintain the consumer's personal information in order to:
  - (1) **Complete the transaction** for which the personal information was collected, fulfill the terms of a written warranty or product recall conducted in accordance with federal law, provide a good or service requested by the consumer, or reasonably anticipated within the context of a business' ongoing business relationship with the consumer, or otherwise perform a contract between the business and the consumer.
  - (2) **Detect security incidents, protect against malicious, deceptive, fraudulent, or illegal activity**; or prosecute those responsible for that activity.
  - (3) **Debug to identify and repair errors** that impair existing intended functionality…
  - (6) Engage in public or peer-reviewed scientific, historical, or statistical research in the public interest that adheres to all other applicable ethics and privacy laws, when the business' deletion of the information is likely to render impossible or seriously impair the achievement of such research, if the consumer has provided informed consent.
  - (7) To enable solely internal uses that are **reasonably aligned with the expectations of the consumer** based on the consumer's relationship with the business

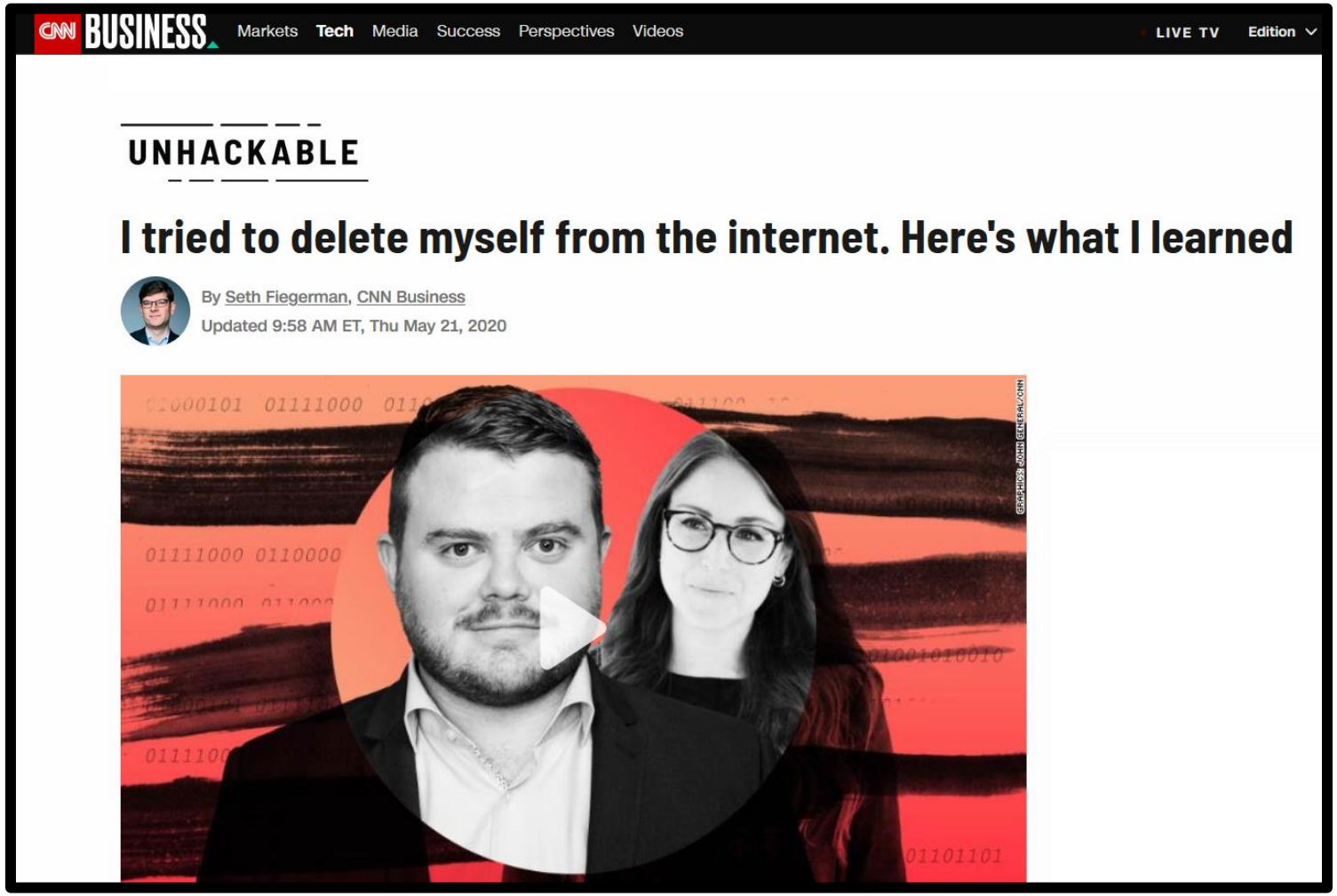
Right to Erasure

- Bound to jurisdictions
- Not applicable to public figures / issues of public interest



The Difficulty of Data Deletion

Making Others Delete Your Data is Hard



https://www.cnn.com/2020/05/21/tech/deleting-personal-data-online/index.html

Learning Who Has Your Data is Hard

The New York Times

I Got Access to My Secret Consumer Score. Now You Can Get Yours, Too.

Little-known companies are amassing your data — like food orders and Airbnb messages — and selling the analysis to clients. Here's how to get a copy of what they have on you.

https://www.nytimes.com/2019/11/04/business/secret-consumer-score-access.html

Backup Copies Are Fun

http://www.gdprtoons.com/2017/09/right-to-erasure-right-to-be-forgotten.html

Shared Responsibility is Also Fun

http://www.gdprtoons.com/2017/11/gdpr-addresses-joint-controllers-with.html

Challenges for data deletion

- Backup copies and data duplication
- Log files and other subtle records
- Removing the data that should be erased from aggregated data
  - How does this impact an ML model?
- Legal, contractual, or policy considerations for data *retention*
- Provenance tracking
  - How do you store metadata about the subject of particular data? How does this vary based on the data structure / data type?
  - What if the data is sold?
  - What if the entity holding the data is sold?

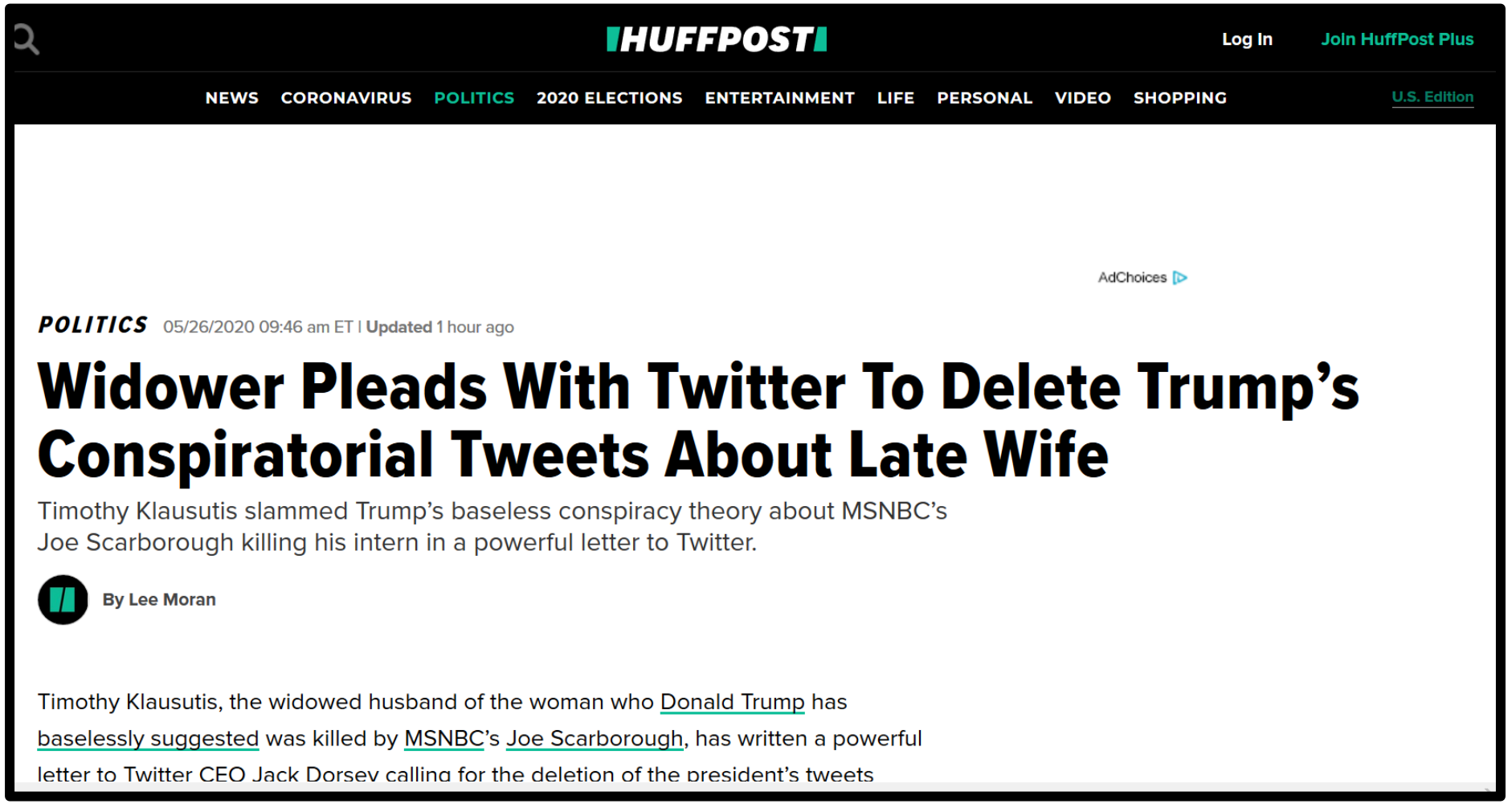
Design exercise: data deletion

- You have a policy that all personal data must be deleted after 90 days
  - Data that has been pseudonymized can be kept forever
- You decide that you will also respond within 72 hours to erasure requests

Who is the Data Subject?

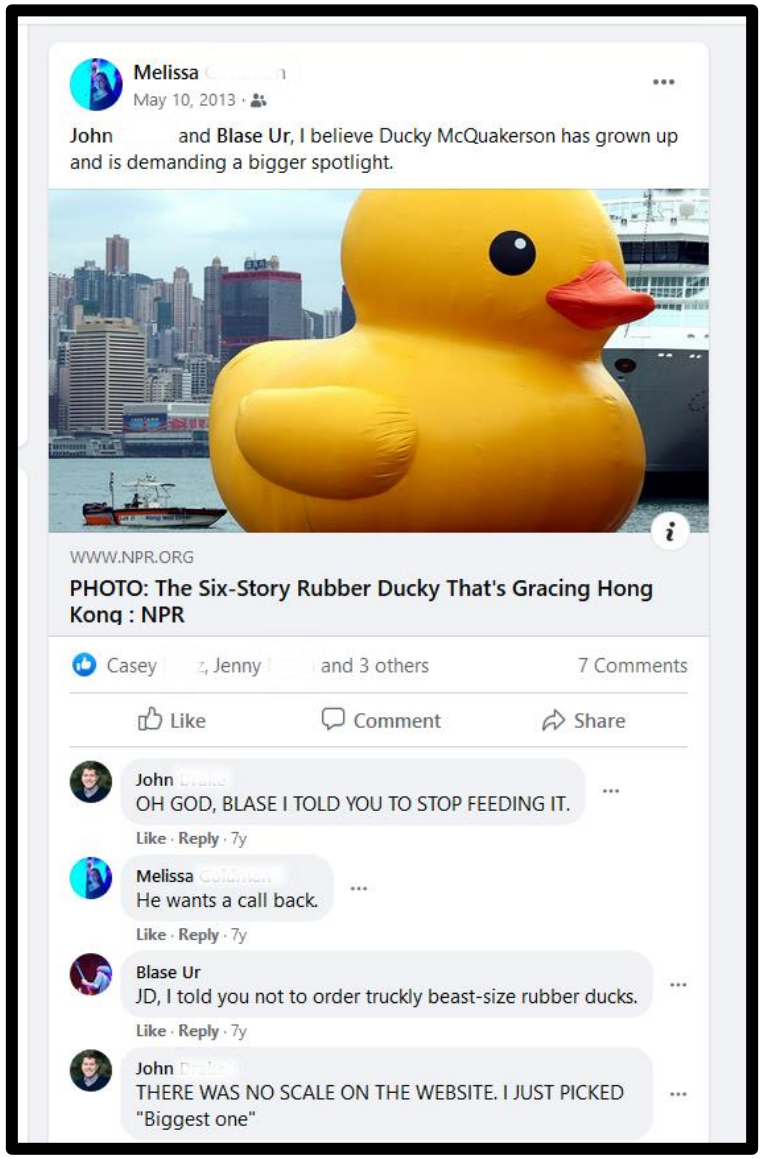
Image from https://freesvg.org/group-of-people

Who is the Data Subject?

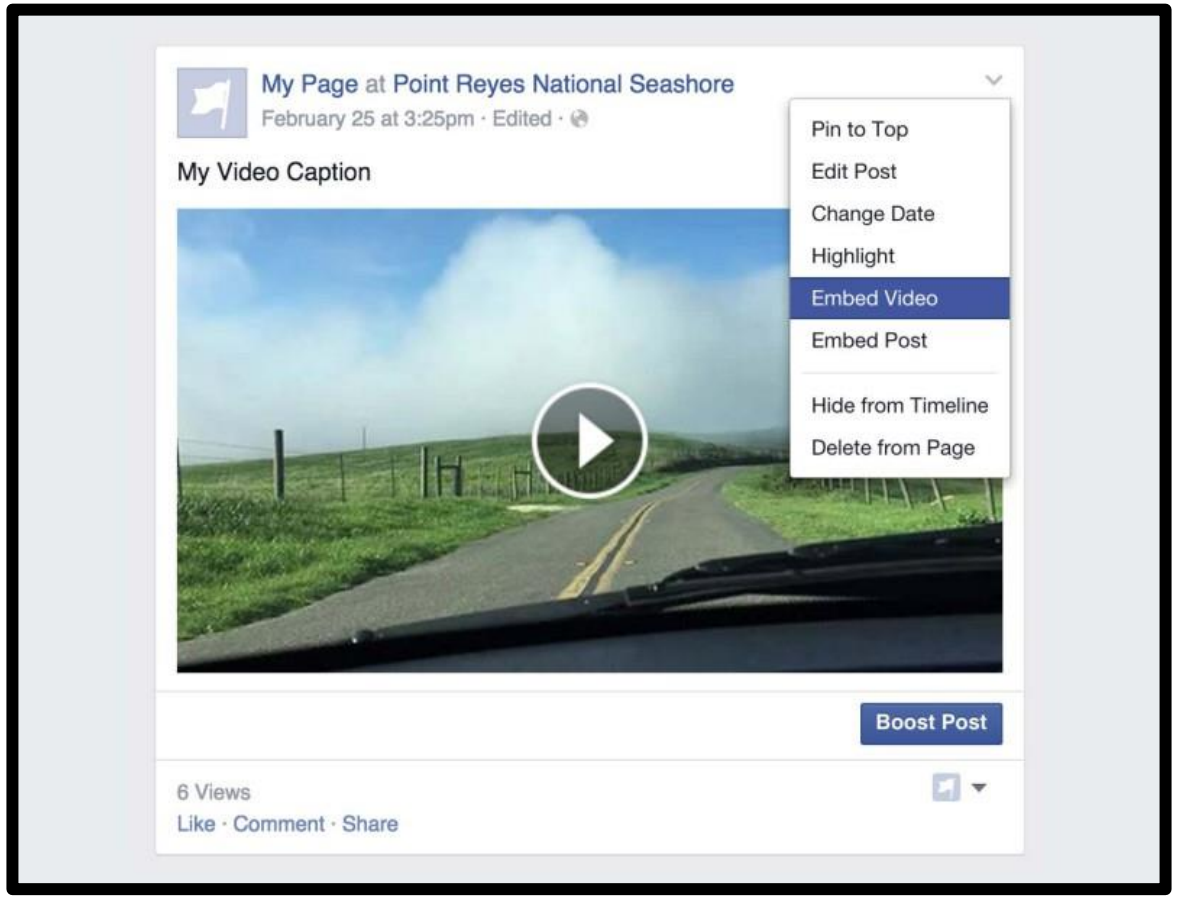


https://www.huffpost.com/entry/donald-trump-joe-scarborough-letter-husband-twitter_n_5ecd036ac5b6c992ff263b7b

The Nuances of Deletion



The Nuances of Deletion



https://marketingland.com/facebook-launches-new-video-embeds-comment-syncing-from-site-to-page-122868

The Nuances of Deletion

https://www.facebook.com/notes/bob-baldwin/new-videos-in-comments/10156919502775277/

The Nuances of Deletion

Facebook Launches New Video Embeds & Comment Syncing From Site To Page

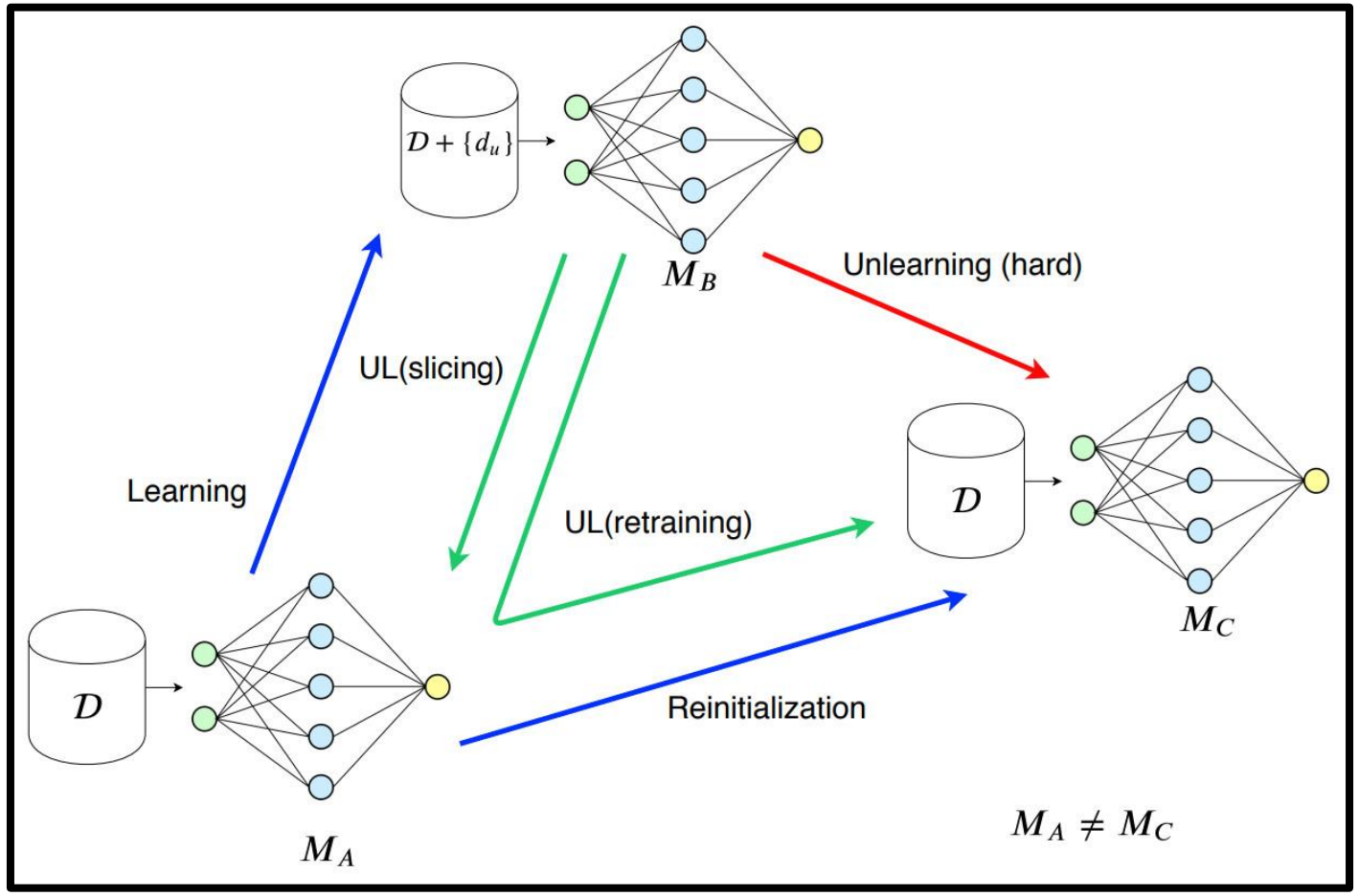
Facebook video now can be embedded independent of Facebook posts; conversation threads in the Facebook comment plugin will have the option to be mirrored on Facebook Pages.

Martin Beck on March 25, 2015 at 3:25 pm

https://marketingland.com/facebook-launches-new-video-embeds-comment-syncing-from-site-to-page-122868

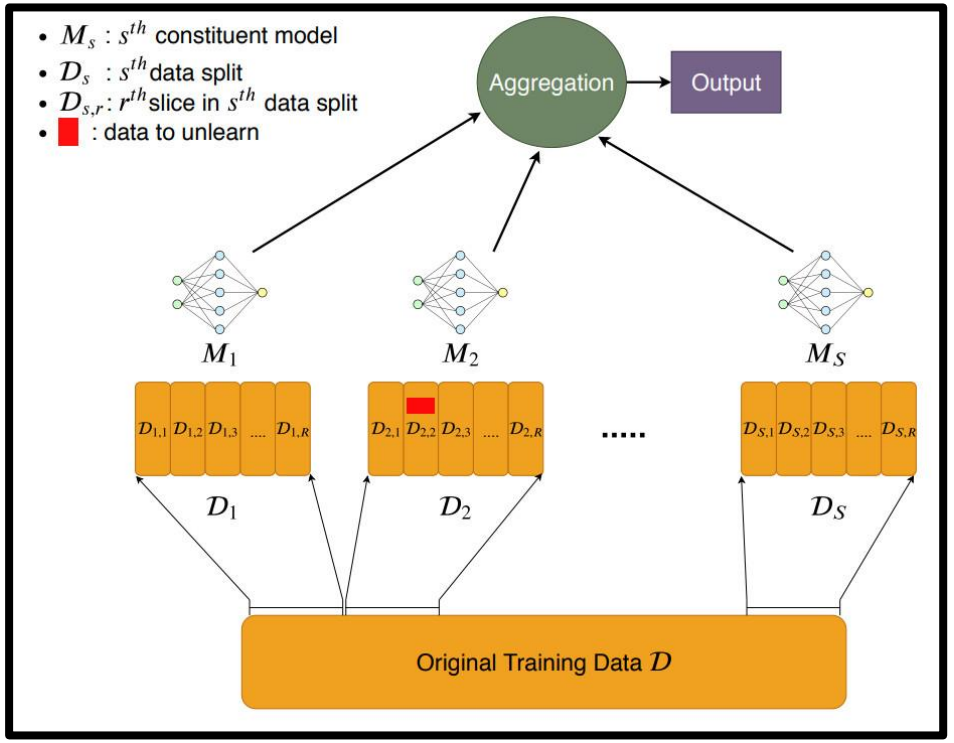
Machine Unlearning

Machine Unlearning



Images taken from https://arxiv.org/abs/1912.03817
The work is summarized on http://www.cleverhans.io/2020/07/20/unlearning.html

Machine Unlearning



- Shard data: Each subject's data is contained in only one shard
  - You only need to retrain 1 of N shards
- Slice data within a shard: Train for Slice 1, Slices 1-2, Slices 1-3, and maintain state
  - Expectation that you can start retraining halfway through the slices

Images taken from https://arxiv.org/abs/1912.03817
The work is summarized on http://www.cleverhans.io/2020/07/20/unlearning.html

Genetic Data

The Ownership of Biological Data

'Henrietta Lacks': A Donor's Immortal Legacy

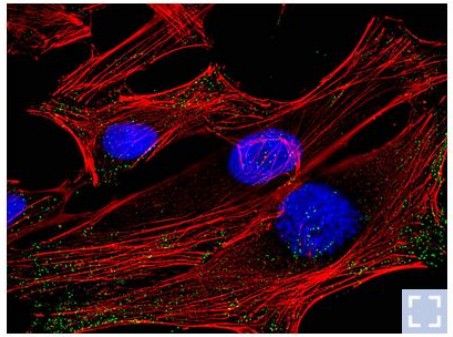
February 2, 2010 · 12:00 PM ET
Heard on Fresh Air

FRESH AIR

37-Minute Listen + PLAYLIST

In 1951, an African-American woman named Henrietta Lacks was diagnosed with terminal cervical cancer. She was treated at Johns Hopkins University, where a doctor named George Gey snipped cells from her cervix without telling her. Gey discovered that Lacks' cells could not only be kept alive, but would also grow indefinitely.

For the past 60 years Lacks' cells have been cultured and used in experiments ranging from determining the long-term effects of radiation to

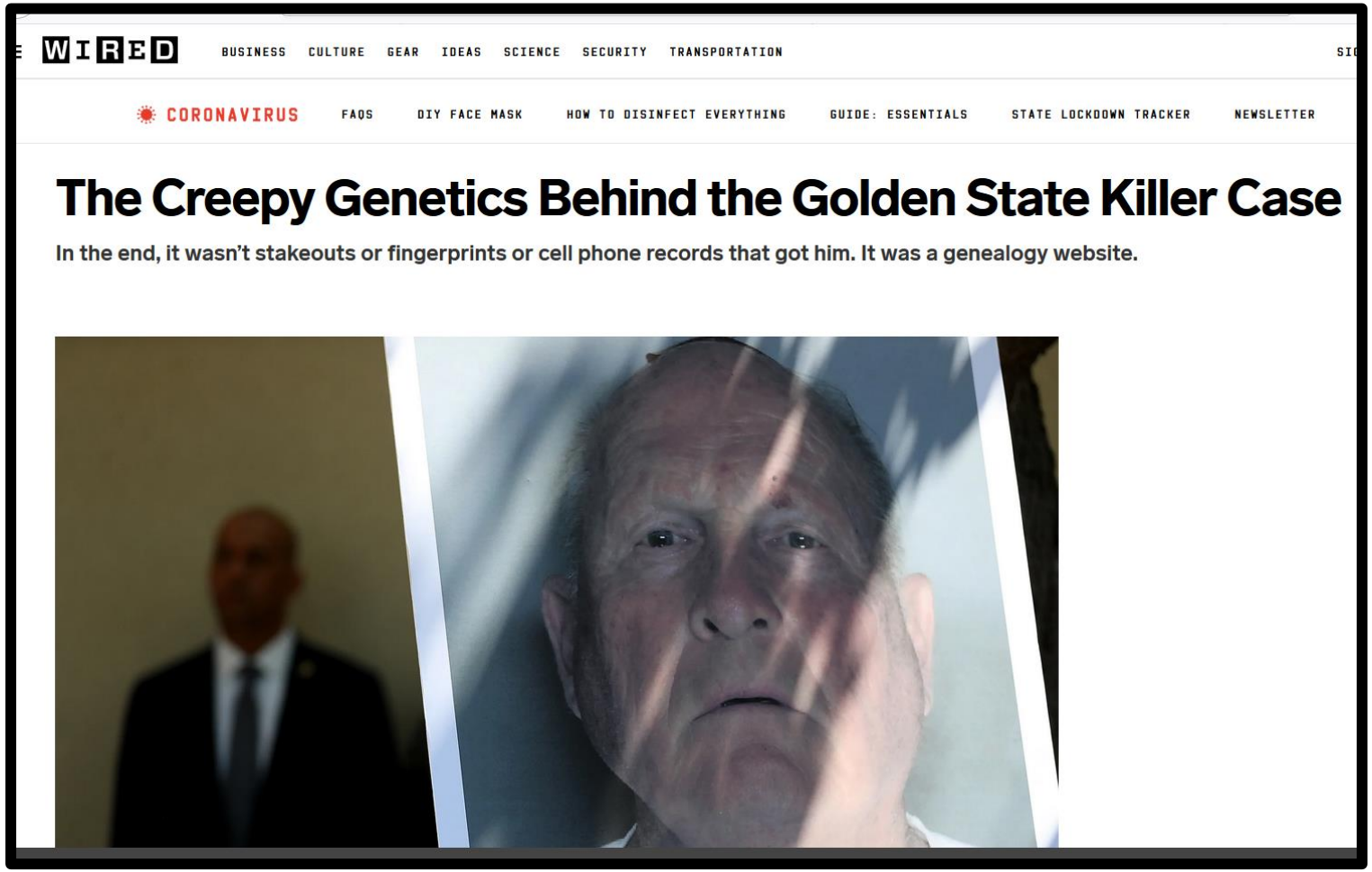


A fluorescence micrograph of HeLa cells, derived from cervical cancer cells taken from Henrietta Lacks and named in her honor

Tomasz Szul/Visuals Unlimited, Inc./Getty Images

https://www.npr.org/2010/02/02/123232331/henrietta-lacks-a-donors-immortal-legacy

Wins (?) for DNA Data



https://www.wired.com/story/detectives-cracked-the-golden-state-killer-case-using-genetics/

Losses (?) for DNA Data

https://www.theguardian.com/lifeandstyle/2018/sep/18/your-fathers-not-your-father-when-dna-tests-reveal-more-than-you-bargained-for