

6.1040: Software Design

Problems that *Matter*:
Value Sensitive Design

Arvind Satyanarayan & Daniel Jackson



Poster by Alvy Brooks (@alvybrooks)



Photo from Sam Altman (@sama)

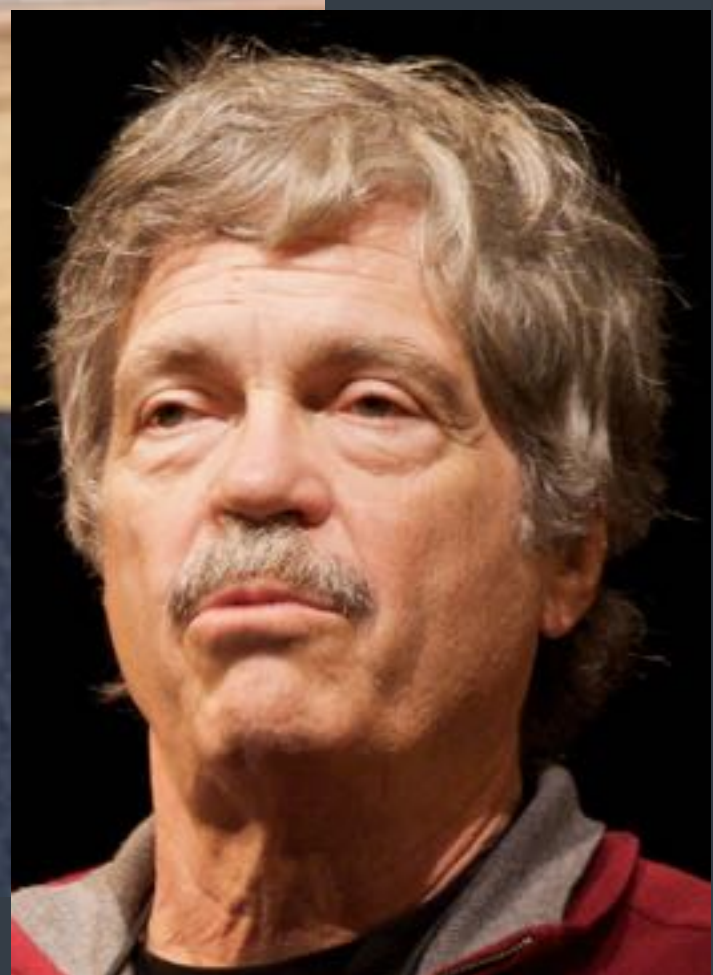


Photo by Marcin Wicharyz



Brussels



**Need finding / empathy building
*is not enough***

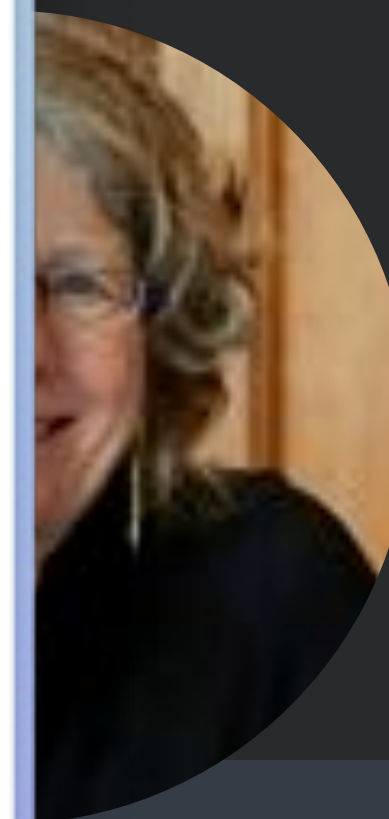
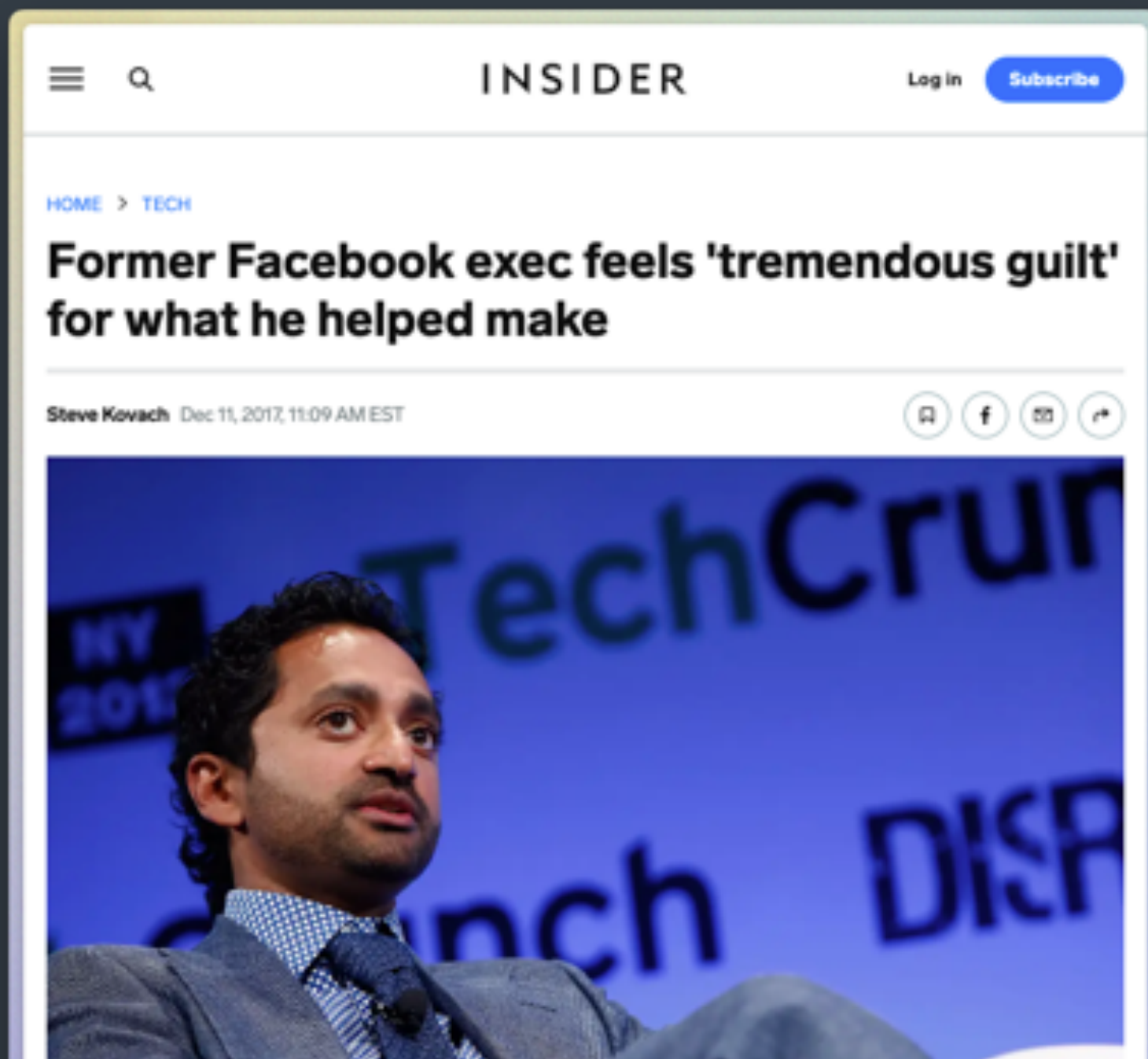
Value Sensitive Design

Designers often focus on the **immediate context of use**: how will a product be used by the person who purchases it?

Designers rarely have the time to **consider the long-term and indirect effects of their technologies**.

VALUE SENSITIVE DESIGN

SHAPING TECHNOLOGY WITH MORAL IMAGINATION



BATYA FRIEDMAN
DAVID G. HENDRY

Value Sensitive Design: 4 Criteria

Stakeholders

Describes the range of effects both on the people who are in direct contact with the technology, as well as those who might not be direct users, but whose lives are nevertheless affected by various interactions around the technology.

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Pervasiveness

Systemic interactions that follow from the widespread adoption of an interactive technology.



Elon Musk Acknowledges Withholding Satellite Service to Thwart Ukrainian Attack



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Values

What do people consider important in life? E.g., autonomy, community, cooperation, democratization, environmental sustainability, fairness, dignity.

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Stakeholders

Direct Stakeholders · Indirect Stakeholders · Non-targeted Use
Children · Variation in Abilities · Changing Hands · One Person, Many Roles

Time

The Long Now · Long-Term Health & Well-Being · Sustained Friendships
Work of the Future · Adaptation · Non-Use · Obsolescence · Reappropriation

Pervasiveness

Widespread Use · Diverse Geographies · Crossing National Boundaries
Accounting for Culture · Political Realities

Values

Elicit Stakeholder Values · Consider Key Values at Stake · Choose Desired Values
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Indirect Stakeholders: The Waze Effect



The image displays four vertical panels illustrating the Waze app's features:


- Panel 1:** Titled "Get the best routes with real-time alerts for traffic, accidents & more". It shows a smartphone screen with a map displaying a blue route, a red traffic jam icon, and a yellow accident icon.
- Panel 2:** Titled "Avoid unnecessary speeding tickets". It shows a smartphone screen with a map displaying a blue route, a yellow construction worker icon, and a yellow trophy icon labeled "1" with the text "real-time traffic app" below it.
- Panel 3:** Titled "Listen to music, podcasts & more". It shows a smartphone screen with a map displaying a blue route, a speed limit sign of 100, a speedometer showing 122 km/h, and a music player interface at the top.
- Panel 4:** Titled "Listen to music, podcasts & more". It shows a smartphone screen with a map displaying a blue route, a speed limit sign of 35, and a music player interface at the top.

BOROUGH
of
LEONIA
settled
1668

 CBS THIS
MORNING

WAZED AND CONFUSED

NJ TOWN TARGETS CONGESTION FROM NAVIGATION APPS



Indirect Stakeholders: The Waze Effect



WBZ-TV

Gail Barry of Medford says navigation apps have **completely changed her neighborhood.**

"The cars go whiz, whiz, whiz. It's like we are living on a highway. It's horrible."

Traffic on her residential street has gotten worse every year over the past couple of years.

<https://www.cbsnews.com/boston/news/iteam-waze-google-maps-traffic-navigation-apps-commuters/>



Photo by Evelyn Hockstein for The Washington Post

Tim Connor lives on a quiet residential street in Takoma Park, Maryland.

One afternoon, Connor **counted a vehicle every two seconds on a street with a single lane** available between parked cars.

One morning, neighbors **awoke to a cacophony of honks** and went out to find a **backup dozens of cars deep**, two drivers in the middle **about to come to blows.**

https://www.washingtonpost.com/local/traffic-weary-homeowners-and-waze-are-at-war-again-guess-whos-winning/2016/06/05/c466df46-299d-11e6-b989-4e5479715b54_story.html

Indirect Stakeholders: The Waze Effect



Gail Barry of Medford says navigation apps have **completely changed her neighborhood**

1. How might Waze update its design to account for its indirect stakeholders?
2. What could the indirect stakeholders do to fight back?

WBZ-TV



Photo by Evelyn Hockstein for The Washington Post

~3 mins: Discuss in Pairs.

One morning, neighbors **awoke to a cacophony of honks** and went out to find a **backup dozens of cars deep**, two drivers in the middle **about to come to blows**.

https://www.washingtonpost.com/local/traffic-weary-homeowners-and-waze-are-at-war-again-guess-whos-winning/2016/06/05/c466df46-299d-11e6-b989-4e5479715b54_story.html

t's horrible."
ver the past couple

, Maryland.

on a street with a

Indirect Stakeholders: The Waze Effect



DAVID E. RYU
COUNCILMEMBER, FOURTH DISTRICT

April 17, 2018

City Attorney Mike Feuer
Office of the Los Angeles City Attorney
James K. Hahn City Hall East
200 North Main Street, 8th Floor
Los Angeles, CA 90012

Dear City Attorney,

I am writing you today to urge your office to explore filing suit against Waze, owned by Google LLC, a subsidiary of Alphabet, for creating a dangerous condition in the public right of way. After numerous attempts to reach a resolution with Waze for the threats to public safety and infrastructure caused by their mobile technology, it has become clear that any and all legal options should be considered.

Wayfinding technology such as Waze has grown increasingly popular with drivers. In 2015, Waze reported that it had about 2 million users in Greater Los Angeles, one of the app's most popular locations. This new kind of wayfinding technology promises users a faster commute by giving real-time traffic updates and alternate routes to traditional arteries. To achieve this, it can wreak undue havoc on traffic plans, residential communities, and the safety of the residents of Los Angeles. Ironically, many of these "short cuts", end up causing more traffic in a race-to-the-bottom effort to cut travel times by using small cut-through streets, leading drivers to make unsafe turns and often unpermitted traffic directions.

Indirect Stakeholders: The Waze Effect



"All roads are the public domain and therefore the right of everyone to use [...] In that sense, Waze redistributes traffic to create a better traffic situation for everyone."

– Uri Levine, Waze Co-Founder

Variation in Human Ability: Designing for Accessibility



Liz Jackson

@elizejackson




Disability Dongle: A well intended elegant, yet useless solution to a problem we never knew we had. Disability Dongles are most often conceived of and created in design schools and at IDEO.

3:49 PM · Mar 26, 2019 · Twitter Web Client

90 Retweets **17** Quote Tweets **366** Likes



Mashable 
@mashable



These students just blew minds with their wheelchair prototype

5 Most Amazing Futuristic Transport Inventions Available Now 2017 Concept

2.4K views • 4 years ago



Insane Gadgets

Mashable

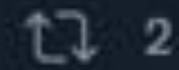




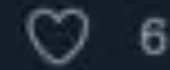
Manual chairs are far too expensive for those that need them to afford, so who knows how anyone who isn't a billionaire is supposed to afford these glorified (and ugly) segways?



2



2



6



I'd for sure fall out going up backwards. My core strength to hold myself upright is rubbish, no way I'd be able to do that. Also, going upstairs backwards in a crowd seems like it would be.... challenging at best



2



3



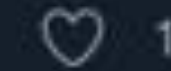
If it takes my HMO six weeks to approve new tires for my manual wheelchair, there isn't a chance in hell that they're approving one of these 'fancy' chairs



1



1



10



"What's the market price, what's the lifespan of the rubberized tracks, what's the maintenance model, what's the functionality of the chair if it stops working suddenly, what's the charge-cycle of the batteries, what's the lifespan of the batteries?"

"But it looks cool!"



1



5



Looks expensive. A simple ramp would be accessible to people who cannot afford this kind of tech as well as those with other mobility restrictions.



1



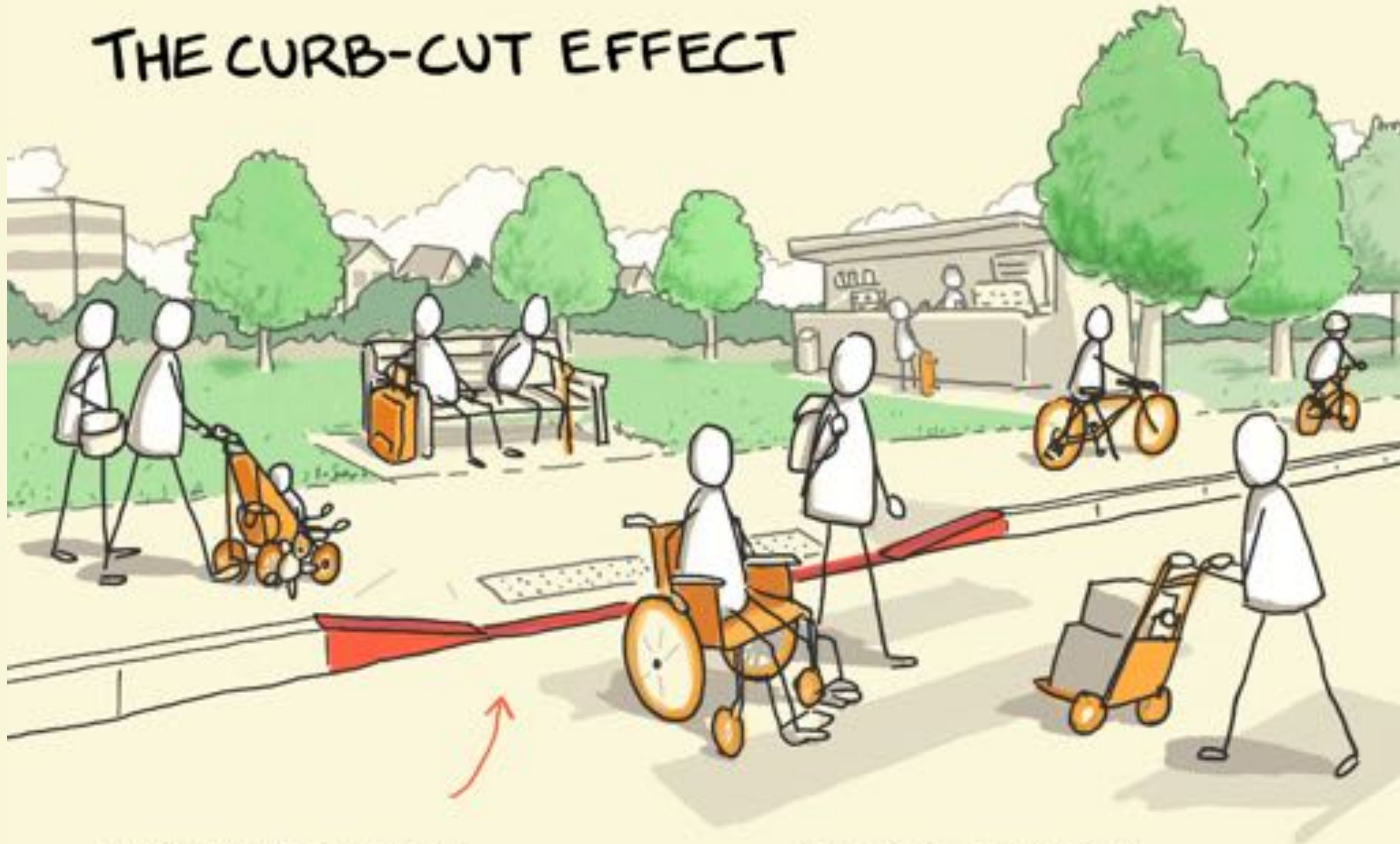
1



6



THE CURB-CUT EFFECT



WHEN WE DESIGN
FOR DISABILITIES

... WE MAKE THINGS
BETTER FOR EVERYONE

sketchplanations

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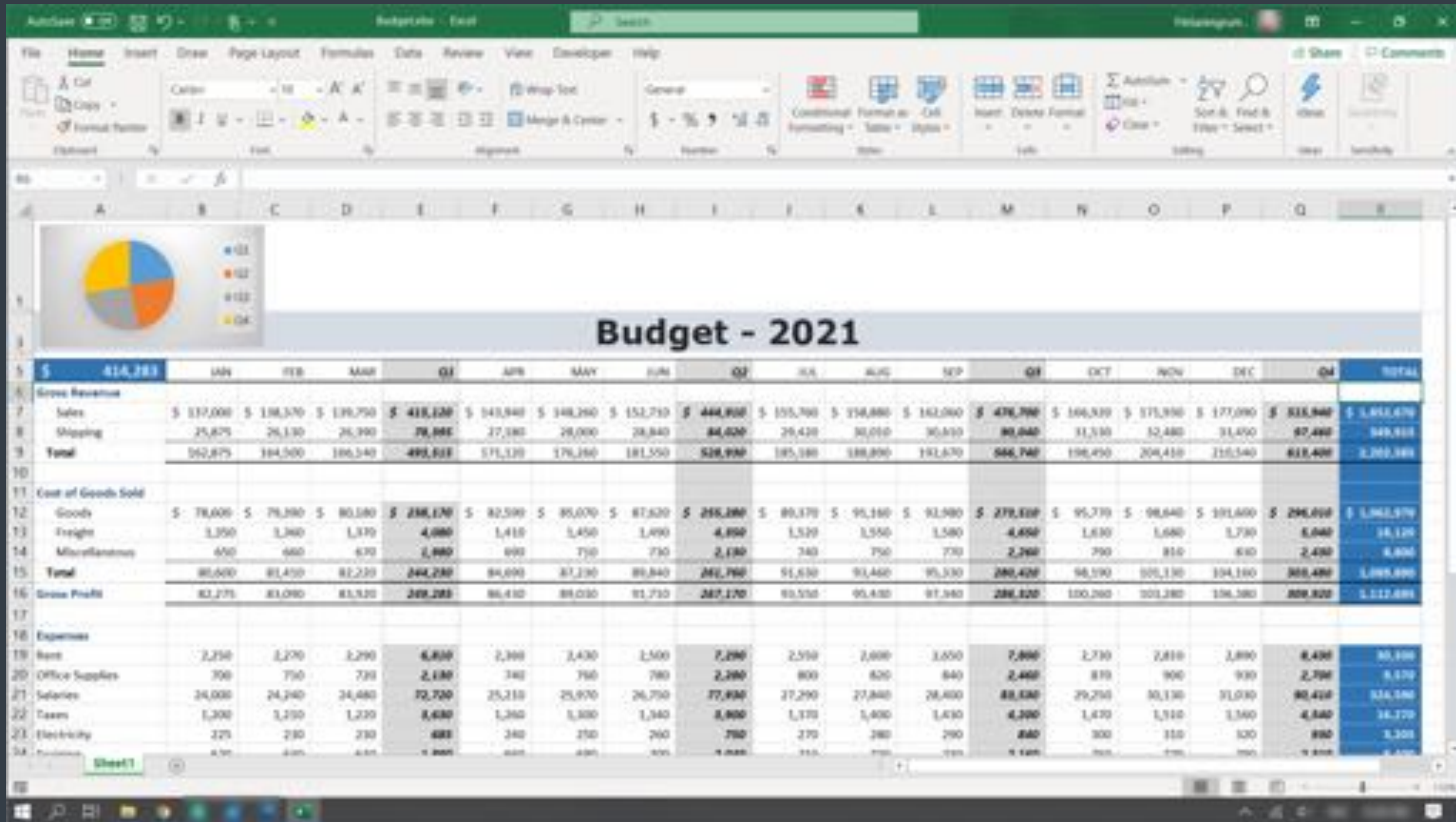
Reappropriation



Photo by Clément Gault



Reappropriation: Malleable Software

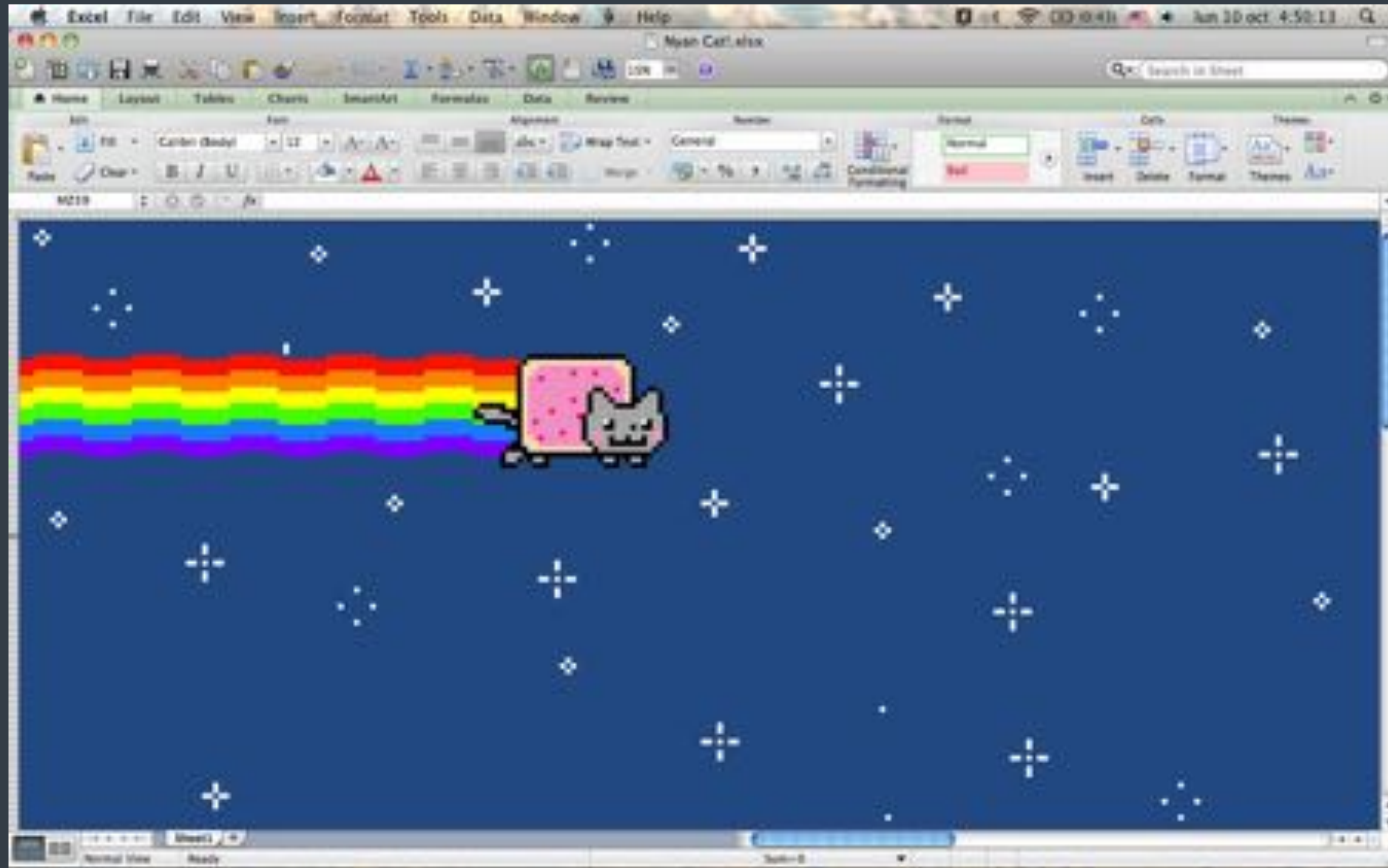


Reappropriation: Malleable Software



Pixel art by [reijr.](#)
Curated by [Maggie Appleton](#)

Reappropriation: Malleable Software



Pixel art by [Oscarito7](#).
Curated by [Maggie Appleton](#)

Reappropriation: Malleable Software

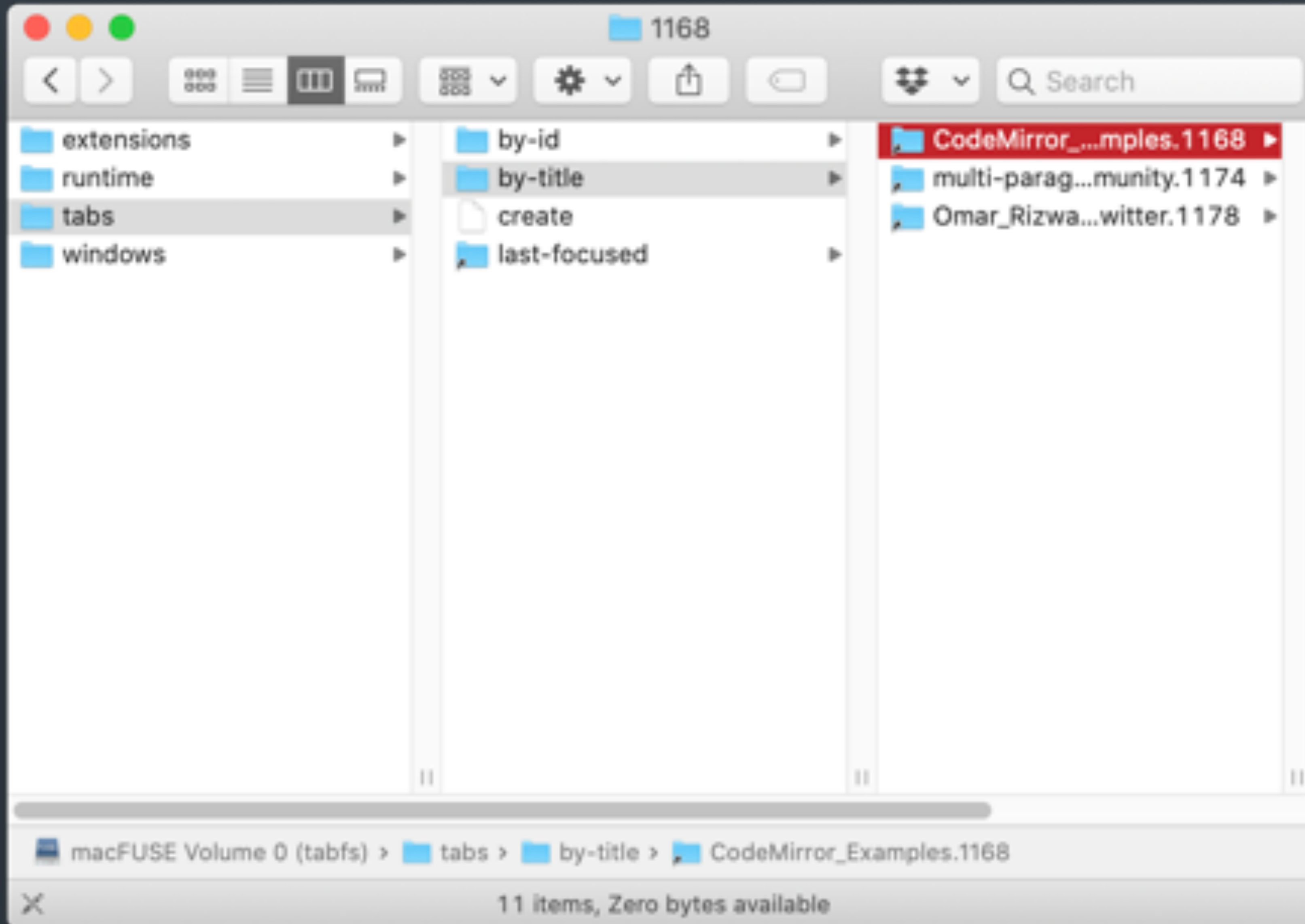
The screenshot displays the X1Studio software interface, which is a digital audio workstation (DAW) designed for reappropriation. The interface is set on a grid background and includes the following elements:

- Title Bar:** "X1Studio v1 by Dylan Tallchief" with a "Click Here!" link.
- Control Panel:** A table of settings on the left and four main buttons in the center.
- Timeline:** A horizontal bar at the top with a playhead and markers for "Intro", "Hook", and "Verse 1".
- Tracks:** A list of tracks on the left, each with a corresponding colored bar in the timeline showing the duration of the track.

Parameter	Value
BPM	169
Device	1
Legato	Off
Swing	0

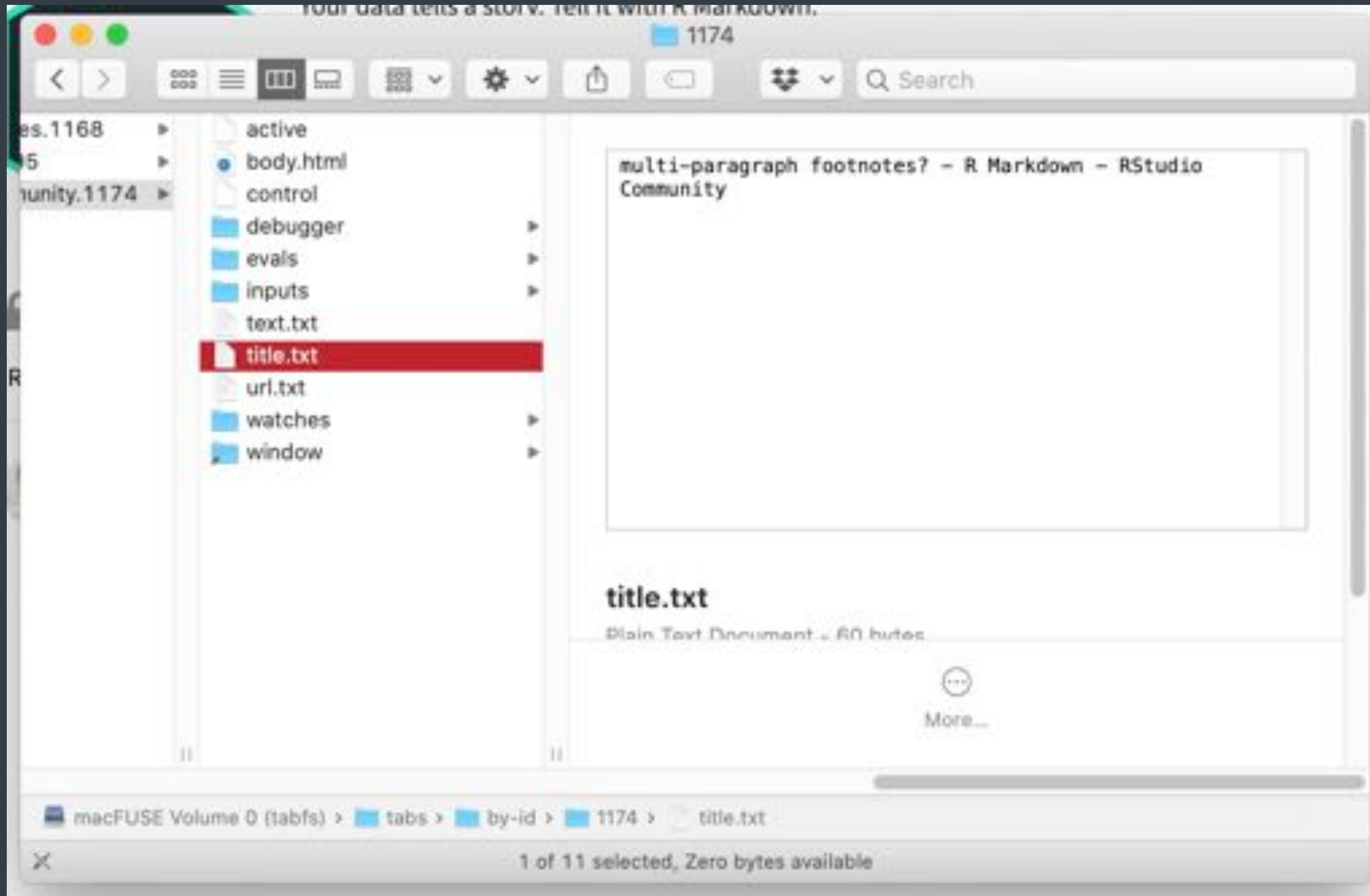
Track	Start	End
Drums	1	12
Synth	10	14
Bass	11	21
Slow Strings	12	14
Lead	15	17
Lead 2	15	17
Strings 2	16	16

Reappropriation: TabFS by Omar Rizwan



<https://omar.website/tabfs/>

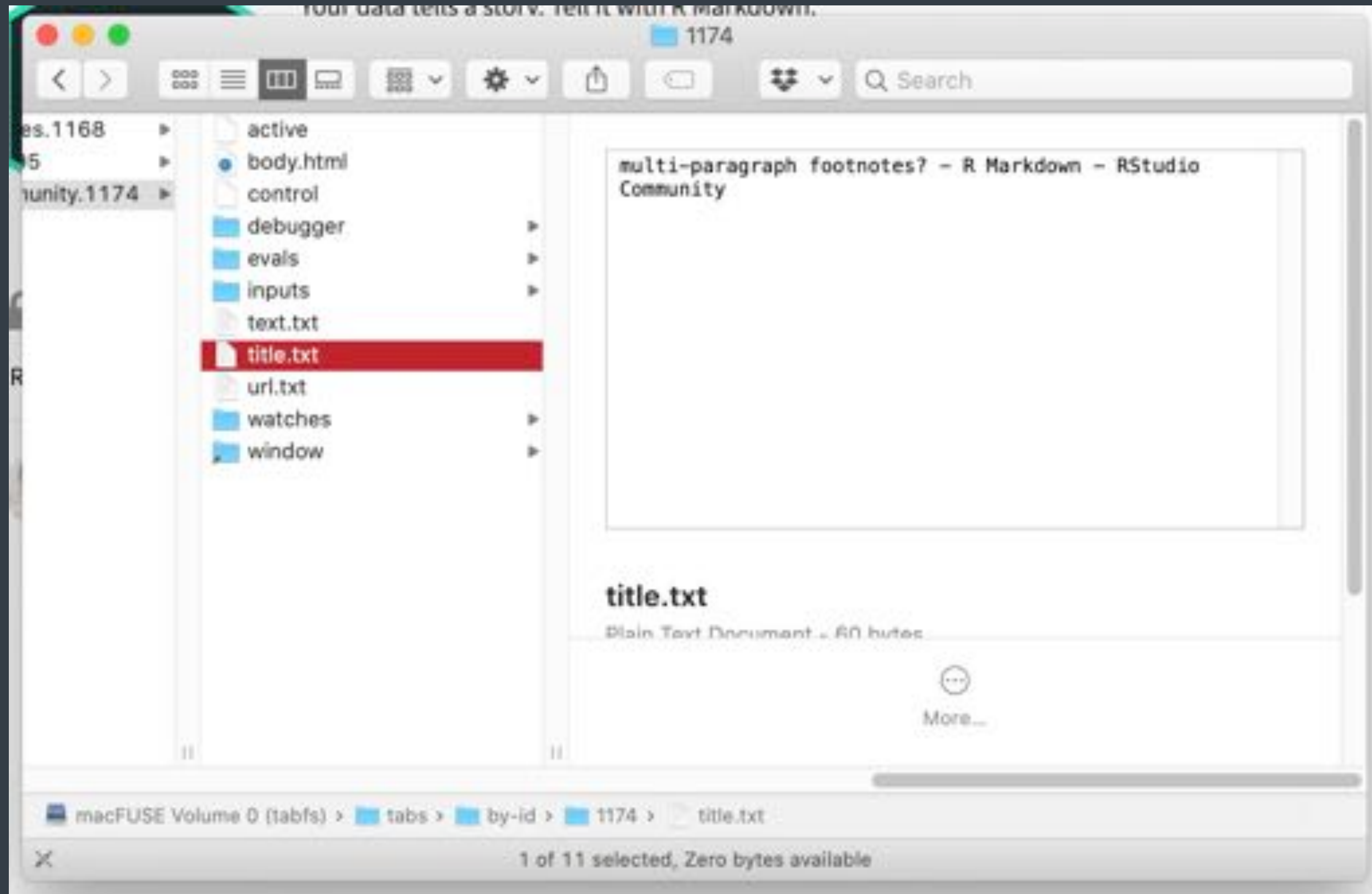
Reappropriation: TabFS by Omar Rizwan



What can you envision doing now that tabs are just files and folders?

~3 mins: Pair Discussion.

Reappropriation: TabFS by Omar Rizwan

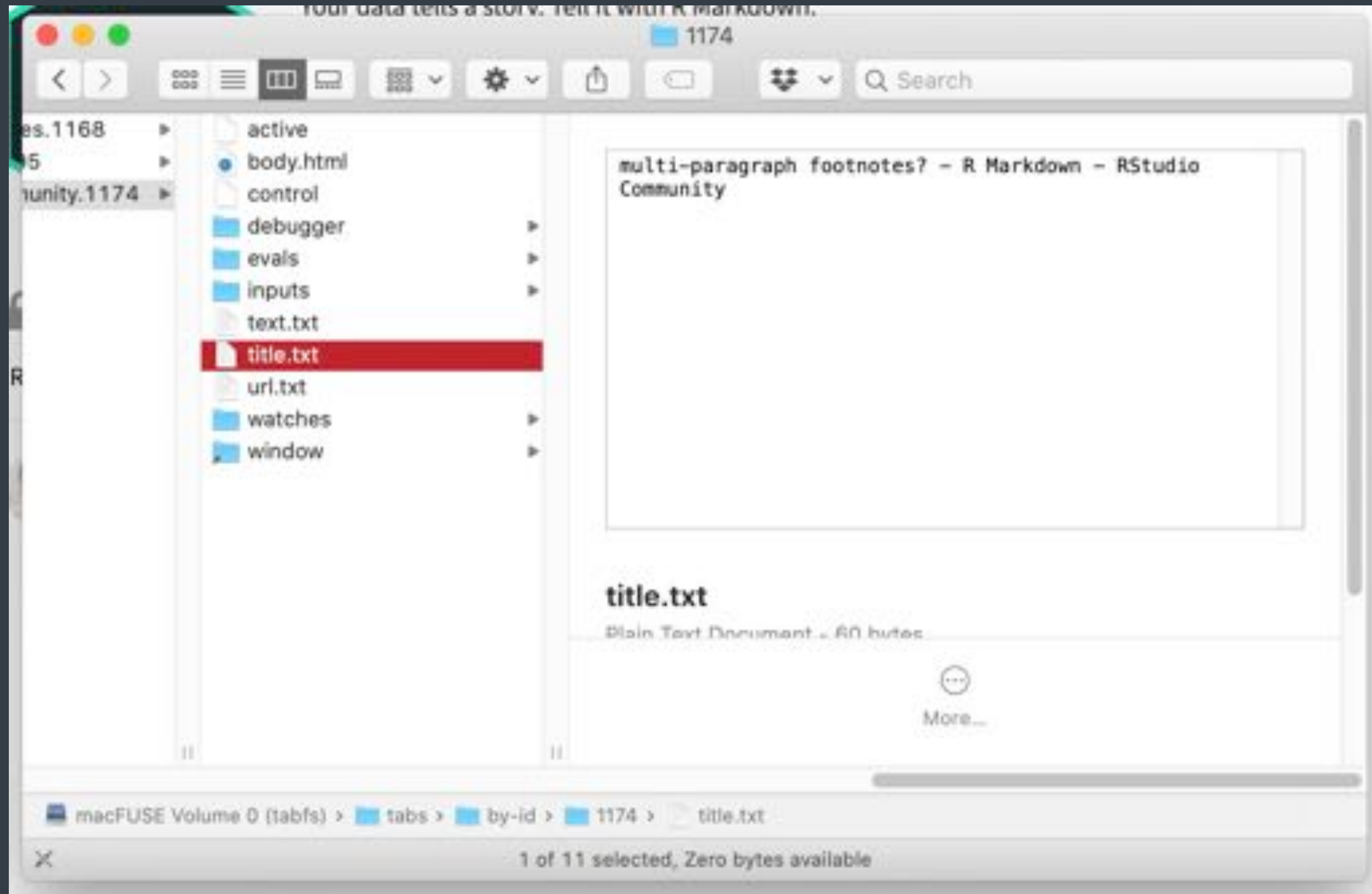


List titles of all open tabs:

```
$ cat mnt/tabs/by-id/*/title.txt  
GitHub  
Home / Twitter  
61040 Discourse
```

<https://omar.website/tabfs/>

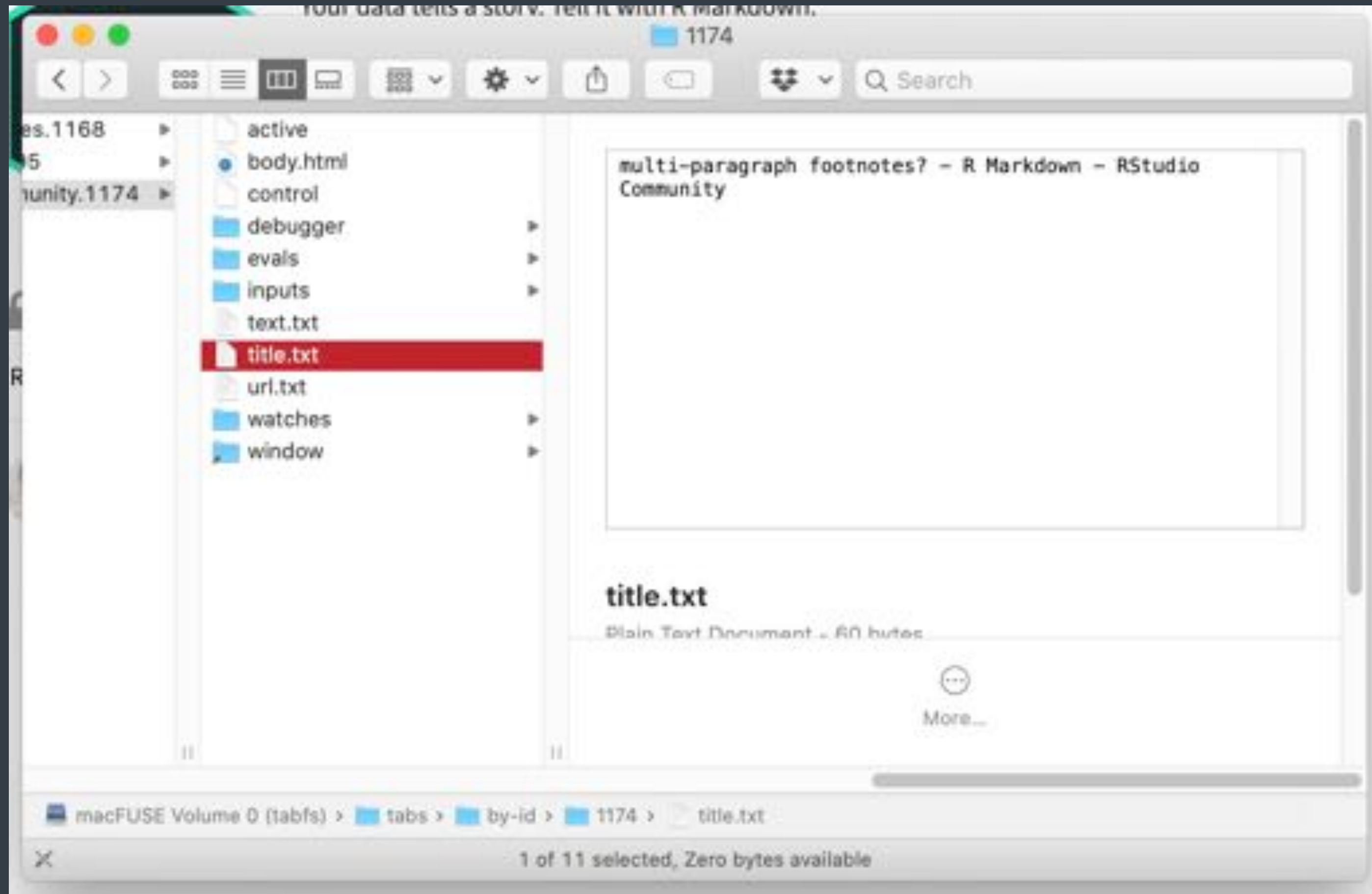
Reappropriation: TabFS by Omar Rizwan



Close all Stack Overflow tabs:

```
$ rm mnt/tabs/by-title/*Stack_Overflow*
```

Reappropriation: TabFS by Omar Rizwan



Live edit `body.html` in your favourite code editor

<https://omar.website/tabfs/>

Choosing Not to Use



15 WMTV MADISON nbc15.com 73° Madison, WI

First Alert Weather Navigating School NBC15 Investigates Coronavirus News

Madison Common Council passes ordinance banning facial recognition technology

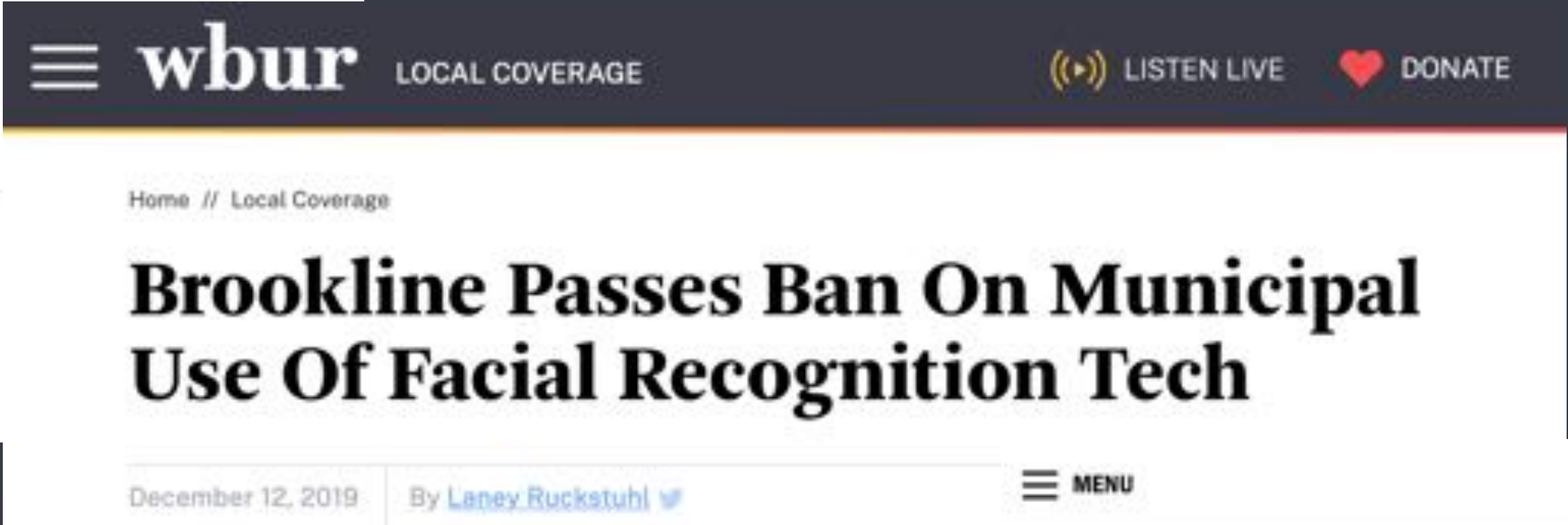


The New York Times

San Francisco Bans Facial Recognition Technology

Give this article 360

By [Kate Conger](#), [Richard Fausset](#) and [Serge F. Kovaleski](#)
May 14, 2019



wbur LOCAL COVERAGE LISTEN LIVE DONATE

Home // Local Coverage

Brookline Passes Ban On Municipal Use Of Facial Recognition Tech

December 12, 2019 By [Laney Ruckstuhl](#)



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Boston Bans Use Of Facial Recognition Technology. It's The 2nd-Largest City To Do So

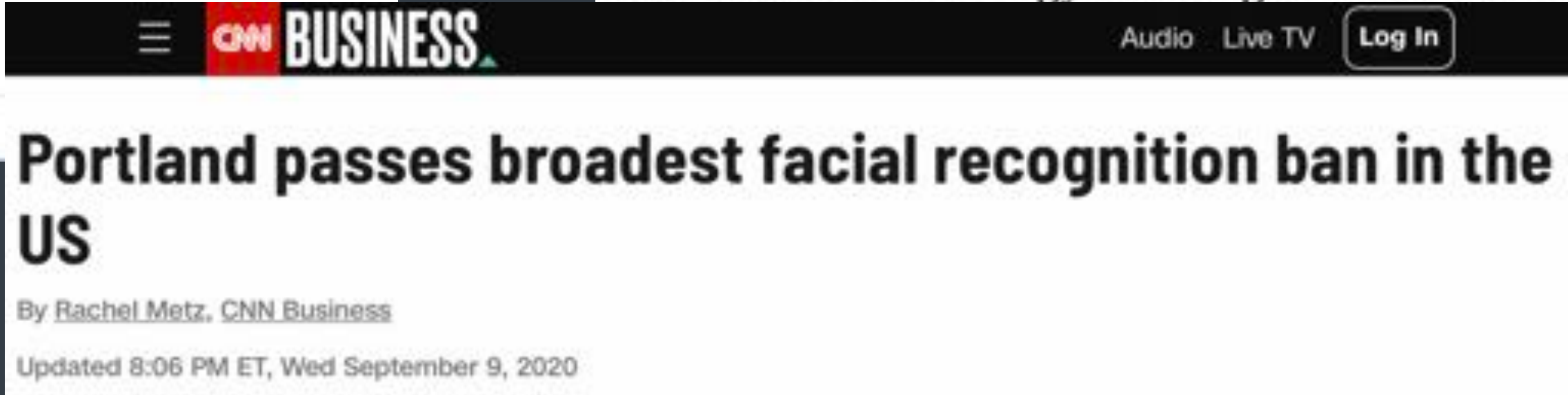
Updated June 24, 2020 By [Ally Jarmanning](#)



BOSTON.COM

Cambridge becomes the largest Massachusetts city to ban facial recognition

"Massachusetts cities and towns are stepping up to ensure that face surveillance technology doesn't get out ahead of our basic rights."



CNN BUSINESS Audio Live TV Log In

Portland passes broadest facial recognition ban in the US

By [Rachel Metz](#), CNN Business
Updated 8:06 PM ET, Wed September 9, 2020

Choosing Not to Use: Face Recognition



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Resisting the Menace of Face Recognition

BY ADAM SCHWARTZ | OCTOBER 26, 2021

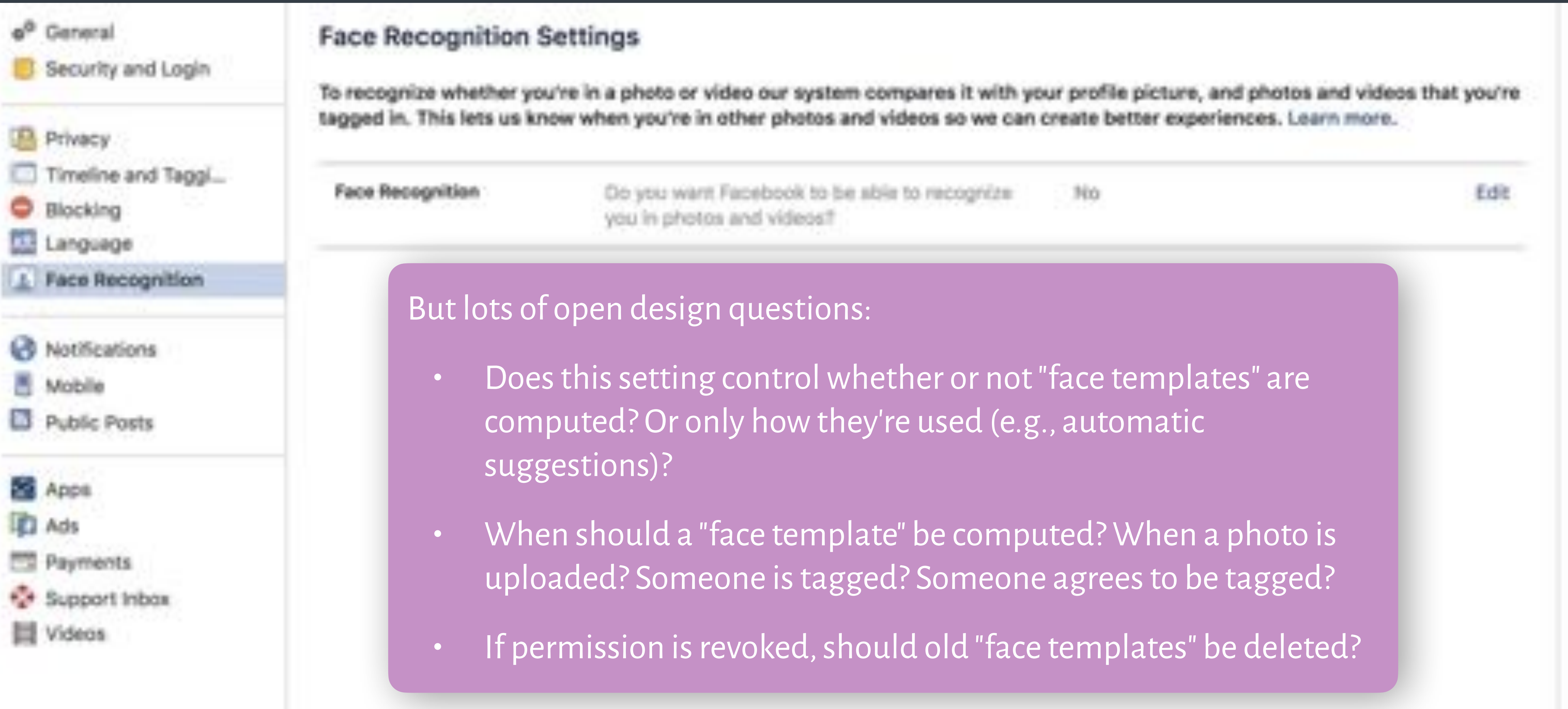
ESPAÑOL

Face recognition technology is a special menace to privacy, racial justice, free expression, and information security. Our faces are unique identifiers, and most of us expose them everywhere we go. And unlike our passwords and identification numbers, we can't get a new face. So, governments and businesses, often working in partnership, are increasingly using our faces to track our whereabouts, activities, and associations.

Choosing Not to Use: Face Recognition



Choosing Not to Use: Face Recognition



The image shows a screenshot of the Facebook settings page, specifically the 'Face Recognition Settings' section. On the left is a navigation menu with categories like General, Security and Login, Privacy, Timeline and Tagging, Blocking, Language, and Face Recognition (which is highlighted). The main content area is titled 'Face Recognition Settings' and includes an introductory paragraph: 'To recognize whether you're in a photo or video our system compares it with your profile picture, and photos and videos that you're tagged in. This lets us know when you're in other photos and videos so we can create better experiences. Learn more.' Below this is a toggle switch for 'Face Recognition' with the question 'Do you want Facebook to be able to recognize you in photos and videos?' and a radio button set with 'No' selected. An 'Edit' link is visible to the right of the toggle.

Face Recognition Settings

To recognize whether you're in a photo or video our system compares it with your profile picture, and photos and videos that you're tagged in. This lets us know when you're in other photos and videos so we can create better experiences. [Learn more.](#)

Face Recognition Do you want Facebook to be able to recognize you in photos and videos? No [Edit](#)

But lots of open design questions:


- Does this setting control whether or not "face templates" are computed? Or only how they're used (e.g., automatic suggestions)?
- When should a "face template" be computed? When a photo is uploaded? Someone is tagged? Someone agrees to be tagged?
- If permission is revoked, should old "face templates" be deleted?

Choosing Not to Use: Face Recognition

The New York Times

Facebook to Pay \$550 Million to Settle Facial Recognition Suit

It was another black mark on the privacy record of the social network, which also reported its quarterly earnings.

 Give this article



By [Natasha Singer](#) and [Mike Isaac](#)

Jan. 29, 2020


 Meta

[Who We Are](#)

[What We Build](#)

[Our Actions](#)

[Our Community](#)

 [Back to Newsroom](#)

[Facebook](#)

An Update On Our Use of Face Recognition

November 2, 2021

By Jerome Pesenti, VP of Artificial Intelligence

- We're shutting down the Face Recognition system on Facebook. People who've opted in will no longer be automatically recognized in photos and videos and we will delete more than a billion people's individual facial recognition templates.
- This change will also impact Automatic Alt Text (AAT), which creates image descriptions for blind and visually-impaired people. After this change, AAT descriptions will no longer include the names of people recognized in photos but will function normally otherwise.
- We need to weigh the positive use cases for facial recognition against growing societal concerns, especially as regulators have yet to provide clear rules.

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Widespread Use: Text Autocomplete



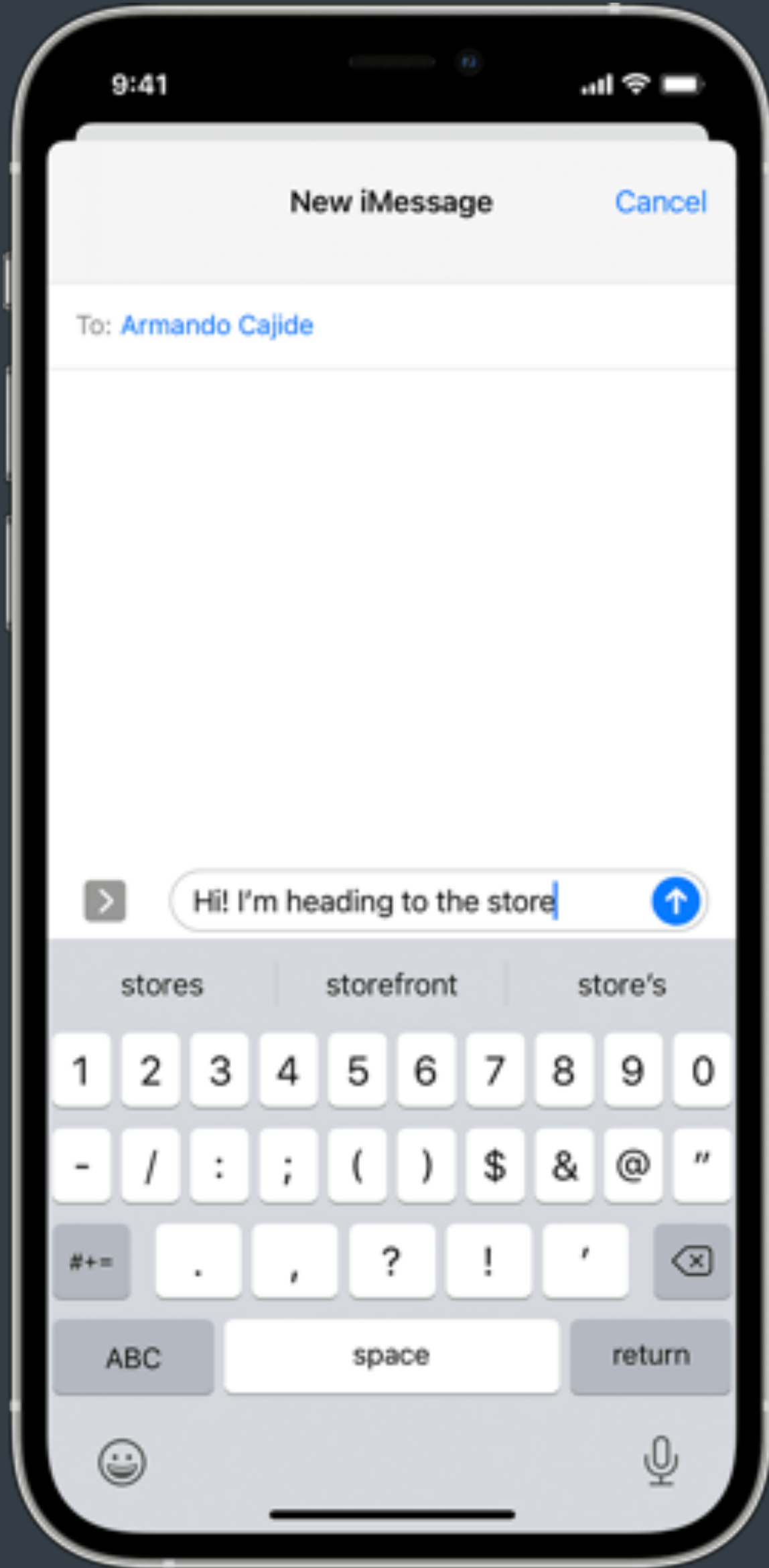
By The Digital Owl.



From Engadget

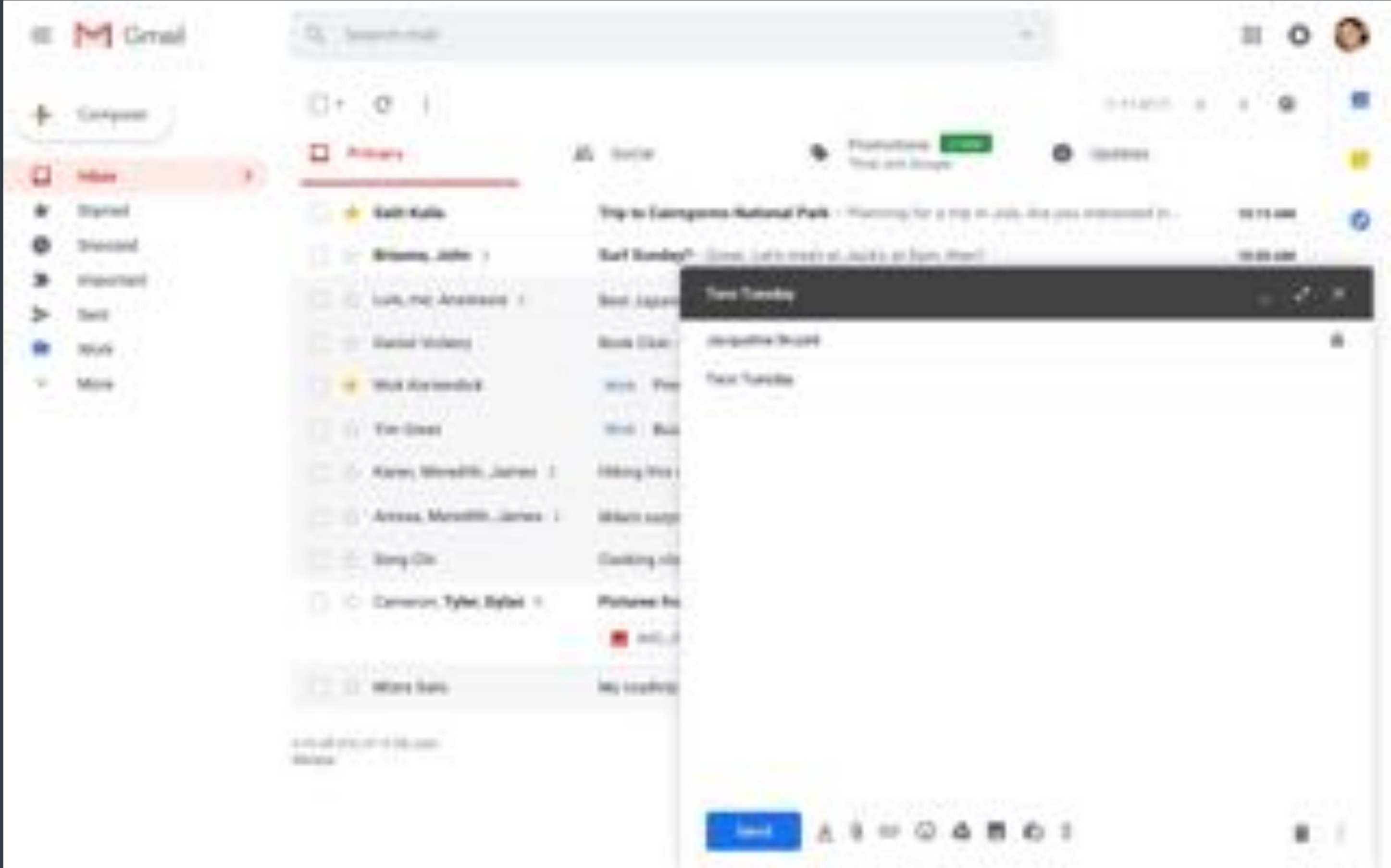
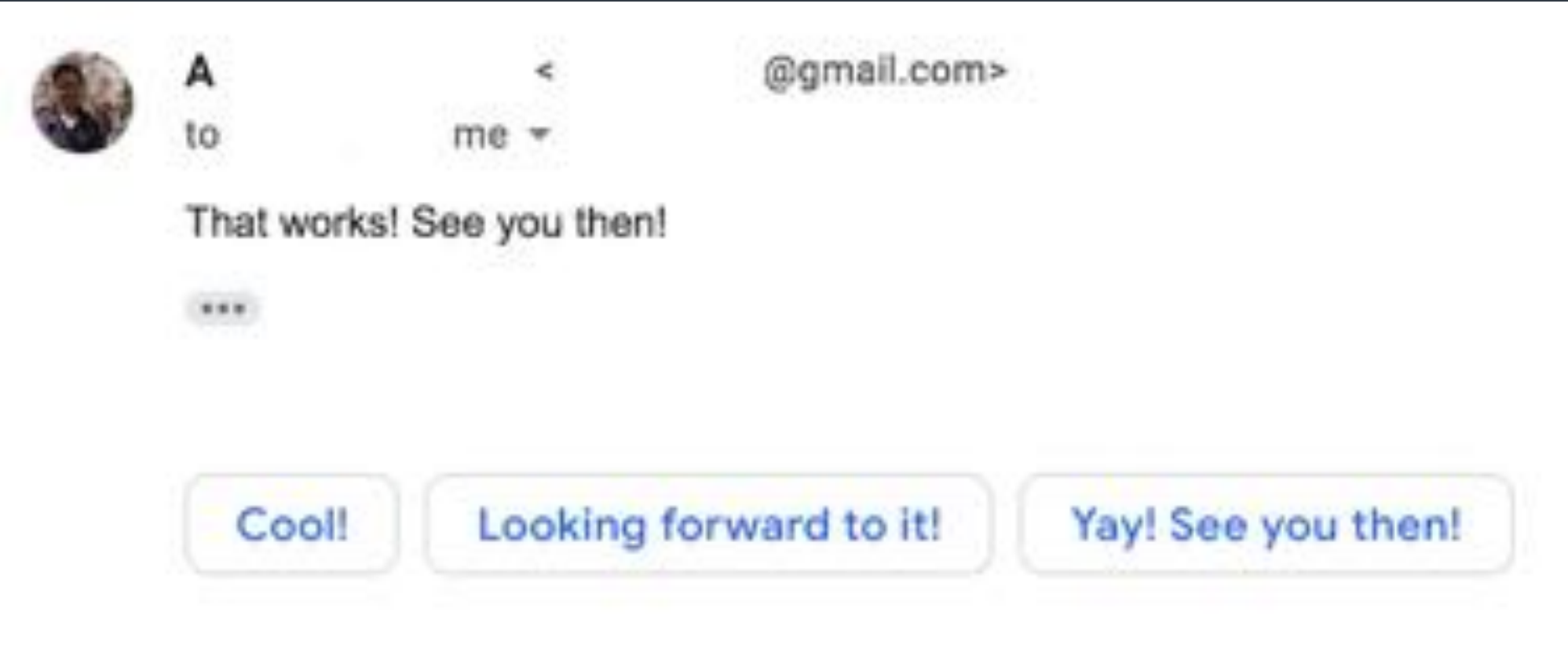
By smial (talk) at English Wikipedia.

Predictive Text



Smart Compose

Smart Reply



Widespread Use: Text Autocomplete



Paradox:

- Making it easier to send emails → increases overall number of emails people send!
- Making it easier to send emails → changes social norms/expectations → pressure to be responsive

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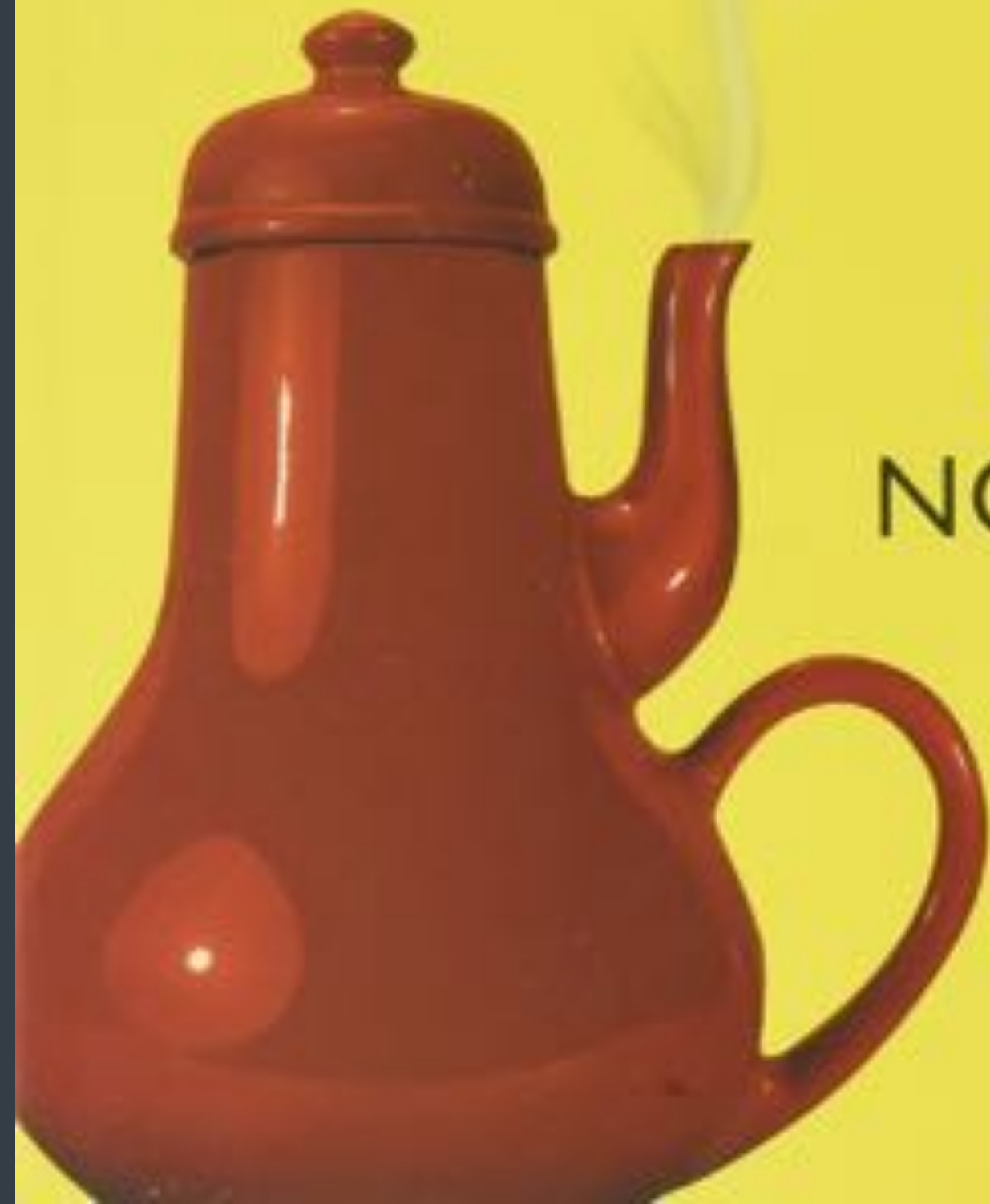
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REVISED & EXPANDED EDITION

The DESIGN *of* EVERYDAY THINGS

DON
NORMAN



Designers are asked to figure out how to manage the interaction of technology and people. Good designers are quick learners, for today they might be asked to design a camera; tomorrow, to design a transportation system or a company's organizational structure. How can one person work across so many different domains? Because the fundamental principles of designing for people are the same across all domains. People are the same, and so the design principles are the same.

Designers are only one part of the complex chain of processes and different professions involved in producing a product. Although

six: *Design Thinking* 239

Photo from J. Nathan Matias (@natematias)

Software is *not neutral*

Software is *not neutral*

Developing software involves a series of **design choices and tradeoffs**, large and small.

Each design decision is **implicitly encoding your values and priorities**.

Through adoption, those values are then **applied at scale**.

Those design choices then begin to **shape our values**.



Poster by Alvy Brooks (@alvybrooks)



Photo from Sam Altman (@sama)

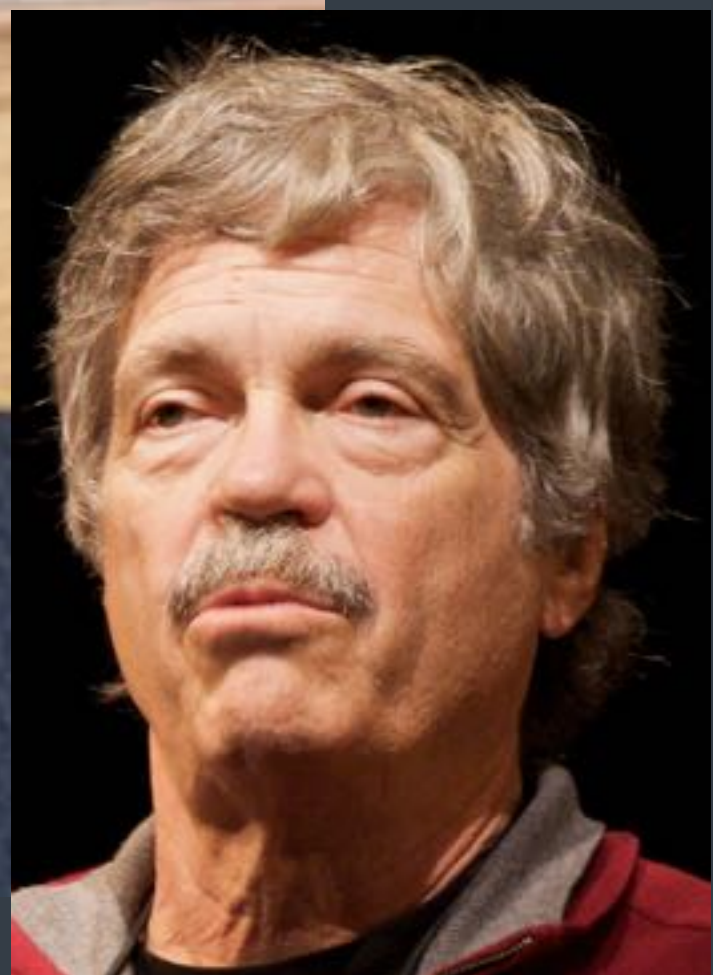
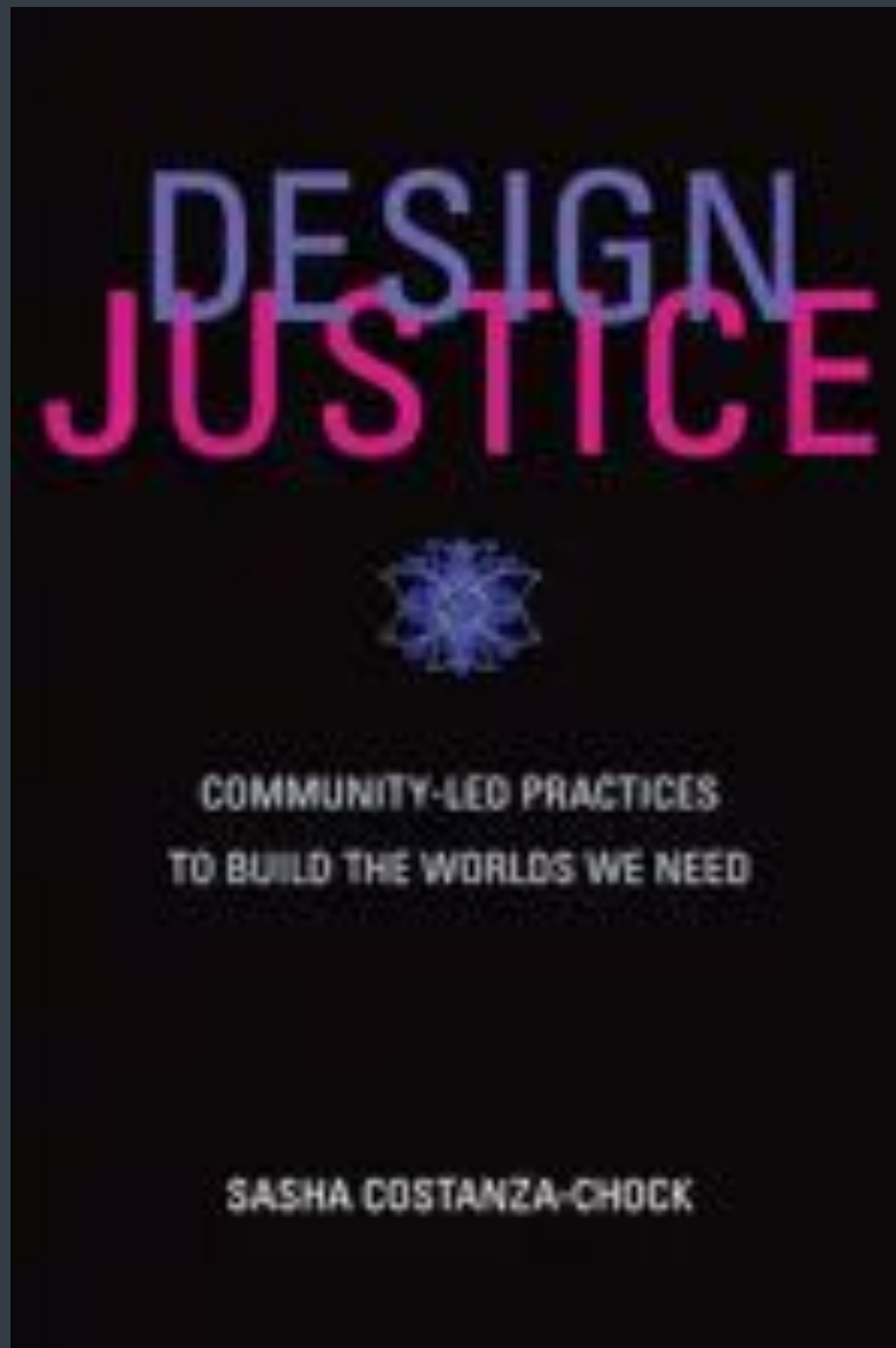
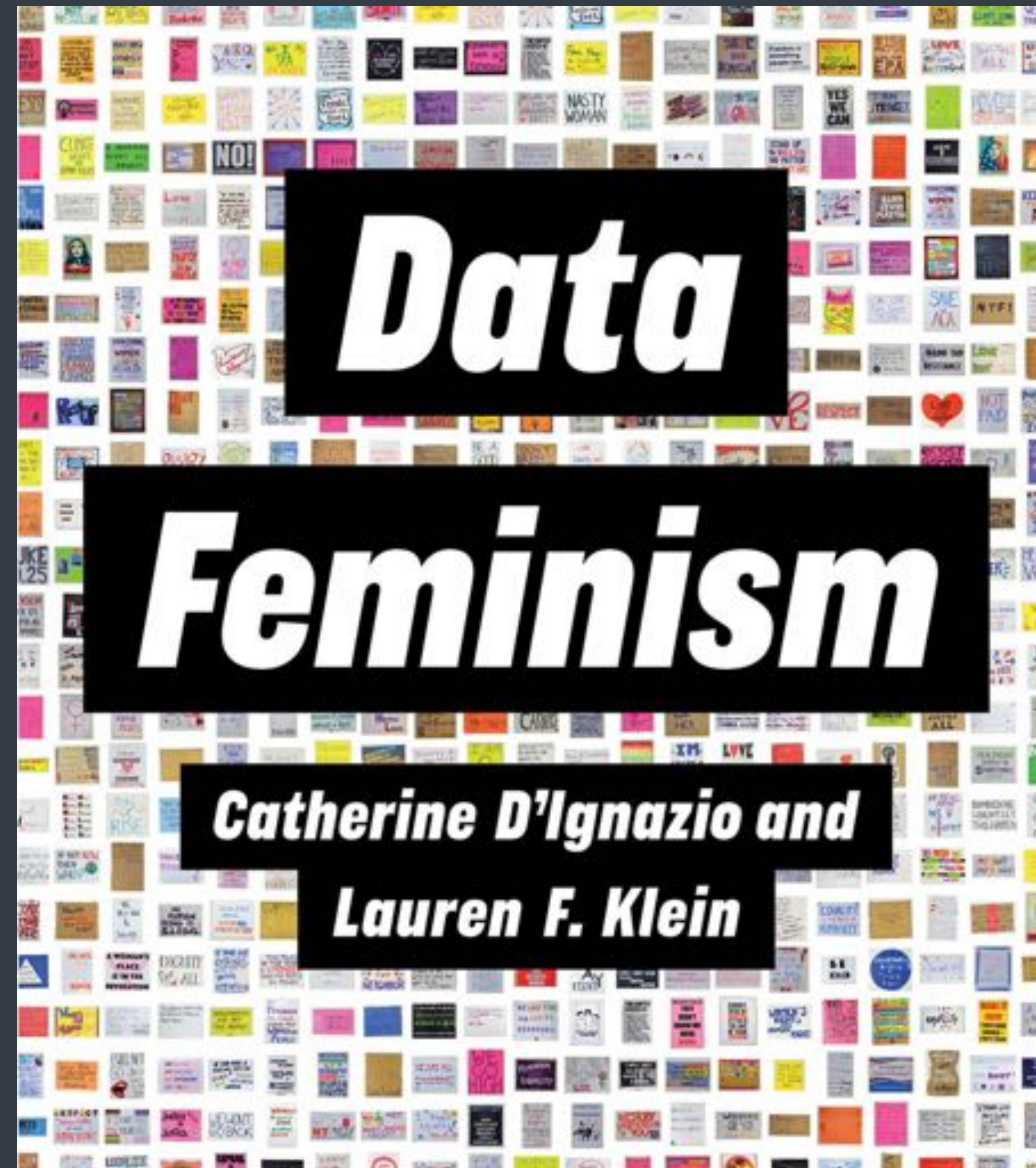


Photo by Marcin Wichary2



<https://designjustice.mitpress.mit.edu>



<https://data-feminism.mitpress.mit.edu>

