

# WIRED



JULY/AUG 2021 • DON'T BE EVIL

**Timnit  
Gebru**  
warned that  
big, messy  
AI systems  
would  
generate  
racist, unfair  
results.

Google  
brought  
her in  
to prevent  
that fate.  
Then  
it forced  
her out.

Can  
Big Tech  
handle  
criticism  
from  
within?

BY TOM SIMONITE

# Wired.2021.07.02

[Fri, 02 Jul 2021]

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07.01.2021 03:30 PM

# Six-Word Sci-Fi: Stories Written by You

Here's this month's prompt, how to submit, and an illustrated archive of past favorites.

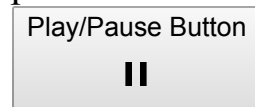


Illustration: Elena Lacey

THIS MONTH'S PROMPT

**In six words, write a story about a self-aware self-driving car.**

Submit stories on [Twitter](#), [Facebook](#), or [Instagram](#), or email us at [mail@wired.com](mailto:mail@wired.com). We'll choose one to illustrate.

*Disclaimer: All #WiredSixWord submissions become the property of WIRED. Submissions will not be acknowledged or returned. Submissions and any other materials, including your name or social media handle, may be published, illustrated, edited, or otherwise used in any medium. Submissions must be original and not violate the rights of any other person or entity.*

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JULY 2021

## A Story About a Casual Encounter With Aliens

ILLUSTRATION: VIOLET REED

## **SO, ABOUT YOUR PLANET'S EXTENDED WARRANTY ....**

—@phorne96, via Twitter

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### **Honorable Mentions:**

**You look nothing like your photo.** —@markgyles, via Twitter

**Lights, camera ... where did it go?** —thalia925, via email

**They came, too late, for Elvis.** —Bruce Lyon, via Facebook

**Seeking vital fluids, they commandeered snacks.** —Scott Medintz, via email

**Do you have the correct spacetime?** —Richard Krzemien, via email

**I awoke with a probing thought.** —@andynez, via Twitter

**Take us to the Nigerian prince.** —Juan Garcia, via Facebook

**Quite unexpectedly, cocktail recipes were exchanged.** —John Wagner, via email

**You're an alien! No you are!** —@simon\_staffans, via Twitter

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JUNE 2021

## **A Story About an International Digital Heist**

ILLUSTRATION: VIOLET REED



# **THERE WAS NOTHING LEFT, ONLY ZEROES.**

—@jamesnsmith, via Twitter

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## **Honorable Mentions:**

**"Hand it over," the ATM said.** —Lauren Dolan, via email

**They never suspected Alexa was Alexei.** —Liz Ransom, via email

**Why wouldn't I help a prince?** —Harleigh Marsh, via Facebook

**They said nonfungible. They were wrong.** —@eminay86, via Twitter

**Use his eyeball while there's time.** —Noreen Anastasia, via Facebook

**"Update Later" was the incorrect choice.** —@terryfphotos, via Instagram

**Check Google Maps. Kiev is gone.** —r0cket fr0g, via email

**They got away on the blockchain.** —JYRWG, via email

**Every cat photo gone. Police baffled.** —@john.cartan, via Instagram

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MAY 2021

## **A Story About a Freaky Discovery in Physics**

ILLUSTRATION: VIOLET REED

# **GRAVITY WAS A CONSENSUAL, SHARED ILLUSION.**

—Mark Crane, via Facebook

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### **Honorable Mentions:**

**Schrodinger's cat is actually a dog.** —@tynanwrites, via Twitter

**You're the observed. Not the observer.** —@parkerstmailbox, via Instagram

**Our last seconds appear the longest.** —Paul Hagaraars, via email

**It was simultaneously huge and microscopic.** —@Cezary\_Z, via Twitter

**All lost socks found at Cern.** —Felix Quarnström, via Facebook

**Astonishingly, up was down all along!** —Christopher Walton, via email

**Actually, the tides pull the moon.** —@the4lw, via Instagram

**A seventh Infinity Stone is found.** —@taayywells, via Instagram

**Faster than light announcement scheduled yesterday.** —David Cinabro, via email

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APRIL 2021

## **A Review of a Future Work of Art**

ILLUSTRATION: VIOLET REED

## **IT TICKLED ALL OF MY SENSES.**

—Jacky Reif, via Facebook

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### **Honorable Mentions:**



**So that's an AI self portrait?** —Jason Cohen, via Facebook

**I prefer Boston Dynamics' earlier work.** —@sscarsdale, via Twitter

**Uninspired. Lacking originality. Try again, Earth.** —Amanda Bull Chafin, via email

**NFT or not, it is great.** —Peter Boersma, via Facebook

**Not as good as Banksy's virus.** —Simon O Wright, via Facebook

**Brave to show an unfiltered canvas.** —@Alcestronaut, via Twitter

**Not what teleportation was invented for.** —@Arturo\_thrdez, via Twitter

**Shame mortals will not appreciate it.** —@asylbek0205, via Instagram

**Reminds me of the Before Times.** —Jacqueline Jaeger Houtman, via Facebook

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MARCH 2021

## **A Story About a Tech-Centric Religion**

ILLUSTRATION: VIOLET REED

### **IN THE BEGINNING WAS THE “WWW” ...**

—Eduardo Bolívar, via Facebook

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#### **Honorable Mentions:**

**I swiped right and found salvation.** —Conrad Dean, via Facebook

**Praying to AI got better results.** —@jgmclean0, via Twitter

**The prophet revealed the source code.** —@the4lw, via Instagram

**Atop the hill, sayeth he, “reception”?** —@dghutt, via Twitter

**The app works in mysterious ways.** —Tyler Hughs, via Facebook

**Move fast. Break things. Repent. Repeat.** —@iampinch, via Twitter

**Always back up to be saved.** —Tadeusz Walter Misztela, via Facebook

**Chip implanted, the new priest rose.** —@wlmoseley, via Twitter

**“Worship the Apple.” —iBook of Jobs** —ThoreauRug, via email

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FEBRUARY 2021

## **A Story About a WFH Office Scandal**

ILLUSTRATION: VIOLET REED

### **THEY WERE IN THE SAME ROOM.**

—@abhignak, via Instagram

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#### **Honorable Mentions:**

**He was never a real person?** —Ian Schoen, via Facebook

**Wife realized my job is easy.** —@jchavizzle, via Twitter

**Dress code updated after yesterday's "incident."**

@mistermistermistertibbs, via Instagram

**He certainly shouldn't have stood up.** —Małgorzata Kuś, via Facebook

**"Joe's the father." "You're not muted."** —Austin Craver, via email

**Worker's comp? It is her dog!** @thefitzroymclean, via Instagram

**It looks real, but it's not.** —Jonathan Goode, via Facebook

**The window behind her reflected images.** —@chmslady, via Twitter

**As everyone's computer froze, she laughed.** —@mcgroup53, via Twitter

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JANUARY 2021

## **A Story About a Future American President**

ILLUSTRATION: VIOLET REED

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06.22.2021 06:00 AM

# He Thought He Could Outfox the Gig Economy. He Was Wrong

Jeffrey Fang was a ride-hailing legend, a top earner with relentless hustle. Then his minivan was carjacked—with his kids in the back seat.

 Image may contain Human Person Vehicle Transportation Automobile Car and Convertible

“Get that money!” Jeffrey Fang would cry out to his fellow drivers when the surge hit. Photograph: Kelsey McClellan

Jeffrey Fang, DoorDash delivery guy, knows you judge his parenting skills, and he’ll join in your condemnation in a moment. He’ll explain that bringing his kids along on his Saturday night shift “made sense, until it didn’t,” and that in hindsight, he understands that it really, really didn’t. But right now, on the night of February 6, he’s not thinking clearly, and you’ll have to excuse him as he sprints pell-mell down a promenade of swank homes after the thief who just stole his phone.

He sees the thief dive into the back seat of a silver sedan, and as the car accelerates Fang keeps running alongside and grabs the passenger door handle—less DoorDash Dad than some kind of bespectacled Jason Bourne. The phone, you see, is his “moneymaking tool”; it’s how he feeds his family. But each stride is taking him farther from his unlocked Honda Odyssey minivan, parked illegally, engine humming, in a driveway where he was making a delivery, with precious cargo in the back seat.

His kids.

Earlier that day, Fang's wife said she needed quiet in the house in order to tutor their 6-year-old son, because their kids are sure as hell not going to be gig workers. Fang couldn't afford to miss the money on a Saturday night run near San Francisco's Billionaires' Row, but in this city a babysitter earns nearly what Fang does. His solution was to fasten the younger kids, 4 and nearly 2 years old, into their car seats, ply them with ice cream, and cue *Shrek 2* on the videoscreen in the van. He delivers expensive orders in ritzy neighborhoods, the only way this dumpster fire of a job is marginally worth it. He doesn't expect to need the taser that he stows in his glove box. He figured the kids would be safe.

Now it has all gone sideways. His taser is uselessly back in the van. Yanking open the passenger door of the getaway car, he thrusts in his left leg, which gets battered with punches, and then swoops in to ride shotgun with the thieves. *God, farther from my kids!* Fang starts yelling, "Give me back my phone!" and pushes the door wide with his right foot in hopes of smacking a parked car. The thieves, apparently deciding that some Huawei Mate 20 X phone isn't worth all this, hand Fang his cell. He jumps out, panting, and then runs and speed-walks the two blocks back to his parking spot.

The van is gone.

Fang's Honda Odyssey was carjacked, with his kids in the back, on February 6.

Photograph: Kelsey McClellan

Twelve years after the birth of [Uber](#), the country—the world—is still reckoning with how the on-demand economy has upended the marketplace and people's lives. Companies running on [gig work](#) emphasize the upsides: Here's a job where you can be your own boss, set your own hours. They speak of the flexible and temporary nature of gig work, how most people do it part-time or to get back on their feet—points repeated before federal judges and in Facebook ads and *New York Times* op-eds.

Jeffrey Fang represents something else: the long tail of the economy that Uber built.

Fang has worked in the gig economy full-time for seven years. He signed on first with Lyft, and as the app tweaked fares and incentives and his income declined, he added Uber, then Amazon Flex and Kango. Then came the pandemic. As people locked down, he found work driving for delivery apps like DoorDash, Instacart, and Uber Eats. His phone lured him like a blackjack table. Each offer sliding on the screen was an enticing gamble; it might bring 18 bucks, 24 bucks, or, if he played it extremely well, 100 bucks. He ignored his friends' and family's pleas to get out, thinking he could somehow beat the financial odds.

For a long time, he did. He even felt moments of pride. Compatriots speak of Fang as a sort of gigging folk hero. He was one of the top drivers in the ride-hailing industry's hometown. The guy to emulate. Yet here he is, age 39, in the middle of Jackson Street, screaming and dialing 911. Let your judgments pour out; the online chorus certainly let theirs. It's nothing Fang hasn't said in self-loathing ever since: Why in the world did he leave his kids?

Well, hop into Fang's Odyssey. He got it back, dusted in graphite powder from fingerprinting but functioning. Behind the wheel is where Fang can talk. He doesn't want to play victim. He wants to take blame and dole it where he says it's due. He's not going to pretend he's a saint. He made bad decisions. He found ways to exploit the ride-hailing apps too. But to understand how a man could arrive at the point where he abandons his children to chase a phone, you might want to follow him on a journey. He's ready to explain.

## 2.

"The rideshare years were, in some ways, a tragedy of my own making," Fang says. "By all measures, I should be successful, but I'm not." He got more chances in life than most people do. So where to begin?

Maybe in 1994, when at age 12 he reluctantly stepped off a plane outside of Washington, DC. His father, who worked for Cummins, the multinational maker of diesel fuel engines, had taken a transfer, moving his wife and two sons from Taiwan to the Maryland suburbs. The older son switched his first

name from Shao-yu to Jeffrey in order to blend in. He didn't know English, but he loved American sci-fi, especially *Star Trek: The Next Generation* and Captain Jean-Luc Picard—stately, cool-headed, *the guy who gets things done*.

In his own life, Fang tended to biff the execution. He was 15 when another transfer—this time to Cummins' mainland China office—uprooted the family again. The company paid Jeffrey's way at the prestigious International School of Beijing, but he slacked off among the scions of executives and diplomats. He was, he says, the world's "most pathetic" rebel. To his parents' disappointment, he didn't opt for college, so they gave him orders to chaperone his younger brother in San Francisco, where they had family and his brother would finish high school. During the tail end of the dotcom boom, Fang, 18, was sulkily driving his brother to basketball practice and selling jewelry at Fisherman's Wharf. Nudged by his parents, he enrolled in community college, floundered, and dropped out. A classmate referred him to Bank of America, where, soon enough, he was pushing mortgages.

The work didn't come naturally—"You're pushed to treat people like products," he says—but it was a job he could do without a college degree. His mom, who was splitting her time between Beijing and San Francisco, started buying houses as an investment. She tried to help Fang get business by having him process one of her loans. She also urged him to borrow for a place of his own. Fang was 22 and earned only \$40,000 after bonuses, but it was 2004. He got an adjustable-rate mortgage for a cookie-cutter \$638,000 house in a working-class neighborhood. His parents pitched in on the down payment.

Four years later, scraping along at the bottom of employee performance targets, he quit the bank before he got fired. Now 26, he returned to City College, this time with zeal. He dove into philosophy, sashayed on the waltz team, and won election to the highest student office, student trustee, hoping to juice a transfer application to his dream schools, Stanford and Berkeley. Fang was on his way up, haranguing the community college board to step up their leadership, lobbying the California legislature in the Mao suit made



for his high school prom, presiding over graduation on the same stage as Nancy Pelosi. *The guy who gets things done.*

In 2010, with only a part-time gig at a pet shop, he was also the guy who often missed his \$2,500 monthly house payment. His house wasn't worth what he owed on it, and in 2013 he was pushed into the ranks of the 10 million Americans whose homes were put into foreclosure during the Great Recession. He was lucky once more: His parents let him move into one of their investment homes, rent-free. Still, the grind—his money woes, college politicking, the side job—started pulling down his grades. A familiar shame set in: “Forget your dream, you’re not going to make it.” So, he says, “I left.”

During a trip to Beijing in 2013, Fang encountered a more welcome complication. His parents, he says, wanted him to get on with his life—their younger son was married, while Fang had “X number of failed relationships and nothing to show for it,” he says. They invited a young physical therapist over for dinner. He was struck by her gentleness and her college education. They stayed in touch, and over the months, via texts and calls, he fell “super in love.” They started talking about marriage. He told her that he was broke, his credit shot, and he had no job. She said they’d work it out. “I told myself, ‘She’s the one.’”

Fang pulled more than half the money from his 401(k) to buy a ticket to China for the wedding in April 2014. The plan was for his wife to eventually join him in San Francisco. But to make sure immigrants don’t become public charges, US citizens need assets to sponsor visa applications. Fang figured that it would take months, if not more than a year, to raise enough cash to bring his new bride to California. Soon after returning to San Francisco, married but alone, he learned that his wife was pregnant. Now, with two people to sponsor and his bank account empty, the process was going to take longer. He needed a job where he could save money and also take time off to visit Beijing for a few months a year. *What job would allow that?*

One day, while Fang was walking in Union Square, a car plastered with a Day-Glo mustache drove by. He Googled “pink mustache.” While Fang had been consumed with City College politics, his adopted city had become a

postrecession boom town. Since Uber's founding, in 2008, venture capital had poured into the so-called on-demand economy. Using freelancers to meet the fluctuations of customer demand, apps promised groceries delivered, Ikea cabinets assembled, dogs walked. The companies' pitch to drivers: In a city of hustling disruption, they too could be entrepreneurs.

Fang just needed the money. He climbed into his dad's 2002 Acura TL and opened the pink app. After a couple hours of driving, he'd earned \$71. "I got comfortable with this job really quickly," Fang says, "and I got *good* at it pretty quickly." Looking back, this was precisely the problem.

### 3.

In the beginning, Fang was the driver of Lyft's marketing fantasies. He cheerily accepted nearly every ride for eight to 10 hours a day. Customers gave him five-star reviews: "Great guy. Very intelligent." He'd wait half an hour, unpaid, for a couple to finish their sidewalk spat before one of them climbed in. He handed out free water bottles. He chatted amiably, played the classical station, and dressed up as Batman for Halloween.

After a few months, Fang got more strategic. He divided up the day to surf the morning and evening rushes, when the surge would push up fares. Thursday through Saturday he ferried the bar crowd home until just before dawn. Fang imposed a tight budget, scoping the \$3 Safeway burrito bowl or the \$1.50 hot dog and soda at Costco. He was bringing home \$1,200 a week before expenses—enough, because he was living rent-free, to put money away and send some to Beijing, where his wife had moved into his parents' home. He'd visit her, usually for about two months at the beginning of the year and again for a month in the fall. The app, the passengers, and his strict frugality aligned in a virtuous circle. *I'm helping people. I'm making money. This is gonna work out.*

On a walkie-talkie app called Voxer, Fang heard about a Lyft driver hangout in a shopping plaza in a nice part of town. Starbucks let them use the bathroom. One guy spun music on turntables out of his back hatch, people caught naps in their cars, and Fang assessed a landscape of cliques—gym rats, DJs, vapers. A veteran Lyfter told him that \$1,500 a week was about

the max you could make. *Challenge accepted.* Fang doubled down, taking rides for 60 hours a week, and by the end of 2014 he topped \$2,000 a week, then \$2,500. He stopped asking the old guard for advice.

Fang found his own clique—the millennial worker bees: Jose Vivanco, a wry film student from Peru who’d started driving full-time and persuaded his girlfriend, Bianca Santori, to drive to support her sewing blog. Fallon Brooks-Magnus, 6 feet tall, proudly intersex and part Native American, who’d moved to San Francisco from Oklahoma for a drafting job but found that driving paid almost as well. Christian Perea, a witty UC San Diego graduate and former bank teller, who drove a Mercedes. Kris Rohr, a gamer from Palm Springs, who was the only driver in the group who could out-earn Fang.

The group traded tips and barbs in their own channel on Voxer, like long-haul truckers on a CB radio. The group cued a recording of Rohr screaming, “There’s *Prime Tiiime!*” Or Fang would say, “Good luck. Get that money!” when the surge hit, and everyone knew to follow the playbook they’d worked out: Don’t flock to the area with the highest surge—that will be played out by the time the heat map refreshes. Go to the area that’s just starting to inch up. Oh, and “Fuck Uber.”

A half-decade into the on-demand economy, Uber was the original and dominant juggernaut. By early 2015, 200,000 people across the country were driving for the company. Lyft, the perpetual underdog, had 51,000. But as ride-hailing services expanded, so did the backlash. As contractors, not employees, drivers weren’t guaranteed a minimum wage or paid expenses or offered sick days or health insurance. Taxi drivers staged protests. Drivers sued Uber and Lyft, arguing that since the companies dictated the manner and means of work, they met the legal standard of an employer. Fang and some of his group joined the class action suits. (Settlements came years later: Fang got \$7,400 from Lyft and \$3,800 from Uber but remained a contractor.) The companies retorted that they dealt in software, not driver services, and that labor laws were hopelessly out of date.

While the Voxer group knew that Lyft was benefiting from the business model, most of them decided their real war was with Uber. They didn’t

mind that Lyft took a 20 percent commission from their rides if that's what sustained the business. Even with Lyft's commission, each of the Voxers was earning at least \$1,200 a week—or about \$50,000 to \$60,000 a year—before expenses. They were exuberant with the fast cash. Lyft felt like a friendly place; Uber didn't allow tipping and had a more brash, aggressive image. “We looked at Uber like it was Darth Vader,” Brooks-Magnus says. Sure, Vivanco drove for Uber in the mornings, because it seemed busier. “But I wasn't happy about it,” he says.

No one's allegiance to Lyft was deeper than Fang's, who credited the app with rescuing him from failure. “I was at the lowest point in my life,” he says. “Lyft was a lifeline to get back up.” He spoke of the company as a benefactor that “takes care of its drivers.” Lyft offered a bonus to drivers who accepted 90 percent of calls, and word spread around the Starbucks lot that you could use the phone's airplane mode to decline unprofitable rides—tricking the app—and still get the bonus. Fang argued that the hack wasn't fair to Lyft and refused to do it. “Jeffrey is the oldest young guy you'll ever meet,” Brooks-Magnus says.

When the Voxel group met during slow hours at 24-hour diners, Fang would order soup and gobble everyone's leftover fries and burgers, spurring Scrooge McDuck jokes. He and Rohr constantly checked their phones, ready to dart back out when a surge hit. They were the most obsessive drivers in their group. But everyone got pulled into the game more than they'd expected. Despite the flexible schedule, Santori and Vivanco started missing deadlines on her sewing blogs, which Vivanco took pictures for. Rohr put on 20 pounds. For Perea, driving started to feel like his cigarette addiction: When he felt anxious about money, the only way he could relax was to turn on the app and work. “Your brain starts to sort of change,” Perea says. “Imagine every time you got a TikTok notification, it gave you 10 or 15 bucks.”

At one point, Brooks-Magnus, Vivanco, and Perea convinced Fang to teach them The Way, a tongue-in-cheek name for his sensei-like ability to rack up \$2,500 a week while driving “clean”—no cheating shenanigans, just shrewd surge-surfing and grit. After warning them it wouldn't be easy, Fang put them in training. He messaged his acolytes on Voxel at 4 am to make sure

they were at the wheel, ready for airport runs. “Rise and shine, go get that money!” he would say. “It’s day three, and I’m dead,” Vivanco reported. After a month or two of hitting close to \$2,000, they quit Fang’s program out of exhaustion. Fang didn’t want to blemish his reputation by revealing the toll it was taking on him too. He was swigging four espressos a night. Psoriasis flared on his back and scalp; with no health insurance, he went to a free city clinic. His accelerator ankle started to pop like an arthritic knuckle. He grew a gut. He’d work bar close until 3 am, then nap in the Starbucks lot until airport rides started at 4. The group just assumed Fang was intense for intensity’s sake, obsessed with the challenge of maximizing his profits. “I just don’t understand when he ever slept,” Brooks-Magnus says. Nor did they know exactly why he’d disappear to China for weekslong stretches.

Fang met his clique in a Laurel Heights parking lot where drivers hung out.

Photograph: Kelsey McClellan

In 2015 the friends pressured Fang to join them for a July trip to a cabin near Lake Tahoe, nearly four hours east of the city. Fang resisted, wanting to work, but his friends persisted: C’mon, he could take *one* weekend off. Fang finally gave in. One night during the trip, the group gathered at the cabin’s hot tub for a boozy game of Truth or Dare. Fang opted for truth, then revealed, matter-of-factly, that he was married and had a baby son in China. His friends erupted in disbelief, congratulations, and, for some, a pang of betrayal that he’d concealed something so vital. They returned to San Francisco chastened by the knowledge that Fang was playing at a different level of stakes.

That year, Fang capped off his best one-year haul—some \$71,000 for 10 months of work. On New Year’s, he accepted one last ride on his way home at 3 am, then, fatigued, rear-ended a parked SUV.

The Acura needed more repairs than it was worth, so Fang decided it was time to get his dream car. Not only one that could hold more people, to get bigger tips, but the one with space to someday haul his family on adventures.

Aha! Here's a listing: a used minivan. Honda Odyssey.

Rohr drove Fang out to the suburbs to pick it up.

#### 4.

By the time Fang sailed out of the car dealership with his Honda Odyssey in January 2016, the long-running feud between Uber and Lyft had turned into a full-on price war. For years, as the two services became nearly indistinguishable, they battled for customers by cutting fares, tit-for-tat, especially during slow times. They also started taking a bigger commission from new drivers. These experiments hit drivers hard, whittling away their earnings along with any residual sense of loyalty to either app. "Uber was the devil that you know," Fang says. "Lyft felt like a betrayal. It's the betrayal that cuts deeper. You just slowly lose faith." Members of the Voxer group started to drive for their nemesis, Uber. Even Fang had secretly tried some Uber rides.

Around this time, the Voxer group gathered in Vivanco and Santori's apartment in the Castro to launch a podcast. They called it *Run TNC*, for "transportation network company," which is California's official name for ride-hailing apps. On the show, the drivers were battle-hardened, cynical. Perea said he only got through the rides with obnoxious customers by thinking, "I can't wait to fucking one-star your ass." Vivanco mentioned his irritation with Lyft for advertising drivers who gave free candy to passengers: "I can't do that! I don't get paid enough." That January, as Uber slashed fares by 10 percent and Lyft followed suit, everyone talked about feeling taken for granted. Some of their podcast episodes reached more than 9,000 downloads.

"I'm throwing all the money in on baseball season," Rohr said. "You can still make decent."

"What if baseball season is a total bust?" Vivanco asked.

"Hmm ... that's a good question," Rohr paused. "Software engineering."

Rohr, then in his mid-twenties, had thought about trying to become a tech worker. The closest he'd come to a stationary job was as a part-time contractor for an informal Lyft call center, something the Voxers all tried, to pad their flagging profits on the road. Lyft paid about \$20 an hour for people to call inactive drivers and passengers and urge them to return to the app. They made other calls too. Cities and states were rolling out regulations, including driver background checks and insurance requirements. Lyft was pushing back. The Voxers lobbied Texas voters on an Uber- and Lyft-sponsored ballot measure in Austin, leaning on their status as drivers. Perea bailed after about a month, unwilling to do Lyft any favors. He dove into blogging for *The Rideshare Guy* about labor issues to subsidize his driving. Brooks-Magnus started looking for drafting jobs. She had loved driving for Lyft; she steered a pink-wrapped car in Lyft's contingent of the Pride parade. The fare cuts changed her mind. She had to borrow money from Fang to make rent. "Over time, the love story falls apart and you realize you're just the pawn in this big game," Brooks-Magnus says. "I often felt like a sort of faceless, nameless not-even-a-person. Like the GPS unit or something." In the spring of 2016, she moved back to Oklahoma.

Fang never took to Lyft telemarketing. Santori and Vivanco, though, threw themselves into the task. The \$900 a week was less than they had made driving, but it was guaranteed, and they believed it allowed them to network with Lyft managers. The bet paid off. After a couple of months, they were promoted to contractor jobs in the marketing department, inside Lyft's headquarters.

In the summer of 2016, when Fang returned from a long trip to China, he was fixated on how the fare cuts had sliced into his earning potential. He was crestfallen. As he saw it, the apps had broken the mutually beneficial agreement in which he'd toiled ethically for years. He started—tentatively at first, then more boldly—to tease out a new philosophy, this time of mutual exploitation: "Being a choir boy has done nothing for me."

In those days, the drivers were irked by an Uber app feature that blocked them from seeing an incoming ride's destination until the passenger climbed in, at which point it was too late to decline an unprofitable ride. So



one day, driving near Golden Gate Park, Fang tried his first, tiny hack: He turned off his phone's cellular data, which disconnected his phone from Uber's network. Then, sweat beading on his neck, he started the next ride. This revealed the destination, even though the passenger wasn't in the car. From then on, if he saw that the rides wouldn't pay enough, he would force-close the app. The passenger would get rerouted to another driver, none the wiser. It was a simple hack, and just the beginning.

Perea was depressed to see the king of clean driving go rogue. If Fang couldn't make money playing by the rules, then *no one* could. "The Way," Perea says, "became the Way to Cheat."

## 5.

The Voxel squad was now just Fang, Perea, and Rohr. The three joined a WhatsApp group of like-minded drivers, surfing the surge and exploiting loopholes before the companies patched them. "Everything was fair game," Fang says. "It's a tango: They go forward, you go back, give and take. You know you're on the losing end, but you do it anyway."

While Fang hacked with a sense of bittersweet resignation, Perea reveled in it. "It felt like vengeance; it felt wonderful." They steeled themselves for deactivation, but without the hacks the job was no longer worth it anyway. By 2017, rideshare drivers were making 47 percent of what they had in 2013, according to a JP Morgan Chase Institute survey, though they might have been working fewer hours; one think tank estimated that Uber drivers nationally were making \$9.21 an hour after all expenses.

For Fang the cheating became something of a crutch. He could make just enough to keep adding a bit to his savings, but he was too drained to look for something better. "I got complacent and tired and a little too comfortable," he said. "At a certain point, it's almost like an addiction." He was still on the hamster wheel. "In Asia," Fang's mom, Annie, says, "everyone wants their children to be a doctor, lawyer, CPA, and an engineer in Silicon Valley." But over the years, as she realized that Jeffrey's driving wasn't just some temporary gig, she made her peace. Fang was 35, and in 2017 he and his wife had a daughter, their second child—and the next year,

they learned their third was on the way. Fang calculated he would easily need more than \$100,000 in savings to sponsor the brood. Three years of driving 50 to 80 hours a week and his \$5 lunch budget and free rent had gotten him halfway there.

Growing impatient, Fang's father badgered him to bring his family to the US. His younger brother had already graduated from medical school. His mother offered to help with money, but Fang refused out of pride and anger at being pressured. His cousin offered to refer him for a nontechnical role at the tech company he worked for, starting salary \$60,000; Fang thought he could still make better money on the road. His wife thought he was in a dead-end loop. Perea saw Fang as less addicted than stubbornly chasing a sunk cost. "The more you change your life to do this job, it's easy to dig deeper and not want to give up on the idea that this is going to pay out." One day, behind the wheel, Fang braced as he recognized his next fare. It was a woman he'd known at City College back in the day. As Fang recalls, the conversation went like this:

*Wait, you're Jeff Fang, like City College student trustee?*

*Yeah, yeah.*

*Like Jeff Fang?*

*Yeah, yeah.*

*Wait—but you're driving now?*

*Yeah.*

*Oh ... how IS that?*

In China, Fang's wife had stopped working to raise the kids; the money he sent was enough for her to make ends meet while living in his parents' home. Still, he knew that being a driver would demote his family in the eyes of their social circle. His wife had told the parents of his son's preschool classmates that Fang worked in law. On one of his trips to Beijing, at a luncheon with some of those parents, Fang gamely perpetuated the ruse. As kids played and adults sat around a table chatting in one of their homes, he parried questions from an actual attorney with bits about law that he'd picked up at college. "It was like *Catch Me If You Can*," he says.

Bianca Santori and Jose Vivanco bootstrapped up from drivers to corporate jobs.

Photograph: Kelsey McClellan

In October 2018, back in San Francisco, the WhatsApp group huddled in a burger joint and sketched out a drivers' association, a way to organize against the apps. Fang, comfortable speaking publicly from his days as a student trustee, was president. The effort didn't go much of anywhere. They were all too busy driving.

The work itself had become a parade of irritations: Riders who asked about Fang's life then *uh-huh*-ed while phone-scrolling; the jerks who blasted a stadium horn in the car and said, "It's OK. Don't worry. He's Asian"; and the dude who, unforgivably, mistook his Jean-Luc Picard Halloween costume for a concierge.

One day that year, Fang had lunch with Vivanco. After he quit the driving life, Vivanco had learned basic coding and left Lyft for a job test-driving autonomous cars for Cruise, the startup acquired by GM. He had risen to coordinating the road-testing program, and he invited Fang to Cruise's slick SoMa headquarters. Vivanco offered to refer his friend to his new bosses, but Fang wasn't sure test-driving would be any better than ride-hail. Vivanco gave Fang a tour of the game rooms, and they peered in at the garage of cars. Fang thought, *Wow, a full-blown techie*. "I see the growth you've had," Fang told him, "and I wonder if I've missed the boat."

Months later, in spring 2019, Lyft went public. As a token of appreciation, it gave drivers a bonus that they could either get in cash or invest in Lyft stock. Fang received \$1,000—the equivalent of a dime for each of the roughly 10,000 rides he'd given over five years. "I call that cheap," he gripes. Critics saw the bonus as a sop to drivers who might resent that the IPO meant a windfall for Lyft executives and the staff classified as employees. By then, Santori was among them. Devouring management books, networking with an employee resource group for Latinos, she had worked her way up from telemarketing to be the program manager of a team in Lyft's own autonomous vehicle division. Given her limited time on staff, though, Santori received a humble four-figure stock option.

Around this time, out on the road, the loopholes that drivers had used to push up their earnings were all getting plugged. Uber continued upping its fees and changed the lucrative surge system to a flat dollar bonus in some cities. Fang saw his pay plunge. If he'd been working full-time, he now would make about \$52,000 a year; with his trips to China, he was down to \$32,000. Rohr had already begun experimenting with delivering packages for Amazon Flex, and they both signed up for Uber Eats with new emails, to get a hefty sign-up bonus. Fang started plotting a course into another wing of the sharing economy: He'd renovate one of his mother's investment homes to rent on Airbnb.

In the fall of 2019, Vivanco and Santori married in an elegant ceremony in San Francisco's Presidio, paid for with their respective six-figure salaries. They were bootstrapping Silicon Valley success stories. Fang wore the Mao suit from his high school prom and sat at a table with driver friends. While mingling with the tech employees in attendance, he steered clear of job talk.

Fang's wife had given birth to their third child, a boy, the previous spring. Finding out that he actually needed some \$150,000 to sponsor his family, Fang finally accepted his parents' help. He headed to Beijing to collect his family just as a new coronavirus was rampaging through Wuhan. After six years of grasping toward the goal, he, his wife, and their three kids—ages 5, 3, and 9 months—landed in San Francisco in late February 2020. Fang wrangled 10 jumbo suitcases of clothes and toys off the baggage carousel. Two weeks later, the Bay Area issued the country's first shelter-in-place order. Office commuters hunkered in their homes.

Perea decided that this was where gigging ended. He left the city for the mountains. Once again, Fang adapted. People were locked down, but they still had to eat. He cued up Amazon Flex and Instacart, then Uber Eats, Caviar, and DoorDash. He and Rohr were the last two standing from the original squad. Having felt increasingly invisible and expendable, they couldn't help but roll their eyes at the new title of respect. So *now* we're essential workers.

Fang snapped on a mask and latex gloves. He'd been through two Covid lockdowns in China. But the uneasiness he felt going out into a world of contagion slackened as he and Rohr chatted into their Bluetooth earpieces and blazed around an empty city. Zero traffic, endless parking, no tickets—nothing but orders upon orders of takeout and end-times tippers, a gold-rush glory he hadn't felt since the earliest driving days.

“Does it make me a bad person to hope the pandemic doesn't get better anytime soon?” Fang said into Rohr's earpiece.

“It just makes us greedy,” Rohr would say back. “But is that really so bad?”

Working on three apps on two phones each, the two of them quickly learned to “stack”—delivering for various apps simultaneously—putting the less lucrative ones at the end of the run. Contactless delivery meant ding-dong-ditching sacks on porches and running back to orders waiting in the car. Whole Foods shoppers were stockpiling water, milk, and toilet paper and shelling out \$80 tips through Amazon Flex. The app asked freelancers to sign up to work blocks of time. Rohr huddled with a programmer friend, figuring out how to automatically grab all possible Whole Foods shifts available to him as soon as they posted, and he shared it with Fang. They were gunning to make \$3,000 a week. Late one Sunday night, Fang's haul was \$2,900, and he thought he might crack the goal. Then his phone rang. *The kids smeared lotion all over the house. Get home.*

The new dad life was overwhelming. Fang's wife was locked down in a foreign country without a driver's license or the ability to speak English. Their eldest son was enrolled in a public school kindergarten with a bilingual Mandarin program, but Fang was on duty to help him with the English homework. He loaded up the Costco shopping haul, drove the family to parks in the Odyssey, tucked the kids into bed. “I was trying to be a better husband to share the load,” he says, “even though I'm not successful, or you know, with a high-power earning job.” Though his bachelor working days were over, with the pandemic frenzy, Fang cleared \$12,000 in May 2020.

It couldn't last, of course. After a couple of months, the essential-worker gratitude tips dried up. People who'd lost their jobs in the pandemic joined

the delivery ranks, increasing competition. Uber Eats cut its base fare, changing over to a more complex structure; Fang saw his earnings take a nosedive. They adapted again, drifting to DoorDash, scrutinizing incoming orders for profitability like diamond appraisers.

During the pandemic summer, Fang started to pass billboards of smiling ride-hail workers in ads for a state referendum called Proposition 22. In 2019, the California legislature had passed a law that would require gig workers to be classified as employees, conferring on them a minimum wage and benefits. That also meant gig companies would have to pay the state's payroll and unemployment tax; one study showed that the law would deepen Uber's operating loss by more than \$500 million. The companies resisted, so the state attorney general sued Uber and Lyft, and the San Francisco district attorney sued DoorDash, to force compliance. Judges ruled against the ridesharing companies, and they threatened to leave the state.

Uber, Lyft, and DoorDash tried a new tack: Go straight to voters. They sponsored a ballot measure that defined "app-based drivers" explicitly as contractors and not employees, but sweetened the deal by requiring companies to help pay for health care insurance for those clocking more than 15 hours a week, to offer access to insurance for on-the-job injuries, and to guarantee an hourly income for "engaged" time spent driving a passenger or a delivery (but not for any time spent waiting). The gig companies claimed it would save jobs, allow workers flexibility, and maintain low fares. They shoveled more than \$200 million into the campaign, the most in state electoral history, outspending the labor opponents 10 to 1. Their ads asserted that "the vast majority of app-based drivers say yes on 22."

Fang wasn't sure he wanted to be an employee, but he appreciated that lawmakers had forced clarity from the industry giants. If they want contractors, he reasoned, stop treating us like quasi-employees and don't deactivate us for acting in our own interests. "They're sitting on top of a volcano," Fang says. "I don't think they understand how much difficulty we're dealing with."

In November, Fang voted no on Prop 22; 59 percent of Californians voted yes.

A month after the Prop 22 vote, [DoorDash held its IPO](#). Like other on-demand companies, it had struggled with anything resembling regular profitability, but that didn't trouble Wall Street. The move made a billionaire of CEO Tony Xu, the 36-year-old cofounder.

Through the fall, to pad their plummeting delivery money, Fang and Rohr worked as census takers. It was the last job the two would do together. Rohr went on unemployment and finally started studying for coding bootcamp. The pandemic had forced him to leave—and he was grateful. In January, Prop 22 became law. Albertson's grocery stores laid off their unionized drivers. They replaced them with DoorDash.

Now, in the mornings, Fang shepherded face-masked students to their private elementary schools for Kango, a hailing app for kids. By the late afternoon, he was delivering for DoorDash. He was eking out just over \$800 a week before expenses, better than the federal poverty line for a family of five but well below San Francisco's. Nearing 40, Fang's hair was flecked with gray. He started tapping into his savings for living expenses.

## 7.

Fang had taken the kids out on his deliveries twice before, to give his wife a break. His cars had been broken into in the past, but now he only delivered in wealthy neighborhoods, and he hadn't yet heard about the [carjackings](#) that were skyrocketing during the pandemic. So, on February 6, he brought the kids to work again.

On a pizza delivery, Fang parked his Odyssey in front of a stately art deco apartment building near Billionaires' Row. His 21-month-old was quiet, probably sleeping. He didn't lock the minivan or turn off the engine, as doing so would cut off *Shrek 2*, which was entertaining his 4-year-old daughter in the back seat. He'd be gone less than a minute. Fang darted inside, dropping the pizzas in front of a ground-floor door. When he walked out, he saw a man with long curly hair sitting in the Odyssey's driver's seat.



He yanked open the door, yelling, “Get the fuck out of my car!” After a tussle, the man pushed past him and, grabbing the Huawei from his hand, took off running. Fang’s phone had been his moneymaker, manager, fixer, and dictator for the past seven years. He thought he had a shot at getting it back.

After the chase, Fang rushed back with his phone in hand. But the van was gone—and his kids with it. He screamed as loud as he could for help. One of the men rushing outside said he knew—literally, *knew*—DoorDash CEO Tony Xu. He’d call him. Soon after, DoorDash texted other drivers asking them to watch for the Odyssey. An old friend of Fang’s from City College, a San Francisco journalist, tweeted a cry for help and dialed local reporters. Police pulled up at the scene, blocking off the street, and later issued an Amber Alert.

His wife called to ask when he was getting home, and he broke the news. Officers offered Fang a seat in a patrol car, but he declined: *I’m not taking any comfort*. His journalist friend arrived to wait with him, McDonald’s in hand, but Fang couldn’t eat. Press gathered, and in the glaring ABC7 News camera light, Fang pleaded to the kidnappers. “I just want my kids back. Times are hard. If you’re gonna have to resort to stealing, that’s a different matter, but please don’t hurt my kids. Help them return safely back to me and my wife. *Please*.” For all these years, his tunnel vision, his money-chasing, and his scrimping was for one single purpose: to bring his family together. He’d made many bad decisions—goofing off in high school, dropping out of City College—but none could possibly match the awfulness of this one.

While Fang remained at the crime scene, relatives arrived at his home across town to pray with his wife. After four hours, at nearly 1 am, police on patrol spotted a Honda Odyssey abandoned in a driveway just minutes from Fang’s house in the Bayview neighborhood, 7 miles from where the van was stolen. Both kids were in the back, out of their seats, refusing to emerge from the car. The police sped his wife to the scene. She rushed to the van, Fang says, and the older child fell into her mother’s arms, heaving with sobs. Police took the family to the hospital, where doctors looked over the children; they were unharmed.

Meanwhile, Fang continued helping police with the investigation. They drove him from the delivery spot in one of the city's richest neighborhoods to his Odyssey in one of the poorest, asking him to identify anything out of place. They shuttled him to a police station in yet another part of town, where Fang gave a statement and an artist etched his description of the long-haired thief. Police drove Fang home at dawn. Shuffling into his bedroom, he stared at his wife and their children, all sleeping together, and felt waves of relief and guilt.

The following Monday, a payment for \$10,000 landed in Fang's DoorDash account. He'd also missed a call from a Silicon Valley area code and called back.

"Hi, who's this? I'm returning a call from you earlier."

It was Tony Xu.

Xu told Fang that, as a father himself, he was happy that the children had been found and that he wanted to make sure Fang had gotten the deposit. Fang listened, surprised at how young Xu sounded. He thanked Xu for the money, but, more than that, for texting the advisory to drivers, adding, "My thoughts about the gig economy are a different matter." He reasoned that there was a time and place for his protests, and a phone call about his kids getting kidnapped wasn't it. Xu told him to feel free to call back if he needed anything. After the call, Fang added the CEO's number to his contacts. When Fang's brother heard about the call, he wanted to know if Jeffrey had asked Xu for a job. He hadn't.

The DoorDash kidnapping became national news. Many blasted Fang for leaving his children alone, but soon another narrative emerged. Prop 22's critics used it as a prime example of workers drowning in the freelance economy. The attention was inevitable, but it outed the secret Fang had carefully maintained for years. A friend of his family's in Beijing, who now lives in the States, texted Fang's wife: "Did you know he was a driver?"

"I still feel the pull," says Fang about being behind the wheel. "I'm basically in rehab now."

Photograph: Kelsey McClellan

## 8.

Jeffrey Fang's gig odyssey ends here. Well, kind of.

A GoFundMe set up by his reporter friend raised more than \$155,000 for the Fangs, an act of charity that Fang is well aware doesn't solve the despair of the gig life for anyone else. This spring, a string of violent confrontations resulted in the killings of DoorDash and Uber Eats workers in New York City, Chicago, and Washington, DC. Fang earmarked the money to send his kids to college.

Rohr is studying for coding school. Brooks-Magnus runs her own home-design business in Oklahoma City. Santori is a technical project manager at Scribd, the ebook subscription service. She and Vivanco worry that the early startup ladders that helped striving drivers into management are harder to find, but Vivanco says his offer to help Fang remains. Perea, who writes an occasional salty post for his own gig economy blog, is also trying to figure out what's next. "If this is the future of work," he says, "we're sincerely fucked."

So how does a 39-year-old dad with a gig résumé change course? Fang still wants what the industry claims it offers: "I've gotten a taste of what it is like to be my own boss, and I want to be my own boss." Fang finally finished the renovation of his mother's investment house this spring and hopes to get it on Airbnb soon. He started studying for notary and real estate licenses.

But he also needed just a little bit of cash on the side. In the spring, passengers began hailing more rides again, and Lyft and Uber cranked up temporary incentives to lure reluctant drivers back. Fang decided to take Uber up on its promotion to give three rides for \$100. He did just three and drove home. He worked in the mornings for Kango—"driving kids is OK"—and occasionally a night on DoorDash. "I still feel the pull. Less than before, but I still feel it." He thinks he can keep it in check. "If you are

somewhat enlightened to the cat-and-mouse game that Uber uses to get you back in, you'll take the catnip and you won't get hooked."

Jeffrey Fang, reformed gig worker, knows you're doubting his capacity for restraint. "I'm basically in rehab right now."

Perea called him this spring. Physically leaving gigging was the easy part, Perea had said. But it had taken him an entire year to unplug his mind from the addictive thrum, to reclaim his attention and stop checking his phone.

Fang knows what he meant. The afternoon after the kidnapping, after talking to police and reporters, Fang retreated to a nook in his house behind the garage, where his family tends to leave him alone. It was a bit after 3 pm, the hour he usually started getting ready to make deliveries. Sunday evening is the pinnacle of takeout. Fang peeked at the DoorDash app. A red cloud marked "Busy" hovered over the grid of the city, and the candy-red button to "Dash Now" beckoned. The incentive was high—\$4 extra per delivery. The familiar tug: *You're missing out on money.*

With his Odyssey impounded as evidence, he'd have to borrow his parents' car, which would entail asking his mom for permission. He imagined her taciturn disapproval, the justified hell from his wife.

*Better not push it.*

Fang closed the app. The familiar map disappeared. He headed upstairs to join his family, pretending for the kids that everything was OK, pretending he didn't still want to work.

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06.17.2021 08:00 AM

# On Microphones, Music, and Our Long Year of Screen Time

Pianist Glenn Gould proved long ago that an existence heavily mediated by technology is not nonexistence.


 Glenn Gould

Illustration: SAM RODRIGUEZ

There is a music-tech controversy that rivals Bob Dylan's choice to plug in his guitar at the Newport Folk Festival in 1965. A year earlier, on April 10, 1964, the pianist Glenn Gould made a radical exit from live concerts.

Gould played seven pieces to a packed house at the Wilshire Ebell Theatre in Los Angeles, including four fugues. He gave no indication that the program was his swan song. Then he strolled—he never stormed—away from his Steinway CD 318 and out the door of the concert hall, into the mild California air. A year later, he boarded a train for the desolate Northwest Territories of his native Canada. He never played another concert. When Arthur Rubinstein bet him in 1971 that he'd be back, Gould took the bet; when he died 11 years later, at 50, he won. He came to regard live music as a “blood sport.” He especially held the sociability of concerts in contempt. “Music is something that ought to be listened to in private,” he said.

From that evening on, the pianist's life became a testament to the raptures of electronic media. In the studio he found something subtler, kinder, and more intimate than what he considered the relationship of dominance and submission between performer and audience. To Gould, sound engineering

and music production conveyed, as nothing else, “the spine-tingling awareness of some other human voice or persona.”

Rejecting as priggish the cliché that technology is “depersonalizing,” Gould was smitten. “I was immediately attracted to the whole electronic experience ... I fell in love with microphones; they became friends, as opposed to the hostile, clinical inspiration-sappers that many people think they are.”

This summer, as people in many countries are attending concerts and [touching each other again](#), the case for solitude and computers over community and real life seems especially unpersuasive. It would dishonor the pandemic dead not to take life by the horns and go for broke on packed-yard barbecues and front-row tickets to Lady Gaga. But Gould proved at least that an existence heavily mediated by technology is not *non*-existence. Screen nausea and social media compulsions are no joke, but the current self-loathing about the long year of screen time is misplaced. It was not lost time. Rather, the boring and sometimes hallucinatory quarantine opened new portals for imagination that the culture hasn't yet begun to assimilate.

Because he idealized northerliness and mused often on solitude, Gould after 1964 is figured as a recluse. But he was hidden away only if you don't count telephones, photography, recorded sound, recorded video, and speedy distribution networks. For his two electronic decades, Gould managed to be nowhere and everywhere. Though often sequestered, he suffused tens of millions of television sets, movie theaters, car radios, and eventually outer space, when, in 1977, his stunning interpretation of Bach's *Well-Tempered Clavier* was launched out of Earth's atmosphere on the phonographic time capsule aboard the Voyager spacecraft. Gould may be best experienced by curious extraterrestrials, ones with decent turntables or at least working ESP.

Gould had a sweet tooth for some pop music, including Petula Clark; he called Barbra Streisand's voice “an instrument of infinite diversity and timbral resource.” And though he himself had perfect pitch, he was captivated by unusual speaking voices, off-key or otherwise. He invented a form of documentary film known as contrapuntal, in tribute (maybe) to Bach, in which speaking voices are made to overlap with weird effects. The



most evocative example is Gould's film about the bleak Canadian tundra, *The Idea of North*, which sits easily among the most avant-garde fare on YouTube.

Though he hummed compulsively while he played, avoided shaking hands for fear of disease, developed an addiction to prescription pills, and dressed for a winter storm whatever the weather, Gould managed to stay in the flicker of electric eccentricity, never quite slipping into the monotony of madness. This delicate psychic balance is palpable in the erudite stem-winders he delivered straight to the camera. It comes through in his experimental acoustic collages and the innumerable radio broadcasts he recorded. Gould also spoke for hours on end to friends and unwitting acquaintances on landlines and pay phones, sometimes putting his companions to sleep as he reeled off theories of everything, a one-man soundscape whose changeable cadences of speech were uncannily like his piano playing. “No supreme pianist has ever given of his heart and mind so overwhelmingly while showing himself so sparingly,” said Gould's close friend, the violinist Yehudi Menuhin.

Gould became what might be known now as a pandemic musician. Tim Page, the music critic and a close Gould confidant, was asked last year what his friend might have made of quarantine living. “Glenn would have loved the internet,” Page replied. “He was a germophobe and didn't like much physical contact. But he would have enjoyed things like Skype and Facebook [so he could] still enjoy his friendships while keeping his distance.” Indeed, Gould was at his best *at a distance*—far from the baroque chamber and the modern stage, holed up where he could send a signal to just one other person, lonely, like him, afraid of touch, across the very same untenanted Canadian expanses that inspired the media philosopher Marshall McLuhan, a frequent interlocutor of Gould.

Between 2016 and 2019, the English musician Leyland Kirby, under the pseudonym the Caretaker, layered and edited samples from old, worn 78s to create an album in stages called *Everywhere at the End of Time*. The theme of the album is decay and deterioration; each record represents a phase of dementia until, in the last one, the reeling musical signals are all but drowned out by noise, the static of the mind's final exhalation.

During the pandemic, an extraordinary fate befell *Everywhere at the End of Time*. It galvanized adolescents. And not just any adolescents—the adolescents of [TikTok](#). Shut up at home, they seemed to find in the recording an opportunity to glut private sorrows and test their intellects on difficult music. In the Caretaker challenge, they dared each other to listen to the whole piece, which runs at six and a half hours, and record their responses in videos. “Literally the definition of pain,” wrote 16-year-old Owen Amble in a caption on the music last fall. “Never cried listening to something.” There are now hundreds of such videos, some with tens of thousands of views.

The vertical TikTok rectangles show young faces, alone, framed as if in a narrow closet. Often the listeners are crying as they listen and listen and listen. “The justification of art is the internal combustion it ignites in the hearts of men and not its shallow, externalized, public manifestations,” Glenn Gould once wrote.

Over the course of the pandemic, housebound students created Spotify and YouTube playlists that offer music not for exercise or seduction but for scholarship. Some of these compilations promote relaxation with [lo-fi beats](#). But others don't sedate. They keep the isolated mind alive and awake. Work by the Caretaker sometimes makes an appearance on these lists. But it's baroque music that still best serves the thrill-seeking intellect, and the most stimulating study playlists feature Bach's *Goldberg Variations*, performed by Glenn Gould. The tracks are 30 contrapuntal variations beginning and ending with an aria.

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*This article appears in the July/August issue. [Subscribe now.](#)*

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06.10.2021 06:00 AM

# How *Roblox* Became a Playground for Virtual Fascists

Thousands of players flocked to a digital world filled with draconian rules, slavery, and anti-Semitism—and tested how far “just a game” can go.

 Image may contain Advertisement and Poster

Illustration: Toma Vagner

Ferguson, a middle schooler in Ontario, Canada, had been tapping out the same four-letter sequence on his keyboard for hours.

*W, A, S, D.*

*W, A, S, D.*

He was steering his digital avatar, a Lego-man-like military grunt, in laps around a futuristic airfield. Although his fingers ached, he would gladly have gone on for hours more. Every keystroke brought the 11-year-old closer to his goal: scaling the ranks of a group in the [video game \*Roblox\*](#).

The group had rules. Strict rules. Players dressed as pilots and marines went around barking out orders in little speech bubbles. When Ferguson wasn't running laps, he was doing drills or scaling walls—boot camp stuff. The only three words he could say during training were “YES,” “NO,” and “SIR.” And “SIR” generally applied to one person, Malcolm, the domineering adolescent who ruled the group. “His thing was the winky face,” Ferguson says. “He was charming. He was funny. He always had a response; it was instant. He was a dick.”

At the time, in 2009, *Roblox* was just over two years old, but several million people—most of them kids and teens—were already playing it. The game isn't really a game; it is a hub of interconnected virtual worlds, more like a sprawling mall video arcade than a stand-alone *Street Fighter II* machine. *Roblox* gives players a simple set of tools to create any environment they want, from *Naruto*'s anime village to a high school for mermaids to Somewhere, Wales. Players have built games about beekeeping, managing a theme park, flipping pizzas, shoveling snow, using a public bathroom, and flinging themselves down staircases. They have also built spaces to hang out and role-play different characters and scenarios—rushing a sorority, policing Washington, DC.

Ferguson was attracted to the more organized, militaristic role-plays. (Now 23, he asked that I refer to him only by his online name. He says he hears it more often than his given name; also, he doesn't want to be doxed.) Growing up, he says, he was an annoying kid. He was checked out of school, had no hobbies or goals or friends. "Literally, like, zero," he says. Self-esteem issues and social anxiety made him listless, hard to relate to. It didn't matter. When he got home from school every day, he'd load up *Roblox*. There, he says, "I could be king of the fucking world."

Or at least the king's errand boy. In that early group he was in with Malcolm—a role-play based on the sci-fi military game [\*Halo\*](#)—Ferguson proved his loyalty, drill after drill, lap after lap. Malcolm (not his real name) didn't demand control; he simply behaved with the total assurance that he would always have it. "It very much was like being in a small military team," Ferguson says. "You value that person's opinion. You strive to do the best. You have to constantly check up to their standards." Eventually, Ferguson became one of Malcolm's trusted lieutenants.

To grow their influence, the boys would invade other groups, charging in as Malcolm shouted the lyrics to System of a Down's "[Chop Suey!](#)" over Skype. They funneled new followers into their own role-plays—one based on *Star Wars*, where they were the Sith; another based on Vietnam, where they were the Americans; and one based on World War II, where they were the Nazis.

Ferguson says that Malcolm's interest in Nazism began with his discovery of the edgelord messaging board 4chan. From there, he started fixating on anti-Semitic memes and inversions of history. He built a German village where they could host reenactments—capture the flag, but with guns and SS uniforms. Malcolm's title would be Führer.

Ferguson describes himself as an “anarchist shithead.” At first, this sensibility expressed itself as irreverence. Then it became cruelty. He had finally found his community and established some authority within it. He didn't mind punching down to fit in. At the same time, he believed that Malcolm was attracted to contrarianism, not out-and-out fascism. He says he chafed at Malcolm's “oven talk,” the anti-Semitic jokes he made over late-night voice calls. Malcolm's favorite refrain was “muh 6 million,” a mocking reference to the victims of the Holocaust. “It was at a point in the internet where it's like, OK, does he mean it?” Ferguson recalls. “He can't mean it, right? Like, he'd be crazy.” (Malcolm says it was “a little bit of typical trolling, nothing too serious.”)

In 2014, according to Ferguson, Malcolm watched HBO's *Rome*, which depicts the Roman Republic's violent (and apparently very raunchy) transformation into an empire. Inspired, he told Ferguson they would be swapping their uniforms for togas. Together, they forged Malcolm's proudest achievement within *Roblox*—a group called the Senate and People of Rome. The name conjured high-minded ideals of representative democracy, but this was a true fascist state, complete with shock troops, slavery, and degeneracy laws. Malcolm took the title YourCaesar. In 2015, at the height of the group's popularity, he and Ferguson claim, they and their red-pilled enforcers held sway over some 20,000 players.

*Roblox* is no longer the lightly policed sandbox it once was. The company that owns it [went public in March](#) and is valued at \$55 billion. Tens of millions of people play the game daily, thanks in part to a recent pandemic surge. It has stronger moderation policies, enforced by a team of humans and AIs: You can't call people your slaves. You can't have swastikas. In fact, you can't have any German regalia at all from between 1939 and 1945.

Still, present-day *Roblox* isn't all mermaids and pizzaiolos. Three former members of the Senate and People of Rome say the game still has a

problem with far-right extremists. In early May, the associate director of the Anti-Defamation League's Center for Technology and Society, Daniel Kelley, found two *Roblox* re-creations of the Christchurch mosque shooting. (They have since been taken down.) And there are still Nazi role-plays. One, called Innsbruck Border Simulator, received more than a million visits between mid-2019 and late May or early June of this year, when—not long after I asked a question about it—*Roblox* removed it.

But how do these communities shape who young players become? [Dungeons & Dragons](#) was supposedly going to turn kids into devil worshippers. [Call of Duty](#) was going to make them feral warhounds. “It’s the same thing you see in relation to alt-right recruitment,” says Rachel Kowert, the director of research at Take This, a nonprofit that supports the mental health of game developers and players. “‘*And they play video games*’ or ‘*And this happened in video games*.’” It’s harder to pin down *because*. “There’s a line of research talking about how games are socially reinforcing,” she says. “There’s this process of othering in some games, us versus them. All of these things do seem to make a cocktail that would be prime for people to recruit to extreme causes. But whether it does or not is a totally different question. Because nobody knows.”

Ferguson, who today claims he is penitent for his role in the Senate and People of Rome, says he wants people to know about it, to make sense of it, to learn something, and hopefully, eventually, make it stop. They just have to get it first. “I say, ‘Oh, when I was a kid, I started playing this game. Suddenly, I’m hanging out with Nazis, learning how to build a republic on the back of slavery,’” he says. “But no one understands how. ‘It’s just a game.’”

Earlier this year, Ferguson took me to Rome. Or rather, he took me to a dusty, far-flung Roman outpost called Parthia, which, for complex reasons involving a catfish and some stolen source code, is the most Malcolm ever got around to building. My avatar materialized beyond the settlement’s walls, beside some concrete storehouses. The label “Outsider” appeared next to my username. Ferguson was pacing toward me in a cowboy hat with antlers, and I hopped over a line of wooden looms to meet him.

The area appeared deserted. On a typical day in 2014 or 2015, he explained over [Discord](#) voice chat, this was where “random children” would craft weapons and tools. He gestured toward some stone barracks in the distance. “Over there,” he said, “there would be legionaries watching the barbarians and practicing formations.” A barbarian was any player who hadn’t yet been admitted into Parthia’s rigid hierarchy. Inside the outpost, the rankings got more granular—commoner, foreigner, servant, patrician, legionary, commander, senator, magistrate.

Ferguson, whose title was aedile, was in charge of the markets and the slaves. “They’re not technically slaves,” he explained. “They’re, in a sense, submitting their free will to participate in a system where they’re told everything to do.” (*W, A, S, D.*) Slaves could earn their citizenship over time, either through service or by signing up to be gladiators. When a Roblox employee visited the group once, he says, Ferguson helped stage a battle between two slaves in the amphitheater.

As Ferguson and I walked the rust-colored pathways toward Parthia’s towering gate, he described the exhaustive spreadsheets that he and others had kept about the group’s economic system, military strategy, governance policies, and citizenry. Unlike other *Roblox* role-plays of its era, Parthia stored your inventory between login sessions, which meant that whatever you crafted or mined would still be there the next time. This apparently cutting-edge development enticed some players, but what kept them logging in day after day was the culture.

Another of Malcolm’s former followers, a player I’ll call Chip, joined when he was 14. He says he liked the structured social interactions, the definite ranks, how knowable it all was. “I’ve always been the kind of gamer who prefers a serious environment,” he says. As a middle schooler in Texas, he felt like a computer missing part of its code—never quite sure “how to be normal, how to interact with people, how to not be weird.”

Parthian society was a product of Malcolm’s increasingly bigoted politics and his fierce need for control, three former members say. The outpost’s laws classified support for race-mixing, feminism, and gay people as “degeneracy.” They also required one player in the group, who is Jewish in real life, to wear “the Judea tunic or be arrested on sight.” Inside Parthia,



*vigiles* patrolled the streets. We'd be stopped, Ferguson said, for having the wrong skin tone. (My avatar's skin was olive.) The players voted overwhelmingly to allow Malcolm to execute whomever he wanted.

We approached Parthia's gate, which was on the other side of a wooden bridge. Ferguson faced me and stuck his hand out. "If you're an outsider, they'd go like this to you," he said, blocking my avatar's path. A bubble with the words "Outsiders not allowed" appeared above his head. The gate itself was closed, so Ferguson and I took turns double-jumping off each other's heads to scale the wall. On the other side, I got my first glimpse inside Parthia.

Ferguson and Malcolm had talked a talented *Roblox* architect into designing it. Everything was big, big, big—columned public buildings, looming aqueducts, a mud-brown sprawl of rectangular buildings stocked with endless tiny rooms. After a brief tour, we ascended a ladder into a half-dome cupola. "If you had wealth or a name, you were standing here," Ferguson said. "You're supposed to be admiring yourself, your success, and looking down on the barbarians." Romans would hang out, talk, collect social status, and, in Ferguson's words, "smell their own farts all day."

One of the most exclusive cliques in Parthia was the Praetorian Guard, Malcolm's personal army. According to several former members, he sometimes asked high-ranking members to read SS manuals and listen to a far-right podcast about a school shooter. ("Simple friendly banter among friends," Malcolm says.) Chip started an *Einsatzgruppen* division, a reference to the Nazis' mobile death squads—partly because he thought it would get laughs, he says, and partly to please the caesar. In one case, memorialized on YouTube, Malcolm's henchmen executed someone for saying they didn't "care about" the architect's girlfriend, Cleopatra. Chip still thinks that, for a lot of people, fascism started as a joke. "Until one day it's not ironic to them," he says. "One day they are arguing and fully believe what they're saying."

When it comes to Malcolm's fascist leanings, Chip says, "On the stand, under oath, I would say yes, I believe he actually thought these things." Malcolm, who says he is "just a libertarian on the books," disagrees. "It's



always been just trolling or role-playing,” he says. “I’m just a history buff. I don’t care for the application of any of it in a real-world setting.”

Chip and Ferguson estimate that a third of the 200 players who ran the Senate and People of Rome—most of them young adults—were IRL fascists. Enforcing the group’s draconian rules was “a game-play function to them,” Ferguson says. In other words, they enjoyed it.

Here is one vision of how far-right recruitment is supposed to work: Bobby queues up for a *Fortnite* match and gets paired with big, bad skinhead Ryland. Ryland has between two and 20 minutes to make his pitch to Bobby over voice or text chat before enemy player Sally shotguns them both in the face. If Ryland’s vibe is intriguing, maybe Bobby accepts his *Fortnite* friend request; they catch some more games and continue their friendship on Discord. Over time, weeks or months, Ryland normalizes extremist ideology for Bobby, and eventually the kid becomes radicalized.

Or, just as likely: Bobby thinks that guy is wack and sucks at *Fortnite*, and he doesn’t accept Ryland’s friend request. Next game, he’ll go for the shotgun.

Radical recruitment in games is a tricky subject to study. For one thing, all the useful data on Ryland and Bobby is locked away in private corporate databases. Also, this is an illness with a bewildering array of causes. In March, the Department of Homeland Security hosted a digital forum called Targeted Violence and Terrorism Prevention in Online Gaming and Esports Engagement, designed to highlight how “violent extremists maliciously manipulate the online gaming environment to recruit and radicalize.” The ADL’s Daniel Kelley, who gave a keynote address, struck a more cautious note than the event’s name would suggest. He pointed to the New Zealand government’s [official report](#) on the Christchurch mosque attack. The shooter played games, yes. But he also used Facebook and Reddit and 4chan and 8chan, and he told the Kiwi authorities that YouTube was, as the report put it, a “significant source of information and inspiration.”

Earlier this year, I asked Rabindra Ratan, an associate professor of media and information at Michigan State University, what the latest research said about far-right recruitment in games. Curious himself, he put it to

GamesNetwork, a listserv he's on that goes out to some 2,000 game scholars and researchers.

Responses trickled in. A couple of scholars pointed to the ADL's [survey](#) on harassment and racism in online games, in which nearly a quarter of adult gamers said they'd been exposed to talk of white supremacy while playing. Others noted the existence of alt-right messaging boards for gamers, the deep links between edgelord internet culture and white supremacy, and the popularity of Felix "PewDiePie" Kjellberg, a gaming YouTuber who has made several anti-Semitic jokes to his audience. When one designer questioned the idea that radicalization in games is widespread, someone else shot them down: "I think it's a dangerous mistake to dismiss radicalization in gaming communities and culture as merely 'urban legend,'" they wrote.

Then a switch seemed to flip. Chris Ferguson, a psychology professor at Florida's Stetson University, brought up the lack of data. "To the best of my knowledge, there is not evidence to suggest that the 'alt right' is any more prevalent in gaming communities than anywhere else," he wrote. Further, he said, there doesn't seem to be evidence that recruitment in games is happening on a large scale. "I do worry that some of this borders on Satanic panics from the '80s and '90s," he said.

Chris Ferguson is known as a bit of a brawler. In the book *Moral Combat: Why the War on Violent Video Games Is Wrong*, he and a colleague tear into the now mostly debunked idea that, say, *Grand Theft Auto* could turn a kid into a carjacker or a drugstore robber. Last July, with researchers in New Zealand and Tasmania, he published a peer-reviewed analysis of 28 previous studies involving some 21,000 young gamers in total. "Current research is unable to support the hypothesis that violent video games have a meaningful long-term predictive impact on youth aggression," the paper concluded.

On the listserv, some researchers bristled. Was Chris Ferguson dismissing their more qualitative approach to the work, which they considered equally valid? Someone dropped a Trump meme: "Very fine people on both sides." The reply: "Can you not."

The thread exploded. There were ad hominem attacks, pointed uses of the word “boomer.” “Casting aspersions such as these crosses a line into the unacceptably unprofessional,” one researcher wrote. “For shame.”

Several scholars quit the listserv in a fury. Nearly 100 messages were sent before the thread petered out. Nobody could reconcile the lack of data on extremist recruitment in games with the fact that so many signs seemed to point in that direction.

In the very broadest sense, the qualities associated with gamers—young, white, male, middle class-ish, outsider—overlap with the qualities associated with people who might be candidates for radicalization. Of course, most of the nearly 3 billion people who play games don’t fit that stereotype. The word “gamer” summons these qualities because, for a long time, this was the consumer class that [corporations like Nintendo marketed to](#). Over the decades, that consumer class became a passionate, even obsessive cultural faction. And in 2014, with the Gamergate controversy, a sexist harassment campaign founded on a lie, parts of it curdled into a reactionary identity. Right-wing provocateurs such as Milo Yiannopoulos spurred it on, seeing in the “frustrated male stereotype” a chance to transform resentment into cultural power. Gaming and gamer culture belonged to a particular type of person, and that type of person was under attack, Gamergate’s adherents held. “Social justice warriors” were parachuting into *their* games to change *their* culture. Nongamers, or gamers who didn’t resemble them, became “normies,” [“e-girls,”](#) “Chads,” “NPCs” (non-playable characters).

“It’s a good target audience, mostly male, that’s often been very susceptible to radicalization,” says Julia Ebner, a counterterrorism expert for the United Nations. Ebner has gone undercover in a number of extremist groups, both online and offline, including jihadists, neo-Nazis, and an antifeminist collective. She watched as subcultures that grew out of 4chan—initially trolling, not explicitly political—slowly became more political, and then radical. Gradually, inherently extremist content camouflaged as satire became normalized. Then it became real. The vectors, she says, were people like Malcolm.

“Recruitment” isn’t always the right word, Ebner told me. Sometimes “grooming” is a better descriptor. “It’s often not really clear to the people who are recruited what they’re actually recruited into,” she says.

Ebner does not believe that video games are radicalizing people on any large scale. But she has seen extremists use gamification or video games as a method of recruitment, partly because of those qualities associated with capital-G gamers. “There is a big loneliness issue in parts of the gaming community,” she says. “And there’s also a certain desire for excitement, for entertainment.”

Ebner argues that there should be more intervention programs targeting fringe communities on the internet, staffed by trained psychologists and recovered extremists. But first, she says, society needs to change the way it talks about far-right recruitment and gaming. People write off entire communities as being “completely extremist, being alt, being radical,” she says. But extremists “lure individuals from those subcultures into their political networks.” It’s a complex, diffuse problem, and the conversation about it, she says, “isn’t nuanced enough.”

The Senate and People of Rome fell in 2015. It wasn’t sacked by Lego-man Visigoths or brought down by the parasitic forces of degeneracy. What happened was that Parthia’s architect fell in love with Cleopatra, whom he married in-game and gave his login credentials. But Cleopatra turned out to be a catfish, and the dude behind the account leaked Parthia’s source code. Anyone could copy Malcolm’s empire and rule over it themselves. The increasingly paranoid caesar began exiling players. He tried to forge a new fascist dystopia, but the attempt fizzled. Rome was dead. By 2016, he and Ferguson had stopped spending time in the same groups.

A year after that, though, 4chan users on the infamous /pol/ board would reminisce about the Senate and People of Rome in its heyday. /Pol/, short for “politically incorrect,” is infamous specifically for hate speech and political trolling, and as an engine of extremism. One person wrote that most of the high-ranking members of Parthia were “/pol/tards”—frequent commenters on the board. User after user thanked Malcolm for red-pilling them. One said that after “simulating life under Fascism” as a 14-year-old,

he had since become even “more supportive” of it. (Malcolm says that his “cult of personality is strictly built off of trolls.”)

After the Unite the Right rally in Charlottesville, Virginia, in 2017, the left-wing activist collective Unicorn Riot obtained hundreds of thousands of messages from white supremacist Discord servers. They suggested that communities like Parthia existed elsewhere in *Roblox*. In a /pol/ gaming server, a user named Lazia Cus welcomed new arrivals. “Currently,” they wrote, “we have started a ‘Redpill’ the Youth project which is going on in ‘Roblox.’ We’ve created a clan in which we will operate Raids/Defences and expand on this project into other platforms.” (The clan was a “futuristic Roman legion,” though not necessarily modeled after Malcolm’s Rome or one of its many offshoots.)

Ferguson still isn’t sure whether he participated in a fascist recruitment campaign. It was a role-play. Sure, the structure of the Senate and People of Rome normalized and even gamified fascism. And there were people like Malcolm who browbeat kids into adopting extremist beliefs. “I’ve never interacted with people who were like, ‘OK, we’re going to make more neo-Nazis,’” he says. “But I feel like it’s inevitable. It’s indirect.” Ferguson pointed out a *Roblox* role-play of the US-Mexico border in which players are Border Patrol agents. Nearly 1.1 million people had visited the game. “It’s not *racially motivated*,” Ferguson says, dripping with irony. “They’re just *pretending* to be a law enforcement agency that has a long history of extremely racist and xenophobic tendencies.” (A Roblox spokesperson said the company reviews “every single image, audio file, and video before it is uploaded.”)

Members of Malcolm’s Praetorian Guard have gone on to join the military and the TSA and to become police officers, or what Ferguson calls “actual Nazis.” Malcolm himself now owns a *Star Wars* role-play group with 16,000 members. To become citizens, players must follow the group’s social media accounts. “Hail the Empire,” one winky-faced commenter wrote.

Earlier this year, back in *Roblox*, Ferguson took me to the Group Recruiting Plaza. Booths manned by avatars lined the perimeter. Next to a *Star Wars*

group was a red, white, and blue booth and a bearded man in a suit. The poster above him featured a Confederate flag. It read:

**(Were not racist, were just a war group) 5th Texas Infantry Regiment, Confederate States. We're at war with a USA Group.**

A Discord handle appeared below.

When I approached, the avatar behind the booth explained to me that they role-play the Confederacy.

“Why does your sign say ‘We’re not racist?’” I asked.

“It’s just Southern pride, and a war group,” he responded. A human-sized scorpion walked through me. A boxy gentleman with aviators and a blue Napoleon jacket came over to offer support to his friend in the suit.

“But how is that not racist?” I asked. The booth operator hopped over the counter and stood in front of me. “You can’t call a nation racist,” he responded. “That’s just unfair.”

Ferguson and I decamped to another role-play: Washington, District of Columbia. The server was nearly full, 60 players. I spawned inches from the National World War II Memorial honoring American troops. “Visitor” appeared above my avatar’s head. Ferguson was sitting in a police car. The officer had a gun on him. “You should hop in,” Ferguson said.

On our way to federal prison, Ferguson explained that, like the Senate and People of Rome, this role-play had a strict hierarchy—senators, FBI and NSA agents, and so on. We exited the car as it did a midair triple-flip beside a mob of people just standing around talking. As I was escorted in, a Department of Justice official with beaded hair asked a man in a headscarf what he thought about Black Lives Matter. We were forced into an interrogation room. The interrogator, our driver, jumped on the table. He demanded to know what race we were. Washington, DC, was apparently at war with South Korea.

In his real life these days, Ferguson travels around Ontario, sometimes living with his dad, sometimes living elsewhere, picking up manual labor jobs when he can. He has taught infiltration methods to the youth, he says, so they can investigate *Roblox* groups for extremist behavior. They then report the groups or take them over. And for years, he has been growing his own online group, the Cult, which he calls “a family of friends to protect younger people”—particularly over *Roblox*. Right now, members of the Cult pay him between \$100 and \$1,000 a month for his efforts. He says he’s closer to them than to his family.

Ferguson is sorry, he says, for his role in connecting so many people to Malcolm, and for his own bigotry. The Cult’s values are the antithesis of all of that, he says. He made his followers read “Desiderata,” a prose poem by the American writer Max Ehrmann about how to be “kind, nurturing souls.” Right now he’s on a farm, growing arugula, he says. He hopes to one day buy a plot of land and till it with the Cult’s most dedicated members. At some point, he says, he had a realization: “If we took all of what we did online and slowly shifted it toward real life, we’d never be alone.”

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06.08.2021 06:00 AM

# What Really Happened When Google Ousted Timnit Gebru

She was a star engineer who warned that messy AI can spread racism. Google brought her in. Then it forced her out. Can Big Tech take criticism from within?

 Timnit Gebru dipytch

Photograph: Djeneba Aduayom

One afternoon in late November of last year, Timnit Gebru was sitting on the couch in her San Francisco Bay Area home, crying.

Gebru, a researcher at Google, had just clicked out of a last-minute video meeting with an executive named Megan Kacholia, who had issued a jarring command. Gebru was the coleader of a group at the company that studies the social and ethical ramifications of [artificial intelligence](#), and Kacholia had ordered Gebru to retract her latest research paper—or else remove her name from its list of authors, along with those of several other members of her team.

The [paper in question](#) was, in Gebru’s mind, pretty unobjectionable. It surveyed the known pitfalls of so-called large language models, a type of AI software—most famously exemplified by a system called GPT-3—that was stoking excitement in the tech industry. Google’s own version of the technology was now helping to power the company’s search engine. [Jeff Dean](#), Google’s [revered](#) head of research, had encouraged Gebru to think about the approach’s possible downsides. The paper had sailed through the company’s internal review process and had been submitted to a prominent



conference. But Kacholia now said that a group of product leaders and others inside the company had deemed the work unacceptable, Gebru recalls. Kacholia was vague about their objections but gave Gebru a week to act. Her firm deadline was the day after Thanksgiving.

Gebru's distress turned to anger as that date drew closer and the situation turned weirder. Kacholia gave Gebru's manager, Samy Bengio, a document listing the paper's supposed flaws, but told him not to send it to Gebru, only to read it to her. On Thanksgiving Day, Gebru skipped some festivities with her family to hear Bengio's recital. According to Gebru's recollection and contemporaneous notes, the document didn't offer specific edits but complained that the paper handled topics "casually" and painted too bleak a picture of the new technology. It also claimed that all of Google's uses of large language models were "engineered to avoid" the pitfalls that the paper described.

Gebru spent Thanksgiving writing a six-page response, explaining her perspective on the paper and asking for guidance on how it might be revised instead of quashed. She titled her reply "Addressing Feedback from the Ether at Google," because she still didn't know who had set her Kafkaesque ordeal in motion, and sent it to Kacholia the next day.

On Saturday, Gebru set out on a preplanned cross-country road trip. She had reached New Mexico by Monday, when Kacholia emailed to ask for confirmation that the paper would either be withdrawn or cleansed of its Google affiliations. Gebru tweeted a cryptic reproach of "censorship and intimidation" against AI ethics researchers. Then, on Tuesday, she fired off two emails: one that sought to end the dispute, and another that escalated it beyond her wildest imaginings.

The first was addressed to Kacholia and offered her a deal: Gebru would remove herself from the paper if Google provided an account of who had reviewed the work and how, and established a more transparent review process for future research. If those conditions weren't met, Gebru wrote, she would leave Google once she'd had time to make sure her team wouldn't be too destabilized. The second email showed less corporate diplomacy. Addressed to a listserv for women who worked in Google Brain, the company's most prominent AI lab and home to Gebru's Ethical AI

team, it accused the company of “silencing marginalized voices” and dismissed Google’s internal diversity programs as a waste of time.

Relaxing in an Airbnb in Austin, Texas, the following night, Gebru received a message with a 😊 from one of her direct reports: “You resigned??” In her personal inbox she then found an email from Kacholia, rejecting Gebru’s offer and casting her out of Google. “We cannot agree as you are requesting,” Kacholia wrote. “The end of your employment should happen faster than your email reflects.” Parts of Gebru’s email to the listserv, she went on, had shown “behavior inconsistent with the expectations of a Google manager.” Gebru tweeted that she had been fired. Google maintained—and still does—that she resigned.

Gebru’s tweet lit the fuse on a controversy that quickly inflamed Google. The company has been dogged in recent years by accusations from employees that it mistreats women and people of color, and from lawmakers that it wields unhealthy technological and economic power. Now Google had expelled a Black woman who was a prominent advocate for more diversity in tech, and who was seen as an important internal voice for greater restraint in the helter-skelter race to develop and deploy AI. One Google machine-learning researcher who had followed Gebru’s writing and work on diversity felt the news of her departure like a punch to the gut. “It was like, oh, maybe things aren’t going to change so easily,” says the employee, who asked to remain anonymous because they were not authorized to speak by Google management.

Dean sent out a message urging Googlers to ignore Gebru’s call to disengage from corporate diversity exercises; Gebru’s paper had been subpar, he said, and she and her collaborators had not followed the proper approval process. In turn, Gebru claimed in tweets and interviews that she’d been felled by a toxic cocktail of racism, sexism, and censorship. Sympathy for Gebru’s account grew as the disputed paper circulated like samizdat among AI researchers, many of whom found it neither controversial nor particularly remarkable. Thousands of Googlers and outside AI experts signed a public letter castigating the company.

But Google seemed to double down. Margaret Mitchell, the other coleader of the Ethical AI team and a prominent researcher in her own right, was

among the hardest hit by Gebru's ouster. The two had been a professional and emotional tag team, building up their group—which was one of several that worked on what Google called “responsible AI”—while parrying the sexist and racist tendencies they saw at large in the company's culture. Confident that those same forces had played a role in Gebru's downfall, Mitchell wrote an automated script to retrieve notes she'd kept in her corporate Gmail account that documented allegedly discriminatory incidents, according to sources inside Google. On January 20, Google said Mitchell had triggered an internal security system and had been suspended. On February 19, she was fired, with Google stating that it had found “multiple violations of our code of conduct, as well as of our security policies, which included exfiltration of confidential, business-sensitive documents.”

Google had now fully decapitated its own Ethical AI research group. The long, spectacular fallout from that Thanksgiving ultimatum to Gebru left countless bystanders wondering: Had one paper really precipitated all of these events?

The story of what actually happened in the lead-up to Gebru's exit from Google reveals a more tortured and complex backdrop. It's the tale of a gifted engineer who was swept up in the [AI revolution](#) before she became one of its biggest critics, a refugee who worked her way to the center of the tech industry and became determined to reform it. It's also about a company—the world's fifth largest—trying to regain its equilibrium after four years of scandals, controversies, and mutinies, but doing so in ways that unbalanced the ship even further.

Beyond Google, the fate of Timnit Gebru lays bare something even larger: the tensions inherent in an industry's efforts to research the downsides of its favorite technology. In traditional sectors such as chemicals or mining, researchers who study toxicity or pollution on the corporate dime are viewed skeptically by independent experts. But in the young realm of people studying the potential harms of AI, corporate researchers are central.

Gebru's career mirrored the rapid rise of AI fairness research, and also some of its paradoxes. Almost as soon as the field sprang up, it quickly attracted eager support from giants like Google, which sponsored

conferences, handed out grants, and hired the domain's most prominent experts. Now Gebru's sudden ejection made her and others wonder if this research, in its domesticated form, had always been doomed to a short leash. To researchers, it sent a dangerous message: AI is largely unregulated and only getting more powerful and ubiquitous, and insiders who are forthright in studying its social harms do so at the risk of exile.

In April 1998, two Stanford grad students named Larry Page and Sergey Brin presented an algorithm called PageRank at a conference in Australia. A month later, war broke out between Ethiopia and Eritrea, setting off a two-year border conflict that left tens of thousands dead. The first event set up Google's dominance of the internet. The second set 15-year-old Timnit Gebru on a path toward working for the future megacorp.

At the time, Gebru lived with her mother, an economist, in the Ethiopian capital of Addis Ababa. Her father, an electrical engineer with a PhD, had died when she was small. Gebru enjoyed school and hanging out in cafés when she and her friends could scrape together enough pocket money. But the war changed all that. Gebru's family was Eritrean, and some of her relatives were being deported to Eritrea and conscripted to fight against the country they had made their home.

Gebru's mother had a visa for the United States, where Gebru's older sisters, engineers like their father, had lived for years. But when Gebru applied for a visa, she was denied. So she went to Ireland instead, joining one of her sisters, who was there temporarily for work, while her mother went to America alone.

Reaching Ireland may have saved Gebru's life, but it also shattered it. She called her mother and begged to be sent back to Ethiopia. "I don't care if it's safe or not. I can't live here," she said. Her new school, the culture, even the weather were alienating. Addis Ababa's rainy season is staccato, with heavy downpours interspersed by sunshine. In Ireland, rain fell steadily for a week. As she took on the teenage challenges of new classes and bullying, larger concerns pressed down. "Am I going to be reunited with my family? What happens if the paperwork doesn't work out?" she recalls thinking. "I felt unwanted."

The next year, Gebru was approved to come to the US as a refugee. She reunited with her mother in Somerville, Massachusetts, a predominantly white suburb of Boston, where she enrolled in the local public high school—and a crash course in American racism.

Some of her teachers, Gebru found, seemed unable or unwilling to accept that an African refugee might be a top student in math and science. Other white Americans saw fit to confide in her their belief that African immigrants worked harder than African Americans, whom they saw as lazy. History class told an uplifting story about the Civil Rights Movement resolving America's racial divisions, but that tale rang hollow. "I thought that cannot be true, because I'm seeing it in the school," Gebru says.

Piano lessons helped provide a space where she could breathe. Gebru also coped by turning to math, physics, and her family. She enjoyed technical work, not just for its beauty but because it was a realm disconnected from personal politics or worries about the war back home. That compartmentalization became part of Gebru's way of navigating the world. "What I had under my control was that I could go to class and focus on the work," she says.

Gebru's focus paid off. In September 2001 she enrolled at Stanford. Naturally, she chose the family major, electrical engineering, and before long her trajectory began to embody the Silicon Valley archetype of the immigrant trailblazer. For a course during her junior year, Gebru built an experimental electronic piano key, helping her win an internship at Apple making audio circuitry for Mac computers and other products. The next year she went to work for the company full-time while continuing her studies at Stanford.

At Apple, Gebru thrived. When Niel Warren, her manager, needed someone to dig into delta-sigma modulators, a class of analog-to-digital converters, Gebru volunteered, investigating whether the technology would work in the iPhone. "As an electrical engineer she was fearless," Warren says. He found his new hardware hotshot to be well liked, always ready with a hug, and determined outside of work too. In 2008, Gebru withdrew from one of her classes because she was devoting so much time to canvassing for Barack

Obama in Nevada and Colorado, where many doors were slammed in her face.

As Gebru learned more about the guts of gadgets like the iPhone, she became more interested in the fundamental physics of their components—and soon her interests wandered even further, beyond the confines of electrical engineering. By 2011, she was embarking on a PhD at Stanford, drifting among classes and searching for a new direction. She found it in computer vision, the art of making software that can interpret images.

Unbeknownst to her, Gebru now stood on the cusp of a revolution that would transform the tech industry in ways she would later criticize. One of Gebru's favorite classes involved creating code that could detect human figures in photos. "I wasn't thinking about surveillance," Gebru says. "I just found it technically interesting."

In 2013 she joined the lab of Fei-Fei Li, a computer vision specialist who had helped spur the tech industry's obsession with AI, and who would later work for a time at Google. Li had created a project called ImageNet that paid contractors small sums to tag a billion images scraped from the web with descriptions of their contents—cat, coffee cup, cello. The final database, some 15 million images, helped to reinvent machine learning, an AI technique that involves training software to get better at performing a task by feeding it examples of correct answers. Li's work demonstrated that an approach known as deep learning, fueled by a large collection of training data and powerful computer chips, could produce much more accurate machine-vision technology than prior methods had yielded.

Li wanted to use deep learning to give computers a more fine-grained understanding of the world. Two of her students had scraped 50 million images from Google Street View, planning to train a neural network to spot cars and identify their make and model. But they began wondering about other applications they might build on top of that capability. If you drew correlations between census data and the cars visible on a street, could that provide a way to estimate the demographic or economic characteristics of any neighborhood, just from pictures?

Gebru spent the next few years showing that, to a certain level of accuracy, the answer was yes. She and her collaborators used online contractors and car experts recruited on Craigslist to identify the make and model of 70,000 cars in a sample of Street View images. The annotated pictures provided the training data needed for deep-learning algorithms to figure out how to identify cars in new images. Then they processed the full Street View collection and identified 22 million cars in photos from 200 US cities. When Gebru correlated those observations with census and crime data, her results showed that more pickup trucks and VWs indicated more white residents, more Buicks and Oldsmobiles indicated more Black ones, and more vans corresponded to higher crime.

This demonstration of AI's power positioned Gebru for a lucrative career in Silicon Valley. Deep learning was all the rage, powering the industry's latest products (smart speakers) and its future aspirations (self-driving cars). Companies were spending millions to acquire deep-learning technology and talent, and Google was placing some of the biggest bets of all. Its subsidiary DeepMind had recently celebrated the victory of its machine-learning bot over a human world champion at Go, a moment that many took to symbolize the future relationship between humans and technology.

Gebru's project fit in with what was becoming the industry's new philosophy: Algorithms would soon automate away any problem, no matter how messy. But as Gebru got closer to graduation, the boundary she had established between her technical work and her personal values started to crumble in ways that complicated her feelings about the algorithmic future.

Gebru had maintained a fairly steady interest in social justice issues as a grad student. She wrote in *The Stanford Daily* about an incident in which an acquaintance wondered aloud whether Gebru was "actually smart" or had been admitted due to affirmative action. At Stanford's graduate school, Gebru encountered a significantly less diverse student population than she had during her undergraduate years, and she felt isolated. She bonded with people who, like her, had experienced global inequality firsthand. "Once you've seen the world in terms of its injustice and the ways in which the United States is not always the answer to everybody's problems, it's very difficult to unsee," says Jess Auerbach, a student from South Africa who

became friends with Gebru at Stanford, and who is now an anthropologist at North West University in South Africa.

In 2016, Gebru volunteered to work on a coding program for bright young people in Ethiopia, which sent her on a trip back home, only her second since she had fled at the age of 15. Her coding students' struggles, she felt, exposed the limits of US meritocracy. One promising kid couldn't afford the roughly \$100 required to take the SAT. After Gebru paid the fee for him, he won a scholarship to MIT. She also pitched in to help students who had been denied visas despite having been accepted to US schools. "She tried all she could to help these kids," says Jelani Nelson, the UC Berkeley professor who founded the program.

Li, Gebru's adviser at Stanford, encouraged her to find a way to connect social justice and tech, the two pillars of her worldview. "It was obvious to an outsider, but I don't think it was obvious to her, that actually there was a link between her true passion and her technical background," Li says. Gebru was reluctant to forge that link, fearing in part that it would typecast her as a Black woman first and a technologist second.

But she also became more aware that technology can sometimes reflect or magnify society's biases, rather than transcend them. In 2016, ProPublica reported that a recidivism-risk algorithm called COMPAS, used widely in courtrooms across the country, made more false predictions that Black people would reoffend than it did for white people (an analysis that was disputed by the company that made the algorithm). This made Gebru wonder whether the crime data she'd used in her own research reflected biased policing. Around the same time, she was introduced to Joy Buolamwini, a Ghanaian American MIT master's student who had noticed that some algorithms designed to detect faces worked less well on Black people than they did on white people. Gebru began advising her on publishing her results.

It wasn't just the algorithms or their training data that skewed white. In 2015, Gebru got her first glimpse of the worldwide community of AI researchers at the field's top conference, Neural Information Processing Systems (NIPS), in Montreal. She noticed immediately how male and how white it was. At a Google party, she was intercepted by a group of strangers



in Google Research T-shirts who treated the presence of a Black woman as a titillating photo op. One man grabbed her for a hug; another kissed her cheek and took a photo. At the next year's conference, Gebru kept a tally of other Black people she met, counting just six among the 8,500 attendees—all people she already knew, and most of whom she'd already added to an email list she'd started for Black people in the field. After the event, Gebru posted a warning to AI researchers on Facebook about the dangers of their community's lack of diversity. "I'm not worried about machines taking over the world, I'm worried about groupthink, insularity, and arrogance in the AI community," she wrote. "If many are actively excluded from its creation, this technology will benefit a few while harming a great many."

Gebru's awakening roughly coincided with the emergence of a new research field dedicated to examining some of the social downsides of AI. It came to be centered on an annual academic workshop, first held in 2014, called Fairness, Accountability, and Transparency in Machine Learning (FATML) and motivated by concerns over institutional decisionmaking. If algorithms decided who received a loan or awaited trial in jail rather than at home, any errors they made could be life-changing.

The event's creators initially found it difficult to convince peers that there was much to talk about. "The more predominant idea was that humans were biased and algorithms weren't," says Moritz Hardt, now a UC Berkeley computer science professor who cofounded the workshop with a researcher from Princeton. "People thought it was silly to work on this."

By 2016 the event had grown into a meeting that sold out a hall at NYU School of Law. The audience included staffers from the Federal Trade Commission and the European Commission. Yet the presenters, by and large, applied a fairly detached and mathematical lens to the notion that technology could harm people. Researchers hashed out technical definitions of fairness that could be expressed in the form of code. There was less talk about how economic pressures or structural racism might shape AI systems, whom they work best for, and whom they harm.

Gebru didn't attend the FATML workshop that year or the next—she was still mainly focused on building AI, not examining its potential for harm. In January 2017, at a one-day event centered on how AI could shake up

finance, Gebru stood in a gray turtleneck in a large octagonal room overlooking Stanford's terracotta-roofed campus and presented the findings of her PhD thesis to members of Silicon Valley's elite. She clicked through slides showing how algorithms could predict factors like household income and voting patterns just by identifying cars on the street.

Gebru was the only speaker who was not a professor, investment professional, or representative of a tech company, but, as one organizer recalls, her talk generated more interest than any of the others. Steve Jurvetson, a friend of Elon Musk and an early investor in Tesla, enthusiastically posted photos of her slides to Facebook. A longtime AI aficionado, he wasn't surprised that machine-learning algorithms could identify specific cars. But the way Gebru had extracted signals about society from photos illustrated how the technology could spin gold from unexpected sources—at least for those with plenty of data to mine. “It was, ‘My God, think of all the data that Google has,’” Jurvetson says. “It made me realize the power of having the biggest data set.”

For Gebru, the event could have been a waypoint between her grad school AI work and a job building moneymaking algorithms for tech giants. But she decided that she wanted to help contain the technology's power rather than expand it. In the summer of 2017, she took a job with a Microsoft research group that had been involved in the FATML movement from early on. Gebru wrote her pivot into the final chapter of her thesis: “One of the most important emergent issues plaguing our society today is that of algorithmic bias. Most works based on data mining, including my own works described in this thesis, suffer from this problem,” she wrote. Her plan for a career, she went on, was “to make contributions towards identifying and mitigating these issues.”

While Gebru was completing her thesis at Stanford, Margaret Mitchell was developing her own doubts about AI, 800 miles north at Microsoft's verdant campus outside Seattle.

In 2015, Mitchell, an expert in software that generates language from images, was working on an app for blind people that spoke visual descriptions of the world. She had christened it Seeing AI, and she loved the idea that the flourishing power of machine learning could lift up

society's most vulnerable. But Microsoft didn't seem willing to seriously invest in such projects at the time.

Mitchell also noticed some troubling gaffes in the machine-learning systems she was training. One would describe someone with pale skin, like the red-haired Mitchell, as a "person," but a figure with dark skin as a "Black person." In another test, an image of an inferno at an oil storage depot was captioned "great view." She began to fear that AI was laced with land mines, and the industry was not paying enough attention to finding them. "Oh crap," she remembers thinking. "There are serious issues that we have to solve right now because no one else is working on them and this technology is evolving."

In 2016, Mitchell moved to Google to work full-time on those problems. The company appeared to be embracing this new, conscientious strand of AI research. A couple of weeks before she started, Google published its first research paper on machine-learning fairness. It considered how to ensure that a system that makes predictions about people—say, assessing their risk of defaulting on a loan—offered equal treatment to individuals regardless of their gender, race, religion, or other group identity. The company highlighted its research in a blog post for a general audience, and signed up, alongside Microsoft, as a corporate sponsor of the FATML workshop.

When Mitchell got to Google, she discovered a messier reality behind the company's entrée into fairness research. That first paper had been held up for months by internal deliberations over whether Google should publicly venture into a discourse on the discriminatory potential of computer code, which to managers seemed more complex and sensitive than its labs' usual output. Mitchell's own first publication at the company, on making smile-detection algorithms perform well for people of different races and genders, also met with a degree of corporate hesitancy that didn't seem to encumber more conventional AI projects. She chose to work on smiles in part because of their positive associations; still, she endured rounds of meetings with lawyers over how to handle discussions of gender and race.

At other times, Mitchell's work inside Google faced little resistance, but also little enthusiasm. "It was like people really appreciated what I was

saying, and then nothing happened,” she says. Still, Mitchell hadn’t expected to change the company overnight, and gradually her efforts gained momentum. In late 2017 she formed a small team dedicated to “ethical AI research” and embarked on a campaign of meetings with teams across Google to spread the word and offer help. This time people seemed more receptive—perhaps in part because broader attitudes were shifting. Some of Google’s rivals, like Microsoft, appeared to be taking AI fairness more seriously. Industry hype about AI was still intense, but the field’s culture was becoming more reflective.

When Gebru presented her PhD thesis on computer vision to members of Silicon Valley’s elite, her talk generated intense interest.

Photograph: Djeneba Aduayom

One person driving that change was Timnit Gebru, who was introduced to Mitchell by an acquaintance over email when Gebru was about to join Microsoft. The two had become friendly, bonding over a shared desire to call out injustices in society and the tech industry. “Timnit and I hit it off immediately,” Mitchell says. “We got along on every dimension.”

Gebru was also hitting it off with others who wanted to work in AI but found themselves misunderstood by both people and algorithms. In December 2017, Inioluwa Deborah Raji, a young Nigerian-Canadian coder at an AI startup called Clarifai, stood in the lobby of the Long Beach Convention Center in a crowd of mostly white faces at that year’s NIPS conference. She was beginning to feel that working in AI was not for her. At Clarifai, Raji had helped to create a machine-learning system that detected photos containing nudity or violence. But her team discovered it was more likely to flag images of people of color, because they appeared more often in the pornography and other material they’d used as training data. “That really hit me,” Raji says. “I built this thing, and it was actively discriminatory in a way that hurt people of color.”

The NIPS conference provided a look at the world of AI beyond her startup, but Raji didn’t see people like herself onstage or in the crowded lobby. Then an Afroed figure waved from across the room. It was Gebru. She invited Raji to the inaugural Black in AI workshop, an event born out of

Gebru's email list for Black researchers. Raji changed her plane ticket to stay an extra day in Long Beach and attend.

The event mixed technical presentations by Black researchers with networking and speeches on how to make AI more welcoming. Mitchell ran support for remote participants joining by video chat. At the post-event dinner, on the cruise ship *Queen Mary*, permanently docked in Long Beach, Gebru, Raji, and other Black AI researchers mingled and danced with big names from Amazon and Google.

Other events at NIPS that year had made the hype-saturated world of AI research appear seamy and elitist. Intel threw a corporate party that featured provocatively dressed women performing acrobatics, and Elon Musk made an anatomical joke about the conference's acronym. NIPS organizers released a "statement on inappropriate behavior," promising tougher policies for attendees and sponsors. (They also ended up changing the event's acronym, in due course, to NeurIPS.)

At the Black in AI event, by contrast, there was an atmosphere of friendship and new beginnings. People spoke openly and directly about the social and political tensions hidden beneath the technical veneer of AI research. Raji started to think she could work in the field after all. Jeff Dean, the storied Googler who had cofounded the Google Brain research group, posed for selfies with attendees. He and another top Google Brain researcher, Samy Bengio, got talking with Gebru and suggested she think about joining their group.

Gebru's research was also helping to make work on AI fairness less academic and more urgent. In February 2018, as part of a project called Gender Shades, she and Buolamwini published evidence that services offered by companies including IBM and Microsoft that attempted to detect the gender of faces in photos were nearly perfect at recognizing white men, but highly inaccurate for Black women. The problem appeared to be rooted in the fact that photos scraped from the web to train facial-recognition systems overrepresented men as well as white and Western people, who had more access to the internet.

The project was a visceral demonstration of how AI could perpetuate social injustices—and of how research like Gebru’s could hold companies like her own employer to account. IBM and Microsoft both issued contrite statements. Gebru had not informed her bosses of Microsoft’s inclusion in the Gender Shades project much in advance, but Microsoft’s research division was known for being kept relatively isolated from the business in order to give its researchers freedom. A product manager quizzed her about the study, but that was it. The lab promoted a *New York Times* write-up of the project on its homepage, with a photo of Gebru over the newspaper’s headline: “Facial Recognition Is Accurate, If You’re a White Guy.”

Gebru’s primary research project at Microsoft contrasted her experience as an electrical engineer with the working habits of machine-learning experts. At Apple, Gebru and her coworkers had studied standardized data sheets detailing the properties of every component they considered adding to a gadget like the iPhone. AI had no equivalent culture of rigor around the data used to prime machine-learning algorithms. Programmers generally grabbed the most easily available data they could find, believing that larger data sets meant better results.

Gebru and her collaborators called out this mindset, pointing to her study with Buolamwini as evidence that being lax with data could infest machine-learning systems with biases. Gebru’s new paper proposed a framework called Datasheets for Datasets, in which AI engineers would document the patterns and contents of their data to avoid nasty surprises later. The project treated AI systems as artifacts whose creators should be held to standards of responsibility. “For the first time it gave some structure in my mind about how to think about implementing fairness,” says Krishna Gade, who led a team developing machine learning for Facebook’s News Feed before founding Fiddler Labs, which creates AI transparency tools.

The Datasheets project bolstered Gebru’s prominence in the movement to scrutinize the ethics and fairness of AI. Mitchell asked her to think about joining her Ethical AI team at Google.

Some people warned Gebru about joining the company. While she was interviewing, Google employees were pressuring their leaders to abandon a Pentagon contract known as Project Maven, which would use machine

learning to analyze military drone surveillance footage. Gebru signed a letter with more than 1,000 other researchers urging the company to withdraw. Her uncomfortable experience at the 2015 Google party in Montreal preyed on her mind, and multiple women who had worked at Google Brain told her that the company was hostile to women and people of color, and resistant to change.

Gebru considered walking away from the job offer, until Mitchell offered to make her colead of the Ethical AI team. They would share the burden and the limelight in hopes that together they could nudge Google in a more conscientious direction. Gebru reasoned that she could stick close to Mitchell and keep her head down. “I thought, OK, I can do my work and be careful who I collaborate with, and try to ignore some of the other things,” she says. “My number one concern was: Can I survive in this environment?”

Gebru arrived at the Googleplex in September 2018. She took a desk not far from Jeff Dean’s in one of the buildings that housed Google Brain, across the main courtyard from the volleyball court and the replica of a *Tyrannosaurus rex* skeleton. She didn’t keep a low profile for long. Two months into her new job, she walked out, joining thousands of employees worldwide to protest the company’s treatment of women after *The New York Times* reported that Google had paid \$90 million in severance to an executive accused of sexual harassment.

Gebru joined a discussion about the protest on an internal email list called Brain Women and Allies. She pointed out some problems she’d noticed at her new workplace, including “toxic men” and a lack of women in senior positions. She was summoned to a brief meeting with Dean—now her boss’s boss—and a representative from human resources to discuss her observations.

Soon after, Gebru met with Dean again, this time with Mitchell at her side, for another discussion about the situation of women at Google. They planned a lunch meeting, but by the time the appointment rolled around, the two women were too anxious to eat. Mitchell alleged that she had been held back from promotions and raises by performance reviews that unfairly branded her as uncollaborative. Gebru asserted that a male researcher with

less experience than her had recently joined Google Brain at a more senior level. Dean said he'd look into the pair's claims. Gebru was promoted; Dean told her that the hiring committee had not previously seen all parts of her résumé, an explanation she found dubious. After more back and forth over Mitchell's position, Dean let her switch supervisors.

Gebru and Mitchell's work didn't fit easily into Google's culture, either. The women and their team were a relatively new breed of tech worker: the in-house ethical quibbler. After the dustup at Google over Project Maven, and in the wake of research like Buolamwini and Gebru's, tech giants began trumpeting lofty corporate commitments to practice restraint in their AI projects. After Google said it would not renew its controversial Pentagon contract, it announced a set of seven principles that would guide its AI work. Among them: AI projects had to be "socially beneficial" and could not relate to weapons or surveillance (though other defense work was still permitted). Microsoft posted six AI principles that were less specific, including "inclusiveness" and "accountability." Both companies created internal review processes for cloud computing deals that they said would weed out unethical projects. In 2016, Microsoft and Google were the only corporate sponsors of the FATML workshop; in 2019, they were joined by Google's Alphabet sibling DeepMind, as well as Spotify and Twitter, as sponsors of an entire conference that had in part grown out of the FATML workshop. Gebru was one of its organizers.

Despite those changes, it remained unclear to some of the in-house quibblers how, exactly, they would or could change Google. The Ethical AI team's primary job was to conduct research, but Mitchell also wanted the group to shape the company's products, which touched billions of lives. Indifference and a lack of support, however, sometimes stood in their way. In some cases, Mitchell herself wrote code for product teams that wanted to implement AI safeguards, because engineering resources weren't regularly made available for their kind of work.

So the Ethical AI team hustled, figuring out ways to get traction for their ideas and sometimes staging interventions. In one case, they noticed problems in Gmail's Smart Reply feature, which suggests short responses to emails: It made gendered assumptions, such as defaulting to "he" if a



message included mention of an engineer. A member of the Ethical AI team met with an engineer on the project for a quiet chat. That helped set off a series of conversations, and the feature was adjusted to no longer use gendered pronouns.

Mitchell also developed a playbook for turning ethical AI itself into a kind of product, making it more palatable to Google's engineering culture, which prized launches of new tools and features. In January 2019, Mitchell, Gebru, and seven collaborators introduced a system for cataloging the performance limits of different algorithms. The method, which built on Gebru's earlier work documenting the contents and blind spots of data sets, noted the conditions under which algorithms were most likely to return accurate results and where they were likely to falter. Mitchell's team named the concept Model Cards, to make it sound generic and neutral, and shopped it around to other teams inside the company. The cloud computing division adopted Model Cards, using them as a form of disclosure, like a nutrition label, to show the public how well, say, Google's facial detection algorithm performs on different kinds of images.

On at least one occasion, the Ethical AI team also helped convince Google to limit its AI in ways that ceded potential revenue to competitors. Microsoft and Amazon had for years offered face-recognition services that could be used for more or less anything, including law enforcement. With the Ethical AI team's help, Google launched a limited service that just recognized public figures and was offered only to customers in the media after careful vetting.

Mitchell and Gebru believed their successes derived in part from the fact that their team provided refuge from Google's internal culture, which they and some other researchers found hostile, territorial, and intensely hierarchical. The dozen or so people on the Ethical AI team took pride in being more diverse in terms of gender, race, and academic background than the rest of the company. Gebru fondly thought of them as misfits and believed that diversity made the group more likely to spot problems or opportunities that Google's largely white male workers might overlook. Gebru and Mitchell also successfully lobbied executives to allow them to bring in sociologists and anthropologists—not just the usual computer

science PhDs. “A lot of people in our team would either not be at Google or maybe even in the tech industry if they didn’t join,” Gebru says.

Over time, the team seemed to show how corporate quibblers could succeed. Google’s Ethical AI group won respect from academics and helped persuade the company to limit its AI technology. Gebru and Mitchell both reported to Samy Bengio, the veteran Google Brain researcher, whom they came to consider an ally. The company had built up a handful of other teams working on AI guardrails, including in the research and global affairs divisions, but they were tied more closely to the company’s business priorities. The Ethical AI team was more independent and wide-ranging. When Mitchell started at Google, the field mainly took a narrow, technical approach to fairness. Now it increasingly asked more encompassing questions about how AI replicated or worsened social inequalities, or whether some AI technology should be placed off-limits. In addition to creating handy tools for engineers, members of the team published papers urging AI researchers to draw on critical race theory and reconsider the tech industry’s obsession with building systems to achieve mass scale.

At the same time, however, Mitchell and Gebru’s frustrations with Google’s broader culture mounted. The two women say they were worn down by the occasional flagrantly sexist or racist incident, but more so by a pervasive sense that they were being isolated. They noticed that they were left out of meetings and off email threads, or denied credit when their work made an impact. Mitchell developed an appropriately statistical way of understanding the phenomenon. “What is the likelihood that I will not be invited to a meeting that I should be at? What is the likelihood that my male colleague will be invited? You start to see the trends,” she says.

Together, the two women joined and sometimes led attempts to change Google’s culture. In 2019, with two others, they circulated a pointed internal document listing concerns about the treatment of women in Google’s research teams. Women were treated as “punching bags,” the document asserted, and senior managers dismissed observations about inequality as “temper tantrums.” Mitchell disseminated a chart explaining how to support marginalized groups at work, including checklist items like “Did you listen to their answer and respond with empathy?”

Gebru was the more outspoken of the two—usually because she felt, as a Black woman, that she had to be. She admits that this won her enemies. She dismissed as backward diversity programs that placed an emphasis on mentoring for women: The company’s problems, she would say, were rooted in its culture and leadership, not in the marginalized workers. Gebru’s willingness to speak up sometimes led to blowups. In one incident, she and another woman warned Dean that a male researcher at Google had previously been accused of sexual harassment. Managers did not appear to act until the man was accused of harassing multiple people at Google, after which he was fired. The man’s lawyers then sent Google a letter in which they accused Gebru and the other woman of defaming him. Google lawyers in turn advised the pair to hire their own counsel. Gebru and her coworker did so, and their own lawyers warned Google that it had a duty to represent its employees. After that expensive pushback, the two women didn’t hear more about the issue. (Google did not respond to a request for comment on the incident, but told Bloomberg it began an investigation immediately after receiving reports about the man and that he departed before the investigation concluded.)

Some Googlers chafed at Gebru’s willingness to confront colleagues. “Timnit’s behavior was very far outside the norm,” says one researcher at Google who was not authorized to speak to the press. The researcher recalls an incident in the summer of 2020, during the wave of Black Lives Matter protests, when Gebru got into a dispute on an internal mailing list dedicated to discussing new AI research papers. A male colleague posted a short, enthusiastic message about a new text-generation system that had just been opened up for commercial use. Gebru, acutely conscious of the demonstrations roaring across America, replied to highlight a warning from a prominent woman in the field that such systems were known to sometimes spew racist and sexist language. Other researchers then replied to the initial post without mentioning Gebru’s comment. Gebru called them out for ignoring her, saying it was a common and toxic pattern, and she says one man privately messaged her to say he wasn’t surprised she got harassed online. A hot-tempered debate ensued over racism and sexism in the workplace.

According to the Google employee, the incident—which is also described in anonymous posts on Reddit—showed how Gebru’s demeanor could make some people shy away from her or avoid certain technical topics for fear of being pulled into arguments about race and gender politics. Gebru doesn’t deny that the dispute became heated but says it ultimately proved productive, forcing attention to her negative experiences and those of other women at Google.

About a year after Gebru first arrived at Google, in October 2019, the company summoned journalists to its headquarters in Mountain View to raise the curtain on a new technology. After a sumptuous breakfast buffet, reporters were shepherded into a narrow meeting room to hear from Dean and two vice presidents in charge of Google’s search engine. The trio touted a new kind of machine-learning system that they said made the company’s signature product better able to understand long queries.

Dean raised a polite chuckle when he explained that the new system was called Bidirectional Encoder Representations from Transformers, but was generally known by a name borrowed from *Sesame Street*: BERT. It was an example of a new type of machine-learning system known as a large language model, enabled by advances that made it practical for algorithms to train themselves on larger volumes of text, generally scraped from the web. That broader sampling allowed models like BERT to better internalize statistical patterns of language use, making them better than previous technology at tasks like answering questions or detecting whether a movie review was positive or negative.

When a reporter asked whether BERT would also learn, say, sexist language patterns, Dean responded, “This is something that we definitely look at for all the machine-learning-related product launches and also in our own research,” citing the work of people like Mitchell and Gebru. “We want to make sure that our use of machine learning is free of unfair forms of bias.” The Q&A also revealed that Google had other reasons to value BERT. When another journalist asked if it was being used by Google’s ads team, one of the search executives replied, “I’m sure they must be applying it.”

In the months that followed, excitement grew around large language models. In June 2020, OpenAI, an independent AI institute cofounded by

Elon Musk but now bankrolled by a billion dollars from Microsoft, won a splurge of media coverage with a system called GPT-3. It had ingested more training data than BERT and could generate impressively fluid text in genres spanning sonnets, jokes, and computer code. Some investors and entrepreneurs predicted that automated writing would reinvent marketing, journalism, and art.

These new systems could also become fluent in unsavory language patterns, coursing with sexism, racism, or the tropes of ISIS propaganda. Training them required huge collections of text—BERT used 3.3 billion words and GPT-3 almost half a trillion—which engineers slurped from the web, the most readily available source with the necessary scale. But the data sets were so large that sanitizing them, or even knowing what they contained, was too daunting a task. It was an extreme example of the problem Gebru had warned against with her Datasheets for Datasets project.

Inside Google, researchers worked to build more powerful successors to BERT and GPT-3. Separately, the Ethical AI team began researching the technology's possible downsides. Then, in September 2020, Gebru and Mitchell learned that 40 Googlers had met to discuss the technology's future. No one from Gebru's team had been invited, though two other "responsible AI" teams did attend. There was a discussion of ethics, but it was led by a product manager, not a researcher.

That same month, Gebru sent a message to Emily M. Bender, a professor of linguistics at the University of Washington, to ask if she had written anything about the ethical questions raised by these new language models. Bender had not, and the pair decided to collaborate. Bender brought in a grad student, and Gebru looped in Mitchell and three other members of her Google team.

The resulting paper was titled "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? □" The whimsical title styled the software as a statistical mimic that, like a real parrot, doesn't know the implications of the bad language it repeats.

The paper was not intended to be a bombshell. The authors did not present new experimental results. Instead, they cited previous studies about ethical

questions raised by large language models, including about the energy consumed by the tens or even thousands of powerful processors required when training such software, and the challenges of documenting potential biases in the vast data sets they were made with. BERT, Google's system, was mentioned more than a dozen times, but so was OpenAI's GPT-3. Mitchell considered the project worthwhile but figured it would come across as boring. An academic who saw the paper after it was submitted for publication found the document "middle of the road."

Plenty of people inside Google knew about the paper early on, including Dean. In October, he wrote in a glowing annual review that Gebru should work with other teams on developing techniques to make machine-learning software for language processing "consistent with our AI Principles." In her reply, she told him about the paper she was drafting with Bender and others. Dean wrote back: "Definitely not my area of expertise, but would definitely learn from reading it." Gebru also informed Google's communications department about the project and mentioned it to Marian Croak, a Black engineering executive on Google's Advanced Technology Review Council, an internal review panel that was added after the Maven protests. Croak said the paper sounded interesting and asked Gebru to send her a copy. But Gebru never got the chance before the fatal controversy over "Stochastic Parrots" erupted.

It's not clear exactly who decided that Gebru's paper had to be quashed or for what reason. Nor is it clear why her resistance—predictable as it was—prompted a snap decision to eject her, despite the clear risk of public fallout. Other researchers at Google say it isn't unusual for publications about AI to trigger internal corporate sensitivities before public release, but that researchers can usually work through managers' objections. Gebru, with her track record of rattling management about Google's diversity and AI ethics problems, got little such opportunity. One reason managers were not more open in explaining their feedback to Gebru, according to Google, was that they feared she would spread it around inside the company. Those fears may have been compounded when Gebru took to an internal listserv to criticize Google for "silencing marginalized voices," even as she offered to kill her own paper in exchange for greater transparency.

On the night of her forced exit from Google, in early December, members of Gebru's team joined a tearful Google Meet video call that lasted until early the next morning. In normal times, they might have hugged and huddled in a bar or someone's home; in a pandemic they sniffled alone over their laptops. Two weeks later, the remaining team members sent an email to Google CEO Sundar Pichai demanding an apology and several changes, including Gebru's reinstatement (and Kacholia's reassignment). Mitchell's firing two months later brought new pain. She hired lawyers who blasted out a press release saying she had been fired after "raising concerns of race and gender equity at Google."

Dean became the face of Google's displeasure with the "Stochastic Parrots" paper. He sent an email to the members of Google Research, also released publicly, saying the work "didn't meet our bar for publication," in part because one of its eight sections didn't cite newer work showing that large language models could be made less energy-hungry. Dean repeated the point so often inside Google that some researchers joked that "I have an objection to Parrots section three" would be inscribed on his tombstone. The complaint made little sense to many AI researchers, who knew that grumbles about citations typically end with authors revising a paper, not getting terminated. Dean's argument suffered another blow when reviewers accepted the paper to the conference on fairness and technology.

Others, including Gebru, offered a different explanation from Dean's: Google had used an opaque internal process to suppress work critical of a technology that had commercial potential. "The closer the research started getting to search and ads, the more resistance there was," one Google employee with experience of the company's research review process says. "Those are the oldest and most entrenched organizations with the most power." Still others surmised that Gebru was the casualty of a different kind of turf battle: that other internal groups working on responsible AI—ones with closer relationships to Google's product teams—felt that Gebru and her coauthors were encroaching where they didn't belong.

The repercussions of Gebru's termination quickly radiated out from her team to the rest of Google and, beyond that, to the entire discipline of AI fairness research.

Some Google employees, including David Baker, a director who'd been at the company for 16 years, publicly quit over its treatment of Gebru.

Google's research department was riven by mistrust and rumors about what happened and what might happen next. Even people who believed Gebru had behaved in ways unbecoming of a corporate researcher saw Google's response as ham-handed. Some researchers feared their work would now be policed more closely. One of them, Nicholas Carlini, sent a long internal email complaining of changes that company lawyers made to another paper involving large language models, published after Gebru was fired, likening the intervention to "Big Brother stepping in." The changes downplayed the problems the paper reported and removed references to Google's own technology, the email said.

Soon after, Google rolled out its response to the roiling scandal and sketched out a more locked-down future for in-house research probing AI's power. Marian Croak, the executive who had shown interest in Gebru's work, was given the task of consolidating the various teams working on what the company called responsible AI, including Mitchell and Gebru's. Dean sent around an email announcing that a review of Gebru's ouster had concluded; he was sorry, he said, that the company had not "handled this situation with more sensitivity."

Dean also announced that progress on improving workforce diversity would now be considered in top executives' performance reviews—perhaps quietly conceding Gebru's assertion that leaders were not held accountable for their poor showing on this count. And he informed researchers that they would be given firmer guidance on "Google's research goals and priorities." A Google source later explained that this meant future projects touching on sensitive or commercial topics would require more input from in-house legal experts, product teams, and others within Google who had relevant expertise. The outlook for open-minded, independent research on ethical AI appeared gloomy. Google claimed that it still had hundreds of people working on responsible AI, and that it would expand those teams; the company painted Gebru and Mitchell's group as a tiny and relatively unimportant cog in a big machine. But others at Google said the Ethical AI leaders and their frank feedback would be missed. "For me, it's the most critical voices that are the most important and where I have learned the



most,” says one person who worked on product changes with Gebru and Mitchell’s input. Bengio, the women’s manager, turned his back on 14 years of working on AI at Google and quit to join Apple.

Outside of Google, nine Democrats in Congress wrote to Pichai questioning his commitment to preventing AI’s harms. Mitchell had at one point tried to save the “Stochastic Parrots” paper by telling executives that publishing it would bolster arguments that the company was capable of self-policing. Quashing it was now undermining those arguments.

Some academics announced that they had backed away from company events or funding. The fairness and technology conference’s organizers stripped Google of its status as a sponsor of the event. Luke Stark, who studies the social impacts of AI at the University of Western Ontario, turned down a \$60,000 grant from Google in protest of its treatment of the Ethical AI team. When he applied for the money in December 2020, he had considered the team a “strong example” of how corporate researchers could do powerful work. Now he wanted nothing to do with Google. Tensions built into the field of AI ethics, he saw, were beginning to cause fractures.

“The big tech companies tried to steal a march on regulators and public criticism by embracing the idea of AI ethics,” Stark says. But as the research matured, it raised bigger questions. “Companies became less able to coexist with internal critical research,” he says. One person who runs an ethical AI team at another tech company agrees. “Google and most places did not count on the field becoming what it did.”

To some, the drama at Google suggested that researchers on corporate payrolls should be subject to different rules than those from institutions not seeking to profit from AI. In April, some founding editors of a new journal of AI ethics published a paper calling for industry researchers to disclose who vetted their work and how, and for whistle-blowing mechanisms to be set up inside corporate labs. “We had been trying to poke on this issue already, but when Timnit got fired it catapulted into a more mainstream conversation,” says Savannah Thais, a researcher at Princeton on the journal’s board who contributed to the paper. “Now a lot more people are questioning: Is it possible to do good ethics research in a corporate AI setting?”

If that mindset takes hold, in-house ethical AI research may forever be held in suspicion—much the way industrial research on pollution is viewed by environmental scientists. Jeff Dean admitted in a May interview with CNET that the company had suffered a real “reputational hit” among people interested in AI ethics work. The rest of the interview dealt mainly with promoting Google’s annual developer conference, where it was soon announced that large language models, the subject of Gebru’s fateful critique, would play a more central role in Google search and the company’s voice assistant. Meredith Whittaker, faculty director of New York University’s AI Now Institute, predicts that there will be a clearer split between work done at institutions like her own and work done inside tech companies. “What Google just said to anyone who wants to do this critical research is, ‘We’re not going to tolerate it,’” she says. (Whittaker herself once worked at Google, where she clashed with management over AI ethics and the Maven Pentagon contract before leaving in 2019.)

Any such divide is unlikely to be neat, given how the field of AI ethics sprouted in a tech industry hothouse. The community is still small, and jobs outside big companies are sparser and much less well paid, particularly for candidates without computer science PhDs. That’s in part because AI ethics straddles the established boundaries of academic departments. Government and philanthropic funding is no match for corporate purses, and few institutions can rustle up the data and computing power needed to match work from companies like Google.

For Gebru and her fellow travelers, the past five years have been vertiginous. For a time, the period seemed revolutionary: Tech companies were proactively exploring flaws in AI, their latest moneymaking marvel—a sharp contrast to how they’d faced up to problems like spam and social network moderation only after coming under external pressure. But now it appeared that not much had changed after all, even if many individuals had good intentions.

Inioluwa Deborah Raji, whom Gebru escorted to Black in AI in 2017, and who now works as a fellow at the Mozilla Foundation, says that Google’s treatment of its own researchers demands a permanent shift in perceptions. “There was this hope that some level of self-regulation could have

happened at these tech companies,” Raji says. “Everyone’s now aware that the true accountability needs to come from the outside—if you’re on the inside, there’s a limit to how much you can protect people.”

Gebru, who recently returned home after her unexpectedly eventful road trip, has come to a similar conclusion. She’s raising money to launch an independent research institute modeled on her work on Google’s Ethical AI team and her experience in Black in AI. “We need more support for external work so that the choice is not ‘Do I get paid by the DOD or by Google?’” she says.

Gebru has had offers, but she can’t imagine working within the industry anytime in the near future. She’s been thinking back to conversations she’d had with a friend who warned her not to join Google, saying it was harmful to women and impossible to change. Gebru had disagreed, claiming she could nudge things, just a little, toward a more beneficial path. “I kept on arguing with her,” Gebru says. Now, she says, she concedes the point.

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05.20.2021 07:00 AM

# Coder Dee Tuck Is on a Mission to Help Diversify Hollywood

At Ava DuVernay's Array film collective, Tuck is making it easy for showbiz types to hire a more inclusive workforce.

 illustration with Black creators in film

Illustration: JIAQI WANG

Dee Tuck has heard all the excuses. “I want to hire more women, but I just don't know where they are.” Yep. “I want to hire more people of color, I just don't know anybody.” That too. She's been working in tech for more than a decade and has often been the only Black female engineer on her team. She has reviewed company hiring practices and pointed out that “maybe you're weeding out a lot of people who can't code with eight non-people-of-color watching them on Zoom.” Tuck doesn't want to hear the excuses anymore.

Last November she was tapped to be chief technology officer at Array, the film collective founded by [director Ava DuVernay](#). Her main objective: launching Array Crew, a database of women and people of color that studios can use when staffing up for movies and TV shows. The goal is to see if the industry will diversify its ranks when the “We can't find anybody” barrier is removed. “When we really diagnosed the issue, it wasn't that people weren't willing to do it, it was that people weren't willing to be inconvenienced to do it,” DuVernay says. “So what we tried to do is create a platform that made it really easy. And so now we're in a space where, to be frank, if you still don't do it, you never really wanted to.”

[Hollywood](#) has been in the midst of a yearslong reckoning with its overabundance of white male directors and stars. But less noticed is how few women and people of color appear in what are known as below-the-line jobs—the ones on the bottom half of the production budget. For decades, the industry has relied on people hiring the folks they already know for these gigs, leaving out swaths of qualified applicants. “It's harder to manage on the production side, because hundreds of productions come and go each year within each studio,” says Kevin Hamburger, head of production at Warner Horizon Unscripted Television. [Array Crew](#), which debuted online in February and will be available as a mobile app in June, allows job seekers to create a profile that includes their résumé, location, images, reels, and contact information so that line producers can pull up every candidate near their film set; it also has tools to help managers keep track of the people they hire for each shoot.

On its face, there's a tension in how Array is using technology to solve Hollywood's inclusivity problem. We now have search engines optimized to find everything from adoptable pets to dinner (for better or worse), but leaving something as complicated as workplace diversity to machines is far more tricky. Which might be why Array's fix is purposefully simple. The database's results are organic; there aren't algorithms boosting some folks and not others. Someone crewing up a movie can search for certain positions (makeup artist, grip), locations (Los Angeles, New York), names, trade union membership, and experience level, but that's it. Unlike, say, Google results, Crew's list of candidates comes up in the most analog way possible: alphabetically. Hiring managers can sort by first or last name or those most recently added, but from there it's up to them to pick a team.

Zooming from her Atlanta home, wearing a sweatshirt from her alma mater, Tuskegee University, Array's CTO speaks pointedly about the best ways to remove barriers. Tuck has witnessed roadblocks to hiring throughout her career, and from the beginning her team was intentional about spotting and eliminating them. “We have conversations about the smallest things,” she says. Like that search function. Array could have made every field on a user's profile searchable, but doing so might have left someone out of the results just because they didn't include a certain keyword. “We realized that could've created some type of barrier to entry for people,” Tuck says. That

puts an onus on the line producer to look through the list of candidates. But that's the point—to make them look somewhere they hadn't been looking.

Born and raised in Cincinnati, Tuck started trying to figure out Windows 95 at her uncle's house when she was about 11 years old. “A few times,” she laughs, “he had to call me and be like, ‘What did you do? I can't get in.’” She spent time at IBM and worked on missile defense at Lockheed Martin. By the time Tuck got to GitHub in 2020, she was making sure every job she took gave her a say in hiring decisions. “I really do believe in building diverse teams, because we ship better products that way,” Tuck says. “If you just have one demographic building a thing, you're not going to end up with the best solution.”

Array chief technology officer Dee Tuck (left) with filmmaker Ava DuVernay in Atlanta.

Photograph: Paul Garnes/Array

When Tuck and I spoke, Array Crew had more than 5,000 verified users. It's free for work-seekers; studios pay an annual fee. “This is an investment. It's incumbent upon us to make sure this works,” says Jennifer Lynch, who oversees corporate social responsibility at Paramount Pictures, one of several studios, including Netflix and Disney, that signed on to be a Crew launch partner. “We're in this for the long haul.”

That footslogging is key. Too often diversity efforts fail when old habits creep back in. Studios must buy in, because for the effort to succeed it's essential that their employees and partners use the service. One function Tuck's team is working on is the ability to provide demographic breakdowns for each production. DuVernay notes that she doesn't want Crew to become just a “report card” for whether studios keep their promises, but Tuck sees other benefits: “We have to be able to tell a story of how we impacted the industry.”

As we're wrapping up our Zoom, Tuck's team jumps on. She opens the conversation by asking everyone to name the song they currently have on repeat. (Bill Withers, Big K.R.I.T., and “Baby Shark” are all represented.) Kelsey Kearney, who handles Array's relationships with studios, notes that

it's been a week of questions and requests from partners wanting more from the Crew database, like support and help desk functions. A lot of these wants will be fulfilled by the new mobile app. “I love a deliverable,” she laughs.

But there's something else they want. Hollywood's push for diversity goes far beyond LA. Could Crew release an international version? Tuck says it's at the top of her to-do list and promises there's “more to come on that.” So, yes, she's on it. No excuses.

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*This article appears in the June issue. [Subscribe now.](#)*

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05.18.2021 07:00 AM

# To Observe the Muon Is to Experience Hints of Immortality

Attempting to model the universe as precisely as possible is to try to see the one thing that even the strictest atheist agrees is everlasting.

 Illustration with organic multicolor shapes with a square around them  
Illustrations by Kate Dehler

All people want to enact a paradigm shift, don't they? Even if it's not mRNA, or Lego, we want at least, on our one chance on Earth, to make a meme happen.

So imagine the excitement on April 7, when more than 200 physicists from seven countries convened on a Zoom call for a kind of nonexplosive gender-reveal party. What was to be disclosed was not a baby's sex but the fate of particle physics.

While the rest of the world has spent more than a year preoccupied with [epidemiology](#), this team of physicists has spent three years collecting data for something called the [Muon g-2 experiment](#), a much anticipated project headquartered at Fermilab, a physics and accelerator laboratory in Batavia, Illinois, that is overseen by the Department of Energy. The physicists had done their work half in the dark, with a key variable concealed. If you want a eureka badly enough, after all, you might be tempted to help the data along. Now the lights were coming on.

“We had no idea” of the outcome, Rebecca Chislett, a physicist at University College London, told *Scientific American*. “It was exciting and



nerve-racking.”

*Eureka.*

The experiment had aimed to determine, to the finest measurement, the strength of the internal magnetic field generated by a muon, a particle similar to an electron but 200 times more massive and supremely unstable, with a lifetime of 2.2 microseconds. Muons rain down on us all the time, the indirect product of [cosmic rays](#) colliding with particles in Earth's atmosphere. But Fermilab's accelerator makes its own.

Many subatomic particles act like magnets, and the so-called Standard Model predicts the strength of their magnetism with great exactitude. To test the model, the team watched muons as they wobbled in a magnetic field and clocked whether the wobble deviated from what theory had predicted it would be. Indeed, it did. As Galileo might have said: *Eppur si deviare*.

In the journal *Physical Review Letters*, the researchers reported that the infinitesimal deviation—0.0000002 percent away from what theory stipulated—was highly significant. In its press release, Fermilab even suggested that the discovery could force us to revise our basic model of how subatomic particles work.

“The strong evidence that muons deviate from the Standard Model calculation might hint at exciting new physics. Muons act as a window into the subatomic world and could be interacting with yet undiscovered particles or forces,” read the press release. Graziano Venanzoni, a physicist at the Italian National Institute for Nuclear Physics in Pisa, called the findings “an incredible result ... long awaited not only by us but by the whole international physics community.”

The known universe seemed, briefly, muonstruck. But it took only 12 days for another Italian physicist to throw cold water on the bliss. Carlo Rovelli, a founder of loop quantum gravity theory, which seeks to combine quantum mechanics and general relativity, and the author of [Helgoland: Making Sense of the Quantum Revolution](#), which was published in English in May, wrote in *The Guardian*, “Physicists love to think of themselves as radical.”

This self-conception, Rovelli went on, is understandable, especially among physicists, who make their names in the outer reaches of human understanding. But it also leads labs to overhype their findings. He cited examples of would-be “discoveries” in supersymmetry that initially seemed groundbreaking but didn't live up to the hype. Rovelli especially zeroed in on the word “hint,” which appeared in that Fermilab press release. “I do not remember a time without some colleague talking about ‘hints’ that new supersymmetric particles had been ‘nearly discovered.’” The *nearlys* and *hints*, presumably, are often at a value that, unlike Fermilab's 0.0000002 percent, may not be statistically significant.

In 1807, William Wordsworth published an ode that was to Romantic poetry as the discovery of quarks was to particle physics in 1964: a breakthrough. “Intimations of Immortality from Recollections of Early Childhood” chronicles the poet's emotional detachment from nature; his blissful rediscovery of it in memories of childhood; and his bittersweet resolution that, though the Earth will die, the suggestions of deathlessness in the present moment will sustain him in his grief.

*Though nothing can bring back the hour  
Of splendour in the grass, of glory in the flower;  
We will grieve not, rather find  
Strength in what remains behind;  
In the primal sympathy  
Which having been must ever be;  
In the soothing thoughts that spring  
Out of human suffering; In the faith that looks through death ...*

An intriguing approach to literature called ecocriticism, pioneered in the 1990s by the English philosopher Jonathan Bate, argues that Romantic poetry like this ode can suggest ways to conceive of our dying planet as one that we must save—or perhaps, in sorrow, and maybe love, allow to die. But Wordsworth's poem doesn't just concern the fate of humans and the blue planet. Its subject is also intimations—what the physicists on the Muon g-2 project call “hints.”

As it happens, they are hints of the same thing: immortality.

The central contention of physics has it that the building blocks of the universe will endure even if, or even when, the humans who tally them, and the planet we live on, all die. To see into the deathless universe is to try to see nothing so flamboyant as Wordsworth's favorite daffodils and walnut groves, but to peer into the coldest spaces, the black holes and the fractional electric charge of theoretical subatomic particles. These entities have no blood flow, of course, but also no DNA; they're not susceptible to pandemics, however virulent, or the dividends and ravages of carbon. They don't live, so they don't die. To model the universe as precisely as possible is to try to see the one thing that even the strictest atheist agrees is everlasting—to try to achieve, in a lab, an intimation of immortality.

Back to the living world that's under our feet. Rovelli is right to caution against the potential delusions of those who are greedy for eureka's. But, as a fellow physicist with a radical streak, he is also sympathetic to their ambitions, a drive to “learn something unexpected about the fundamental laws of nature.” To Rovelli, whose latest book describes quantum mechanics as an almost psychedelic experience, a truly radical discovery entails the observation of phenomena that fall outside three existing frameworks in physics: quantum theory, the Standard Model of particle physics, and general relativity. Only by blowing up one of those frameworks can one achieve the kind of immortality that scientists get, the glory of someone like Einstein or Heisenberg.

But to keep looking, as Rovelli has, as Fermilab has with this study on the muon's magnetism, is also to apprehend hints. To follow hints. In that way, the physicist's work and the poet's are the same. And if Wordsworth is right, immortality can be found, of all places, in the hint—the staggering proposition by nature itself that, in spite of all the dying around us, something of all we love might be imperishable, might still flicker or shine or wobble when the rest of our world is gone.

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05.04.2021 07:00 AM

# They Told Their Therapists Everything. Hackers Leaked It All

A mental health startup built its business on easy-to-use technology. Patients joined in droves. Then came a catastrophic data breach.  
Illustration: Mark Harris

Jere woke up on the morning of October 24, 2020, expecting what Finnish college students call *normi päivä*, an ordinary day. It was a Saturday, and he'd slept in. The night before, he had gone drinking by the beach with some friends. They'd sipped cheap apple liqueur, listened to Billie Eilish on his boom box. Now Jere (pronounced "yeh-reh") needed to clear his head. He was supposed to spend this gray fall day on campus, finishing a group physics project about solar energy. The 22-year-old took a walk around the lake near his apartment outside Helsinki. Then, feeling somewhat refreshed, he jumped on the bus.

The day went quickly. Jere caught up with his friends, many of whom he hadn't seen since the pandemic began. They chatted about their Christmas plans, ordered pizzas from a favorite local spot, and knuckled down to work in the cafeteria.

This article appears in the June 2021 issue. [Subscribe to WIRED.](#)

At around 4 pm, Jere checked Snapchat. An email notification popped up on his screen. His hands began to shake. The subject line included his full name, his social security number, and the name of a clinic where he'd

gotten mental health treatment as a teenager: Vastaamo. He didn't recognize the sender, but he knew what the email said before he opened it.

A few days earlier, Vastaamo had announced a catastrophic data breach. A [security flaw](#) in the company's IT systems had exposed its entire patient database to the open internet—not just email addresses and social security numbers, but the actual written notes that therapists had taken. A group of hackers, or one masquerading as many, had gotten hold of the data. The message in Jere's inbox was [a ransom demand](#).

“If we receive €200 worth of Bitcoin within 24 hours, your information will be permanently deleted from our servers,” the email said in Finnish. If Jere missed the first deadline, he'd have another 48 hours to fork over €500, or about \$600. After that, “your information will be published for all to see.”

Jere had first gone to Vastaamo when he was 16. He had dropped out of school and begun to self-harm, he says, and was consuming “extreme amounts” of Jägermeister each week. His girlfriend at the time insisted he get help; she believed it was the only way Jere would see his 18th birthday.

During his therapy sessions, Jere spoke about his abusive parents—how they forced him, when he was a young kid, to walk the nearly 4 miles home from school, or made him sleep out in the garden if he “was being a disappointment.” He talked about using marijuana, LSD, DMT. He said he'd organized an illegal rave and was selling drugs. He said he'd thought about killing himself. After each session, Jere's therapist typed out his notes and uploaded them to Vastaamo's servers. “I was just being honest,” Jere says. He had “no idea” that they were backing the information up digitally.

In the cafeteria, Jere grabbed his bag and told his friends he'd turn in his portion of the physics project the next day. On the bus ride home, he frantically texted his best friend to come over. Then his mother called; as the adult listed on his old account, she'd received the ransom note too. She and Jere were on good terms now, but if she got involved she might learn what he'd said in his sessions. Then, he says, he'd probably lose her from his life completely. He told his mother not to worry. That afternoon, he filed an online police report.

Jere poured himself a shot of vodka, then two or three more. He found his vape pen and took a Xanax, prescribed to him years earlier for anxiety. He'd stored a few pills in his bedroom drawer just in case, but he never believed he'd need them again. He passed out shortly after his friend arrived.

The next morning, Jere checked Twitter, where he was both horrified and relieved to learn that thousands of others had received the same threat. "Had I been one of the only people to get the mail, I would have been more scared," he says.

Vastaamo ran the largest network of private mental-health providers in Finland. In a country of just 5.5 million—about the same as the state of Minnesota—it was the "McDonald's of psychotherapy," one Finnish journalist told me. And because of that, the attack on the company rocked all of Finland. Around 30,000 people are believed to have received the ransom demand; some 25,000 reported it to the police. On October 29, a headline in the *Helsinki Times* read: "Vastaamo Hacking Could Turn Into Largest Criminal Case in Finnish History." That prediction seems to have come true.

If the [scale of the attack](#) was shocking, so was its cruelty. Not just because the records were so sensitive; not just because the attacker, or attackers, singled out patients like wounded animals; but also because, out of all the countries on earth, Finland should have been among the best able to prevent such a breach. Along with neighboring Estonia, it is widely considered a pioneer in digital health. Since the late 1990s, Finnish leaders have pursued the principle of "citizen-centered, seamless" care, backed up by investments in technology infrastructure. Today, every Finnish citizen has access to a highly secure service called Kanta, where they can browse their own treatment records and order prescriptions. Their health providers can use the system to coordinate care.

Vastaamo was a private company, but it seemed to operate in the same spirit of tech-enabled ease and accessibility: You booked a therapist with a few clicks, wait times were tolerable, and Finland's Social Insurance Institution reimbursed a big chunk of the session fee (provided you had a diagnosed mental disorder). The company was run by Ville Tapio, a 39-year-old coder

and entrepreneur with sharp eyebrows, slicked-back brown hair, and a heavy jawline. He'd cofounded the company with his parents. They pitched Vastaamo as a humble family-run enterprise committed to improving the mental health of all Finns.

For nearly a decade, the company went from success to success. Sure, some questioned the purity of Tapio's motives; Kristian Wahlbeck, director of development at Finland's oldest mental health nonprofit, says he was "a bit frowned-upon" and "perceived as too business-minded." And yes, there were occasional stories about Vastaamo doing shady-seeming things, such as using Google ads to try to poach prospective patients from a university clinic, as the newspaper *Ilta-lehti* reported. But people kept signing up. Tapio was so confident in what he'd created that he spoke about taking his model overseas.

Before "the incident," Tapio says, "Vastaamo produced a lot of social good." Now he is an ex-CEO, and the company he founded is being sold for parts. "I'm so sad to see all the work done and the future opportunities suddenly go to waste," he says. "The way it ended feels terrible, unnecessary, and unjustified."

Tapio grew up in a "peaceful and green" neighborhood in northern Helsinki during a bad recession. His mother, Nina, was a trauma psychotherapist, and his father, Perttu, a priest. His grandparents gave him a used Commodore 64 when he was 10, which led him to an interest in coding. Something in his brain resonated with the logical challenge of it, he says. He also saw it as a "tool to build something real."

The obsession endured: In middle school Tapio coded a statistics system for his basketball team, and in high school he worked for the Helsinki Education Department, showing teachers how to use their computers. Rather than going to college, he set up an online shop selling computer parts—his first business, funded with "a few tens of euros," he says. A couple of years later, at age 20, he joined a small management consultancy.

The idea for Vastaamo came to Tapio when he was working with the Finnish Innovation Fund, a public foundation that invests in solutions to social and environmental problems. The fund sent him on a survey of health



care systems in Western Europe. Being his mother's son, he noticed that the Netherlands and other countries seemed to do a better job of providing mental health services than Finland did; the public system at home was known for patchy coverage and long wait times. Ever the coder, he wondered whether a web-based counseling service would help. It could sell vouchers to cities and towns, which could distribute the vouchers for free to residents. People could use the service anonymously. They wouldn't have to worry about the stigma of seeking care, and they'd have access anytime, anyplace.

In 2009, the Finnish Innovation Fund backed Tapio's idea with an initial grant of about \$12,000. He and his parents used the money—along with more than \$13,000 of their own savings—to start Vastaamo, Finnish for “a place where you get answers from.” Tapio registered the company as a social enterprise, meaning that the bulk of its profits would be poured back into its mission to improve mental health services. He would own around 60 percent, and most of the remainder would belong to his parents. Perttu would serve as CEO.

Clients could send a message to Vastaamo, and within 24 hours they'd get a personal response from a qualified therapist. (Wahlbeck, of the mental health nonprofit, notes that such services aren't regulated by the government.) But counseling by internet “was not enough for customers,” Tapio says. Many of them needed access to in-person therapy.

One way to meet that need was to grow Vastaamo into a network of brick-and-mortar clinics. Tapio planned to digitize whatever he could, from bookings to invoices to medical records—everything but the appointment itself. The idea was that independent therapists would join Vastaamo to avoid dealing with their own administrative headaches. Freed by automation, they'd have more time to spend with clients (and rack up billable hours).

To deliver on this vision, Vastaamo needed an electronic medical record system, but Tapio didn't like the options he found. Either the systems bristled with irrelevant features or they were too tightly tailored to a different area of medicine. The lack of good software, Tapio says, was one

of the “main reasons” nobody had done what Vastaamo was about to attempt.

A Vastaamo clinic location in Espoo, near where Jere lives.

Illustration: Mark Harris

Rather than use an existing system, the company designed its own. It launched in late 2012, around the same time Vastaamo’s first in-person clinic opened, in the Malmi district of Helsinki. Tapio wouldn’t go into technical detail about the system, but in court documents he suggests it was browser-based and stored patients’ records on a MySQL server. More important for Vastaamo’s purposes, the interface was easy to use. When therapists applied for a job at the company, they heard all about how much it would quicken their work.

But the slick exterior concealed deep vulnerabilities. Mikael Koivukangas, head of R&D at a Finnish medtech firm called Onesys Medical, points out that Vastaamo’s system violated one of the “first principles of cybersecurity”: It didn’t anonymize the records. It didn’t even encrypt them. The only thing protecting patients’ confessions and confidences were a couple of firewalls and a server login screen. Anyone with experience in the field, Koivukangas says, could’ve helped Vastaamo design a safer system.

At the time, though, fears of a breach were far from Tapio’s mind. The summer after Vastaamo’s first clinic opened its doors, he took over as CEO and set the company on a path toward expansion.

In 2014 there was a change in the regulations around Vastaamo’s business. The Finnish Parliament decided to split medical information systems into two categories. Class A systems would connect with Kanta, the national health data repository, so they’d need to meet strict security and interoperability standards. Anyone who planned to keep their patients’ records in long-term electronic storage would have to use a Class A system.

Smaller organizations, the kind that kept vital records in manila envelopes and filing cabinets, would be allowed to use Class B systems. These weren’t as tightly regulated, in part because they wouldn’t make very interesting

targets for a hacker. Class B operators would simply self-certify to the government that their setup met certain requirements. “The government” being, in this case, a single man—Antti Härkönen—whose purview includes all 280 Class B systems in Finland.

The new law gave Vastaamo several years to adopt a Class A system. The problem, Tapio says, is that the Finnish government hadn’t specified how psychotherapy practices should format their data. Vastaamo could build a Class A system and plug into Kanta, but there was “no way to stop, for example, general practitioners at health care centers or occupational health physicians from accessing” therapy records, he says.

Outi Lehtokari, Kanta’s head of services, pushes back against this claim. “Tapio might have misunderstood how Kanta works,” she says. Patients can choose to restrict access to their information.

In any event, on June 29, 2017, Vastaamo registered a Class B system. As Tapio tells it, the company was eager to upgrade to Class A as soon as the government released formatting specs for psychotherapy. But that didn’t happen. Instead, when the specs came out, Vastaamo kept on going with its Class B.

Tapio says that Finland’s “supervisory authorities” then signed off on the system “numerous times” in the years ahead. Härkönen, who is one of those authorities, says that to monitor all the Class B systems carefully would be “mission impossible” for him. He adds, however, that there should be more “proactive inspections.”

By 2018, Vastaamo was operating nearly 20 clinics and employing around 200 therapists and staff. By the end of 2019, annual revenue had risen to more than \$18 million. The company drew the interest of Intera Partners, a Finnish private equity firm, which bought out the majority of Tapio’s and his parents’ stakes. Tapio took home nearly \$4 million from the deal.

With each new clinic that opened, the original process repeated: Härkönen reviewed Vastaamo’s self-certification and gave the thumbs-up. More patient data flowed into the MySQL server. And the reservoir behind the dam rose a little higher.

Tapio first heard from the hacker on September 28, 2020. The demand was 40 bitcoin, around half a million dollars at the time. The message came to him and a pair of developers he'd hired in 2015, Ilari Lind and Sami Keskinen. Lind was responsible for maintaining the company's IT systems, including its servers and firewalls; Keskinen was the data protection officer.

According to a statement Tapio made to Helsinki District Court, he immediately notified various government authorities, including the police. Lind sifted through Vastaamo's network traffic logs but reported finding no evidence of a hack. Tapio hired a security company called Nixu to investigate further. Two days later, Tuomas Kahri, COO of Intera Partners and chairman of the board of Vastaamo, sent an email to Tapio to thank him for his diligence in handling the breach. Kahri would later say that some of his own loved ones had been targeted in the attack.

In early October, Tapio got another shock. Keskinen and Lind called with a confession: Just before they'd joined Vastaamo, they had been arrested as part of a security breach at Tekes, the Finnish Funding Agency for Technology and Innovation. Lind had discovered that he could download Tekes' entire database, containing information on as many as 20,000 companies, by changing the URL on a funding application. He informed Tekes, which fixed the vulnerability—but he also notified Keskinen, who downloaded the database. There was a pretrial investigation for aggravated fraud, breach of confidentiality, and burglary, but the prosecution could not establish that Lind and Keskinen had used the database for financial gain.

Tapio says that if he had known about the two men's histories, he would never have hired them. (Keskinen and Lind declined to comment.) As it was, though, he had more pressing problems to worry about.

On the morning of Wednesday, October 21, the hacker posted a message on Ylilauta, an anonymous public discussion board. "We have attempted to negotiate with the Ville Tapio, the CEO of vastaamo, but he has stopped responding to our emails," they wrote in English. Until they got their 40 bitcoin ransom, they were going to leak 100 patient records each day. The first batch was already up on a Tor server. Anyone who wanted to could go read them.

The hacker started emailing with Henrik Kärkkäinen, a reporter at the newspaper *Ilta-Sanomat*. To prove they were the real McCoy, they uploaded a file to the Tor server called “henrik.txt”—a snippet of their exchange. In emails to Kärkkäinen, the hacker scorned Vastaamo: A company with security practices that weak was the real criminal, he recalls them writing. They claimed to have been sitting on the stolen database for 18 months, unaware of its value.

When Ylilauta’s moderators removed the posts, the conversation migrated to Torilauta, a popular discussion forum on the dark web. The hacker took on a name: ransom\_man. At least one desperate person offered to pay the full 40 bitcoin. Another wrote, in English, “I have discussed about very private things with my therapist and will literally kys myself if they are released.” They had their bitcoin ready: “I can send it in minutes, I’m constantly refreshing this page.” About 30 payments ended up going to the hacker’s Bitcoin wallet, according to Mikko Hyppönen, the chief research officer at F-Secure, a global cybersecurity company. It is unclear whether ransom\_man actually deleted anyone’s information.

The hacker did follow through on another promise, however. On October 22, they leaked 100 more patient records. Some belonged to politicians and other public figures. They contained details about adulterous relationships, suicide attempts, pedophilic thoughts. The next batch came around 2 am the following morning. The hacker also put all the records they’d leaked so far into a single file called “Vastaamo.tar.”

And then something strange happened. Ransom\_man replaced the first “Vastaamo.tar” with a much bigger one. It was 10.9 gigabytes—the entire leaked database. This file also contained a Python script that the hacker had used to organize the therapy records. The 10.9 GB upload seems to have been a mistake, because it disappeared in a matter of hours, along with the entire Tor server. Some speculated that Vastaamo had paid the 40 bitcoin, though company officials denied it.

Either way, ransom\_man soon changed tactics and started extorting individual patients. This was unusual. Most of the time, cybercriminals go after institutions, according to Hyppönen. He knew of only one earlier instance of patients being singled out—in late 2019, after a breach at the

Center for Facial Restoration in Miramar, Florida. (Since the Vastaamo attack, he adds, two other hacks have also targeted patients of plastic surgery clinics.) “Most attackers want money, and health care data is not directly monetizable,” Hyppönen says. But with real-world examples of the crime paying off, he adds, “it could become more common.”

Vastaamo reacted by offering patients a free counseling session. Therapy continued as normal. One patient says her therapist advised her to consider that not everything being said in the news was true. Some patients picked up a physical copy of their records, to learn what had been stolen, and others joined Facebook groups dedicated to victim support. Jere, however, opted not to; he wanted to minimize his online presence. He changed his phone number and purchased credit protection. He never seriously considered paying the hacker, he says, because “there was absolutely no guarantee they would obey” their own terms.

A Vastaamo clinic location in Turku.

Illustration: Mark Harris

On the Monday after the breach became public, Tapio went to Vastaamo headquarters in Helsinki. He’d been summoned there by Tuomas Kahri, the Intera COO who a month earlier had thanked him. Instead of speaking to Tapio face to face, Kahri had a consultant hand him a letter. It said that Tapio’s contract as CEO was terminated.

Hours later, the company announced Tapio’s dismissal. Shortly after that, in response to a legal motion filed by Intera, the Helsinki District Court ordered the temporary seizure of \$11.7 million worth of the Tapio family’s assets—exactly what Intera had paid for its share of Vastaamo. Kahri declined several requests to comment on Intera’s claims, but they’re described in public (albeit redacted) court documents.

In its filings, Intera says it became aware of two previously unreported breaches at Vastaamo, in late 2018 and the spring of 2019. The second date fell shortly before the buyout went through. “Based on the information received so far, it is reasonable to assume that Ville Tapio was aware of the

breach,” Intera argues. Not only that, but he “sought to conceal” it. Intera wanted to dissolve the transaction and reclaim the purchase price.

Tapio, as the defendant, submitted written testimony in rebuttal. He claims to have been blindsided by the news of the 2019 breach. The reason he didn’t find out about it at the time, he writes, is that Keskinen and Lind—the “system architects”—never told him about it.

On the morning of March 15, Vastaamo’s servers crashed and the patient database was replaced with a blackmail message. Tapio notified staff of the crash at 11:18 am, but no one appears to have discussed the possibility of a breach in either of the reports submitted to the government.

According to Tapio’s testimony, Keskinen and Lind—who shared an administrator account—told him that the crash might have been caused by some minor adjustments they’d made shortly beforehand. But he says that Nixu, the cybersecurity company he hired in September, found something else: The shared account read the ransom message and deleted it.

In Tapio’s version of events, then, whoever was using that account covered up the March breach. And the reason they did it, he contends, was to conceal a vulnerability they’d created themselves—one that had left Vastaamo’s patient database “without firewall protection” for more than a year.

There were supposed to be three levels of security surrounding the database, Tapio tells me: one firewall at the network level, which blocked connections from the public internet; another around the individual server that stored the patient database; and the server configuration itself, which prevented connections from outside accounts. In November 2017, Lind spent a few hours configuring the server to allow remote access. Tapio believes that Lind and Keskinen wanted to be able to manage the server from offsite, and that instead of going to the trouble of setting up a VPN, they simply peeled back the firewalls.

“Those are two professionals that know much more about the network and firewall and server management than I,” Tapio says. “I was not responsible.”

Keskinen and Lind have not testified in the Intera case. They declined to comment on Tapio's numerous allegations. Until the dispute is resolved, the \$11.7 million that Intera wants back—the fortune that Vastaamo built—will remain frozen.

In early January of this year, the Vastaamo patient database reappeared on at least 11 anonymous file-sharing services across the public internet. The file contained all the same records as before but was a fraction as big, so it spread easily. Without an accompanying message, the motivations for the upload are hard to discern—but it did appear fewer than 48 hours before Vastaamo's board was due to discuss the company's future. Was this a spiteful push to bring the company down?

If so, then it was a success. On January 28, Vastaamo was put into liquidation, and it filed for bankruptcy two weeks later. In early March, its staff and services were transferred to Verve, a provider of occupational welfare services. The acquisition did not include Vastaamo's customer data, and Verve will use a Class A system.

Almost immediately after the hack happened, Parliament fast-tracked legislation that would allow victims like Jere to change their social security numbers in case of a serious breach. But patients were spooked, one counselor told the newspaper *Helsingin Sanomat*. “Not everyone who needed help may have sought treatment,” he said. Some argue that therapists should never be able to enter session notes into Kanta; now more than ever, patients will not risk having their data travel beyond the consultation room.

In wider medicine, Koivukangas says, the Vastaamo scandal has highlighted the “unmet demand” for electronic medical record systems that are scalable, easy to use, and—crucially—secure. This is an area ripe for disruption, he says, and “prior to this breach, many thought with good reason that Vastaamo would've been one of those disruptors.” Until the marketplace improves, he says, expect more bespoke solutions, and more breaches.

Unless ransom\_man is caught and the Finnish authorities sort out everything that happened at Vastaamo, it will be impossible to know exactly how “the incident” began. Would it have happened, for example, if Finland



had been more proactive in policing electronic medical systems? Or if Tapio had implemented a more secure system? What's clear is how it ended—in the most painful way possible for tens of thousands of patients. As more health care systems across the world go digital, the risk of that outcome rises.

“Being honest about my mental health turned out to be a bad idea,” Jere says. He worries about identity theft, about some debt collection company calling him out of the blue and demanding tens of thousands of euros. He worries that his history of teenage alcoholism, so well documented on the web, will make it hard for him to find meaningful work as an adult. And he still worries that his mother may read his file one day. It's somewhere in the ether, accessible to anyone.

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*Photographs: Akseli Valmunen; Getty Images*

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04.29.2021 07:00 AM

# How Pixar Uses Hyper-Colors to Hack Your Brain

The animation studio's artists are masters at tweaking light and color to trigger deep emotional responses. Coming soon: effects you'll only see inside your head.


 grid of four images with different colored versions of the same objects

Illustration: Simoul Alva

The scene wasn't working. It was a moment from the Pixar film *Coco*, still in production at the time—the part when the family of Miguel, the main character, finds out he's been hiding a guitar. It takes place at twilight or just after, a pink-and-purple-tinged time of day everywhere, but even more so in fictional Pixarian Mexico. And Danielle Feinberg, the photography director in charge of lighting the movie, didn't like it. She pressed Pause with a frown.

Lighting a computer-rendered Pixar movie isn't like lighting a film with real actors and real sets. The software Pixar uses creates virtual sets and virtual illumination, just 1s and 0s, constrained only by the physics they're programmed with. Lights, pixels, action. Real-world cameras and lenses have chromatic aberration, sensitivities or insensitivities to specific wavelengths of light, and ultimately limits to the colors they can sense and convey—their gamut. But at Pixar the virtual cameras can see an infinitude of light and color. The only real limit is the screen that will display the final product. And it probably won't surprise you to hear that the Pixarians are pushing those limits too.

Of course the people at Pixar still have to make all the choices that'll produce the final outcome. To prepare, Feinberg had gone on multiple trips with the team to Mexico, taking lots of pictures and notes on the lighting and colors she saw there. And even though this critical moment in Miguel's house looked lovely, it didn't look *right*. But it was awfully late to realize it. "We had finished lighting. We were at the point where we were going to show it to the director," Feinberg says. "And I asked the lighter to put a green fluorescent light in the kitchen."

It was an unusual request. In the conventional chromatic grammar of today's motion pictures, greenish-tinged fluorescence usually means a movie is about to turn eerie, even ominous. But Feinberg wanted to see the kinds of lights she remembered from the warm, homey kitchens they'd seen in Mexico. "I wasn't sure the director was going to be happy with me putting green fluorescent light in the background," Feinberg says. "It was a little bit of a risk."

But after seeing the light, the director, Lee Unkrich, agreed. It looked like Mexico, he said. He remembered those lights and the resulting mood from their travels too. The green glow, which usually had one narrative meaning, assumed another.

In a way, every filmmaker is really just playing with moving light and color on surfaces. That's the whole ball game, a filmic given. But Pixar takes it further, or perhaps just does it more self-consciously and systematically. Its emotionally weighty, computer-generated animated films deploy precisely calibrated color and light to convey narrative and emotion—from the near-total absence of green in *WALL-E* (until postapocalyptic robots find the last plant on Earth) to the luminous orange marigolds that symbolize Miguel's trip to the magical Land of the Dead in *Coco* through the contrast between the cool blue luminosity of the afterlife with the warm, snugly sepia of New York City in last year's *Soul*.

In fact, almost every Pixar movie works within a specific color palette, a story-specific gamut that filmmakers like Feinberg pull from and use to plan the look of each scene, a road map known as the color script. But *Coco* complicated that process. When its story moves to the Land of the Dead, it cranks up all the dials, colorwise. Those scenes look made out of neon, like

a bio-organic version of Tokyo's Shinjuku District at night. “When it came time to do the color script, it was like, ‘The Land of the Dead has every color. All of it takes place at night, so we can't use time of day to elicit emotion. There is no weather in the Land of the Dead, so we can't use weather to elicit emotion.’ Those are three pretty typical things we use to support the story,” Feinberg says.

Using color to express emotion is a hallmark of life. (Humans aren't even the only animals to send signals with a bit of sexy red or dangerous green.) But the mechanical production of color has defined and changed human cultures since before recorded history. The technology for making colored things and the science of how those colors work in the world and in our minds changes and evolves, transforming culture along with it. Right now, that technology is evolving again.

If talking about music is, as someone once said, like dancing about architecture, then talking about color is like doing a trapeze act in zero-g on a space station. But here goes: First of all, you have to forget the dorm-room philosophizing about whether you see the same red that I do even though we both call it “red,” man. If we both agree—and let's agree to agree—that “red” is light with a wavelength of somewhere above 620 nanometers, well, waves of *what*, exactly? (It's fluctuations in electrical and magnetic fields, as if that helps.) Or we could agree that “red” light is made of subatomic particles called photons, the irreducible quanta of energy—1.8 electron volts, to be more or less exact.

Go ahead and map those electron volts and nanometers for red, plus the ones for all the other colors you can name, into a straight line, or even wrap them into a circle as the physicist Isaac Newton did. You still won't be capturing everything that comes together to mean a color. The real map needs more dimensions than that. It needs the *amount* of color, from pastel to saturated. It needs the amount of light you're talking about. That's “luminance,” or sometimes “intensity.” Color that's made of light is different from color that's light bouncing off a surface, changed not only by how that light reflects or refracts but also by whether the surface is colored itself, maybe by a pigment. Map all *those* values together, usually in three dimensions, and try to match the objective numbers to the vagaries of the

way human color vision works—we see yellow as brighter than other colors, even if the actual brightness is equal, and that's just the beginning of the headaches—and you have what's called a color space.

At the movies? Whoof. Even more complicated. The pictures you see on a screen are made of light shining through a colored strip or generated by a digital device, projected outward onto a reflective surface and then bouncing into your eyeballs. (And what happens once it gets in there, where biochemical photoreceptors transduce photons into neuroelectrical signals, is a whole other thing.)

The point is, “color” means a lot of different things, depending on how you're using it. And using it has been a defining trait of humanity since we all first started thinking. We see colors in the world, in nature, and we use what we see and learn to make newly colored things. It's a hallmark of human activity, practice, and culture. We started by collecting objects with colors, turned to grinding rocks into powders and pastes and smearing them onto cave walls and on our bodies—and have arguably reached an evolutionary acme with the ability to control and create light with the precision and fidelity of a Pixar.

None of that highfalutin philosophy would help Danielle Feinberg, though. Her team had a job to do. With too many colors in play and too wide a gamut to narrow, she couldn't use specific colors to code for emotions. So Feinberg's team did it with varying amounts of light—with luminance.

Take the scene where the old ghost Chicharrón dies unremembered in the Land of the Dead. It's a tear-jerking sequence, but the color palette is still just as wide (though it does lean hard into moonlit blue for this moment). Instead of taking away color, the scene is actually just less bright, lit not by the virtual neon or glowing-orange *cempasúchil* flowers but by just a couple of lanterns. “That was the way we had to do it on *Coco*,” Feinberg says, “just because it was a colorful, lively world, but we still needed to elicit that emotion.”

Control the lighting, control the colors, control the feelings. That's filmmaking. As of this writing, Pixar's last 23 movies—going back to 1995's *Toy Story*—have made a combined \$14 billion globally, and that's

not even adjusting for inflation. Kids like them; adults like them. Even in a locked-down, movie-theater-free world, the latest Pixar movie, *Soul*, grossed \$117 million worldwide.

But I'll tell you a secret: When it comes to wringing emotion from color, Pixar cheats.

In a very special screening room at Pixar's Emeryville, California, headquarters is a very special screen. It's not huge, perhaps just 10 feet across, and it's at the front of a room dominated by a huge control panel studded with five smaller computer monitors and at least two keyboards. The ceiling is covered in felt, and the carpet squares are black instead of the gray that's standard at Pixar, to keep light contamination to a minimum.

Explaining what comes next requires me to deliver some bad news. Remember the primary colors you learned in elementary school? Red, blue, and yellow, right? So, yeah, that's wrong. You were supposed to be able to mix those into all the other colors, but that never worked, did it? Blue and yellow were supposed to be green, but you got brown. Red and blue were supposed to make purple, but you got ... brown.

That's partially because *subtractive* colors reflect some wavelengths of light and absorb others. Mix them together and you absorb more and reflect less. Things get dark. Unless you carefully manage the pigments and the mixing, and you start with the primaries cyan, magenta, yellow, and black—the CMYK beloved of magazine designers.

It's also wrong because oftentimes people confuse light streaming from a source like a TV or a star with the color that happens when light hits a surface. Those primary-school primaries aren't the only possible primaries. But even Newton was a little confused about this. His primaries are the specific basic colors he identified in the spectrum he projected from a window onto a wall in 1665, holed up at his mom's house while a pandemic raged back at his university. You can relate, right? Newton broke whitish sunlight into a rainbow's worth of colors and chose to draw the borders at seven: red, orange, yellow, green, blue, indigo, and violet. He called that a spectrum, but of course that categorization leaves out a lot—the

“extraspectral” colors like pink or purple or, yes, brown. (Brown is just dark yellow. Shh.)

If you're reading this on a screen instead of on paper, you're seeing a concatenation of light generated by red, green, and blue pixels—a whole other set of primaries, not coincidentally at similar wavelengths to those the color receptors in your eyes are tuned to. A little more or a little less of each, and just as with CMYK pigments (and white light or white paper), you can make just about every color that the human eye can discern. Point is, the colors we see aren't actually mixed from a list of available ones, like buying from a paint store. It's a continuum of light and reflection, interpolated by the biological sensors of our eyes and the not-totally-understood think-meat just behind them.

That big screen at Pixar isn't lit by a typical projector. Instead, mounted in the wall behind us is a custom-built Dolby Cinema projector head. If you've been to a theater with a Dolby setup, you were looking at images cast by a projector that was actually a pair of triple-barreled laser guns—red, green, and blue beams capable of combining to produce a range of colors closer to what human vision can perceive than anything else out there. The two guns had wavelengths slightly offset from one another so that special 3D glasses can distinguish them, one lens for each, and your brain can combine them to create the illusion of dimensionality.

But at Pixar, all six beams come from one source, which means this projector has six primary colors. Also, the Dolby rig has a span of brightness, from dark-dark to bright-bright—in screen terms that's called dynamic range—and the one at Pixar is more than 10 times brighter than one in a civilian-class Dolby Cinema.

Part of how we see color is how much light is behind it, how much overall energy is pumping toward us. So most modern color spaces have an axis that measures this, with black (no light) at one end and white (all the light) at the top.

The standard unit for measuring what's called luminous intensity, the amount of light coming from a source over a given angle of view, is the candela—as in one candle's worth. But if you're talking about “luminosity,”

the amount of light emitted by something like a TV screen, what you want is candelas per square meter, also known as a nit. Dolby Cinema output is 108 nits, but Pixar amps it up even more. Sitting at the control panel of the Pixar system, senior scientist Dominic Glynn practically glows with praise. “We've goosed this projector with an extra 600 percent laser power. We can get well above a thousand nits on this screen,” he says. “It's one of the most linear, perfect reference color-grading displays you can conceive of.”

So this projection room is where wide-color-gamut, high-dynamic-range colorcasting abilities merge with Pixar's creation of virtual sets, each with their own virtual physics of light. People like Glynn can actually generate a world of color wholly unlike the one you and I usually live in. “We could light the whole set with a green laser,” Glynn says. “That's kind of hard to do in the real world.”

You saw it in *Coco*, but the movie where it might have made the most difference was *Inside Out*. That's the one about personified emotions living in the brain of an 11-year-old girl. When *Inside Out* was in production, Dolby was working on its in-house version of new standards for high dynamic range.

The range of colors it could convey was bigger. The “gray scale ramp” between darkest black and brightest white would allow a theater equipped with these lasers—only a half dozen initially—to turn its light output so low that the screen becomes a black indistinguishable from the walls (“exit signs notwithstanding,” Glynn says). It was an entirely new standard of color, but Pixar's directors of photography were already working to expand even that envelope.

The colors a projection system can reproduce are bounded by a triangle-shaped color space—red, green, and blue at the corners, and everything else a mixture of those inside the lines. But that color triangle is invariably smaller than the possible colors of the universe, or even those that the human eye and mind can distinguish. Which leaves a little wiggle room for Pixar. “The specific hues at the red, green, and blue corners of that triangle are not really what you'd experience under, say, ultraviolet illumination,” Glynn says. “We said, ‘Hey, what would happen if we tickled all the portions outside a traditional cinema gamut?’”



Glynn taps on the control panel keyboard and calls up a scene from *Inside Out* where Joy and Sadness walk into the Realm of the Subconscious. Glynn hits Play; Joy and Sadness enter a dark room and see a forest of giant broccoli, lit from the side so it seems outlined in a bright green. They move to a red staircase headed down into infinity and then meet another character, the clownish imaginary friend Bing Bong, imprisoned in a cage of candy-colored balloons. “These are all basically as saturated a color as one can achieve in digital cinema today,” Glynn says.

Then he cues it up again, in super-high-end digital cinema fireworks, using everything the screen can give us. “They go through the doors, and you see the little long shot of them in the distance, then all of a sudden we kind of have *everything*.” The shot widens, and the camera heads toward the broccoli forest, but now the broccoli is laser-pointer green, glowing against the blackness.

The red archway around the staircase is the most vivid red I have ever seen, and when Joy and Sadness start walking down the stairs, the edges of the screen disappear. The room, the world, is nothing but black except for the stairs. The balloons of Bing Bong's prison look unearthly, like a Jeff Koons dog with eldritch powers. “I want to say 60 percent of this frame is outside the gamut of traditional digital cinema,” Glynn says. “We have a version of this film that has been creatively approved and built for exhibition on televisions that don't exist yet.” You can see them only if you saw *Inside Out* in a fancy-pants Dolby-equipped theater.

You can't buy these colors for your house. But Pixar does have a prototype of what that TV might be like. It's in a room next to the screening room. I convince Glynn to show it to me in action, and when he fires it up to maximum brightness, it's actually painful to look at. The light leaves an afterimage like one caused by staring at the sun.

Once these technologies are in every movie theater and every living room, maybe even on every phone, things are going to get really weird. They will test the limits of human color perception and maybe even extend them. Poppy Crum, the neuroscientist who runs research at Dolby, has been working on all the ways that, for example, seeing images in really high dynamic ranges can trigger not just autonomic responses—like flushing

from heat exposure after just seeing video of flames—but psychological ones too. Crum says her research shows that these tricks of light heighten the entire emotional experience of moviegoing.

The Dolby screen has given Glynn some pretty out-there notions too. He asks if I know how color receptors in the human eye can “bleach,” which is to say that they essentially use up the molecules that absorb specific wavelength-ranges of light and transmit color signals from retina to brain.

I tell him yes. “You're talking about contrast effects and afterimages,” I say.

“For sure,” Glynn answers.

This quirk of human color vision has vexed scientists since before anyone knew about the color photoreceptors in the eye. Color-thinkers in the 19th century recognized that the same colors—or rather, objects of the same color—might look different depending on context, on what colors they were adjacent to.

They also recognized the obverse—different spectra can appear the same in different contexts. This was one of the tricks that the color-seeing brain could play. Varying levels of brightness change the colors people see. Look away from a bright light, like a candle, and the afterimage you'll see is the color of that light's complement on a color wheel. In all those cases the brain seems to be generating colors that aren't there.

Now, Glynn says, it might be possible to take control of those illusory effects. Blast the middle-wavelength greenish receptor in the eye with light at its peak sensitivity and “you can actually heighten the sensitivity or perceived sensitivity to other colors in complement to that.” It'd be like a laser-powered version of Jasper Johns' famous painting *Flags*, where you only see the “correct” colors of the United States flag when you look away, as an afterimage.

So what if, Glynn proposes, a scene in a movie added, subtly, light in a very specific wavelength of green? Then just kept ramping up, more and more green—and, at a key moment, the screen dropped all the green out at once. The movie would induce the complementary color as an afterimage. You'd

*imagine* you were seeing a specific red, not projected on the screen but as a neurophysiological response to stimulus. And if you pick the precise wavelength, “you could actually cause someone to perceive a color that they could never otherwise see. Like, there's no natural way for you to have the perception of that color.”

That color wouldn't be onscreen. It wouldn't be anything a projector could cast or a computer could generate. It'd be a function of pure cognition, different for every viewer, existing only in the mind, then fading to nothingness. Which is true for all colors anyway, when you think about it.

*Excerpt from [Full Spectrum: How the Science of Color Made Us Modern](#) by Adam Rogers. Copyright © 2021 by Adam Rogers. Available May 18, 2021, from HMH Books & Media.*

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[Virginia Heffernan](#)

[Ideas](#)

04.14.2021 08:00 AM

# Who Let the Doge Out? The Cryptocurrency Is As Nutty and Joyful As Ever

The much wow Dogecoin has had its notable influencers—including, for a brief moment, me.

 illustration with three humans with dog faces and one dog sitting at a table with coins

Illustrations: GABRIEL ALCALA

Every human endeavor must have its influencers, and Dogecoin is no exception.

But in case these influencers haven't influenced you yet: [Dogecoin](#) is a [cryptocurrency](#), a virtual medium of exchange made valuable not by any bank or government but by those who use it. Don't worry. It's not a Johnny-come-lately crypto like Potcoin or Fonziecoin; it's almost venerable. Invented in 2013 by Billy Markus (then a software engineer at IBM) and Jackson Palmer (then a product manager at Adobe), Dogecoin was conceived as a cute comeback to the deadly serious [Bitcoin](#), the cloak-and-dagger global-finance opera that started in 2009. Meant to be relatable, Dogecoin was inspired by the beloved [Doge meme](#) of the Obama era, which shows a photo of a cream-colored Shiba Inu embellished with enigmatic phrases in Comic Sans typeface.

*Doge* is a misspelling of—well, yes, *doggy*. That's the joke. That's all. To spin cryptocurrency out of this joke is a better joke still. The best joke of

all? The price of Dogecoin has jumped more than 1,050 percent from the beginning of 2021 to the time of this writing. Of course, by the time you read this, that percentage will be much higher. (Or lower. Crypto proceeds in tantrums.)

And Dogecoin would never have gotten that far without influencers. In the Gilded Age, influencers were known as robber barons, and if one of them, someone like Andrew Carnegie or J. D. Rockefeller, invested in a commodity, you'd see it on ye olde steam-powered stock ticker. More than making steel or railroads, the job of robber barons, with their enormous shares of the whole market, was to manufacture fluctuations by pumping money in or dumping stock—and then buying and selling at whatever prices they chose. These days, influence is exerted by those who don't even (necessarily) invest. No one knows exactly, for example, what Jack Dorsey of Twitter is into, but since February 2, 2020, the day he tweeted the hashtag “[#bitcoin](#)” (and debuted Twitter's Bitcoin emoji), the price of \$BTC has gone wild.

I want to try that. #bitcoin. #bitcoin. Nothing? Anyone?

In any case, the influencers who dusted off silly old Dogecoin, after the joke had gotten shopworn and trading was flat, are a forerunner of the merry pranksters on Reddit who put the squeeze to hedge funds that were short-selling GameStop in January. The Reddit investor-pirates liked \$DOGE for the same reason others liked \$GME: It's a damned likable thing, with childlike nostalgia to it, and it was down on its luck. Over the years, \$DOGE turned from a once-cute teen to a disgruntled pandemic-grounded twentysomething (who is now trading crypto). Along the way, vice-signaler and chronic crimer John McAfee, who Belizean police suspected was involved in the [killing of his neighbor](#), allegedly pumped and dumped Dogecoin and, according to court documents unsealed in March, made a cool \$2 million. Then, in 2019, enthusiasm for Dogecoin went back to the Redditors, where it belonged. Earlier this year, the price spiked from about a third of a cent per coin to five cents a coin—and has stayed in the black ever since. The subreddit r/dogecoin does indeed make Dogecoin look like fun: “The most amazing place on reddit! A subreddit for sharing,

discussing, hoarding and wow'ing about Dogecoins. The much wow innovative crypto-currency.”

But the chief Dogecoin hype man is not Reddit. It's [Elon Musk](#). As amusing as Doge is, a jeu d'esprit in a world of stormy libertarians, we would not be talking about it at all if Musk the oracle hadn't tweeted, “One word: DOGE,” on December 20, 2020. This drove the price up 20 percent and led some—maybe just me—to wonder whether Doge was not a misspelling from a goofy meme but rather the right-spelled word for a Venetian grandee in gold robes the weight of a Tesla. Someone like Musk.

In fact, though I myself do nothing with crypto, all year I have been wondering about dogs, doges, memes-made-currency, and whether it's possible to put a price on lulz. And as I wondered this, this past March, I decided \$DOGE was a good punch line for something. As one does, I kept the word canistered until I saw my chance to deploy it, and then I tweeted at a friend that I'd be happy to pay him in \$DOGE for something or other.

The tweet wasn't even especially funny. It was just a pretext to type “\$DOGE”!

But then *I* became a Dogecoin influencer!

I learned about my astonishing new status on, naturally, Twitter—the most inefficient trading desk in global history—when a document was tagged to my attention that showed a list of Dogeinfluencers, including me. Actually the list was called “The Ultimate DogeCoin All-Stars List,” so I'd say we're all stars, but in Doge world it's all a caper, and woe betide you take it seriously and end up trolled. At the top of the list is, no surprise, @elonmusk, who has some 50 million followers. (More than the population of Spain.) Then comes Mark Cuban, a separate account for Cuban's Dallas Mavericks, and Kevin Jonas, an esteemed JoBro. @mcuban does not have #dogecoin—or #bitcoin—in his Twitter bio. Instead, his bio urges fans to “check out my NFTs” and gives a website.

Sigh. [NFTs](#). Cuban may be over sweet \$DOGE if he has moved on to NFTs—the outlandish nonfungible tokens whose blockbuster entry into the open market last year suggests an internet-wide effort to restore originality, art

status, and “proof of ownership” to valuable bits and pieces of the internet. (In March, Jack Dorsey's first tweet, and the fragment of the blockchain that marked it as the real thing and not a copy-and-paste job, sold to Sina Estavi, a Malaysian CEO, for \$2.9 million.)

My friend, this All-Star is not over \$DOGE. In fact, I've decided to stop complaining about the crypto obsessives around me—the ones who say “HODL” for “hold on for dear life” and seem to measure out their lives in satoshis. As of this spring, some of the crypto youngs also possess limited-edition BlockClocks, clocks that can be customized to show real-time updates on various Bitcoin stats. When Dorsey testified to Congress via Zoom in March, he had a BlockClock Mini in the frame. The throwback design conjures the Soviet era, and the numbers on the face jump around as if in a perpetual glitch. All this might as well measure the effect of chemtrail antibodies on air elves, for all I know, but it's all just so esoteric and leet and ridiculous, like the earliest days of the internet. Naturally, I preordered a BlockClock mini.

And I'm all in for \$DOGE. One coin was worth about a nickel at the time I bought in. Check the price today; I bet I'm up. And if I have cast my influence on you, maybe you are too.

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*This article appears in the May issue. [Subscribe now.](#)*

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[Zak Jason](#)

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04.01.2021 07:00 AM

# Portraits of a Neighborhood's 'Wood Wide Web'

During quarantine, photographer Andres Gonzalez wandered his city and captured lone redwoods, trapped by human sprawl but linked by nature's networks.

Sometimes, mature douglas firs send sugar to saplings via miles of underground, gossamer-thin mycorrhizal fungi. Through these same passageways (the "Wood Wide Web") birches can loan carbon to fir trees in the summer, while firs pay it back in fall. And trees of different species might share nitrogen leached out of salmon carcasses left over from a bear's lunch.

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[Virginia Heffernan](#)

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03.30.2021 08:00 AM

# Bed Tricks, Cod, and the Hidden History of Catfishing

Intriguing, maddening deception can shake up our existence and sometimes—*sometimes*—set us free.


 illustration showing evolution of man but with a statue covering the half of the man's body

Illustration: Sam Whitney

“Quite early in life George Tracy discovered that if he were to be reasonably happy and prosperous he must pretend.” So begins a mesmerizing psychological novel by Charles Marriott, published in 1913. The tale of George's lifelong obsession with an elusive frenemy named Mary, who has “the key to the side door of his nature,” has long been out of print. It's remembered chiefly for its title: [The Catfish](#).

Yes, this century-old book gives us the figure of the modern-day catfish, the shrewd machinator who breaks hearts and passwords with nothing but [Wi-Fi](#), cunning, and yottabytes of imagination. This conceit was reprised in the [2010 documentary](#) by Ariel Schulman and Henry Joost, *Catfish*, which tells the story of a Michigan artist, Angela Wesselman, who used fake [Facebook](#) profiles and other online trickery to deceive Schulman's brother, Nev.

If you're confused, you're where you should be. The numberless catfish who now course through [social media](#), the ones who devastate lives with sophisticated online masquerades, exist to beguile and disturb. Catfish like the fictional Mary or the real-life Angela are foxy and artistic. Others are in

it for money or the lulz. But in all catfishing cases, the happiness of the catfish requires your disequilibrium—and your obsession with them.

The contemporary 2021 catfish leverages everything from Hinge to Photoshop to [WhatsApp](#). But the catfish dynamic long predates the internet, and even Marriott's novel. In the 1660s, the dauntless Mary Carleton concocted letters and official certificates to steal hearts and monies from rich chumps, using a deck of beguiling identities, from a principled virgin heiress to an orphaned German princess.

Around 1700, George Psalmanazar, a fraudster, probably French but posing as a Taiwanese adventurer, published a book describing his pretend homeland as a polygamous bacchanalia where men, naked except for gold and silver genital plates, sacrificed children and ate their wives. The dubious shtick won him admirers for his heroic escape from paganism to Christianity. One of his admirers paid his living expenses.

Shakespeare's characters, of course, can catfish as dexterously as any [Finsta](#) phantom, and they gender-bend and trans-humanize their way through exquisite courtship chicanery. A “bed trick,” a favorite device of Shakespeare, happens when one person subs for another in the *midst of a sexual act*. Take that, ye online catfish pickers.

I recently spoke by phone to Nev Schulman, the original catfish victim who is now famous as the host of MTV's reality show *Catfish*. He called my attention to *A Midsummer Night's Dream* as an ace catfishing precedent. Otherwise, he said, he isn't big on literary allusions, and formal education doesn't suit him. (Indeed, he was kicked out of college for beating up a woman whom he says he took for a man.) But his grandmother, Marlene Strauss, is a distinguished art historian. In 2016 she appeared on a Manhattan stage with Nev, for an intergenerational discussion of love and lies. While Strauss infused the evening with erudition, citing proto-catfishing in works from *Cyrano de Bergerac* to *Some Like It Hot*, Schulman talked about latter-day digital catfishing, a darker affair, which too often ends “in courtrooms and restraining orders.”

Though he did cite Genesis. “Jacob had to stand before his father—though his eyesight was failing—and physically pretend to be someone else,”

Schulman said. “Of course, now we've removed the human element.” With human bodies out of the way, catfishing can finally happen at scale.

In Marriott's novel, the catfish Mary is less a liar than an agitator. She meets George in childhood and nips at the edges of his life into late middle age; she gets him to question everything; he can't tell if he loves or despises her. She also goads him to a more engaged and ecstatic existence. In this way, she is akin to Nev's catfish, Angela, who turned him from a defeated dropout to a man with a purpose.

Angela introduced Nev online to an 8-year-old prodigy painter, a 19-year-old seductress, and a whole cast of supporting characters composed of MP3 fragments, online video, photographs, text messages, and nearly a dozen Facebook profiles. Schulman at 24 had his worldview blown open when he fell hard for the seductress, who in pictures looked like Jennifer Lawrence. Only when he and his brother's film crew, suspecting something was up, drove to Michigan's Upper Peninsula to door-stop Angela did the scales truly fall. Angela, who does not look like Jennifer Lawrence, was playing all the characters. Nev was first annoyed, then impressed, then grateful. He told me that Angela is still the greatest catfish he has ever encountered.

Ultimately, Marriott uses “catfish” to describe “anything or anybody that introduced into life ... the queer, unpleasant, disturbing touch of the Kingdom of Heaven.” Angela's husband, Vince, who likely came to the catfish allegory by way of the popular Christian writer Joel Osteen, puts his own spin on it. “They used to tank cod from Alaska all the way to China,” he says, mixing up the geography. “By the time the codfish reached China, the flesh was mush and tasteless. So this guy came up with the idea that if you put these cods in these big vats, put some catfish in with them and the catfish will keep the cod agile. And there are those people who are catfish in life. They keep you on your toes. They keep you guessing, they keep you thinking, they keep you fresh.”

Thus is the catfish brought full circle. The person of Angela recalls the fictional Mary: Each is an intriguing and maddening woman who shakes up the existence of another.

Not long ago, Schulman's MTV show became a podcast. Schulman and a cohost help a range of young lonelyhearts, who fear they've fallen for digital specters, determine fact from fiction. Over and over the show features catfish victims who have been daydreaming into their phones, shoring up fragmentary missives from outer space to create alternate lives.

“Privacy has become so unbelievably rare,” Schulman told me. “There's been a pendulum swing. Young people are desperately looking for something private in their life—just for them.” The people who appear on *Catfish* don't want to be relieved, right away, of their illusions of intimacy; they want to live in the fantasia a while, juice it for self-knowledge. But by the time they contact Schulman, it's because, as he told me, “something isn't quite right. It's grown and grown as a pit in their stomach.”

The love objects are almost always a mirage. The catfish almost never look like their profile pics. Sometimes they're of another gender or race. Generally they're less successful, less rich, more lost, more incarcerated.

Schulman on the podcast shows something like admiration for anyone sweetly naive enough to end up in the catfished seat, *his* seat. At the same time, he's surprised that many guests don't know he was once nabbed. They never saw his movie. “People in this situation are people who don't do their research,” he told me. Right on.

*Catfish* makes obvious what most adults know: Romantic love is shot through with projection. Our phones mirror back to us our fondest hopes, and into the text bubble we pour all our yearnings. “I can't wait to fill my fingers with your hair,” Schulman once texted his catfish. “My body is craving your touch tonight,” wrote Angela. It's cringe-hyperworthy now. But it's what infatuation sounds like. You're always writing to a half-imagined other. Every sexter is a poet.

But *Catfish* never fails to end in disappointment. “Inevitably, the second they see them they have an instantaneous drain of affection,” Schulman said.

Back to *The Catfish*, 1913. Though George and Mary are both married to other people by the end of the book, George discovers in a flash that he and

Mary have something “beyond love,” as only his catfish can keep him honest. “Before he could be straight with himself he had to have it out with her—and all his life he had shirked it.” The catfish is not the pretender. Quite the contrary, she's the spur to drop all pretense. In talking to Mary, George is finally talking to himself, the self he's been suppressing. He's liberated. Some of the participants on MTV's *Catfish* find the same thing: that once they have it out with their catfish, they are, in Marriott's words, “free to love elsewhere.”

In profound gratitude, George turns back to his beloved wife with renewed passion. The provocations of the catfish have been enlightening, but real love is serene. And sometimes all you want is a person who, in not looking like their ravishing selfie, looks better.

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[Paul Ford](#)

[Ideas](#)

03.12.2021 07:00 AM

# So You Want to Prepare for Doomsday

There's no cool gear with my method, but it has other advantages.

 rucksack with survival contents displayed

ILLUSTRATION: ELENA LACEY, GETTY IMAGES

The preppers have the best stuff. It's because they operate under such constraints: You have to pack your whole society—money, tinctures, food powders—in a lone bag. Then, when the big bug-out comes, you slip on your paracord bracelets and shemagh scarf and vanish into the woods, to an already-scouted redoubt obscured by trees. There, beside your tent, you gnaw jerky and sip bleached snowmelt out of 5-gallon bags, wrapped in a 26-micron bivy that reflects 90 percent of body heat. A society of one.

By day you carefully inventory the dozens of curated objects in your bag, rifling through sub-pockets, enumerating ibuprofen, contemplating seed packets, calculating caloric yields. *Portable hand-cranked flashlight. Clove oil for toothache.* At night, with darkness yielding to bright gray inside your night-vision goggles, you patrol, hand hovering near your CZ-75 P-01. Far off down the mountain you hear the cracks, groans, whistles, and shots of a splintering society. A week ago you administered an Oracle database. Now your job is to survive.

And you dream: One day, after the smoke of civilization has drifted away, you'll link up with others exactly like you. A new world will rise out of your duffel bag. You'll hang up solar-powered mesh networks from trees

and make your own internet. You'll transact for potatoes and penicillin on the blockchain under the watch of vigilant owls. But now, jerky.

What the [preppers](#) do is fully acknowledge their fears and turn them into a particular aesthetic. Like goths. They make their anxieties perfectly legible. I get it. I read *My Side of the Mountain* when I was a kid. But while prepper gear is awesome, I keep thinking: *We should be trying to avoid a civil war, not packing for one.*

The Aesthetics Wiki has hundreds of different entries—Preppy and Punk, of course, but also more modern aesthetics like Dark Academia (Eurocentricity, Whit Stillman, sweaters), Vaporwave (synths, VHS boxes, teal), or [Cottagecore](#) (shortalls, Hozier). Many of the aesthetics have left- and right-wing offshoots: Vaporwave has produced Laborwave and Fashwave; Tradwifery (patriarchy, heteronormativity, childbirth) can be understood as reactionary Cottagecoreism.

I would have told you I don't have an aesthetic. But a few months ago my family moved to an old house, not far from our old apartment. This house has a yard and asbestos and a plaque on the front that says: 1913. Multiple generations of telephone wiring run along and inside the walls, and jacks abound: Bell System four-pin 404A jacks and modular 6P4C jacks, too, all useless in 2021. I like them. They suggest critical infrastructure come and gone. The people who lived in the house before us sent a kind, slightly melancholy note, wishing us the best, but we never met them. Pandemic transaction.

When we moved in, we immediately started to plan for an apocalypse. (My spouse's elementary school overlooked [Donner Lake](#) in California, so worst-case scenarios come easily to her; she has a disaster-preparedness Pinterest board.) I figured out where we could put the tilapia tanks and pondered a new fence. We could store barrels of powdered food in the basement. Following decades of living within the collective fortress of an apartment building, a house—just sitting there by the street—feels extremely vulnerable. After a few days, a nice older neighbor dropped off a box of candy. Hardly the Purge.

Oddly, we keep not buying furniture. We did find a dining room table, cut out of a lane in a decommissioned bowling alley, with little inlaid arrows to guide your throw. Cheap and heavy. We bought some chairs, eBayed out of a university library in Georgia. Each chair carries the shadow of thousands of college butts. We like things that remind us of people gathering, playing, or working. Not shabby-chic, but institutional-heavy. Things that have been rubbed down to a shine.

My kids are doing ballet and tae kwon do on Zoom, I am sending Slack messages in a half-empty house, and my spouse is in the kitchen calling strangers to offer them help navigating the state vaccination website. This is the pandemic aesthetic: Everything is connected, but you can't connect. I lull myself to sleep listening to FDR speeches. In one, he spoke sadly of a Boy Scout jamboree canceled for an outbreak of polio. This is my aesthetic. In this way I achieve safety and control. It's a little silly, really, but I'm Infracore.

My therapist (cognitive-behavioral, Thursday 2 pm, takes Venmo) tells me that one becomes angry when expectations aren't met. Thus, to remain calm, you have to adjust your expectations. The kicker: Behaviors tend to stay the same over time, so don't expect other people to change. Your only real choice, the only thing you can control, is whether to calm down—or not.

This advice has made me think differently about social media. Perhaps social media is not, as people say, a machine for the transmission of viral outrage, but rather an aggregator of shared expectations. In fact, people online are constantly talking about what they expect. They expect political victories, total respect for Taylor Swift, resolution of HR issues, financial aid, and apologies—and they expect it all right now. People online say, *We will never adjust our expectations, so you must adjust your behavior.* Twitter is the exact opposite of therapy.

Personally, I expect the apocalypse will come slowly, with episodic spikes (pandemics, terrorism, superstorms, buildings collapsing in space or value). There's no shortage of warnings, feature articles about human climate migration and wet-bulb temperatures, or op-eds asking us to stop buying fridges.



At least for now the infrastructure we have keeps finding ways to route around the crises. When a train tunnel floods, you run a bus. You dump sand on a damaged beach, and one might always use public funds to construct a fine berm. And when that berm is submerged you can build a bigger berm. We are expecting that we can find solutions, ways to preserve the order of things. Just a little science and some elbow grease, maybe a colony on Mars, and society can be good as new.

What else are we going to do? The therapeutic suggestion is: Broaden your expectations, so that when bad things happen you are ready. For some, this means being ready to grab your stuff, slipping into warm, gray clothes, and vanishing from civilization. For me, the only thing that calms fear is the idea that we'll keep helping until we need help. Doctors at the hospital, National Guard members at the vaccine center, neighbors dropping by with food. Lest you think me too much a fool, we do have a go bag. We just keep raiding it for cash and ibuprofen. And every morning I wake up and prep, by thinking: Expect everything to change but people.

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03.10.2021 07:00 AM

# Good-Bye Zoom. Hello Low-Key Ambient Snooping

If you are missing out on serendipity in your remote work, try ramping up your 2D audio copresence.

 Two coworkers communicated through a series of screens.

ILLUSTRATION: KATTY HUERTAS

**One year into** our all-remote existence, executives at white-collar companies are realizing two things. One is that they're pleased (stunned, even) by how productive employees have been. They'd worried that "work from home" would turn into "Netflix and chill." Instead, their people are killing it: Deliverables are being delivered, milestones milestoned.

But companies have run into a serious problem. They have lost serendipity. Sure, colleagues are connecting on video chat. But it's all very planned and formal; there are no *how's-it-going* encounters at the coffee station. This is a shame, because those chance run-ins help cement a sense of togetherness, and they can engender new ideas too—like when the VP of HR eats lunch next to a salesperson and casually mentions a new market that winds up being worth millions.

So now people are wondering: Could software replicate some of that office magic?

Various startups are giving it a shot. One is Teamflow, a browser-based app that lets you set up a virtual office that you view from above, in 2D, sort of like a cartoony Ikea floor plan. You can set up different rooms and fill them

with furniture icons (or even weird memey images, if you want a MySpace vibe). When employees log in, their faces appear in tiny round video streams. You drag your icon around the virtual office to hang out “near” others, and voice-talk to them too; the closer your icon is to a colleague, the louder they sound. Move farther away for peace and quiet.

It sounds kooky. Frankly, it *looks* kooky. But early users tell me it replicates many of the dynamics of in-person hanging out. “This really streamlined my life,” says Rafael Sanches, the cofounder of Anycart, a food-shopping service. We met recently inside his company’s Teamflow space. The little video icons for Sanches and me were perched at his virtual desk; three engineers were clustered together, chatting, in the corner of the office. Sanches dragged his icon over to say hello to them, then zipped back over to me.

“I do this all the time,” he says. He’ll plant himself near groups of employees, where they’ll work together, sometimes in silence, other times chitchatting. Sanches will also frequently invite an employee to wander off to a corner to talk one on one. He likes the fact that other employees can see that he’s meeting with someone individually; it replicates some of the quasi-public nature of conversation in a real office. “Socially, the engineers know I’m still there, like I’m *around*,” he notes. He’s not vanishing into private Zoom calls with people.

The whole thing felt oddly gamelike. That makes sense, because video games pioneered the art of letting far-flung people hang out online. Some workers have even playfully used games as meeting places during the pandemic. When the author and artist Viviane Schwarz was working on a project last year, she met her team inside *Red Dead Redemption 2*, a cowboy fighting game. They’d sit around a virtual campfire and talk shop (while also watching out for danger: “Was that gunshots?”). Some new copresence apps, like [Bonfire](#) and Remotely, riff explicitly off game aesthetics and let you hang out with workmates as avatars in a 3D environment.

One thing you can see, in all these remote experiments, is that audio beats video. Zoom-staring into a webcam is wearying. So most of these apps actively downplay full-screen video, and users seem to like that. Pragli,

another virtual-meeting startup, gives users a choice to connect with audio or video, and its cofounder, Doug Safreno, estimates that people use the audio-only method twice as often as video. Consider this the revenge of the old-school telephone call: Turns out we just want to talk.

And, more subtly, to listen. Many of these apps allow for a bit of the ambient eavesdropping that happens in an office, where you can look across the room and see that two colleagues are talking—maybe even get a sense what they’re discussing—without fully tuning in. This semiprivate, semipublic nature of office chat helps give a team a proprioceptive sense of itself, one that’s too often missing in our remote world of one-on-one calls.

An office has power dynamics, for good and for ill; part of how we navigate a job involves keeping tabs on how others interact. Is your manager talking to the boss a lot? Maybe it means your team is in trouble? Or that you’re *impressing* the head honcho? We gather intelligence, chew it over with colleagues, become more connected.

One benefit of the physical office, in other words, is that it lets us low-key *creep* on each other. It turns out we might want some of that even in our software.

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[Yi-Ling Liu](#)

[Backchannel](#)

03.09.2021 07:00 AM

# Sci-Fi Writer or Prophet? The Hyperreal Life of Chen Qiufan

As China's science fiction authors are elevated to the status of oracles, Qiufan's career—and his genre's place in society—have gone through the looking glass.

 Chen Qiufan

Chen Qiufan wants his writing to provoke a sense of both wonder and estrangement, like a “fun-house mirror, reflecting real light in a way that is more dazzling to the eyes.” Photograph: Yilan Deng

When Chen Qiufan took a trip to the southwest Chinese province of Yunnan 15 years ago, he noticed that time seemed to slow down as he reached the city of Lijiang. Chen was a recent college graduate with a soul-sucking real estate job in the pressure-cooker metropolis of Shenzhen, and Lijiang was a backpacker's refuge. Wandering through the small city, he was enchanted by the serrated rows of snow-capped mountains on the horizon and the schools of fish swimming through meandering canals. But he was also unnerved by the throngs of city dwellers like himself—burned out, spiritually lost, adrift. He wove his observations together into a short story called “[The Fish of Lijiang](#),” about a depressed office worker who travels to a vacation town, only to discover that everything is artificially engineered—from the blue sky to the fish in the streams to the experience of time itself.

Chen has since gone on to pen many more stories, win virtually every sci-fi literary award in China, and establish himself as a leading voice among the country's growing roster of acclaimed writers in the genre. But unlike Liu

Cixin, the lionized author of [\*The Three Body Problem\*](#), who grapples with the faraway grandeur of outer space, Chen is drawn more to the interior lives of characters struggling to anchor themselves in a moment of accelerated change—much the way nearly anyone in China struggles to anchor themselves today. His work is often described as “science fiction realism.”

At the beginning of his writing process, Chen says, he often tries to act like “an anthropologist conducting fieldwork.” Before writing his debut novel, [\*The Waste Tide\*](#), a 2013 eco-thriller about a workers’ uprising in a futuristic dump called Silicon Isle, Chen spent time in the southeastern city of Guiyu, one of the world’s largest dumping grounds for electronic waste, observing migrant workers toil in the toxin-laden trash. Once he has a feel for a given landscape in the real world, he transports the scene into what he calls the imagined “hyperreal”—a zone where the fantastical and factual are so blurred it is unclear where one begins and one ends. (In the novel, one of his main characters transforms into a cyborg, having become subsumed into the world of waste.) He wants his writing to provoke a sense of both wonder and estrangement, like a “fun-house mirror, reflecting real light in a way that is more dazzling to the eyes.”

But in the past few years—a period that has seen China’s sci-fi authors elevated to the status of New Age prophets—Chen’s own career has become an object in the fun-house mirror. After *The Waste Tide* garnered widespread attention at home and abroad, reviewers began praising Chen as the “William Gibson of China,” and the tech industry has embraced him as a kind of oracle. An institute run by [AI](#) expert and venture capitalist [Kai-Fu Lee](#)’s company has even developed an algorithm capable of writing fiction in the author’s voice. (Chen’s recent short story “The State of Trance,” which includes passages generated by the AI, nabbed first prize in a Shanghai literary competition moderated by an artificially intelligent judge, beating an entry written by Nobel Prize in Literature winner Mo Yan.) In China, it is the place of science fiction itself—and the status of writers like Chen—that have taken a turn toward the hyperreal.

Born in the ’80s, in the wake of China’s opening up and reform movement, Chen grew up during a moment of exhilarating upheaval: The market

economy was introduced, state control over culture loosened, and Western ideas flowed freely into the country—from McDonald's to rock 'n' roll to Star Wars. He lived in the city of Shantou, in the culturally diverse, coastal region of Chaoshan, Guangdong, close to the Hong Kong border, with easy access to foreign entertainment. As a teen, he would devour golden-age sci-fi classics by Arthur C. Clarke and Isaac Asimov that his father, an engineer, brought home for him, and he would watch a movie a day, buying bootleg DVDs of *Blade Runner* and *2001: A Space Odyssey*. “I was a young boy who liked to ask, ‘Why?’ and so I turned to science for answers,” Chen says. “But when science couldn't explain everything, I turned to science fiction.”

But the very reforms that brought intergalactic epics to China also ushered in the myth of capitalism—the belief that “to get rich is glorious.” Along with it came rampant corruption, pollution, and inequality. China transformed from a nation of communes and Mao jackets into a land of Gucci-wearing super-tycoons and migrant workers hustling in Nike sweatshops. While most people were dazzled by the bounty of China's economic boom, Chen was ambivalent. In his first short story, “The Bait,” which he wrote as a precocious high schooler, aliens arrive on Earth, give humans an invaluable new technology, and eventually enslave them with it.

“I was a young boy who liked to ask, ‘Why?’ and so I turned to science for answers,” Chen says. “But when science couldn't explain everything, I turned to science fiction.”

Photograph: Yilan Deng

By the time Chen graduated from Peking University in 2004, China was perched on the edge of another revolution—the internet boom—and the Chinese people had bought into another myth: that technology had the power to change the world for good. After completing a dual degree in Chinese literature and film arts and enduring a brief and dispiriting stint in real estate, he left to work in the tech industry, first in advertising at [Baidu](#), then in marketing at [Google](#), all the while writing science fiction on the side. In 2008, Chen emailed the Chinese American science fiction writer Ken Liu to express admiration for his work. The two became online friends, and in 2011, Liu offered to translate “The Fish of Lijiang” into English.



That small, serendipitous idea would kick-start Liu's role as the preeminent English translator of Chinese sci-fi, and in turn set the stage for the genre's booming global popularity. (Liu went on to translate not only Liu Cixin's *The Three Body Problem* but also a diverse range of new voices, from Hao Jingfang to Xia Jia to Ma Boyong.)

Chen, still moonlighting as an author, kept taking jobs in tech into the 2010s. In 2013 he returned to Baidu to work in product marketing and strategy, then joined the marketing team at a virtual-reality startup in Beijing two years later. He was enchanted by the tech world's wide-eyed idealism and its central belief that a product, if scaled and optimized, could transform the lives of billions. But he also intuited that those ideals were "ultimately hollow at the core," Chen says. In 2017 he quit his job in VR to write full-time.

By then, though, such a move didn't exactly qualify as stepping off the treadmill. Indeed, in the past five years, China has become a nation obsessed with its own science fiction. What was once a niche subculture with a small circle of hardcore fans has blossomed into a full-fledged 66 billion yuan (\$10 billion) industry of films, books, video games, and theme parks. In 2015, Liu Cixin had become the first Chinese writer to win a Hugo Award, for *The Three Body Problem*. The next year, Hao Jingfang became the first Chinese woman to win a Hugo, for her novelette [\*Folding Beijing\*](#). *The Wandering Earth*, a 2019 film adaptation of a story by Liu Cixin, earned more than \$300 million in its first week after release and would become China's fourth-highest-grossing film ever. Once dismissed as frivolous children's literature, science fiction now commands the attention of all kinds of enterprises hoping to profit from its popularity: film studios hungry for screenplay fodder, universities setting up sci-fi research institutions, talent agencies eager to jump on the bandwagon, tech companies keen to borrow the genre's aura of profundity, and even government officials looking to ennoble the national project of innovation.

In hindsight, the ascendancy of sci-fi in Chinese literature seems almost inevitable. After all, walking the streets of Beijing today can feel like inhabiting a cyberpunk fiction: Bright yellow shared bikes line the streets, facial recognition cameras hang on street lamps, robot servers deliver hot-



pot dinners to your table. Liu Cixin has compared present-day China to the US after World War II, “when science and technology filled the future with wonder.” It’s also a time when science and technology have filled the present with a sense of estrangement, ennui, and anxiety, and a writer like Chen is a natural chronicler of that tension.

But for the people working in the genre, the sudden crush of attention and esteem has been vertiginous. “None of us had the goal of taking over the world,” says Emily Jin, a translator and protégé of Ken Liu who has worked closely with Chen. “We’re just a bunch of nerds having fun together.” In China, where rapid technological change keeps transfiguring the world beyond recognition, “one of the most important qualities in a writer is sensitivity—the ability to capture the strangeness in everyday life,” Chen says. And it can be hard to maintain that sensitivity when you’re squinting under the spotlights.

Chen turns 40 this year, but at first glance—lithe and graceful, sporting candy-colored Adidas high-tops—he could easily pass as a man in his twenties. He is cerebral, wry, and soft-spoken. Chen lives in Shanghai but came to Beijing for two weeks in October, where I meet him at a café. He switches seamlessly between languages (English and Mandarin), dialects (Teochew and Cantonese), and names (Chen Qiufan and Stanley Chan). He moves with ease between conversation topics, from autonomous terrorism to his trip to Burning Man, and midway through our discussion of Taoist philosophy, he excuses himself to take a quick call from his investment adviser. He also reads voraciously—citing Aldous Huxley, the Chinese novelist Lao She, and a 10,000-word academic paper on asteroid mining.

When I see him next, he’s standing on a neon-lit stage in the banquet hall of the Grand Millennium Hotel, a slab of glass and steel in Beijing’s central business district, giving a speech titled “Mind Reset and Embracing the Unknown: The Way of Science Fiction” to an audience of suited-up professionals. The *Financial Times* organized the conference, inviting a lineup of modern-day oracles—the CEO of a health care startup, a professor of economics, a machine-learning expert, and Chen—to prognosticate about the near future. To dress up for the occasion, Chen put on a blazer but kept the high-tops.

His visit to Beijing in October was packed with similar engagements. Tencent, the tech monolith behind China's super app WeChat, had invited Chen—again, a literature major—to predict developments in genetic engineering alongside a panel of world-class biophysicists, because he once wrote a story about genetically modified Neo Rats. Kai-Fu Lee summoned him to the glassy offices of his company, Sinovation Ventures, to join a panel on AI-human cooperation in the creative arts and to demonstrate the algorithm that writes fiction like Chen.

It is no surprise that Lee tapped Chen to participate in the panel. The two are collaborating on a book, [\*AI 2041: Ten Visions for Our Future\*](#), to be published this fall. Pairing Chen's speculative fiction with Lee's real-life technical perspective, the book explores how artificial intelligence will transform humankind and the global order in the next 20 years, in areas ranging from contactless dating to natural language processing to job displacement. "Computer scientists and science fiction writers don't speak the same language. If I describe how speech recognition works, it'll go right over people's heads," Lee tells me in a glass-walled conference room called Back to the Future (all the rooms at Sinovation are named after science fiction films: Total Recall, Cloud Atlas, Star Trek). "I needed a writing partner who understands the technology but can also tell a good story."

"I tend toward darker endings, and Kai-Fu toward the positive," Chen says. "He thinks of the narrative as a step-by-step process, like a manual, and I prefer to preserve a story's ambiguity."

Given all the time he spent at tech companies, Chen is both insider and outsider in an environment like Lee's; he's fluent in the language of data and metrics and KPIs. But it's not just that he's at home in tech. I've noticed that in any new environment, Chen is observant and open-minded, careful to absorb its rules and rituals before synthesizing them as his own. Zipping from one engagement to the next, I watched him make a straight-laced professor feel at ease, charm a hippie Mongolian shaman over lunch, then pen an op-ed for a state-run newspaper at night.

This ability to move between disparate worlds has proved useful for navigating more perilous waters: Chinese politics. In China, writers have to be sensitive not only to commercial pressures but also to shifting political

winds, evading the ever watchful eyes of the censors. They have to gauge what the government is thinking, pay attention to developments on the international stage, and discern what to play up and play down, what is OK to write, what is not, and when. In addition to capturing the attention of profit seekers, science fiction's popularity has piqued the interest of the authorities, who are eager to use its skyrocketing profile to boost their own agendas. "If I'm speaking to the government, I emphasize the importance of sci-fi as a tool to strengthen innovation and promote creativity. I fill my message with *zheng neng liang*," Chen says wryly, quoting a hackneyed catchphrase of officialdom. "How do you say that in English?"

"Positive energy," I respond.

Although Chen's *The Waste Tide* can be read as a dark and scathing critique of the government's failure to deal with ecological destruction, the novel can just as easily be interpreted as a criticism of American hypocrisy, a manifesto against global consumerism, or simply an apolitical exploration of post-human consciousness. "With science fiction, I can probe real-life issues through an imaginary narrative," Chen says, "without explicitly arguing who is right or wrong, good or evil."

Lately, though, the leeway afforded to cultural expression seems to be tightening even further. In recent years, authorities have scrubbed the internet clean of not only sensitive political content such as the Three T's—Tibet, Tiananmen, and Taiwan—but also anything the party deems immoral, from tattoos and one-night stands to hip hop. Last summer, film authorities issued a set of guidelines on how to make sci-fi films, urging filmmakers to "highlight Chinese values," "cultivate Chinese innovation," and "thoroughly study and implement Xi Jinping thought." These measures have made writers and publishers more paranoid about making a misstep. (Last year, Chen wanted to write a story about Californian independence, but he was advised against it by his publishers for fear that it would not get past the censors. "It wasn't even about China," he exclaims, rolling his eyes.)

Abroad, China's science fiction writers find themselves caught in a tug-of-war between competing geopolitical agendas. The Western world has always perceived China as a monolith, reading Chinese literature through

the lens of Western dreams and fears and viewing Chinese authors as either romantic dissidents clashing with the regime or soft-power tools parroting the Party's agenda. Recent developments—the US-China trade war, conflicts with Huawei and ZTE, closed borders, and China's aggressive posture as a technological superpower—have only exacerbated the situation. Hawkish academics pen reductive op-eds with subtitles such as “To Know What the Chinese Are Really Up To, Read the Futuristic Novels of Liu Cixin,” as if one novel could demystify a nation of a billion people. Whereas five years ago President Obama touted *The Three Body Problem* as a must-read, last September, Republican senators condemned its Netflix adaptation, criticizing Liu for his politics.

“We do the works a disservice when we focus on the geopolitics alone,” Ken Liu has written. But as much as China's science fiction writers aspire to transcend the boundaries of nationalism, they find themselves swept into a whirlpool of forces outside of their control. According to Chen, the timing of *The Three Body Problem*'s publication was crucial. If it had come out today instead of in 2008—the days of bilateral relations, economic cooperation, and the Beijing Olympics—perhaps it would be censored by the Chinese government or condemned by the American one, targeted by both. “I stay away from politics, because—what do I know?” Chen says. “Sometimes I feel like I'm just being pulled along by the strings of history.”

Sunday evening, at the end of Chen's jam-packed time in Beijing, we share a Didi ride from the Tencent headquarters back to the city center. I can tell he's exhausted. “Nap a little?” I ask. He nods, and we both pull out our headphones. I listen to Bon Iver; he tunes in to a meditation app, carving out a rare period of stillness after a long day.

For a moment, I'm reminded of a passage toward the end of “The Fish of Lijiang,” when the protagonist discovers schools of fish swimming in the waterways. At first sight, they seem to be hovering calmly in the water, but as he looks closer he sees they are struggling to maintain their position. Once in a while, a fish gets pushed out of formation. “But soon,” the passage continues, “tails fluttering, they fight their way back into place.”

Late last year, 15 years after his first visit, Chen returned to Lijiang to find that it had transformed. The city had morphed into the fictionalized Lijiang

of his story—a digitized tourist hub where self-driving cars shuttle smartphone-toting visitors around town and local delicacies are served up by automated bots.

“Today we live in a world dominated by technology,” Chen says. “Where everything is driven by data, productivity, metrics.” In China, with a swipe of a touchscreen, you can order a Luckin coffee that appears wordlessly at your doorstep and hail a nameless Didi driver whenever you want to go somewhere. We turn to algorithms for all the answers: where to eat, what to watch, who to love. The tech industry has learned how to monetize not only consumer goods but also experiences, attention, relationships. In many ways, we’ve become just like our devices—efficient, optimizable, operating faster than ever, caught in the endless churn of increasing productivity. But nobody knows to what end.

In any new environment, Chen is observant and open-minded, careful to absorb its rules and rituals before synthesizing them as his own.

Photograph: Yilan Deng

Of course, this is happening everywhere, but in China the transformation has been faster, vaster, and more bewildering. There’s even a word for this sense of sped-up purposelessness today—an arcane, academic term that has exploded on Chinese social media and popped up in Chen’s speeches: *involution*. The opposite of evolution, a process of involution spirals in on itself, trapping its participants. Originally used by anthropologists to describe the dynamics that prevent agrarian societies from progressing, the term has become a shorthand used by people from all walks of life: tech workers clocking long hours at the office, delivery workers hustling from one gig to another, high school students toiling over college entrance exams. Technological progress has humanity caught in an inward-turning shell. Fifteen years after “The Fish of Lijiang,” everyone, like the story’s burned-out wanderers, is lost, adrift and desperately looking for something to hold onto. “The times have changed,” Chen says. “And the story needs to be renewed.”

So Chen has returned to the drawing board, doing what he does best: going out into the world and observing, gathering material for his next project.

Lately he's been interested in shamans. He's gone on several field trips, interviewing and shadowing shamans, in hopes of understanding the rites, rituals, and traditions of China's Buddhist and Taoist past. Last summer he met a shaman named Aodeng Toya through a WeChat group, and the two became fast friends. He stayed with her in Mongolia and spent a night at the foot of the sacred Bogd Khan mountain, where thousands of villagers gathered to pray to the mountain gods—drinking, eating, and dancing under the stars. For most of the year, Toya practices in Beijing, helping urbanites through all kinds of spiritual ailments. “Depression, overwork, bad luck with love, to ward off evil spirits, to commune with the dead,” she tells Chen and me over lunch. “I’m booked up every day for the next month.”

In our accelerated transition to a technological culture, Chen believes that we've lost so much—our relationship to our bodies, to nature, to our roots, to our faiths—and he has set out in search of them. “Shamans used to predict the weather, prevent disease, counsel leaders, show us how to coexist with the natural world,” he says. “Today, technological tools have replaced those functions, but not all. Why do we still go to them? What are we looking for?” We thought we could divine, precisely and quantifiably, where we're headed, but instead find ourselves hurtling toward an increasingly precarious future: skyrocketing housing prices, soaring unemployment, deepening inequality, accelerating climate change, and a shattering global pandemic.

It's not surprising, then, that people are turning to shamans—and to science fiction. “They are treating sci-fi as an anchor to reality and science fiction writers as prophets, to help them make meaning of an unfolding future and navigate a treacherous world,” says Emily Jin, Chen's translator. How do we reclaim meaning and purpose in the age of computers? What does spirituality look like when everything is mechanized and mass produced? When our lives are so deeply embedded in our devices, how do we preserve what makes us human? “As a result of all this attention, science fiction writers have been given a burden,” says Jing Tsu, a professor of comparative literature at Yale. “To be the soothsayers of technological salvation.”

But Chen is not a soothsayer, he's a writer. And writers need time to write. "With all these panels and talks and attention, Chinese science fiction writers could find themselves stretched thin, eviscerated of their creative energy," Tsu says. "If science fiction is to have a future in China, they need a space to create and keep maturing."

Chen has ambitious goals for 2021: to wrap up his collaboration with Kai-Fu Lee, continue his research on shamans, and write a sequel to *The Waste Tide*. But he also wants to go home to Shantou to visit his parents (he didn't get to see them much during the pandemic), find a few months of quiet in the Cangshan mountains, and maybe return to rock climbing. Like the rest of us, he has no idea where things are headed. What he does know is that he needs to slow down, find things to hold onto, and remember what makes him human: taking the time to swim against the current, fighting his way back into place.

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*Makeup by Xiaodi Zheng*

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03.04.2021 08:00 AM

# Why Can't I Stop Staring at My Own Face on Zoom?

WIRED's spiritual advice columnist on narcissism, Nabokov, and what it means to exist—really *exist*—for other people.


 A faceless man leans over a laptop with a face inside.

Illustration: Elena Lacey; Getty Images

Support Request:

*I don't think I'm a particularly vain person, but whenever I'm on a Zoom call, I'm constantly looking at my own face instead of focusing on the other people. I'm not really admiring myself or scrutinizing my appearance. I'm just ... looking. What is this doing to my self-image? Should I turn off the self-view to avoid becoming a total narcissist?*

—SEEN

Dear Seen—

Turning off the self-view would seem to be the easiest solution, but it's not one I would recommend—in fact, I'd strongly advise against it. From what I've heard, the sight of one's image disappearing from the gallery inspires, almost universally, anguish, terror, and in some cases profound existential despair of the sort that Vladimir Nabokov claims to have felt when he came across family photos taken before he was born. It feels, in other words, as though you no longer exist.



Your larger query—about the possible side effects of staring at yourself all day—is more complex and extends beyond the question of whether you’re a narcissist, which I will venture is unlikely. (Fear of narcissism, at least in the clinical sense, is self-disqualifying: Only those who don’t fit the definition worry that they do.) It’s not as though you’re alone in this fixation, in any event. People who would never dream of looking at a photo of themselves for more than a few seconds nevertheless report, like you, an inability to look away from their own face floating on the screen during virtual classes or PTA meetings, a preoccupation so intense that vanity remains, for me at least, an unconvincing explanation. Perhaps the more relevant question is not what the platform is doing to your self-image but, rather, what has already happened to it such that you—like so many others—are unable to stop staring at your pixelated reflection.

Zoom, of course, is not an ordinary mirror, or even an ordinary digital mirror. The self that confronts you on these platforms is not the static, poised image you’re accustomed to seeing in the bathroom vanity or the selfie view of your phone camera—a blank slate onto which you can project your fantasies and self-delusions—but the self who speaks and laughs, gestures and reacts.

It’s strange to recall how rare this view of the self-in-action was until recently. In your former life, you may have occasionally caught a glimpse of yourself laughing in a bar mirror or momentarily become distracted by the sight of yourself speaking to the salesperson standing behind you in the department store mirror. But it wasn’t until a year ago that we were constantly, relentlessly, obliged to watch ourselves in real time as we interacted with others, to see our looks of dismay, our empathetic nods, our impassioned gestures, all of which appeared so different from how we’d imagined them, if we imagined them at all.

“Oh, would some Power give us the gift to see ourselves as others see us!” wrote the poet Robert Burns in 1786, a virtuous plea for the objective self-knowledge that most of us remain more conflicted about. The technological “powers” of our age have, by and large, given us the inverse capacity: to make others see us as we see ourselves. We’re used to having complete control over our image—the angle, the filter, the carefully selected shot

among hundreds—and yet despite this, or perhaps because of it, there remains something fascinating about the unfiltered spontaneity of Zoom. The person you are seeing there is not the compliant reflection of your ego, but that most elusive of all entities: the self you become in the emergency of a social encounter, when all your premeditations fall away; the self who has always been familiar to your friends, family, and acquaintances while remaining largely invisible to you, its owner.

This desire—to see oneself as others do—is not in any way self-indulgent, but is crucial to forming and sustaining a viable sense of identity. Without getting too bogged down in theory and unnecessary references to Lacan, I'll briefly mention that mirrors have a social function, in that they reveal the self as an other, serving as a portal to the third-person point of view. The ability to pass the mirror test—the moment when infants stop seeing themselves as fragmented collections of body parts and recognize their image, whole, in the mirror—is a crucial rite of passage, marking the child's entrance into the social realm. The self is a fragile illusion that needs constant reinforcing, and this reinforcement happens most often through the gaze of other people, a process known in sociology as the “looking-glass self.” We form our identities in large part by imagining how we appear to others and speculating about their judgments of us.

One aspect of your former life you probably took for granted were the thousands of gestures and reactions, most of them small and registered unconsciously, that contributed to your sense of a solid, continuous self: the curt thank-you from a person squeezing past you on the subway, the brief eye contact from a coworker passing your desk, the laughter in response to a joke you made at a party. Although you weren't forced to literally watch yourself interact with others, you were seeing yourself mirrored back through these intersubjective moments, all of which served, in a very real sense, as proof that you still existed—not merely as an ambient consciousness but as a real, embodied presence in the world.

It seems not coincidental that the most common complaints about social isolation—feeling scattered and fragmented, the inability to remember what one did from one day to the next—are recognizable symptoms of the social self breaking down. After spending the better part of the day alone, in front

of various screens, it becomes all too easy to believe that you are simply a pair of hands moving across a keypad, a pair of eyes scanning a newsfeed, a mind whose boundaries increasingly blur with the virtual world you inhabit. The self-view on Zoom is, unexpectedly, anchoring, and to remove it is to confirm our worst fear—that we have, in fact, dissolved into the ether.

All of which is to say, your obsession with your image likely stems from an impulse that is entirely natural and, at root, pro-social. You are trying to retain an identity that has been gradually eroded throughout the recent disruptions to public life. Far from being an exercise in vanity, the sustenance of this identity, I'd argue, is crucial. Seeing oneself mirrored back by others is bound up in complex ways with the ability to feel empathy and with the construction of consensus reality—the shared belief that there exist objective truths outside the solipsism of our individual minds. This is why, in cases of extreme isolation, people often lose the ability to determine what is real and what is imagined and can no longer identify a clear line between the self and external objects.

I'm not saying, exactly, that you should spend even more time staring at yourself on calls. But the impulse could serve as a reminder of the collective need for mutual recognition—a need likely felt by all the other faces tiled alongside yours in the gallery. It might prompt you to remember that others on the call are similarly experiencing a tenuous sense of identity, that the standard technical queries that accompany each logon (Can you see me? Can you hear me?) might express a deeper longing. The great thing about Zoom is that the mirror is two-sided. Every nod, every responsive gesture, serves to remind the person speaking that they exist for other people, that they remain a vital presence in the world that all of us—still, together—inhabit.

Faithfully,

Cloud

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03.04.2021 07:00 AM

# Adoption Moved to Facebook and a War Began

As the adoption industry migrates to social media, regretful adoptees and birth mothers are confronting prospective parents with their personal pain—and anger.

family walking in the park

Art by Amber Lee Williams; Photograph by Juan Diego Reyes

When Erin and Justin decided to adopt a child at the beginning of 2016, they paid \$25,000 to sign on with one of the largest, most reputable adoption agencies in the United States. They imagined an orderly process, facilitated by lawyers and social workers.

They didn't foresee the internet trolls who would call them cunts and psychopaths. Nor did they imagine they'd be filing a police report, or pleading with [Facebook](#) to delete posts that called them human traffickers. They didn't expect the internet to be involved in the process at all.

Erin and Justin (not their real names) met in Chicago in 2010 on a dating site. Erin was 37 with blond, beachy waves and a Michigan accent. She was divorced at the time and approached the dating market pragmatically, uninterested in wasting time with men who were not serious prospects. When she met Justin, she knew she'd found what she was looking for. "He was so kind, different from anyone I'd dated, and I knew he'd be a good dad," she told me. They married in 2011 and planned to have children, but when Erin got a job offer that took them to New York City, they decided to wait until they were settled. Then, when they were ready to start trying, Erin learned that she had gone into premature menopause. "I wasn't devastated, because I knew I wanted to be a mom, and it didn't matter to me how my child came to me," she said. They forged ahead, excited to adopt.

But several months after they signed with the adoption agency, it filed for bankruptcy. Erin and Justin contacted an attorney, who advised them to

move their search online.

The adoption industry has never been very well regulated, and there is a history of certain firms engaging in unethical practices. But when agencies were the primary facilitators of adoption, they could at least perform basic vetting of expectant mothers and adoptive parents and manage complex legal processes. The open marketplace of the web removed that layer of oversight. A 2012 [report](#) on adoption and the internet, by the now defunct Donaldson Adoption Institute, found, among other things, that online adoptions create opportunities for fraud and for financial incentives that might push expectant mothers to give up their children. Online, prospective adoptive parents negotiate with expectant mothers directly via Craigslist ads. People who adopt children, often from overseas, and then change their minds find new homes for them in Facebook “adoption disruption” groups, without any supervision from child welfare agencies. “One thing that is true about adoption and the internet is that no one is paying attention,” says Adam Pertman, who was the executive director of the Donaldson Adoption Institute. “Whatever is happening is happening because it can, and it’s having enormous impact—some good, some bad, and some unknowable—without any repercussions.”

Erin and Justin signed up for a platform called Adoptimist (“We’re a technology company devoted to family-building. We are not an adoption agency or law firm”) and set up a Facebook page about their “adoption journey.” They filled their profiles with personal information, describing their love of basketball, football, and triathlons. Erin wrote that she came from a large Italian family and hoped to raise her children speaking Italian and English. They shared a picture of the two of them goofing around with a young nephew, another of them eating ice cream.

When they posted their profile to Adoptimist in 2017, Justin and Erin were approached by a woman from Las Vegas. She said she was pregnant with twins and had been diagnosed with cancer, and that she wanted the couple to raise the babies. After many texts and updates about the babies’ heart rates, and an invitation to come meet the twins in the hospital, they discovered the woman had never been pregnant.

She was what Erin described as an “emotional scammer,” someone seemingly uninterested in money who torments prospective adoptive parents for reasons known only to them. Erin said another woman on Adoptimist who claimed to be pregnant sent her a message saying she was hungry and asking her to order a pizza. This was, Erin said, how most of the couple’s interactions on the site went. (Philip Acosta, the president and cofounder of Adoptimist, said that the company has in recent years focused on combating scammers. The site now offers to review the IP addresses of anyone who contacts a prospective adoptive parent, and also alerts users to different types of scams on a “scam blog.”)

Justin and Erin joined a support group for parents seeking to adopt. Several of the couples in their group who had already adopted children passed along advice about using Facebook’s advertising analytics to hone their search. So Justin and Erin paid the social media company between \$25 and \$150 a month to promote their adoption page in the feeds of women age 15 to 65 in college towns around the US. This range, they reasoned, might reach a grandparent or a friend of a pregnant woman.

Soon after they started buying targeted Facebook ads, Erin’s mother became seriously ill. Erin flew to the suburbs of Detroit, where she was raised, to help. For a hectic few weeks, she and her sister took turns staying in the hospital with their mother and watching Erin’s five nieces and nephews.

One night, Justin called Erin and, sounding stricken, asked if she’d seen their adoption page. She hadn’t had time to check it. “Oh my God,” he told her. “You have to go look now.”

That night in Michigan, when Erin logged on to Facebook, she saw, interspersed with encouraging messages, a torrent of abuse. Perhaps because of the increased exposure Facebook analytics offered, their adoption profile had come to the attention of anti-adoption blogs and Facebook groups. Now their profile had been screenshotted and tagged and mocked on many other pages. “How will you have time for a baby while you’re resting your facelift, and getting all that work done?” one poster asked. Another proclaimed, “Get a dog, you stupid cunts.” “No child deserves her ... even the ‘man upstairs’ saw that.”



In the guest bedroom in her sister's house, Erin stayed up late into the night deleting the comments on their adoption profile and trying to report the users who posted them. "I was trying to plug the dam, but there wasn't enough time. It was a 20-person job," she said. "There was no one to talk to at Facebook." (A Facebook spokesperson said, "We continue to improve the technology we use to find bullying and harassing content" and that it had "removed the content that violates our policies.")

As she jumped from one anti-adoption page to another, Erin saw that she and Justin were far from the only targets. Other prospective adoptive parents were called "vultures trolling the net for babies." One group had shared the Adoptimist profile of a gay male couple, asking sardonically, "Which one will be listed on the birth certificate as the woman who gave birth to the child?"

Erin was dumbfounded. "I didn't even know anti-adoption was a thing," she told me.

The anti-adoption movement lives in Facebook groups and on blogs with names like the Wounded Adoptee, Changing the Adoption Narrative, and Adopted Ball of Hate, and it is comprised of people who wouldn't have found each other elsewhere: older women who, as "unwed mothers" in the 1950s and '60s, were forced to give babies up for adoption; women whose churches still pressure them to give up children born outside of marriage; adoptees who want to overturn laws in 40 states that deny them unrestricted access to their original birth certificates.

The people in this movement come to it from a wide range of perspectives. Some recognize the value of adoption in certain circumstances and have specific goals, like improving federal oversight, eliminating practices that are coercive to birth mothers, or giving them more time to reverse a decision to give up a child. Others see adoption as wrong in all cases, as an assault on some transcendent natural bond only possible between a biological mother and child. Some are finding community and expressing feelings of anger and pain for the first time; birth mothers describe pressure, regret, and lifelong mourning for the children they gave up, while adoptees talk about their sense of estrangement and about not knowing their medical history.

Members of these groups run an informal counter-messaging campaign to standard adoption narratives, one which incorporates their trauma and the role that poverty plays in adoption. When the economic devastation from Covid-19 shutdowns became apparent in April, Lifetime Adoption, an agency based in Florida, put up a blog post assuring prospective adoptive parents that the pandemic would open new opportunities. “Difficult times bring a greater need for adoptive parents,” the post read. “Lifetime Adoption has found that phone calls from potential birth mothers are three times what they normally are.” Anti-adoption groups took screenshots and critiqued the post, highlighting the more troubling issues underlying its assumptions, until the agency took it down.

The tactics that Erin encountered—targeting adoptive parents online, mocking their profiles, and calling them names like “womb wet baby snatcher”—are not the standard in the anti-adoption movement. The people who engage in those behaviors make up a small minority, but a vocal one.

For a while, one of the more aggressive anti-adoption posters and commenters was a woman whose online moniker is Julie Gray. She has been removed and blocked from many groups because of her use of harsh language to both birth mothers, whom she calls “relinquishers,” and adoptive parents. Gray was adopted, and she told me that one of her goals in trolling adoptive parents’ profiles was “to scare the crap out of them so they change their mind altogether. I want to stop other children from going through what I went through.”

When Erin told her adoption support group about the response to her profile, other couples acknowledged that they’d been [trolled](#) too. They told her, “Delete, block, and don’t engage,” Erin recalled.

But Erin wasn’t the type to back down. “I’m an attorney. I always advocate for my client, and now I felt I had to advocate for my family. I was not going to shut up and ignore it and walk away. I’m Italian, I’m hot-blooded. If I see something that’s wrong for me or someone else, I am not going to be silent.”

Art by Amber Lee Williams; Photograph by Juan Diego Reyes

Whenever she saw adoptive parents being harassed, she reported it to Facebook. It seemed to Erin that Facebook removed a post only if a significant number of people reported it. (The company says one report is enough if a post violates its policies.) So in September 2017 she started a small Facebook group whose sole purpose was to monitor and report anti-adoption harassment. She sometimes commented acerbically on those posts she reported, and quickly became known in the anti-adoption community. One commenter wrote an ominous post saying she had eaten dinner at the restaurant on the ground floor of Erin's Manhattan apartment building. Another post named the law firm where Erin worked and discussed strategies for getting her disbarred. At that point, Erin says, she filed a police report about the woman who claimed to have been in her building.

Although she was in frequent battle with the anti-adoption movement, Erin shared some of their concerns. She found that the inconsistency of laws from state to state created confusion and believed all adoptees should have access to their original birth certificates. At some point Erin had signed up for a newsletter from an adoption facilitator who connected prospective parents with birth parents for a fee. The emails included what the facilitator called "situations": brief descriptions of children available for adoption along with a price, usually in the tens of thousands of dollars. The idea of putting a "price" on a child above basic expenses incurred by the birth mother disturbed Erin. She thought it might encourage women to place their babies for adoption. She was especially horrified to see enormous race-based discrepancies: In one situation a white child was \$45,000, while in another a Black child was \$20,000.

Then, in the fall of 2017, a pregnant woman from the South reached out to Erin and Justin through Facebook. The woman was in a long-term relationship, was raising three other children, and had previously placed another child for adoption. Erin tried not to get her hopes up, but she had a good feeling as the months passed and the woman kept in regular contact. New York state has strict rules on payments to birth mothers: It permits prospective adoptive parents to give money only for certain expenses and in the final months of pregnancy and just after childbirth. The expectant mother was on Medicaid and didn't need help with medical expenses, but

Justin and Erin paid her \$1,450 a month for three months because she said her doctor ordered her to stop working toward the end of her pregnancy.

As the baby's due date neared, Justin and Erin drove south to meet the family. They all went out for dinner, and Erin gave the birth mother a spa package.

When the baby girl was born, Erin and Justin were in the hospital. They held her soon after she was delivered. Erin cut the umbilical cord. They were overjoyed. Erin and Justin stayed with her in the neonatal intensive care unit for several weeks—she had breathing problems—before returning to New York City.

Erin took down her adoption page, but she continued challenging the harassment she saw on Facebook. For a while, she settled into a kind of routine. She'd tell the trolls to get a hobby, or worse. Sometimes, she'd threaten legal action. There was an anti-adoption Facebook group called Ask a Birth, First, Natural Mom, which Erin had taken to calling Ask a Moron in her posts encouraging her group to report it. She saw the heated exchanges as mutual sport. "They know who I am and know that I troll those pages. They don't block me. They like the engagement," she told me. "It was a cat-and-mouse game."

Then, in August 2019, something happened that changed the tone for Erin. The previous January, when her daughter's adoption was finalized in court, Erin had posted an album on Facebook that she hashtagged #familyday and #gotchaday, a phrase sometimes used by adoptive parents. In addition to taking photos at court, Erin had made a poster with her daughter's full name and stylized numbers showing her birthday and the date "you were forever ours." Erin put a bow in the toddler's blond curls and took pictures of their little family posed on a white leather couch in front of the framed poster.

Erin believed her personal Facebook page's privacy settings allowed only friends to see posts. But months after she posted the celebratory picture, she received notifications that it had been shared on two anti-adoption sites: Ask a Birth, First, Natural Mom and a group Erin hadn't heard of: America's Taken.

On America's Taken, which has more than 14,000 followers, the picture, with Erin's daughter's full name in view, was posted with Erin's name along with hashtags about kidnapping and trafficking. Soon others shared the link, and the mocking comments began.

That was nothing new, but now Erin's name and her daughter's were spreading with those hashtags. "The last thing I want is for her picture and mine to be on a dark web, as if we were available for trafficking," Erin told me.

Erin mobilized her group to report America's Taken and emailed Facebook repeatedly. Eventually Facebook removed the picture from pages that posted it.

America's Taken is run by Geri Pfeiffer, who lives in a trailer heated by a wood-burning stove in central Oklahoma, near the end of a narrow dead-end road. Pfeiffer, who is 61 and stands 6'2", has a big laugh and wears clear Coke-bottle-thick bifocals. She identifies herself on social media as a "hell raiser," "memaw," and "activist," and in her spare time she knits prayer shawls for a local church.

On the America's Taken Facebook page, Pfeiffer posts pictures of children who have been removed from their homes by child protective services, placed in foster care, and then adopted by new families. There are 135,000 adoptions every year in the US, and about 40 percent are from foster care. The birth parents in those cases no longer have the right to visit their children. The children's names are often changed, and many states still seal a child's original birth certificate.

Art by Amber Lee Williams

Pfeiffer logs long hours advising birth parents all over the country on how to find their children. She can be relentless. She once sent Facebook messages to nearly every business owner in a small northwestern Washington town, asking if anyone knew the whereabouts of a child who'd been in foster care there. (It worked.) The tougher cases she brings to the online network of amateur detectives who are known in the adoption community as search angels. Many of them are former adoptees or birth

parents, but some are just genealogy buffs with time on their hands. Most use online consumer tools like Ancestry.com or data-mining sites like Beenverified or Spokeo.

A typical post on America's Taken might show a photo of a child (who a relative has asked Pfeiffer to locate) along with a message:

"As soon as you hit that 18th Birthday ... your grandma and great grandma ... will be waiting.

You weren't hard to find.

They love you. They miss you. They have waited a long time."

When she saw Erin's "forever ours" post, Pfeiffer had thought nothing of sharing a few choice words about it; she frequently compares adoption to kidnapping and trafficking. But Erin fought back. That week, Erin and Pfeiffer—and their respective followers—got into increasingly heated exchanges. On her Facebook group page, Erin posted, "Looks like the tables have turned. How does it feel, Geri Pfeiffer?" When Pfeiffer got online again, she composed a message to her followers with Erin's name: "To think that this attorney has adopted a child is another adoption horror story in the making. A child that was adopted to satisfy the narcissistic need of a psychopath attorney to be a 'mother.'"

Pfeiffer started America's Taken because of her own experience with child protective services. In 2009, one of Pfeiffer's sons—who was 19 at the time—learned that he had become a father. Neither her son nor the mother was prepared to raise a child, Pfeiffer told me, so Pfeiffer took over caring for the baby. "I just held him that whole first year," she remembered. "His skin was paper thin." She had the boy baptized in a white tuxedo. When her grandson was old enough, she enrolled him in preschool through Head Start.

Then, when he was 4, everything fell apart. On Halloween morning in 2013, a witness said she saw Pfeiffer swinging her purse at the boy in front of his preschool, "with such force causing the child to be knocked approximately 10 feet down a concrete ramp causing scrapes to his left and

right forearms and face and head,” according to court records. When we spoke, Pfeiffer denied that this happened; in a court record she had said “he was spanked outside of school grounds.”

When the Halloween report was filed, Pfeiffer was on probation for an incident of assault and battery. (In an official statement, she said a woman she knew attacked her with a tire iron, and “I fought off the blows with a rake. I ran to her truck and put it in neutral, and it ran down the hill and into a tree.”) Her grandson went into foster care.

Both Pfeiffer and her son say they tried to get the boy back. Pfeiffer completed an anger management course. Meanwhile her grandson bounced from one foster placement to another. Records from family court are sealed, so it is not possible to know the full details of this case.

Eventually one of the boy’s foster families filed adoption papers. The last time Pfeiffer saw her grandson was at their final visit in the county Department of Human Services building.

Afterward, Pfeiffer fell into a sleepless depression. She shut the door to her grandson’s room and didn’t open it for two years. She finally cleaned it out when her teenage granddaughter asked to take it over. Her granddaughter hung up a tapestry with an elephant on it, and Pfeiffer moved the boy’s belongings into storage containers. During my visit, she unpacked one that held the preemie outfit the baby wore the day she first met him, the small white tuxedo from his baptism, a plastic octopus he used to fall asleep with, his Spider-Man wallet, and a lock of dirty-blond hair from his first haircut.

“Precious memories from a boy that doesn’t exist anymore,” Pfeiffer said sadly.

She still occasionally feels something embedded in the corner of her quilt and discovers a crayon or Lego sword lodged in the fabric. “Right now the grief is not even acknowledged once your rights are terminated,” she said. “You’re just relegated to the trash heap of life.”

The termination of parental rights has been called the “civil death penalty,” because of its severity and finality. It is overwhelmingly levied against poor

families. Some children are taken away from parents who abuse them horribly—and others who should be removed are not and die at the hands of abusers. Nationally, the majority of children are removed from their homes by child protective services not for abuse but neglect, which can be a more subjective state. Neglect can mean a child was left in a hot car for hours or that a child's parent is an addict. Or it can mean that a child was alone at home while their mother worked an overnight shift or went to the store, or that there's not enough food in the fridge. In other words, poverty can create conditions that lead to neglect, and the exigencies of poverty can also be interpreted as neglect.

Art by Amber Lee Williams

Many anti-adoption advocates, as well as some experts in child-welfare reform, argue that helping families get what they need—rehab, food stamps, child care subsidies—should be prioritized over permanently removing children from their parents. In a [2019 paper](#), “A Cure Worse Than the Disease? The Impact of Removal on Children and Their Families,” Vivek Sankaran, a professor at the University of Michigan Law School, and his coauthors note that removing children from their homes is traumatic for both parents and children, and that standards for removal vary from state to state. In some states there must be evidence that a child is in immediate danger; in others, suspicion of neglect is sufficient cause. Some states allow a parent to appeal the removal within 24 hours; in others a parent may have to wait 10 days. As a result, the authors note, states and even individual counties have widely varying rates of removing children. In 2017, West Virginia removed 10 times as many children from their homes as neighboring Virginia did. In Oklahoma, where Pfeiffer lives, the number of children who are adopted from foster care is far higher than the national average.

Other child advocates, however, point out that, whatever its cause, neglect can be profoundly damaging to children. Elizabeth Bartholet, director of the Child Advocacy Program at Harvard Law School, agrees that “if we eliminated poverty in this country, that would be the best abuse- and neglect-prevention program.” But protecting the welfare of children, she says, has to take priority over parental rights.



In some cases, a judge will rule that a birth parent poses a danger to a child and will prohibit the parent from making contact. But many avenues exist for a birth parent to reconnect with a child unsupervised. The internet, along with widely available genetic testing, has dismantled the possibility of a truly closed adoption. “Judges’ strictures mean nothing if a child can search for his birth mother without [adoptive] parents knowing,” says Pertman, now the president and CEO at the National Center of Adoption Permanency. “But that doesn’t mean an 11-year-old should be forming relationships with people he doesn’t know without parents’ knowledge.”

Martin Guggenheim, an advocate for parental rights and a professor at NYU Law School, who believes many removals are unjust, is not surprised that birth parents and relatives attempt DIY reunions through the web. When he saw the America’s Taken Facebook page, he told me, “When you think about it, how do you not create this website?”

Other online groups have emerged where there are gaps in adoption processes. Adoption-disruption groups on Facebook, where adopted children are “re-homed,” emerged at least partly because there is little post-adoption support and monitoring; some families know almost nothing about the issues their overseas-adopted children faced or how to cope with their medical or behavioral challenges. In private adoptions, the lawyer who represents a birth mother is often paid for by the adoptive family, and some adoption agencies fund flashy public relations campaigns that paint the experience in sunny tones. There are no major organizations that share with expectant mothers potential downsides or that help them with their rights.

Renee Gelin started an organization and Facebook group that plays that role by crowdsourcing assistance and advice that birth mothers might not have access to. As a single parent, Gelin gave up her second child for adoption 10 years ago because she was under crushing financial pressure at the time. Her job as a contractor in IT offered no maternity leave, and her health insurance would not cover her high-risk pregnancy. She was paid too much to qualify for Medicaid.

Just weeks before her son was born, Gelin agreed to place him with a family in another state. As soon as he was on the plane, she regretted the choice. Although she had arranged an open adoption for her son, she says

that the adoptive family ended the relationship when they found critical blog posts she had written expressing grief about the process. Gelin felt she hadn't understood that open adoptions exist at the discretion of the adopting family. In fact, they are not legally enforceable in all states, and where they are enforceable the cost of a lawyer can be prohibitive for a birth mother.

Gelin's organization, called Saving Our Sisters, tries to persuade birth mothers that financial strain shouldn't prevent them from keeping their children. When a woman who is having second thoughts reaches out to SOS online, the group tries to find a "sister on the ground" nearby to bring her diapers, a month's rent, or a baby swing. Gelin says SOS has had around 90 "saves"—adoptions in process that the group helped reverse—in the past six years. Gelin transferred the blog about her adopted son to a public Facebook page years ago and still posts letters and updates to him, often signed, "Mom."

The woman who adopted Pfeiffer's grandson once gave her a framed image of the boy's handprint. Pfeiffer took the handprint, painted it red, and made it the bloody-looking logo of America's Taken. She printed up T-shirts and signs and stood outside the family court in Guthrie in front of her truck, which had a decal that read "my grandson is a victim of forced adoption in logan county." She handed out pamphlets and told her version of the story to anyone who would listen. At the time, her message did not get much further than the Guthrie courthouse steps.

But in 2013, Pfeiffer enrolled in a University of Oklahoma Medical Center study on congestive heart failure. The hospital gave her an iPhone 4 so she could access a medical app she needed for the study. She had never used a smartphone, or even a computer. "I ran a laundromat," she told me, "and you don't need computers to clean people's underwear."

One day, as she entered her health data in the iPhone app, her brother asked her if she knew she could use it for other stuff. She didn't know. He showed her how to text and then helped her set up a Facebook account. Pfeiffer immediately saw the possibilities. Here she could hold up her sign 24 hours a day, all over the country. The first post she wrote was about her grandson. Within minutes, other people were posting stories to her page of children

they were looking for. “It just snowballed,” she told me. “The first person replied within a minute, and it just kept climbing and climbing.”

As Pfeiffer got more familiar with the phone, she started tracking her grandson’s adoptive family. Pfeiffer has liver disease as well as advanced heart failure, and she told me it’s unlikely she will live long enough to see her grandson turn 18, the age at which she could seek him out. She leaves messages for him on the internet. “I want him to know how hard we searched for him,” she says. “And I’m going to spend every minute I have left searching for other taken kids, teaching other parents to leave clues in cyberspace.”

In June 2019, Erin got a new message from her daughter's birth mother. The woman thought she might be pregnant again and wasn’t sure what she wanted to do. She eventually asked if Erin and Justin wanted to adopt the new baby.

Erin had loved becoming a mother. She and Justin had recently put their adoption journey Facebook page back up, hoping to add to their family. The prospect of a biological sibling for their daughter was more than they had dreamed of.

Art by Amber Lee Williams; Photograph by Juan Diego Reyes

I spoke to Erin when the birth mother was six months pregnant. At the time, Erin saw her adoption story as a rebuke to the ones she often saw on anti-adoption websites. The birth mother had reconnected unprompted, which confirmed to Erin that she had never felt bullied or coerced. Erin said she had made a book of pictures of her daughter’s birth family that she read to her, and she shared pictures of the girl with the birth mother.

But when we talked again a few months later, Erin’s view had changed. In February, the birth mother had abruptly stopped returning her messages. Erin grew increasingly frantic and eventually learned that the baby—a boy—had already been born and was in the NICU, along with another couple who also believed they were the baby’s adoptive parents.

It turned out that, some months earlier, the birth mother had posted anonymously on a Facebook adoption group and had connected with the other family. Justin and Erin rushed south with their daughter. When the boy was ready to leave the NICU, they were given temporary custody. They brought him to a townhouse they had rented, where their daughter was thrilled to meet her brother. They nested for almost four months.

The custody case became baroque. The birth mother was indicted for unlawful exchange of money in an adoption, a charge she said she was fighting as of early March. A judge ruled that the boy should be placed in foster care until custody was decided, with both couples granted an hour per week to visit him. The birth mother and her aunt also filed for custody. The birth mother and Erin described a scenario in which all four families visited the baby once a week in the midst of the pandemic. Eventually the second couple dropped their custody claim, and the baby was sent home with his birth mother, where he has lived for months. Erin and Justin are still pursuing custody.

Erin told me about this turn of events in June 2020. At the time, she was hunkered down in the rental, awaiting the final custody decision. She was sad and seething. But for the first time since we initially spoke nearly two years earlier, her target had changed. “The anti-adoption folks? Honestly, I get it now. I get why they say some of the things they say. A lot of their concerns are legitimate,” she told me. “There’s a dark side to adoption.”

In the months she and her husband had spent with their daughter and her brother, she felt they had bonded. Then the boy was put in foster care. In her years of monitoring anti-adoption groups, Erin had read again and again about the trauma a child suffers when removed from his family. Now she was haunted by the rupture and the baby’s experience of losing the “only home he ever knew.”

“It tore me up inside,” she said. “I can’t imagine what he must be thinking and feeling.”

The experience confirmed to her the need for federal adoption reform. Maybe, she said, it made sense to have 50 different sets of state adoption laws when adoptions were done locally. But in a world where a child’s

future may be mediated on various digital platforms with little accountability, one set of rules is needed. For starters, “there needs to be a federal register of hopeful adoptive parents and birth moms,” Erin said. “There should be a registry to see if someone is matched or not matched.”

When I reached the birth mother in February, she told me that she had decided on adoption for her daughter, another child, and initially planned on it for her son, because she was raising three other children and is against abortion. She thought the kids would have a better life. But it was not easy. In the hospital, she told me, she asked for the baby to be put in a separate room with the adoptive parents. “After giving birth knowing the baby was going with someone else,” she said. “That’s a lot to endure.” She got very quiet on the phone. “I step away because it gets harder and harder to say, ‘Well, yes, this is what I want to do.’”

She had liked the idea of getting to know a family directly through Facebook. But the bitter fight over her son had convinced her she had not really known the people who adopted her children. She told me, “Never again would I choose adoption.” The baby is now a year old.

When we spoke in June, Erin said she had mostly stopped following anti-adoption groups on Facebook. But the activists were on her mind as she navigated a chaotic custody case born out of unverified Facebook threads. In a vacuum of oversight, the anti-adoption groups seemed to be the only ones tracking, however imperfectly, the adoption industry. More than once when we spoke that day, she said, almost wistfully, “I would be really curious to hear what they would say about this.”

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[Virginia Heffernan](#)

[Ideas](#)

03.02.2021 08:00 AM

# While Jack Dorsey Mans the Monastery

The small but boisterous slice of Twitter that's preoccupied with politics imagines @jack, the author of our collective Twitter being, as all-powerful. He's not.


 illustration of Jack Dorsey

Illustration: Sam Whitney

The day of January 6, when he hurled down the lightning bolt that cast Donald Trump out of Twitter and into outer darkness, should have been @jack's debut as an imperial overlord. But @jack never seems to flex. This can be maddening. Just when you want him to act Churchillian, @jack is more reticent than ever, a cipher, more Sphinx than Zeus. Last summer, [The New York Times](#) asked Jack Dorsey whether he's “one of the most powerful people on earth,” and his voice was like a dial tone: “No.”

On January 13, @jack threaded ambivalently about the Trump ban, ruminating on the question of how to address “offline harm as a result of online speech” while holding sacred “the noble purpose and ideals of the open internet.” He left his pensées unfinished.

Dorsey doesn't generally use Twitter to tweet. “I use it to listen and to observe and to understand our world and my world and myself,” he told the *Times*. At the same time, he views Twitter as a cosmic verity, a force that mysteriously predates his cocreation of it in 2006. Twitter “wasn't something we really invented. It was something we discovered.” Like suffering, like samsara, Twitter was just always there.

Forty-four-year-old Jack Patrick Dorsey, the reclusive and peripatetic maxibillionaire from St. Louis, exists, presumably, in time and space, somewhere behind his Twitter handle. But it's @jack, that numinous avatar, that's credited with bestowing on his kingdom the relative well-being, quiet, and order that appears to bless us only when Donald Trump is in exile from civilization. The nation would come to know these unfamiliar sensations at the inauguration of President Biden, weeks after @jack, or someone acting in his name, enacted the excommunication. In retrospect, @jack was not just decisive and swift; he was prescient. So he could be forgiven for giving a spike-the-football press conference. But in the weeks since, he's remained every bit as elusive as Q. Or the Holy Ghost. Or Shiva the Destroyer.

And so it has been, for four strange years. @jack is everywhere and nowhere. He's either the emperor of geopolitics or a lost druid. The relatively small but boisterous slice of Twitter that's preoccupied with American politics has come to imagine @jack, the author of our collective Twitter being, as all-powerful. We call out for him, but he stays silent. We beg him to smite trolls; he does nothing. We plead for him to exile Nazis; he retreats to a meditation cushion. Sometimes (as in 2017) he [adds characters](#) to our rations. Sometimes (as in 2020) he introduces Fleets, which no one asked for. Because, like other deities, he's capricious—and often seems not to exist—we're stuck with tea leaves: what he likes, tweets, retweets. None of it adds up. All that can be said with any confidence is that @jack in general likes a laissez-faire Twitter—whether out of Buddhist acceptance of what is, blithe indifference, catch-all libertarianism, or anxiety about his untrained capacity for moral discernment.

When incarnate, as in occasional appearances and paparazzi photos, Jack Dorsey does little to give the lie to the online fantasy of him. In October, as he [testified before Congress](#) via video, he wore a foot-long gray-brown beard and a gold ring in his left nostril. Once a Missouri fashion model and tinkerer enchanted by dispatch technology, then a springy boyish billionaire on the TED-Davos circuit, Dorsey has now gone full Elminster Aumar. His deep-set eyes can still be called piercing, and the vanity of his early blue-steel pose is not lost. What is lost is the look of complaisance that defines young founders looking for capital. Dorsey, like @jack, no longer truckles to anyone.

But there's a twist. There is one at Twitter who takes action while Dorsey mans the monastery. She is Vijaya Gadde, Twitter's former general counsel, and now head of legal, policy, and trust and safety issues. At 46, Gadde wields so much influence at Twitter that she terrified the gnarly crowd at the late wingnut social platform Parler. One Parlerite called her “Goebbels in a pantsuit.” Another warned, “You don't know her face or name because she rules in the shadows.”

Off the mark, of course. Unlike Dorsey, Gadde is famously non-shadowy and forthright. Born in India, she grew up in Southeast Texas when it was still studded with sundown towns, which shut out people of color with threats, violence, and racist statutes. When her father, a jobless chemical engineer, found work knocking on doors to collect insurance premiums, he had to seek permission from no less than the local Ku Klux Klan leader to walk in his own neighborhood. “My family felt very powerless in those moments,” Gadde said in 2016, when she was honored at NYU School of Law, from which she graduated in 2000. “When people ask me why I went to law school—I went to law school to make sure that people have a voice and that people have someone to fight for them.” She now sits on the board of Mercy Corps, a global humanitarian group and NGO that is currently working to provide emergency supplies to especially vulnerable families and communities during the Covid-19 crisis.

Gadde's earnest moral commitments at Twitter might be explained in part by timing. She joined Twitter not at its start as a group-text goof by Dorsey and his crew in 2006, but in 2011, one decade ago, when it moved to center stage as a communication nexus for the so-called Arab Spring. Where most current social media leaders had no idea what they were getting into in the lighter-hearted days of Web 2.0, Gadde instantly saw the seriousness of the endeavor. She could see Twitter's activist possibilities, as well as its exploitation by those looking to stoke disinformation and racist speech. Above all, as she rose in the ranks, she gained Dorsey's druid ear. As one Twitter official told Politico, “I can't imagine a world where Jack looks at [Gadde] and says, ‘No.’”

In fairness, digging in and impeding change is not Dorsey's thing, so Twitter may for the foreseeable future be synched to the clear-eyed moral



vision of Gadde, whose Twitter feed, @vijaya, is focused more on Amanda Gorman's poetry and public health infrastructure than on Bitcoin, a topic that preoccupies @jack.

And while Gadde tweets without reservation about human rights initiatives and progressive projects she admires, and brooks right-wing trolls, the CEO of Twitter continues to be singularly ill-suited to the world of barbs and quips he helped create. He openly prefers the otherworldly interconnectiveness of the service to the tweets that serve as its component parts. When Dorsey reflects on the dynamic of tweeting in interviews, he still hearkens back to the heady early days, when it was “amazing” to be able to tell friends all at once, by making phones buzz in their pockets, that you were headed to a yoga class.

When he had to show up to thread about the Trump ban on January 13, though, he showed up as himself. He expressed his uncertainty, spoke with little ego, and made it clear he was just another human, improvising on insufficient data, hoping to promote both peace and openness in a world where those values are sometimes at odds. However much Twitter might urge him to play oracle, @jack will refuse. The last sentence of the thread's intro tweet would make an excellent epitaph and an excellent koan: “Was this correct?”

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*This article appears in the March issue. [Subscribe now.](#)*

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