



## **Technically Wrong: Sexist Apps, Biased Algorithms, and Other Threats of Toxic Tech**

*Sara Wachter-Boettcher*

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A revealing look at how tech industry bias and blind spots get baked into digital products—and harm us all.

Buying groceries, tracking our health, finding a date: whatever we want to do, odds are that we can now do it online. But few of us ask why all these digital products are designed the way they are. It's time we change that. Many of the services we rely on are full of oversights, biases, and downright ethical nightmares: Chatbots that harass women. Signup forms that fail anyone who's not straight. Social media sites that send peppy messages about dead relatives. Algorithms that put more black people behind bars.

Sara Wachter-Boettcher takes an unflinching look at the values, processes, and assumptions that lead to these and other problems. *Technically Wrong* demystifies the tech industry, leaving those of us on the other side of the screen better prepared to make informed choices about the services we use—and demand more from the companies behind them.

## Technically Wrong: Sexist Apps, Biased Algorithms, and Other Threats of Toxic Tech Details

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# From Reader Review Technically Wrong: Sexist Apps, Biased Algorithms, and Other Threats of Toxic Tech for online ebook

**Kathy Reid says**

**A must read for anyone who designs digital experiences, and doesn't want to be an inadvertent dude-bro.**

Against a backdrop of increasingly ubiquitous technology, with every online interaction forcing us to expose parts of ourselves, Sara Wachter-Boettcher weaves a challenging narrative with ease. With ease, but not easily. Many of the topics covered are confronting, holding a lens to our internalised "blind spots, biases and outright ethical blunders".

As Wachter-Boettcher is at pains to highlight, all of this is not intentional - but the result of a lack of critical evaluation, thought and reflection on the consequences of seemingly minor technical design and development decisions. Over time, these compound to create systemic barriers to technology use and employment - feelings of dissonance for ethnic and gender minorities, increased frustration for those whose characteristics don't fit the personas the product was designed for, the invisibility of role models of diverse races and genders - and reinforcement that technology is the domain of rich, white, young men.

The examples that frame the narrative are disarming in their simplicity. The high school graduand whose Latino/Caucasian hyphenated surname doesn't fit into the form field. The person of mixed racial heritage who can't understand which one box to check on a form. The person who's gender non-conforming and who doesn't fit into the binary polarisation of 'Male' or 'Female'. Beware, these are not edge cases! The most powerful take-away for me personally from this text is that in design practice, edge cases are not the minority. They exist to make us recognise of the diversity of user base that we design for.

Think "stress cases" not "edge cases". If your design doesn't cater for stress cases, it's not a good design.

While we may have technical coding standards, and best practices that help our technical outputs be of high quality, as an industry and as a professional discipline, we have a long way to go in doing the same for user experience outputs. There are a finite number of ways to write a syntactically correct PHP function. Give me 100 form designers, and I will give you 100 different forms that provide 100 user experiences. And at least some of those 100 users will be left without "delight" - a nebulous buzzword for rating the success (or otherwise) of digital experiences.

Wachter-Boettcher takes precise aim at another seemingly innocuous technical detail - application defaults - exposing their (at best) benign, and, at times, malignant utilisation to manipulate users into freely submitting their personal data. It is designing not for delight, but for deception.

"Default settings can be helpful or deceptive, thoughtful or frustrating. But they're never neutral."

Here the clarion call for action is not aimed at technology developers themselves, but at users, urging us to be more careful, more critical, and more vocal about how applications interact with us.

Artificial intelligence and big data do not escape scrutiny. Wachter-Boettcher illustrates how algorithms can be inequitable - targeting or ignoring whole cohorts of people, depending on the (unquestioned) assumptions built into machine learning models. Big data is retrospective, but not necessarily predictive. Just because a

dataset showed a pattern in the past does not mean that that pattern will hold true in the future. Yet, governments, corporations and other large institutions are basing large policies, and practice areas on algorithms that remain opaque. Yet while responsibility for decision making might be able to be delegated to machines, accountability for how those decisions are made cannot be.

The parting thought of this book is that good intentions aren't enough. The implications and cascading consequences of seemingly minor design and development decisions need to be thought through, critically evaluated, and handled with grace, dignity and maturity. That will be delightful!

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### **Parker says**

This is a good solid introduction to a really important issue. Given the nature of the subject matter, a lot of the most striking anecdotes in here were covered by the tech press and so were widely circulated within the community of people observing this kind of thing closely. But even as somebody who pays a lot of attention to the problems described in this book, a few stories were new to me. Certainly, if this is not an area you are already pouring hours of each day into, there will be a lot of new and compelling stories for you.

In any case, this book is entertaining, readable, and persuasive.

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### **Katie says**

Must read for anyone who creates tech products - any product, really. Wachter-Boettcher tells story after story of how tech is only as inclusive, useful, and fair as the ideas behind it.

"Because, no matter how much tech companies talk about algorithms like they're nothing but advanced math, they always reflect the values of their creators: the programmers and product teams working in tech. And as we've seen time and again, the values that tech culture holds aren't neutral."

I would love to see more concrete and specific solutions, but the stories are sticky enough to help me keep inclusivity, privacy, and other needs at the front of my mind when designing and using products.

My personal biggest takeaways - beware demographic data in personas, look for stress cases instead of edge cases, don't trust Facebook, and read the fine print.

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### **Emily Finke says**

This book doesn't really cover anything new, if you've been following conversations about bias in technology in recent years. However, that really isn't a mark against it, since it's trying to be an introduction to the topic rather than an expansive deep dive. It's a really great primer on the topic, and I'll be recommending it to people who aren't necessarily conversant on inequality in technology, but are curious about where to start. I can't think of any other book that would suit that purpose quite as well.

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### **linhtalinhtinh says**

A good and short read. Plenty of examples, but mostly the famous ones on the internet - the author's alignment with the truly marginalized is limited, mostly with female/gays/transgender/nonwhites but still the educated, unlike O'Neil in Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy who places her heart towards the poor, the abused whose stories may not be heard at all, buried deep, powerless. The problems aren't less worthy to discuss, though. The sexist and racist culture is so embedded, the privileges so taken for granted, the arrogance and the belief that tech people are coolest and smartest and above everyone else so fierce. That needs to change.

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### **Elizabeth Grace says**

Wachter-Boettcher's book is a relatively thorough introduction to the many sins of the majority white, majority male silicon valley. Some of her anecdotes were so cringe-worthy, I felt a little guilty for reading them, like I was driving too slowly past a car accident, gawking. The chapter on Northpoint and their recidivism prediction software, COMPASS, was incredibly alarming. The racism of algorithms is a timely topic, and covered in greater depth elsewhere; what this book does is integrate it with the other abuses of the industry in design and advertising. I agree with another reviewer that a critique of capitalism could have been more explicit. It would help explain how a company as morally bankrupt as Uber came to be in the first place, and why it persists.

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### **Rachel says**

I want to qualify my rating of this book: If you haven't previously thought about sexism, racism, or other forms of discrimination in the tech industry, this is a five-star recommendation. However, as someone who regularly reads about this topic and pays attention to tech news, I encountered very little new information in this book. It was also a bit disappointing to see so much focus on recent big news stories (e.g. the Google Photos categorization fail, Uber sexism and spying, Facebook year in review) rather than a wider range of companies and more in-depth looks at what went wrong, how it happened, and how companies are or could be doing things differently. So I wasn't blown away by the book, but it holds valuable information for some folks and I just might be the wrong audience.

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### **John Norman says**

Well . . . This is another one of those funny books that is sort of a "5" and sort of a "3." The book broadly claims that the tech industry builds interfaces and products that are (not necessarily intentionally) biased. The book says that the main driver is the homogeneity of tech company investors and employees.

There is no doubt in my mind that this is true, and on that basis, I'd recommend this to anyone in or outside of tech. We product builders and designers are doing a crap job of acknowledging the incredibly broad types of people and styles of interaction out there. Because of tech's homogeneity, there's so much stuff that just isn't thought about critically (e.g., image analysis software not being able to analyze non-white faces). But as I'll get into it in a moment, I would very strongly recommend this to historians of technology as a little guide

to problems that deserve significantly more research. The author's a web consultant, but I think we need to bring out the scholars. There's good stuff here about geography, the 2010s -- more reports of personal experiences would make the story even more valuable. (I keep thinking about another book I reviewed: Tuco's *The Conversational Firm*, which shows how far we can get with ethnographical strategies.)

There are some arguments here that are very dear to my heart. For example, on p. 137 and chapter 3, the author notes how engineers and product designers will focus on the main experimental flow, and minimize the importance of "edge cases." For example, say 80% of the users are young, and only 20% are old (perhaps needing bigger fonts). Well, the company is going to focus on where the money is: So font-changing features may be downplayed. The author rightly stresses harm and consequences: Even though the 20% might not be where the money is, the negative consequences of not helping them out with a useful UI can cause a lot of damage. One area I have been concerned about is privacy and security in healthcare. Say a login code is sent to an email: But that email might go to a shared account. For the most part, this is probably not troubling: The user "opted in," supplying that email. But should we work harder to ensure that only the individual can access that account? What if it's a shared account and medical details about domestic violence make it to that address. Again, say the patient has signed a consent to allow that message to go via email to a particular address. Should that minority example make us very concerned to protect the "minority" user pattern? I think so. The book does a good job walking the reader through this.

But I have some concerns:

\* Geography: Time and time again, the examples lean towards west coast companies: Uber, Facebook, Twitter, etc. There are some exceptions. But I'd like to know: If the California tech culture is so bad, are there other places that are better?

\* Timespan: Is this a particularly bad moment? Wachter-Boettcher provides the appalling facts around the decline of women computer science majors (37% in 1984, 18% in 2014). "I can't pretend to know the precise reason for this shift" (p. 182). Me neither. But this book is so anchored in the present, it begs the question of how we would assess, say, the tech culture of the 80s. I bet it was better. But was it? Just as an example, back in the day, Ann Wollrath was the lead author on the original RMI article. Big stuff. What was the culture? It would mean a lot if Wollrath told us that it was the same back then. Then we might understand the core problem as a more broader ill.

\* Intentions: There are some good anecdotes here about how female voices are used for Siri, Alexa, and Google Maps (etc.) (pp. 36-38). Right. But what conclusion should we draw? "Women are expected to be more helpful than men . . . The more we rely on digital tools in everyday life, the more we bolster the message that women are society's 'helpers'" (p. 38). I get this. But then the author says: "Did the designers intend this? Probably not." I protest! Go out and interview the designers! What were their reasons? Apple, in particular, thinks hard about this stuff. What were the factors going into a female Siri, and how did they outweigh providing other Siris (male; accented; whatever)? I want to know. The book makes an insinuation, but I think there's a real research task to be performed. Bring out the ethnographers.

In large part, the book is driven by articles in the tech media. The next step is to get out there and start quoting people on their individual experiences, in order to test some claims (e.g., is the problem peculiarly tech in California in the 2010s? Or is it men in tech (more geography would help)? Or even a side-effect of the investment structure and capitalism (seems implicit in chapter 9) -- and, in particular, figure out where people are doing it right, and why. [The one positive example given in the book is Slack, but I'm not going to give much quarter there: Slack was produced by advertising and exploring the corporate customer's desire to control discourse in the company, not by inclusiveness.]

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### **Philipp says**

Recommended reading on the current (very current) state of the tech industry. Overlaps a little bit with and cites Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy, but focuses more on programmer and designer choices, assumptions and hidden biases instead of algorithms. First I'd thought of recommending it only to programmers - there's a bunch of stuff on personas and other design techniques that are not of interest to 'regular' humans - but then it branches out and goes into the role of the tech industry in daily life, fake news, concerted online harassment, and all the other acrid smoke from the garbage fire that is the modern WWW.

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### **Jill says**

I won this book in a giveaway. I work in the tech sector and was interested in this book because I am leading a digital transformation effort at my job and wanted to make sure I didn't fall into any of these traps. The book was not what I was thinking it was but boy were my eyes opened. I have worked in tech for 35 years. I'm a woman and have experienced the discrimination the book describes early in my career developing software for a utility. While I was raising my kids, I taught computers in college part-time then returned to the workforce when they were driving. I thought my days of discrimination were behind me but just last year it happened again. I was being groomed for a position to take over for my boss, the IT Director, when he retired. When he announced his retirement date, I was expecting the promotion but I didn't get it. Even though my boss was progressive, the good ol' boy network of the company, choose otherwise and now I report to someone who not only has never managed IT but has never worked in it. So I am training my boss. Toxic!

I didn't realize that software meant for the general public had such a narrow view of "normal". This book opened my eyes tremendously. I am ashamed of my industry.

This should be required reading for anyone studying in the tech field in college. I have forwarded this title to the college at which I taught.

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### **Rachel Moyes says**

Some parts of it dragged, but overall, it was terrifying. I thought it made especially interesting points about the necessity of training algorithms with unbiased training data so as not to perpetuate past injustices, the myth of the "tech industry" monoculture, and the way free speech on the internet can quickly turn into hate speech.

When you get a bunch of the same types of people making choices, it's easy for them to devalue or overlook the experience of others. I think that is the joy and difficulty of the twenty-first century. We are moving into a society that acknowledges all life experiences, that doesn't say, "Well, you're not in the average, so you can be ignored." That means things are more complicated, and it's teaching all of us to be less selfish, to have more empathy, and to be forced to consider and value those different from us.

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### **Amy says**

This was a very thoughtful exploration of how bias is built into the tech products we use every day, and how that bias subsequently shapes and reinforces behaviors offline. Wachter-Boettcher explores not just how technology is built, but also how the organizations that build it perpetuate particular cultural norms that just don't work for many of the people they supposedly serve. As someone who works in technology as a behavior change designer, I'll return to this book for reflection in the future. This is also a book I can see myself giving to others who either want or need to think about the many ways tech consumes, reiterates, and reinforces harmful biases.

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### **Kylie says**

This is one of those books that I hope gets made into mandatory reading in STEM courses.

It does a little good job of highlighting a lot of the recent problems with the current state of "tech" and the dangerous place it's in right now. It was kind of weird to read something talking about a bunch of internet drama that I remember watching unfold in real time. Also nice to learn more of the factors leading up to the incidents.

Overall there wasn't much in this book that I hadn't heard about before but it's well presented and analyzed here. So I would highly recommend it for anyone who doesn't know how many problems are caused by the inherent biases in technology development.

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### **Ashley says**

Some of the claims this book makes are overly broad, but taken as a whole, this book explains how technology is built on practices of discrimination. It's not just the homogeneity of Silicon Valley—it's that cognitive biases and discriminatory ideologies are built into the very programming of the tech we use to run our lives. And that's a huge problem because technology shapes our cultural landscape. The author doesn't say much that a savvy observer hasn't noticed on her own, but she brings it all together in a cohesive, imminently readable package. I think anyone interested in the unconscious ways technology influences our lives would love this book.

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### **Katie Kovalcin says**

This book is a must read for anyone who uses technology in their daily lives. Sara's writing is so approachable and demystifies tech with examples of how biases in applications affect all of us. It was refreshing to read such an honest critique of the tech-focused world we live in. I couldn't put it down, I read it in one sitting!

