is filled predominantly with minority ethnic faces (likely to be the case given the U.S. criminal justice system's longstanding predilection for ethnic minority incarceration), your face is probably less likely to be recognized if you are white.

Additionally, if you are black, your face potentially stands a higher chance of being falsely recognized because of the limitations of facial recognition software that are understood to work more poorly with black faces. This is the likely result of a photographic industry so obsessed with representing whiteness that it neglected to develop adequate techniques for representing anything else. This last point is fantastically rendered in chapter three, "Coded Exposure," where Benjamin situates this complexity within the broader history of visual technologies, including the Kodak color cards first used in the 1950s to send to photo labs to ensure the coloration of prints was correctly calibrated. The fact that the women featured on these cards were always white would set the standard for photography. Only later, when the profitability of overseas markets became apparent, would the color cards feature women of color.

It is through this impressive tying together of history and the present that the potentially expansive scope of race critical code studies comes into view. Benjamin situates technologies like facial recognition AI within the broader sociomaterial structures that rendered it technically possible and that now sustain it. The software is fed with data that mirror the inequities of the social world, reproducing those very inequities. But while we could call a person a racist, we could never describe a computer as such—could we?

NOW TO IMAGINE A DIFFERENT WORLD

But Benjamin does not make the same kind of category error that many fall into by suggesting that we should instead simply produce neutral technologies. Technologies have politics and always will. But we can have a say in what those politics will be. It is in this way that the entire monograph seems buoyed by the possibility that things do not have to be like this. Technologies' existence, always and only a manifestation of the sociomaterial processes that dreamt, funded, and built them into the world, is never inevitable.

The answer, from Benjamin's perspective, is not simply to steer more people of color into the science, technology, and engineering professions. Nor can we rely on the laudable resistances of technologists already working within the industry, who identify and then agitate against what they deem to be unsavory coded inequities, because responses coming out of the technology industry alone will inevitably be piecemeal. They must, Benjamin concludes, be coupled with more.

A truly inter- and extradisciplinary engagement is required, where technologists work alongside the arts and humanities and crucially, social justice organizations. So too would we need a reorientation from efficiency to equity, from market imperatives to social good. It is a grand task that Benjamin lays out before us but a vital agenda to set. It also requires us to imagine: If technologies and the world they have a hand in producing could have been another way, then what way could it have been? We cannot simply critique but must conjoin this, as Benjamin argues, with "creative alternatives" (2019:197).

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Interrogating Innovation

Ruha Benjamin
Race after Technology: Abolitionist Tools for the New Jim Code. Cambridge, UK: Polity, 2019. 285 pp. $64.95. ISBN 1509526390

Reviewed by: Anne Pollock, *King's College London*
DOI: 10.1177/2332649220942519

The etymological meaning of *innovation* is to "to renew or to change." *Innovation* as a term today carries a positive valence, but this was not the case

when the term emerged in the sixteenth century, when it was a pejorative word for accusations of breaking with tradition. It was the rise of industrialization and capitalism that created the conditions for a consensus that throwing off tradition was a good thing. Today, Silicon Valley's entrepreneurs style themselves as rebels with their "disruptive innovations." However, innovation does not start from scratch, from a blank terrain: It operates on existing structures even as it modifies them. So what exactly does technological innovation break with? What does innovation leave intact or even entrench?

The existing and imaginative scope of innovation in the context of existing structures is a central theme of Ruha Benjamin's absolutely vital *Race after Technology.* A key existing structure on which technology companies build is racial inequality. Even as tech industries bring change, racial inequality is renewed, not eradicated. Indeed, it can even become more insidiously entrenched, in what Benjamin evocatively calls "the New Jim Code." Technology still sorts by race but does so through opaque algorithmic processes rather than signs on water fountains labeled "whites only." As Benjamin highlights, "The issue is not simply that innovation and inequity go hand in hand but that a view of technology as value-free means that we are less likely to question the New Jim Code in the same way we would the unjust laws of a previous era, assuming in the process that our hands are clean" (2019:69).

The notion that innovation is inherently good is a key ideology that Benjamin challenges. As she points out, "the dominant ethos in this arena is best expressed by Facebook's original motto: 'Move Fast and Break Things.' To which we should ask: *What about the people and places broken in the process*?" (2019:13). The distribution of that destruction is not even because the system is such that those who are already marginalized are the ones who get most broken—not least Amazon warehouse workers subjected to inhumane working conditions in a region made unaffordable to live in by the tech industry itself. Instead, Benjamin argues that we should "*Move slower and protect people*" (2019:15) and "*Move slower and empower people*" (2019:17).

In its critique of the valorization of technological "progress," *Race after Technology* has a great deal of continuity with Benjamin's (2013) first book, *People's Science*. Grappling with the politics of stem cell research, Benjamin found that the same social milieu and putatively democratic process that saw limitless potential in regenerative medicine and dedicated tremendous public funding to fostering it also took for granted that in the market-driven health care system, not everyone could have meaningful access to even basic health care. Stem cell advocates articulated themselves as challenging moral boundaries in the service of biotechnical innovation, but they took for granted as inevitable the immoral inequalities in who might actually be in a position to benefit. In *Race after Technology*, digital tech follows a similar path: "A narrow investment in technological innovation necessarily displaces a broader set of social interests" (2019:79).

"Innovation" is held up as a social good, but in the digital sphere as in the biotech one, its priorities are set by much narrower interests. *Race after Technology* includes a beautifully evocative example from the history of technology, specifically, the development of color photography (2019:103–109). The exposure techniques that film companies developed were racist by design because they were optimized for white faces not dark ones. Of course, African Americans complained about this—for example, parents of children in class pictures—but their concerns were not taken seriously by the technology's designers. There were two sets of actors who could successfully demand technological improvement: oppressive states (especially the creators of "passbooks" in apartheid South Africa) and major commercial interests (e.g., manufacturers of products such as chocolate, who wanted a richer range of browns for advertisements). Innovators serve markets but with a strong incentive to attend most closely not to consumers in general but to particular deep-pocketed interests.

Benjamin persuasively argues that individually oriented solutions like European Union privacy protection laws will not reorient technology companies toward the authentically *public* good (2019:187–188). Indeed, as Benjamin points out, those data privacy laws have an explicit exception for governments in pursuit of "crime" (2019:188). In light of the role that criminalization and mass incarceration plays in perpetuating racial inequality—Benjamin's concept of *the new Jim Code* is a reference to Michelle Alexander's (2010) *the new Jim Crow* (2010)—this exemption for control of alleged crime should provoke serious concern. The perverting power of racist states and unequal markets is a key reason that for those concerned about racial justice, *consumer rights* can never replace *civil rights*. Questions of innovation are always political questions, and Benjamin provides invaluable tools for beginning to imagine critical alternatives.

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Always Question the Hype

Ruha Benjamin
Race after Technology: Abolitionist Tools for the New Jim Code. Cambridge, UK: Polity, 2019. 285 pp. $64.95.
ISBN 1509526390

Reviewed by: Jessie Daniels, *Hunter College and The Graduate Center, City University of New York (CUNY)*

DOI: 10.1177/2332649220942520

"We are living in the future we always dreamed of. . . . AI is empowering us to change the world we see. . . . So here's the question: What will you do with it?" These words from the musician and actor, Common, voiced in a 2018 Microsoft advertisement beckon the listener to embrace the "possibility, adaptability, and capability" of algorithmic technology and to ignore its dangers. The image of Common, an African American man, as the personification of this message serves to reassure the viewer that the future of which he speaks will be a racially inclusive one.

Ruha Benjamin explodes the myths in the Microsoft advertisement (2019:21–22), and so much more, in her *Race after Technology: Abolitionist Tools for the New Jim Code.* Her goal in this book is an ambitious one, to map the way that "tech fixes often hide, speed up, and even deepen discrimination while appearing to be neutral or benevolent when compared to the racism of a previous era" (2019:11). Fortunately for all of us interested in the connections between race and technology, Benjamin achieves this goal. The central metaphor of the book, "the new Jim Code," is a riff on Michelle Alexander's (2010) groundbreaking *The New Jim Crow*, and as Benjamin explains, this is to meant to honor and extend that work by demonstrating the ways that *code*, the umbrella term for machine learning, AI, algorithms and the Internet of Things, works as systematically as legal codes do to legitimize and reinforce antiblackness.

In accessible prose, Benjamin tackles theoretically dense subjects in chapters one through four on "Engineered Inequity," "Default Discrimination," "Coded Exposure," and "Technological Benevolence." In these, she lays out how racism works when it is encoded into algorithms designed to make our lives "better, faster, fairer." For example, in chapter four, "Technological Benevolence," Benjamin takes up the issue of employment discrimination, which is widely documented by sociologists and is an area that companies, like HireVue, want to address. As Benjamin describes it, HireVue wants to "reduce unconscious bias and promote diversity in the workplace" by using a machine learning program that analyzes video-recorded interviews with applicants (2019:100). Yet, the push for "data-driven talent decisions" is fraught when it comes to the nuances of race and gender, as when Amazon stopped using an algorithm in its hiring because it favored men 5:1 over women. And, as Benjamin observes, "given tech industry demographics, the training data were likely much more imbalanced by race than by gender" (2019:101–102). The idea of "training data," that is, the data that are entered into computer algorithms for the machine to learn, is central to how this kind of discrimination works. When there is a pattern of discrimination in the social world, it shapes the kind of data available there is to use. In the case of Amazon, the training data consisted of the previous 10 years of job applications the company had received. If those applications are skewed in a particular way (white men), then the algorithm built to assess future applications will use that training data as the standard. As Benjamin writes at the end of Chapter 1, following a discussion of racist robots,

> Ultimately the danger of the New Jim Code positioning is that existing social biases are reinforced—yes. But new methods of social control are produced as well. . . . It means that whenever we hear the promises of tech being extolled, our antennae should pop up to question all that hype of "better, faster, fairer," might be hiding and make us ignore. And, when bias and inequity come to light, "lack of intention" to harm is not a viable alibi. (Pp. 52–53)

In short, Benjamin urges us to always critically examine the hype surrounding tech.

In Chapter 5, her last and most hopeful chapter, "Retooling Solidarity, Reimagining Justice," Benjamin takes up the idea of "abolitionist tools." Here again,