

An Ethical Crisis in Computing?

Moshe Y. Vardi

Rice University

vardi@cs.rice.edu

Follow me on Social Media

Trust

- ◆ **Trust:** "reliance on the integrity, strength, ability, surety, etc., of a person or thing"
 - Assumes an underlying risk, e.g., *trust-fall game*
 - Based on belief, not on knowledge

Rules of Games

- ◆ Every game has an "unwritten" rule
 - *Follow the rules of the game!*
- ◆ **Formally:** The rules of the game are common knowledge among the players.
- ◆ **In addition:** players must *trust* that other players follow the rules.
- ◆ **Example:** Traffic lights, *democracy*

The Economic Value of Trust

Martin Sandbu, Financial Times, 10/'18:

"Income per capita would have increased by 69 percent in Russia, 59 percent in Mexico, 30 percent in Yugoslavia... and 6 percent in the UK had these countries inherited the same level of trust as Sweden."

S. Nadella, Microsoft, 2/'19: "We can't afford not to build more trust in technology because our entire economic growth agenda can come to a standstill without it."

A Crisis of Trust

- ◆ To trust technology, you have to be familiar with the technology,
- ◆ Or you trust the people who developed the technology,
- ◆ Or you trust the company that developed the technology,
- ◆ Or you trust the industry that developed the technology.

What if it is "none of the above"?

Trust in Technology?

- ◆ **Security:** *Resiliency against attacks- dismal!*
 - Daily cybersecurity breaches
 - American democracy hacked
 - *A failure of the computing profession!*
- ◆ **Privacy:** *Surveillance is a feature, not a bug!*
- ◆ **Automated Decision making:** *Opaque!*
 - Explainable AI is a research area, not a commercial reality

Trust in Technology Vendors

- ◆ **Opacity:** Twitter's privacy policy - ~9K words!
- ◆ **Self-serving:** surveillance as a business model
- ◆ **Do what I say, not what I do:**
 - Tech execs limiting the use of tech by their own children.
 - "Silicon Valley pioneered self-driving cars. But some of its tech-savvy residents don't want them tested in their neighborhoods."
- ◆ **Marc Benioff, Salesforce's CEO, 6/'18:** "There is a crisis of trust concerning data privacy and cybersecurity."

The “Techlash”, I

Peggy Noonan, WSJ, Oct. 2017:

“Because all of their personal and financial information got hacked in the latest breach, because our country’s real overlords are in Silicon Valley and appear to be moral Martians who operate on some weird new postmodern ethical wavelength. And they’ll be the ones programming the robots that’ll soon take all the jobs!”

The “Techlash”, II

Niall Ferguson, WSJ, Jan. 2018:

“Most alarming was the morphing of cyberspace into Cyberia, not to mention the Cyber-caliphate: a dark and lawless realm where malevolent actors ranging from Russian trolls to pro-ISIS Twitter users could work with impunity to subvert the institutional foundations of democracy.”

The Techlash, III

◆ Thomas Friedman, *NY Times*, Oct. 2019:

"And, finally, there's the internet barons who for too long ignored the weaponization of social media, which is turning our free press into a house of mirrors, where citizens can no longer cognitively discern fact from fiction and make informed judgments essential for democracy."

A Long Time Ago, in a Galaxy Far Far Away



FP

news | analysis | podcasts | the magazine | channels | newsletters

SIGN IN

SUBSCRIBE

ARGUMENT

Can Silicon Valley Save the World?

Defeating global poverty is the latest start-up trend. But is there really an app for that?

BY CHARLES KENNY, JUSTIN SANDEFUR | JUNE 24, 2013, 4:54 AM



latest

The End of Volodymyr Zelensky's Honeymoon

FEBRUARY 26, 2020, 5:39 PM

Top U.S. Aid Chief Warns of Locust Devastation in East Africa

FEBRUARY 26, 2020, 4:54 PM

China's Military Can't Deliver on Humanitarian Promises

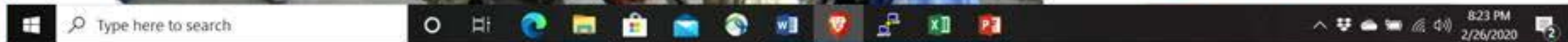
FEBRUARY 26, 2020, 4:33 PM

Malaysia's Geriatric Palace Intrigues Are Causing Political Turmoil

FEBRUARY 26, 2020, 3:35 PM

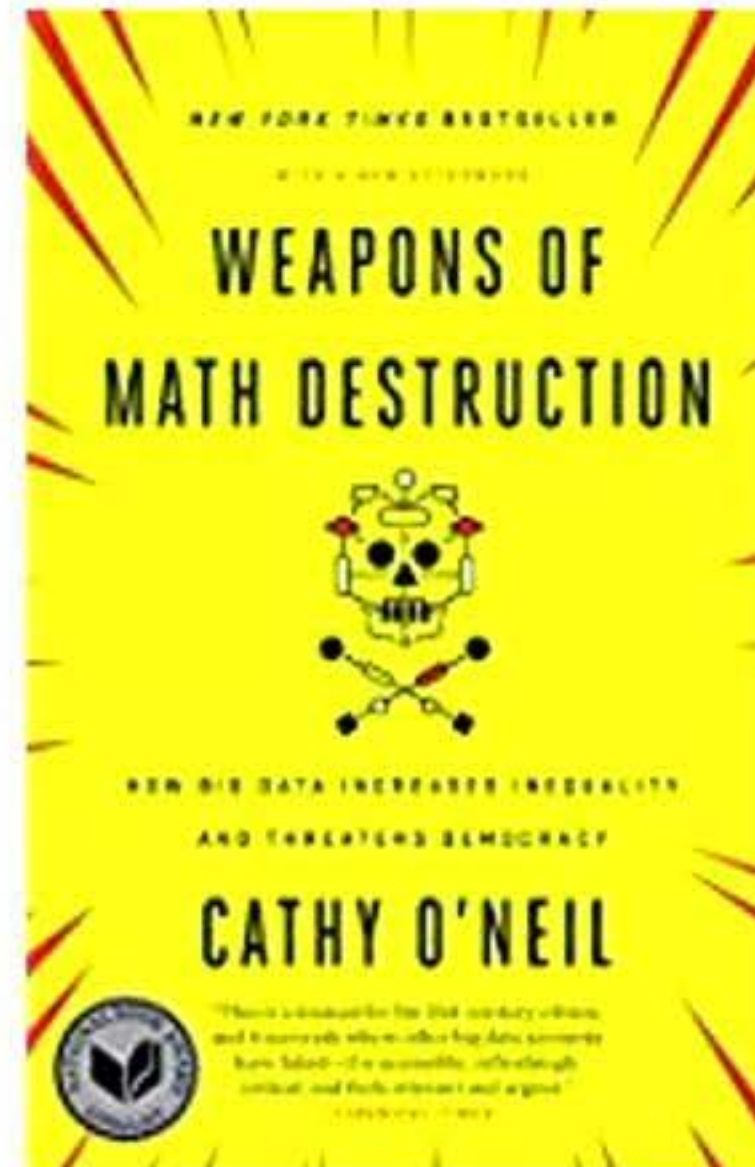
After Virus Peak, Beijing Tries to Get Back on Track

FEBRUARY 26, 2020, 1:25 PM



Weapons of Math Destruction, '17

"How Big Data Increases Inequality and Threatens Democracy"



ML and the Justice System, I

- ◆ **Shirley A. Jackson, President, RPI, April 2017:** "Can you foresee a day when smart machines, driven with artificial intelligences, will assist with courtroom fact-finding or, more controversially even, judicial decision-making?"
- ◆ **John G. Roberts, Chief Justice:** "It's a day that's here, and it's putting a significant strain on how the judiciary goes about doing things."
 - **NY Times:** "An Algorithm that Grants Freedom or Takes it Away."

ML and the Justice System, II

Many applications:

- ◆ Bail
- ◆ Sentencing
- ◆ Parole
- ◆ Separating children from parents
- ◆ ...

Proprietary Algorithms



Advancing Justice.



Embracing Community.

Machine Bias

ProPublica, May 2016: There's software used across the country to predict future criminals. And it's biased against blacks!



“The New Jim Crow”

Michelle Alexander, NYT, 11/'18: Recent criminal justice reforms contain the seeds of a frightening system of “e-carceration.”

“These advanced mathematical models appear colorblind on the surface but they are based on factors that are not only highly correlated with race and class, but are also significantly influenced by pervasive bias in the criminal justice system.”

Accuracy and Fairness

The accuracy, fairness, and limits of predicting recidivism, Science Advances, Jan. 2018:

"We show that the widely used commercial risk assessment software COMPAS is no more accurate or fair than predictions made by people with little or no criminal justice expertise. In addition, despite COMPAS's collection of 137 features, the same accuracy can be achieved with a simple linear classifier with only two features."

AI Faces Reproducibility Crisis

Matthew Hutson, *Science*, Feb. 2018: "The booming field of artificial intelligence (AI) is grappling with a replication crisis. Just because algorithms are based on code doesn't mean experiments are easily replicated. Far from it. Unpublished codes and a sensitivity to training conditions have made it difficult for AI researchers to reproduce many key results."

“My Dog is a Very Well Trained Dog”

- ◆ My dog Fluffy has been trained to detect risk of recidivism.
- ◆ Its accuracy has even been tested!
- ◆ But it is a “black box” and does not provide explanations.



Question: Would you allow Fluffy to make parole decisions?

Our “Ender’s Game” Moment!

- ◆ *Ender’s Game*, Orson Scott Card, 1985:
 - Ender’s team engages in a series of computer-simulated battles, eventually destroying the enemy’s planet, only to learn then that the battles were very real and a real planet has been destroyed.
- ◆ We thought we are just playing with computers, only to find our technology at the center of everything!



An Ethics Crisis!

- ◆ *NYTimes, Feb. 2018*: "Tech's Ethical 'Dark Side': Harvard, Stanford and Others Want to Address It."
- ◆ *Boston Globe, March 2018*: "Computer science faces an ethics crisis. The Cambridge Analytica scandal proves it!"
- ◆ *NYTimes, Oct. 2018*: "Some think chief ethics officers could help technology companies navigate political and social questions."
- ◆ *VentureBeat, Jan. 2019*: "Facebook backs Institute for Ethics in Artificial Intelligence with \$7.5 million."

Social-Responsibility Panel

Computing-Research Association Meeting, 6/18:

- ◆ We live now in the world we have created!
- ◆ We can no longer pretend that we are making the world a "better place".
- ◆ What is our social responsibility as computing professionals?

Answers: ethics, ethics, ethics!

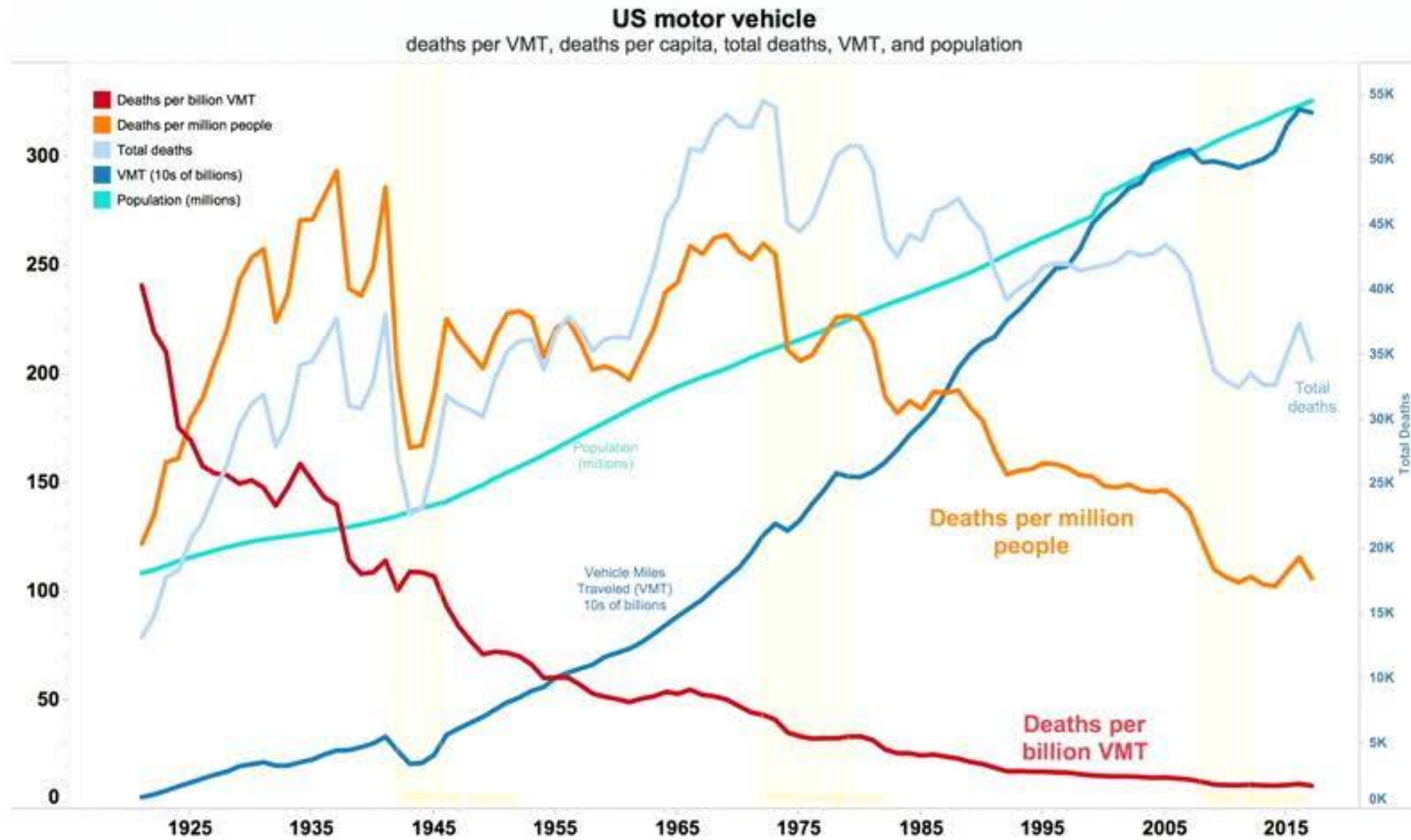
MYV: Really?

The Automobile

1908: *Ford Model T*



US Motor Vehicle Death



Traffic Safety Measures

- ◆ Crash avoidance, e.g., mirrors
- ◆ Driver assistance, e.g., anti-lock brakes
- ◆ Crashworthiness, e.g., airbags
- ◆ Pedestrian safety, e.g., crosswalks
- ◆ Car-to-car safety, e.g., traffic lights
- ◆ Laws, e.g., DWI

Traffic Safety Measures

- ◆ Crash avoidance, e.g., mirrors
- ◆ Driver assistance, e.g., anti-lock brakes
- ◆ Crashworthiness, e.g., airbags
- ◆ Pedestrian safety, e.g., crosswalks
- ◆ Car-to-car safety, e.g., traffic lights
- ◆ Laws, e.g., DWI

NOT: ethics training for drivers!

Traffic Safety Measures

- ◆ Crash avoidance, e.g., mirrors
- ◆ Driver assistance, e.g., anti-lock brakes
- ◆ Crashworthiness, e.g., airbags
- ◆ Pedestrian safety, e.g., crosswalks
- ◆ Car-to-car safety, e.g., traffic lights
- ◆ Laws, e.g., DWI

NOT: ethics training for drivers!

YES: public policy!

Example: Internet

- ◆ **Roots of the Internet:**
 - *The Well*: mid-80s dial-up bulletin board
 - *Usenet*: a worldwide distributed discussion bb
- ◆ **Counterculture**: anti-establishment cultural movement ("hippies")
- ◆ **"Mantra"**: "Information wants to be free!"
- ◆ **WWW**: Unfettered public sharing of information

Problem 1: How can you find information on the WWW?

Internet (ctd.)

- ◆ **Solution 1:** Directory (Yahoo) - does not scale!
- ◆ **Solution 2:** Search Engine (Altavista) - stank!
- ◆ **Solution 3:** Good search Engine (Google)

- ◆ **Problem 2:** How do you monetize free information?
- ◆ **Brilliant Solution:** *advertising* (copied from newspapers and TV)

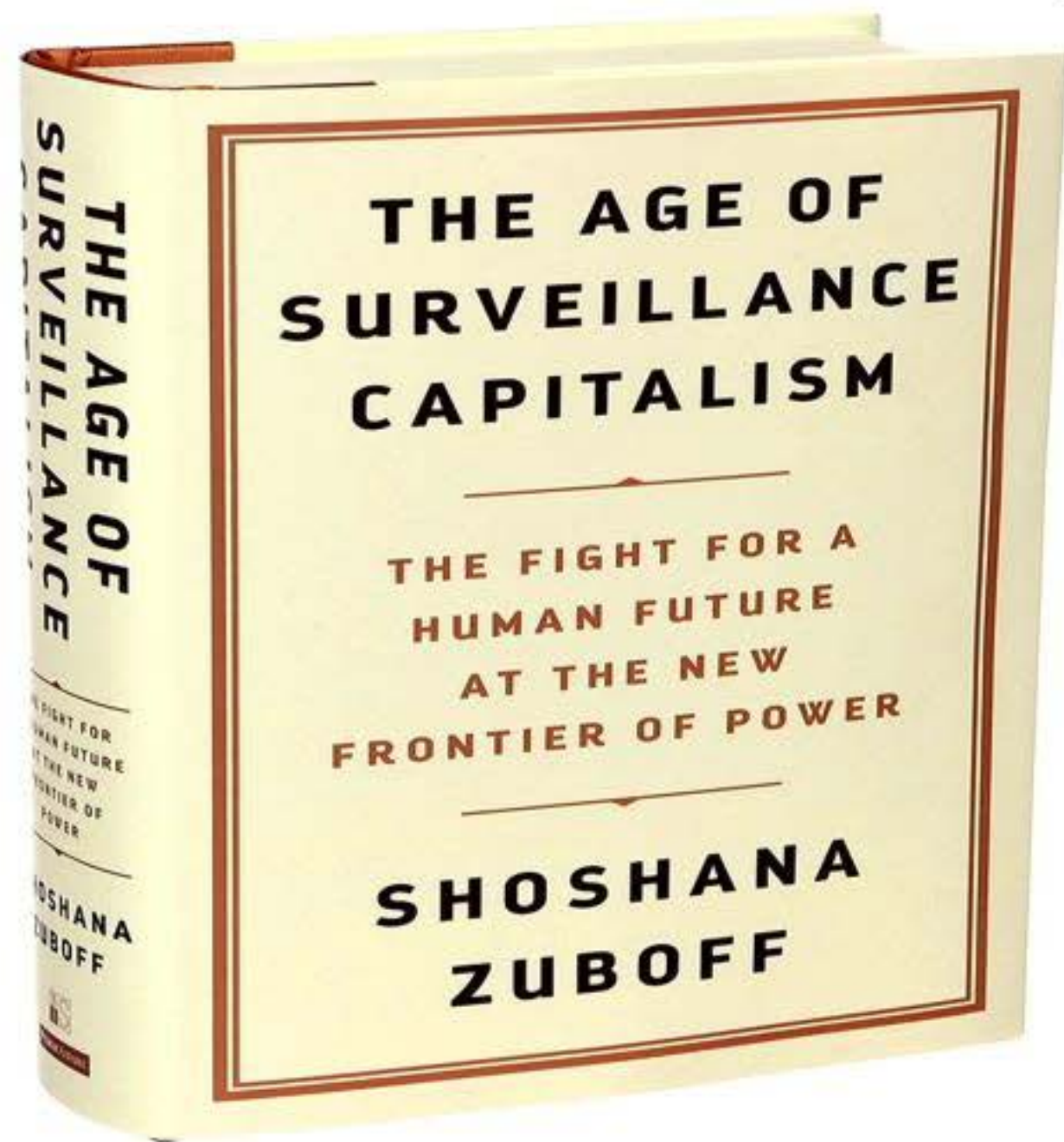
From Advertising to Surveillance

- ◆ **Observation:** Online advertising effectiveness is very low!
- ◆ **Solution:** *Micro-targeted* advertising - match ads with individual preferences.
- ◆ **Requirement:** *Personal data!*

Example: "A secret partnership with Mastercard illuminates the massive amounts of user data Google scrapes and sells—at times without their knowledge."

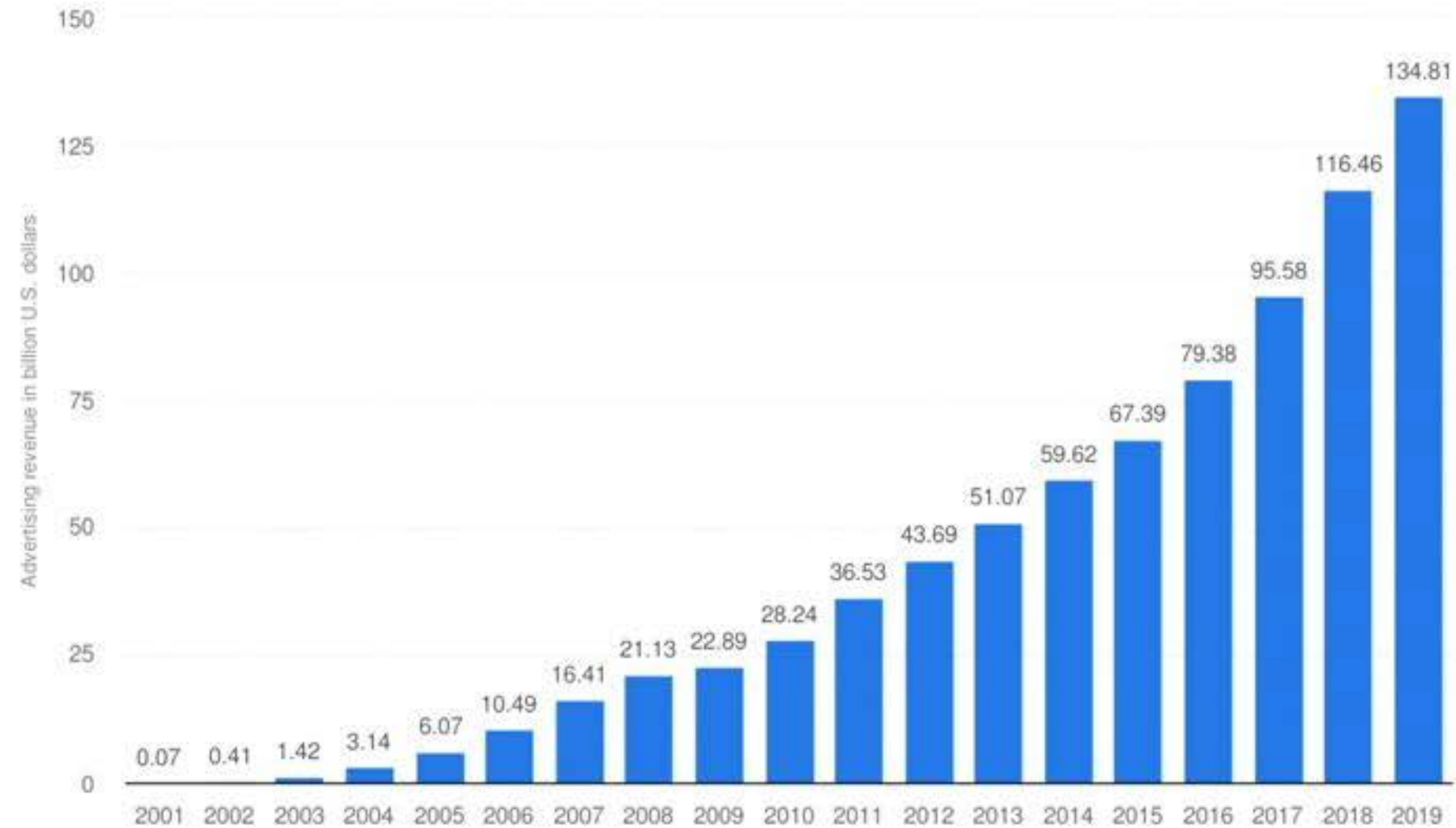
“If you’re not paying for it, you’re the product.”

“The combination of state surveillance and its capitalist counterpart means that digital technology is separating the citizens in all societies into two groups: the watchers (invisible, unknown, unaccountable) and the watched.”



Google's Business

Advertising revenue of Google from 2001 to 2019 (in billion U.S. dollars)



Sources
Google, Alphabet
© Statista 2020

Additional Information:
Worldwide: Google: 2001 to 2019

Business vs Ethics

- ◆ **Imagine:** We send Sergei Brin and Larry Page to an "ethics boot-camp". Will they ditch Google's advertising business?
- ◆ **Moshe Vardi, Jan. 2019:** "If society finds the surveillance business model offensive, then the remedy is public policy, in the form of laws and regulations, rather than an ethics outrage."

There is No Free Lunch!

Question 1: Are Google's service really free to consumers?

Question 2: How does Google make almost \$100B from advertising?

Answer 2: Advertisers pay!

Question 3: Where do advertisers get the \$\$\$?

Answer 3: From consumers!

Answer 1: Consumers pay for Google services, but in a totally *opaque* way!

Outcome: Mass surveillance!

Opacity

- ◆ **Standard argument:** People willingly give their data in exchange for "free" services.
- ◆ **Recent Pew Survey:**
 - 74% of US Facebook users did not know that FB maintains list of their traits and interests.
 - 51% are not comfortable with FB compiling this information.
 - 27% disagree with FB's characterization.
- ◆ **Question:** Have you read Gmail's "terms of service"?

The Destruction of the Information Market

- ◆ **Markets:** prices for goods and services are determined by sellers and buyers
 - A supremely efficient mechanism for value discovery!
- ◆ **Internet:** "How Hippies destroyed the Internet"
 - Haben die Hippies das Internet zerstört?

Question: Is the issue lack of *ethics*, or is it lack of *public policy*?

Example 2: Licensing Terms

Limitation of Liability: "To the extent not prohibited by applicable law, in no event shall XXX be liable for personal injury or any incidental, special, indirect, or consequential damages whatsoever, including, without limitation, damages for loss of profits, corruption or loss of data, failure to transmit or receive any data or information, business interruption or any other commercial damages or losses, arising out of, or related to your use, or inability to use the XXX software."

Strict Liability

Strict liability is a standard of liability under which a person is legally responsible for the consequences flowing from an activity even in the absence of fault or criminal intent on the part of the defendant. A prominent example of strict liability is *product liability*.

Product liability is the area of law in which those who make products available to the public are held responsible for the injuries those products cause. Although the word "product" has broad connotations, product liability is traditionally limited to products in the form of *tangible personal property*.

Laws of Hammurabi, ~2030 BCE

"If a builder has built a house for a man and has not made his work sound, and the house which he has built has fallen down and so caused the death of the householder, that builder shall be put to death."

"If it destroys property, he shall replace anything that it has destroyed; and, because he has not made sound the house which he has built and it has fallen down, he shall rebuild the house which has fallen down from his own property."

Accountability in a Computerized Society

Hellen Nissenbaum, 1996: "This essay warns of eroding accountability in computerized societies. It argues that assumptions about computing and features of situations in which computers are produced create barriers to accountability."

Recommendations: An explicit standard of care, strict producer liability, ...

Question: Is the issue lack of *ethics*, or is it lack of *public policy*?

Example 2: Licensing Terms

Limitation of Liability: "To the extent not prohibited by applicable law, in no event shall XXX be liable for personal injury or any incidental, special, indirect, or consequential damages whatsoever, including, without limitation, damages for loss of profits, corruption or loss of data, failure to transmit or receive any data or information, business interruption or any other commercial damages or losses, arising out of, or related to your use, or inability to use the XXX software."

Accountability in a Computerized Society

Hellen Nissenbaum, 1996: "This essay warns of eroding accountability in computerized societies. It argues that assumptions about computing and features of situations in which computers are produced create barriers to accountability."

Recommendations: An explicit standard of care, strict producer liability, ...

Question: Is the issue lack of *ethics*, or is it lack of *public policy*?

Why No IT public policy?

- ◆ Tech 2020: >\$5T in market capitalization!
- ◆ The IT industry has successfully lobbied against any attempt to legislate/regulate IT public policy under the mantra "*regulation stifles innovation*".
 - *Wired*, 09/'18: "The case against Elon Musk will chill innovation!"

A Techno-Utopian Culture

- ◆ **John Perry Barlow, 1996**, *A Declaration of the Independence of Cyberspace*: "*Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone.*"
- ◆ **But:** What happens in cyberspace does not stay in cyberspace!
 - *Imagine:* A cyberattack on the US power grid
 - **WSJ:** "America's Electric Grid Has a Vulnerable Back Door—and Russia Walked Through It"
 - *Imagine:* A cyberattack on the US election system - see below

The Disruption Culture

- ◆ *C. Christensen, 1995: Disruptive Innovation* -- a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors.
 - Example: Disk-drive technology
- ◆ "Disruption" has become a Silicon Valley mantra!



From Disrupting to Breaking

- ◆ Facebook's motto (until 2014): "Move fast and break things. Unless you are breaking stuff, you are not moving fast enough."
- ◆ We now know:
 - FB's "frictionless sharing" enables massive dissemination of fake news.
 - Decisive impact on 2016 US elections!
- ◆ Kathleen H. Jamieson, 2018: *Cyberwar: How Russian Hackers and Trolls Helped Elect a President What We Don't, Can't, and Do Know*

“Criminality as a Business Model”

- ◆ The “Sharing” Economy is based on law breaking!
 - Most major cities require taxicabs to be licensed, safety-inspected, insured as for-hire vehicles and use taximeters; and there may also be requirements that the taxi driver be registered or accredited.
 - Commercial lodging is affected by regulations in many jurisdictions. Requirements can include acquiring business licenses, payment of transient occupancy tax and complying with building, city and zoning standards.
- ◆ **Imagine:** An app for illegal drug delivery.

Corporate Responsibility

- ◆ **Corporate Social Responsibility** (since 1960s):
 - A form of self-regulation
 - Sacrificing profits for social goals
 - **Corporate stakeholders:** shareholders, customers, employees, community
- ◆ **Shareholder Value** (since 1980s): *the ultimate measure of a company's success is the extent to which it enriches shareholders.*
 - **Milton Friedman, 1970:** "The social responsibility of a business is to increase its profits."
 - **Business Roundtable, 2019:** Back to stakeholders!

Technology is Driving the Future

- ◆ **Question:** Who is doing the steering?
 - **Answer:** Tech corporations!
 - **Marietje Schaake, Bloomberg, 1/'19:** "Beware of Tech Companies Playing Government"
- ◆ Technology has moved very fast, but public policy has lagged behind.
- ◆ *Innovation is not a goal; it is a means for societal progress!*

Ethics vs Public Policy

Is ethics important? Of course! I teach a course on computing, ethics, and society!

- ◆ Ethics should *inform* public policy.
 - **Chief Justice Earl Warren:** "In civilized life, the law floats in a sea of ethics."
- ◆ Balancing public policy and ethics is a delicate task, e.g., Prohibition and the Drug War.
- ◆ **Bottom Line:** Ethics is about *individual* responsibility, public policy is about *societal* responsibility.
 - The law is institutionalized; ethics is not.

Regulation is Coming!

- ◆ FT, 9/18/18: "Social media platforms drawn into regulatory and political net."
- ◆ Guardian, 9/19/18: "Time to regulate bitcoin, says Treasury committee report."
- ◆ WaPo Editorial, 1/'19: "Our privacy regime is broken. Congress needs to create new norms for a digital age."
- ◆ Tim Cook, Apple's CEO, 1/'19: "We all deserve control over our digital lives. That's why we must rein in the data brokers."
- ◆ Reuters, 1/'20: "Alphabet CEO backs temporary ban on facial recognition tech."

How to Regulate?

- ◆ **Caveat:** Smart regulation is hard!
 - Good governance is a necessary condition.
- ◆ **Different Approaches:**
 - US: Technology specific
 - Europe: Societal-impact specific
 - What about international treaties?
- ◆ **The Big Question:** Is Big Tech too big?
 - **Tim Wu, NYT, 11/'18:** "Be Afraid of Economic Bigness. Be Very Afraid".

Initial Policy Suggestions

- ◆ Plain Language Requirement for Terms/Licenses, e.g., "Securities Act Rule 421(d)"
- ◆ Regulation of Automated Decision Systems in the Judicial System
 - See "Regulating Automated Decision Making" by James Larus and Chris Hankin (CACM, 08/'18)
- ◆ A law that requires companies to disclose data breaches quickly.
- ◆ Require Internet companies to provide ad-free subscription option.

Computing for Social Good

- ◆ *Gottfried Wilhelm Leibniz, 1646–1716:*
` ` Mankind will then possess a new instrument that will enhance the capabilities of the mind to a far greater extent than optical instruments strengthen the eyes."
- ◆ *Ada Lovelace, 1843:* "I wish to add my mite towards expounding & interpreting the Almighty, & his laws & works, for the most effective use of mankind."

Fire: The Ur Technology



Pandora's Box



Camp Fire, CA, 2018



A New Rice Initiative

Technology, Culture, and Society

- ◆ Study how technology impacts society and culture
- ◆ Study how society should respond to such an impact
- ◆ **Three Legs:** research and scholarship, education, outreach

BMW on Technology

Don't be driven by technology. Drive it!