

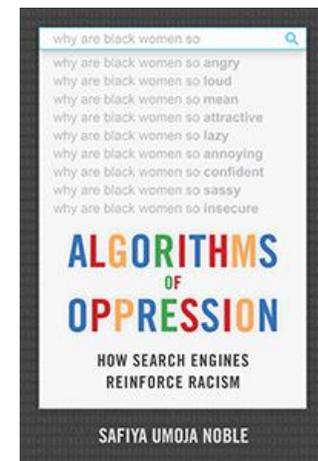
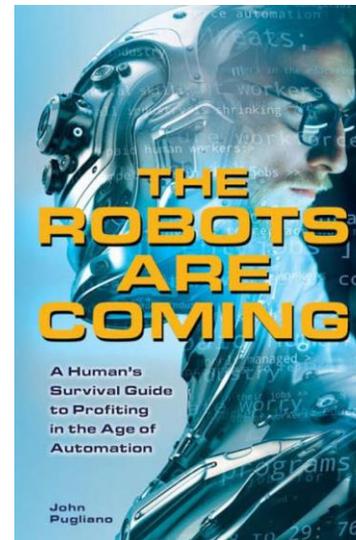
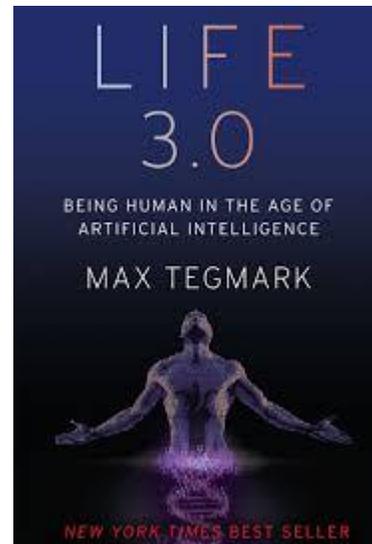
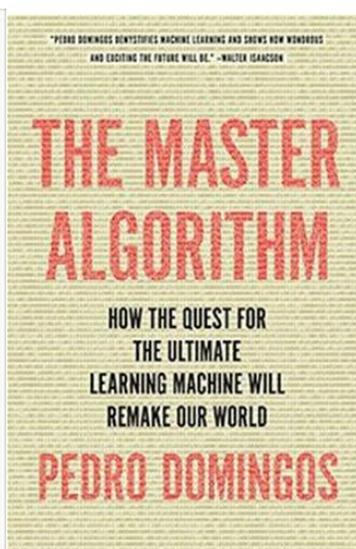
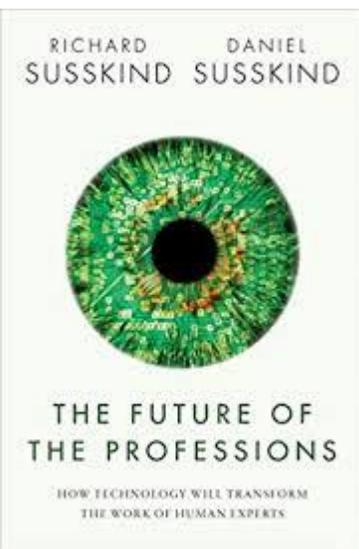
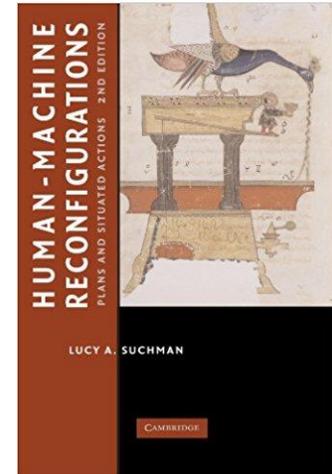
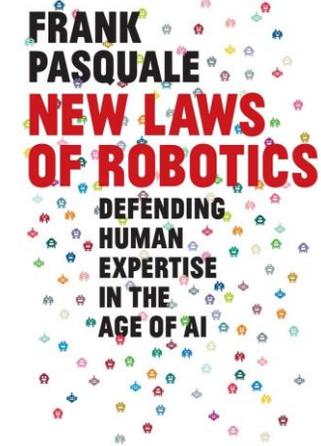
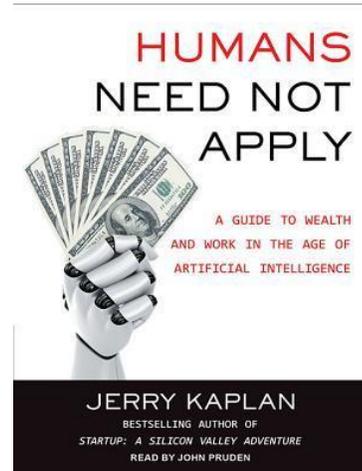
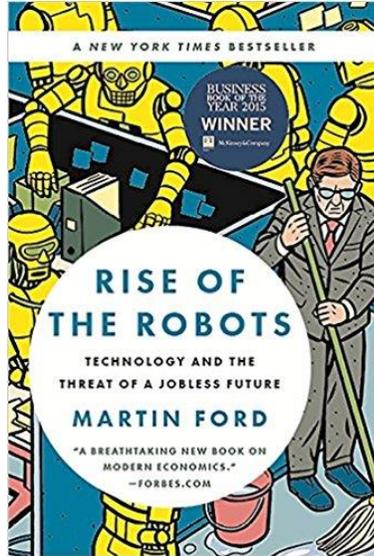
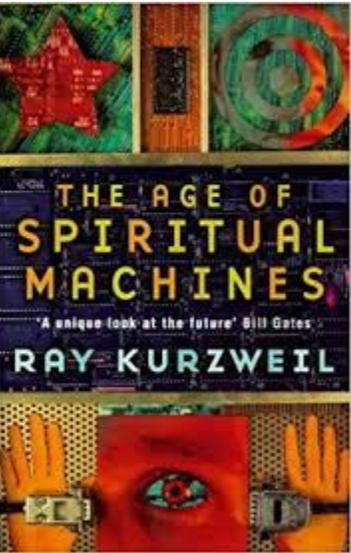
**FRANK  
PASQUALE  
NEW LAWS  
OF ROBOTICS**  
**DEFENDING  
HUMAN  
EXPERTISE  
IN THE  
AGE OF AI**

## *New Laws of Robotics* Book Launch

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- *The Future of Automation Post-Covid-19*
- Frank Pasquale
  - Professor of Law, Brooklyn Law School
  - Affiliate Fellow, Yale Information Society Project
  - Minderoo High Impact Distinguished Fellow, AI Now Institute
- Sept. 28, 2020
- @FrankPasquale on Twitter

# Rebalancing Automation Discourse





Places to Prioritize AI  
over IA (Intelligence  
Augmentation)

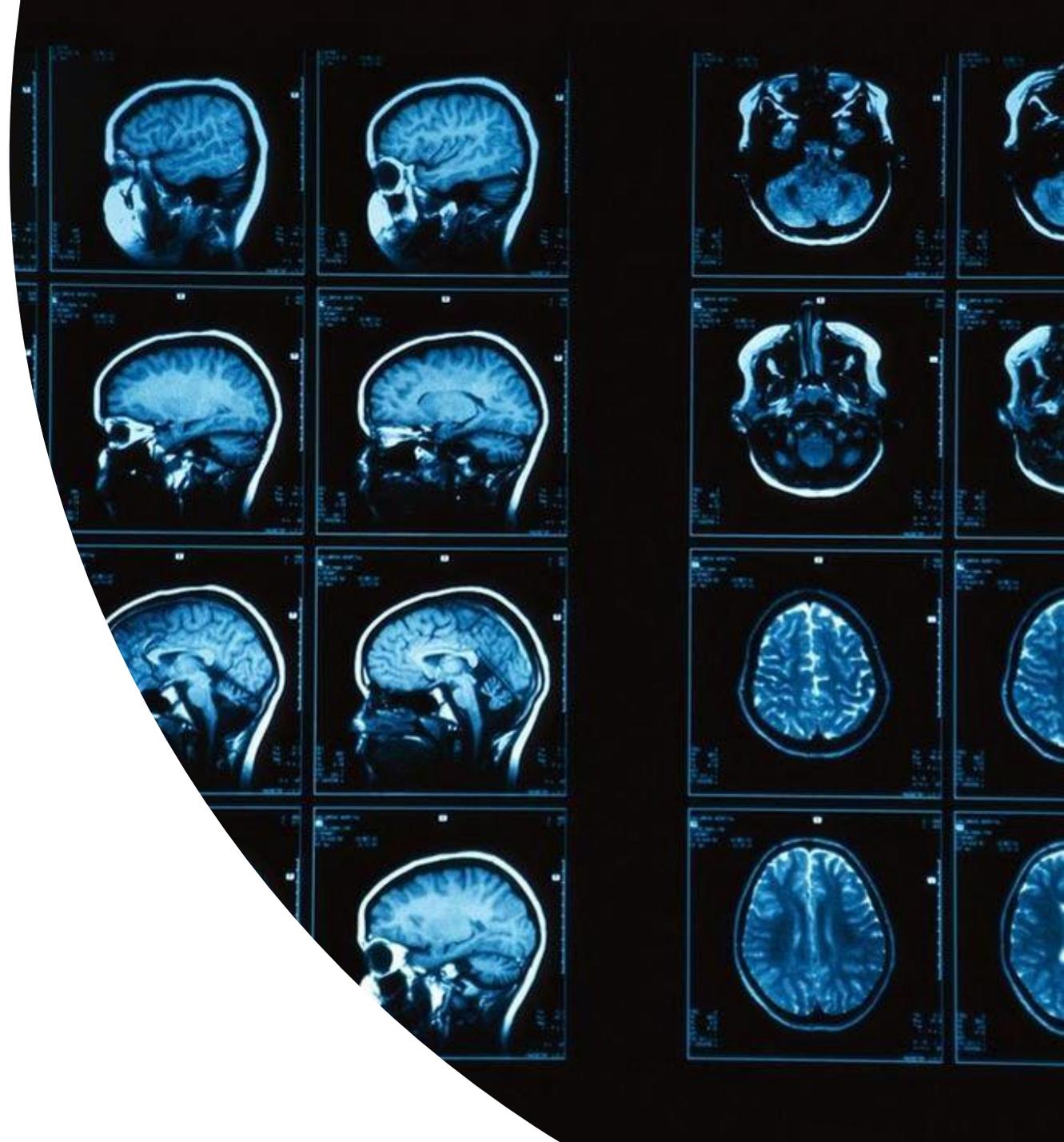
# Paradigm Cases for Rapid Automation

- Manufacturing
- Logistics
- Transport
- Mining
- Agriculture
- Medical testing, but...



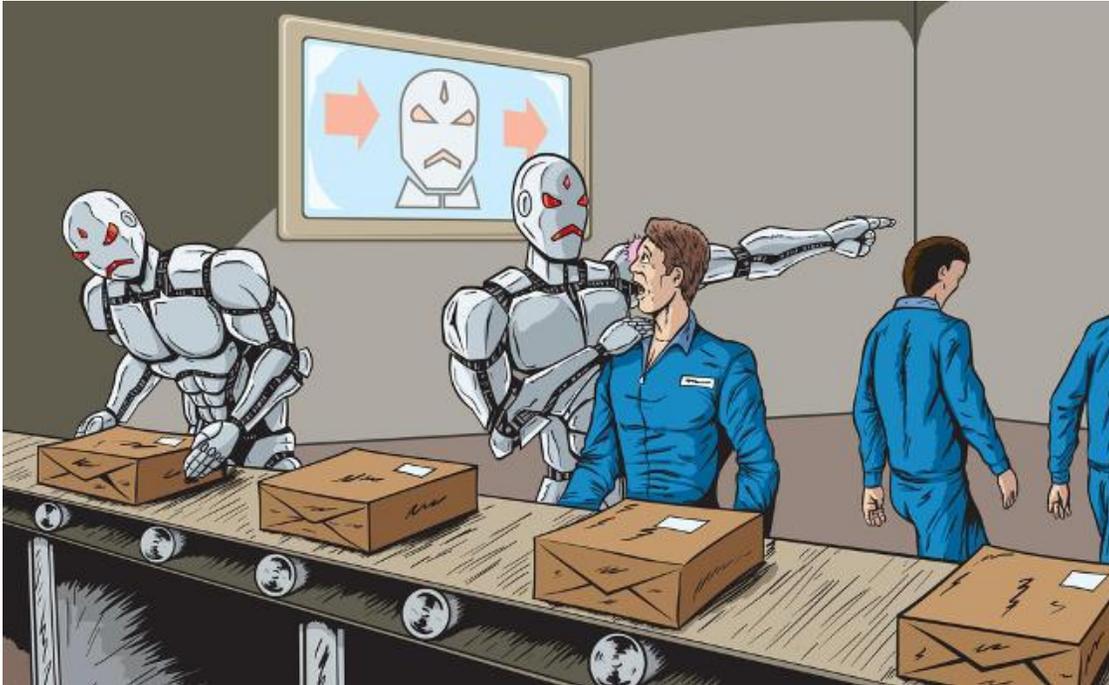
# ...Medicine in general is more than pattern recognition, stimulus, and response

- Richer results from the lab, new and better forms of imaging, genetic analysis, and other sources will need to be integrated into a coherent picture of a patient's state of illness.
- In Simon Head's thoughtful distinction, it will be a matter of practice, not predetermined process, to optimize medical responses to the new volumes and varieties of data.
- For the foreseeable future, technology complementing professionals (as opposed to substituting for them) is the key to advancing AI in medicine.



# New Laws of Robotics

- Automation has changed many aspects of life profoundly, and will continue to do so.



- But many forms of change now touted by technophiles are neither inevitable nor desirable.
- “Four New Laws of Robotics” posed as corrective
  - Complementarity: IA over AI in professions
  - Not counterfeiting humanity
  - Cooperation (anti-arms races)
  - Responsibility (attribution)

# AI Governance & Algorithmic Accountability

- Governance of artificial intelligence



Office of the  
Privacy Commissioner  
of Canada

**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce



- Governance by artificial intelligence



Expect the lowest possible  
interest rates and best terms.

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loans with good rates.

Only secured loans are given  
for people in this range.



# Two Waves of Algorithmic Accountability in Medical AI and Robotics

- **First Wave: Improving accuracy, fairness, safety, & efficacy in extant & developing technology.**

- Machine learning in dermatology
- Learning health care systems
- Robotic surgery

- **Second Wave: Questioning certain trends in health technology.**

- Comprehensive surveillance tools
- Automated therapy
- Robotic caregiving

# DEEP MEDICINE

HOW ARTIFICIAL  
INTELLIGENCE  
CAN MAKE  
HEALTHCARE  
HUMAN AGAIN

ERIC TOPOL

With a foreword by  
ABRAHAM VERGHESE,  
author of *Cutting for Stone*



## AI, ML, and Pattern Recognition in Dermatology

- AI may eventually detect incipient melanoma better than dermatologists.
- However, extant databases may not have enough representation from minorities to match their performance at diagnosing the most common skin type.
- What if
  - Such data becomes available...
  - But is an “add-on,” and is declined by a hospital...
  - Whose radiology department fails to detect malignancy that could have been detected with the additional training set?
    - Adapted from: Adewole S. Adamson & Avery Smith, *Machine Learning and Health Care Disparities in Dermatology*, 154 JAMA DERMATOLOGY 1247 (2018).

# *Thompson v. Nason &* Corporate Negligence

- “Corporate negligence is a doctrine under which the hospital is liable if it fails to uphold the proper standard of care owed the patient, which is to ensure the patient's safety and well-being while at the hospital.”
  - (1) a duty to use reasonable care in the maintenance of safe and adequate facilities and equipment
  - (2) a duty to select and retain only competent physicians
  - (3) a duty to oversee all persons who practice medicine within its walls as to patient care &
  - (4) **a duty to formulate, adopt and enforce adequate rules and policies to ensure quality care for the patients**





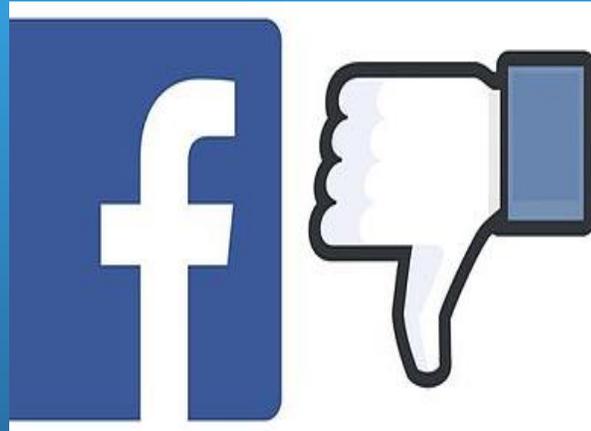
Two Types of Robotics Deployment in Education

# AI in “Journalism:” Proliferation of Twitter Bots



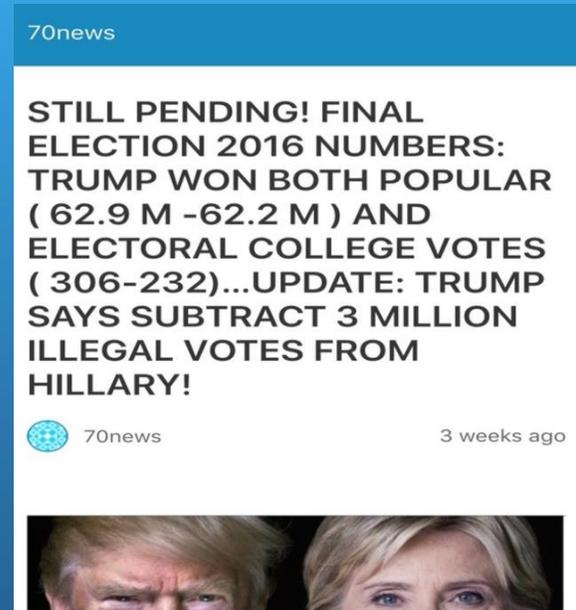
- Academics estimated that tens of thousands of the tweets “written” during the second 2016 US presidential debate were created by bots.
- Bots like the one in the image to the left can promote fake news and flood hash tags.

# Fake Content on Facebook



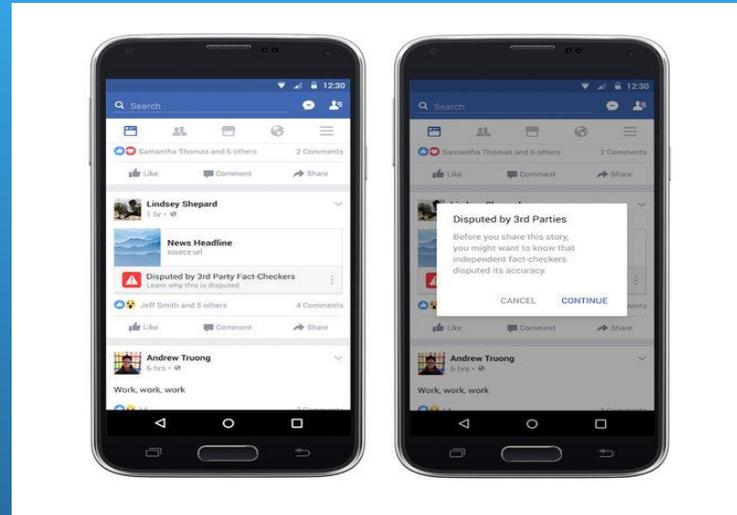
- Fake content generators and hard-core partisan sites flooded newsfeeds with lies and propaganda.

# All Looks the Same



- Google and Facebook mobile applications produce versions of articles that appear more authoritative than html versions.

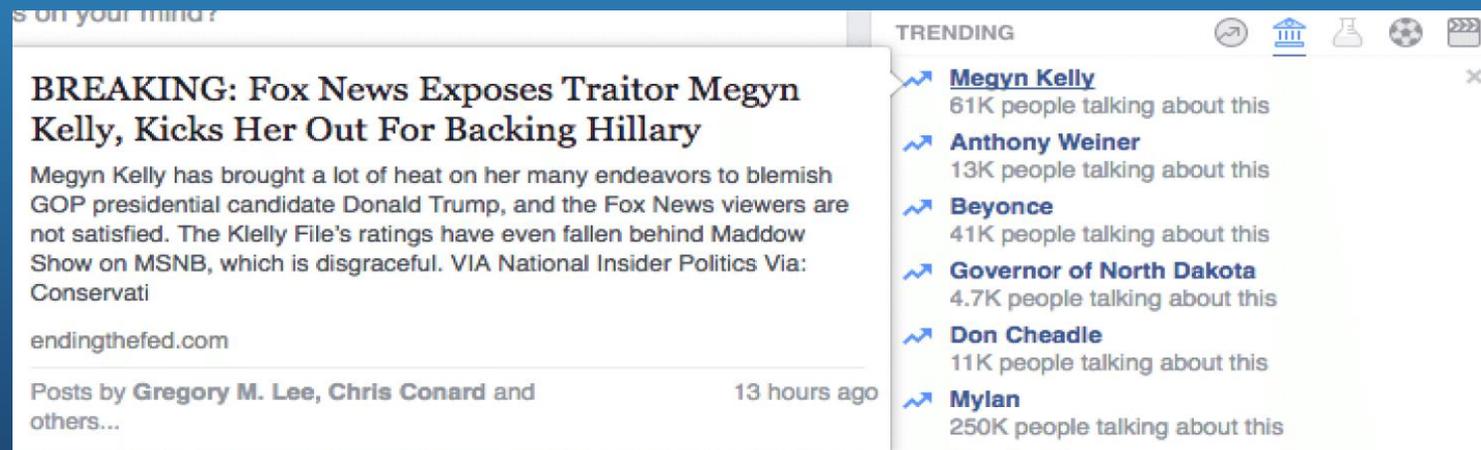
# Taking Responsibility



- Third-party fact checker features like the one demonstrated above are not adequate.
- Facebook is more than just a platform and thus needs to take editorial responsibility.

# Restore Human Editors

- Failure to keep human editors in the loop can lead to the proliferation of fake news articles.
- Fake news can slip through even Facebook's most sophisticated sorting algorithms.



s on your mind?

**BREAKING: Fox News Exposes Traitor Megyn Kelly, Kicks Her Out For Backing Hillary**

Megyn Kelly has brought a lot of heat on her many endeavors to blemish GOP presidential candidate Donald Trump, and the Fox News viewers are not satisfied. The Kelly File's ratings have even fallen behind Maddow Show on MSNB, which is disgraceful. VIA National Insider Politics Via: Conservati

endingthefed.com

Posts by **Gregory M. Lee, Chris Conard** and others... 13 hours ago

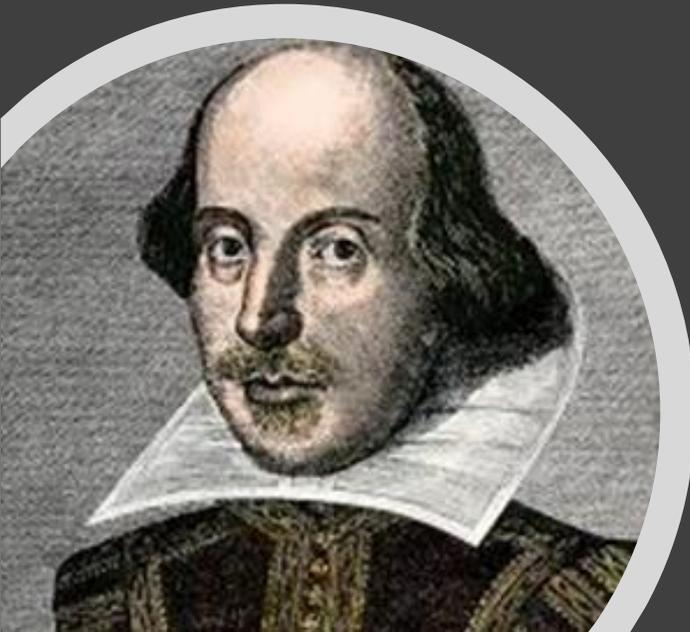
**TRENDING**

- **Megyn Kelly**  
61K people talking about this
- **Anthony Weiner**  
13K people talking about this
- **Beyonce**  
41K people talking about this
- **Governor of North Dakota**  
4.7K people talking about this
- **Don Cheadle**  
11K people talking about this
- **Mylan**  
250K people talking about this

# Why invest in health, education, journalism, the arts, law, and other human services professions?

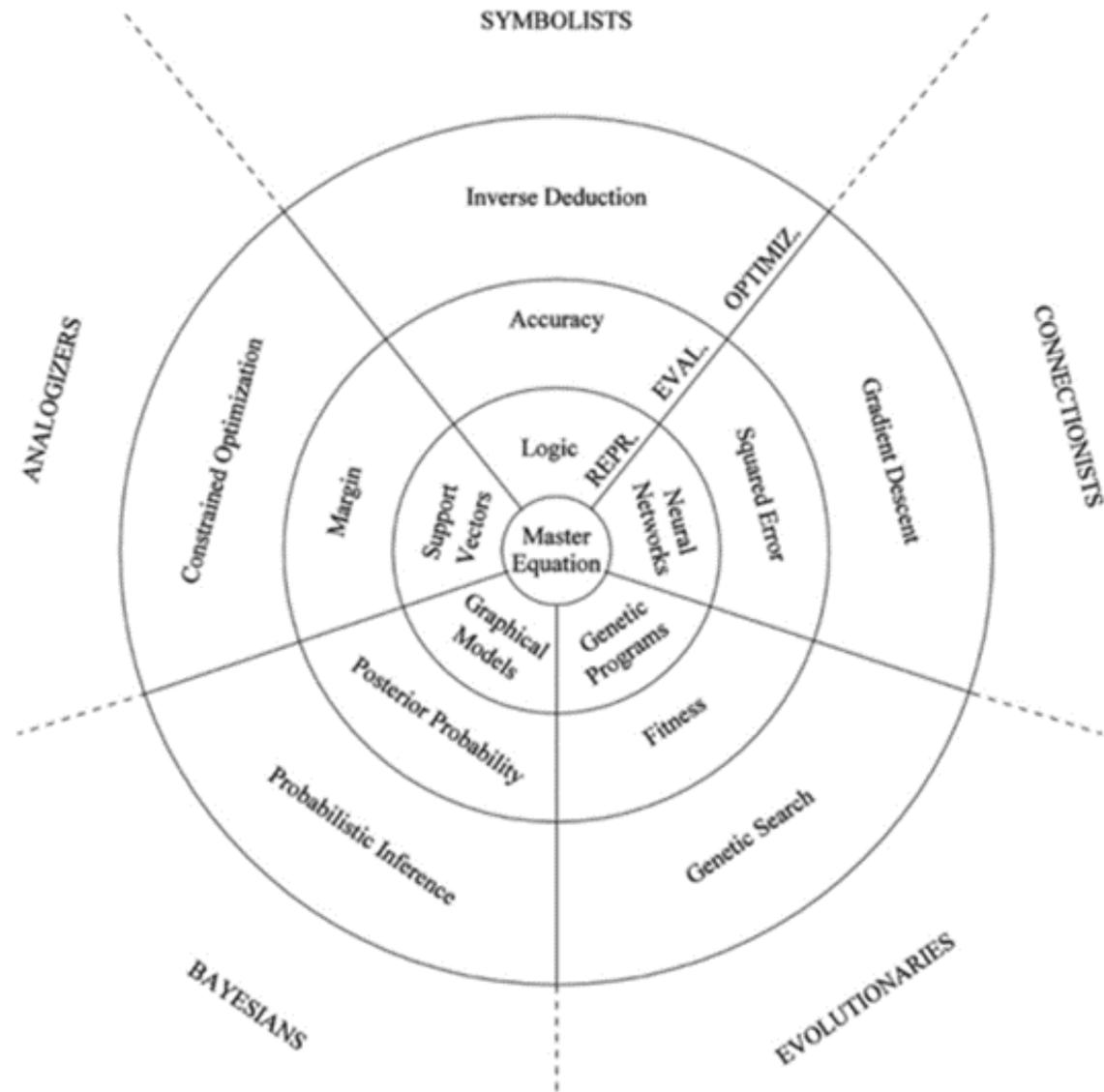
A question of co-governance of technological diffusion

- Doctors, nurses, and teachers often face very difficult conflicts of values — between, say, extending a patient's life, and assuring quality of life in the time remaining;
  - or between attending to disruptive students, or simply ordering them out of the classroom to ensure others can learn better.
- We mark the importance of these decisions by insisting that a human be directly responsible for them.
- Routinized or robotized approaches do not respect the dignity of the client, the patient, and the student.

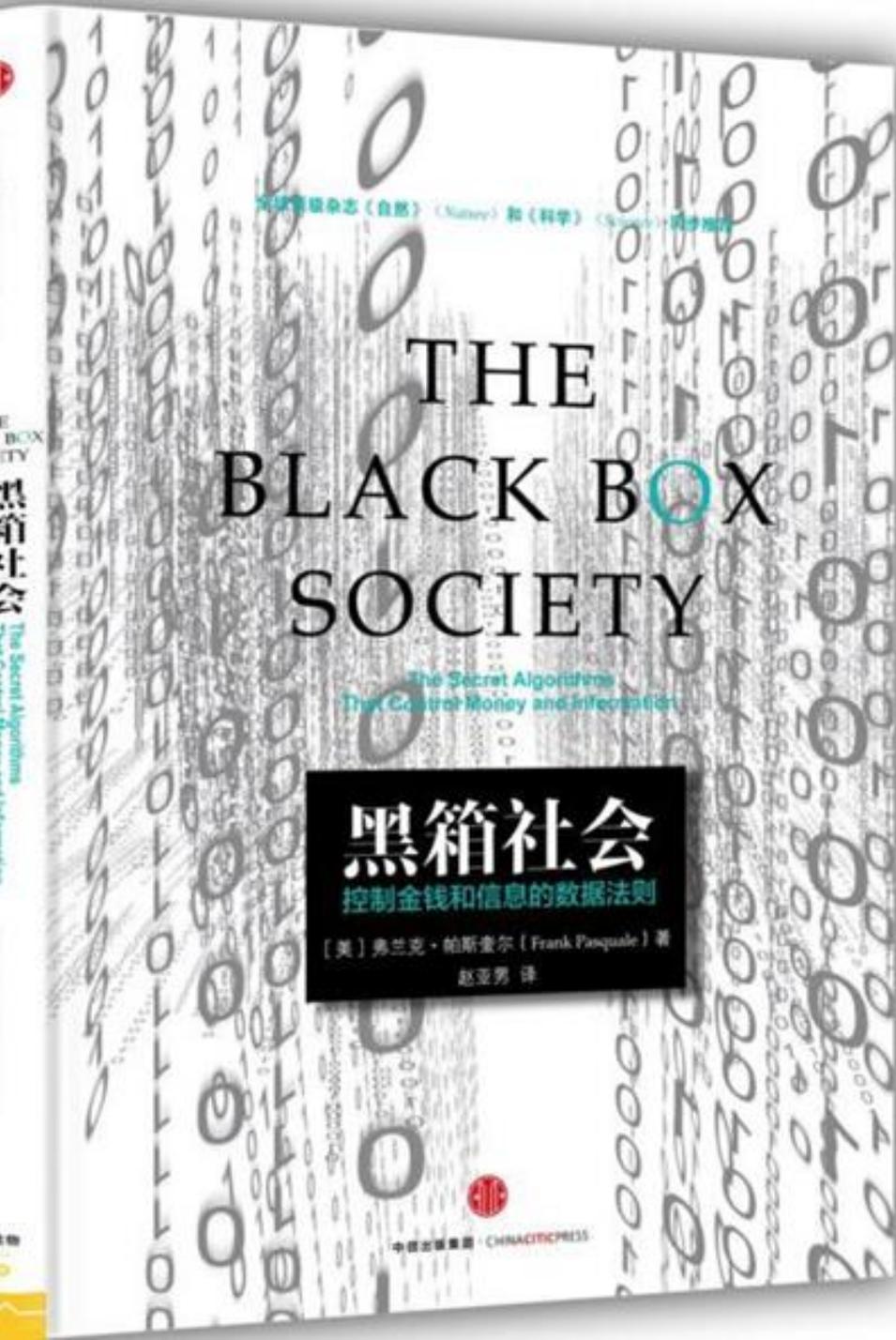


# A Higher Intelligence?

- From *Nature*, “Can we open the Black Box of AI?”:
  - “I think we are definitely losing ground to these algorithms,” says roboticist Hod Lipson.
  - His position: Computers will have great difficulty explaining things to us.
  - “At some point, it's like explaining Shakespeare to a dog.”



# One profession to rule them all?



## THE BLACK BOX SOCIETY

黑箱社会

控制金钱和信息的数据法则

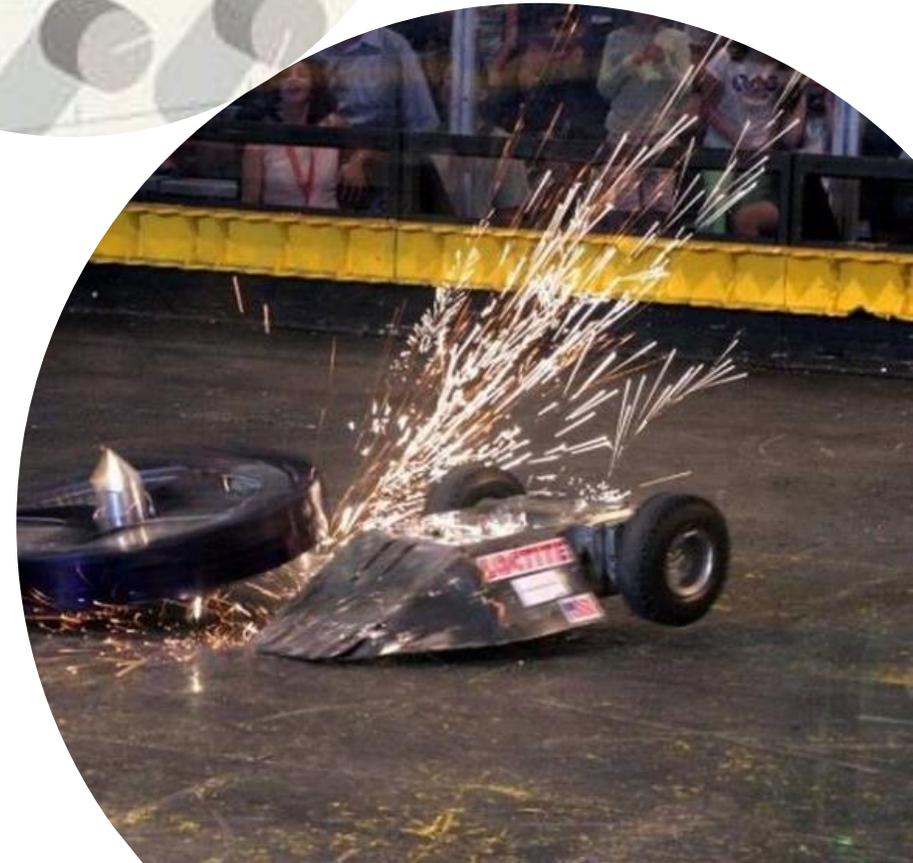
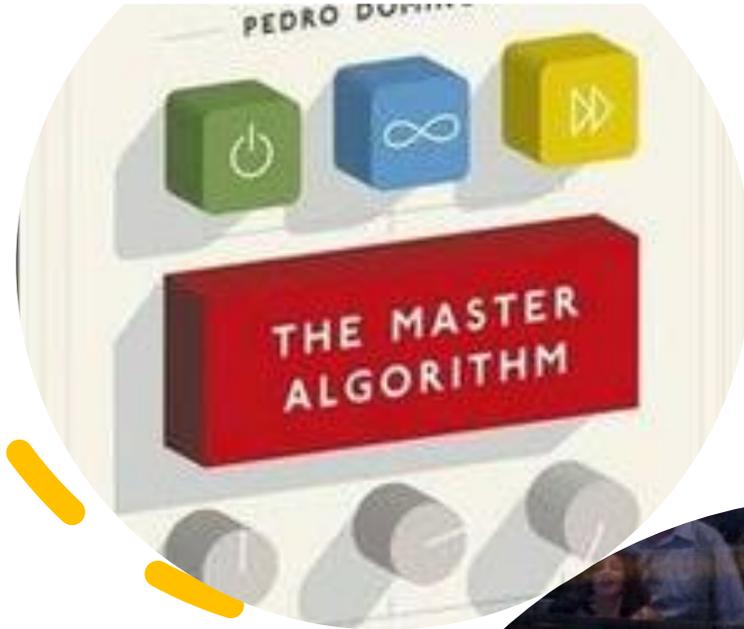
【美】弗兰克·帕斯卡尔 (Frank Pasquale) 著

赵亚男 译

- The ostensibly technical argument that all tasks are reducible to data patterns reproducible by machines is, in fact, a political argument to put AI researchers in charge of the future development of health care, education, etc.
- Our goal needs to be distributed expertise: cooperation between AI researchers and domain experts (teachers, doctors, journalists, nurses, designers, lawyers, and many others).
- But we also need to ensure that societies invest in *productive* AI, rather than *arms-race inducing* AI.

# Lethal Autonomous Weapons Systems (LAWS) as Technology Evolution

- Pedro Domingos hypothesized a Robotic Park, like Jurassic Park, as
  - “A massive robot factory surrounded by ten thousand square miles of jungle, urban and otherwise. . . .
  - **Robots Darwinianly evolve to be best killing machine**
  - “I suggested it as a thought experiment at a DARPA [Defense Advanced Research Projects] workshop a few years ago, and one of the military brass present said matter-of-factly, **‘That’s feasible’**”



# Abolitionists

- Inspired on international bans on biological weapons, blinding lasers
- Have begun a multilateral process at the UN to define and ban “killer robots.”



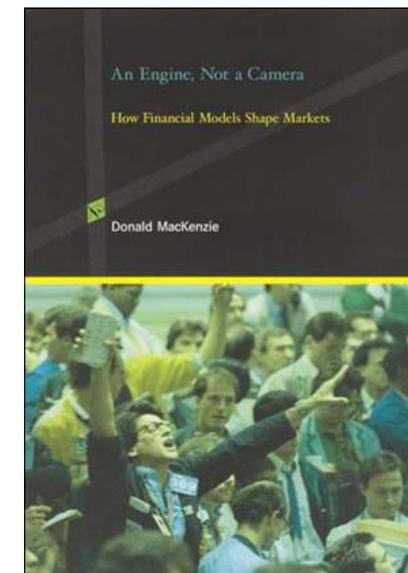
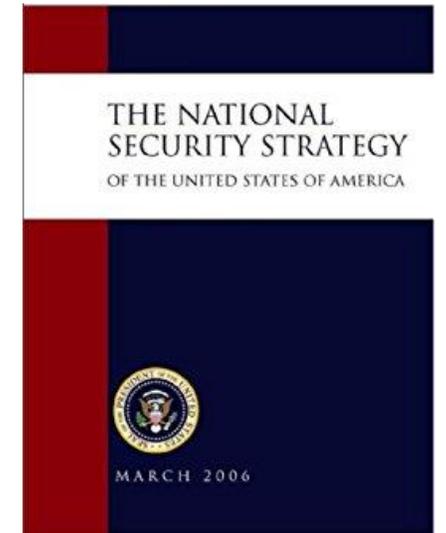
# Problems for Abolitionists

- Abolishing killer robots is an underinclusive and overinclusive arms control approach.
  - Nuclear threats seem far more severe
  - Some forms of autonomous weaponry seem necessary or good
    - Defensive cyberwarfare
    - Other defensive capabilities
  - They're "already here" (Rebecca Crootof) = no way to ban them categorically



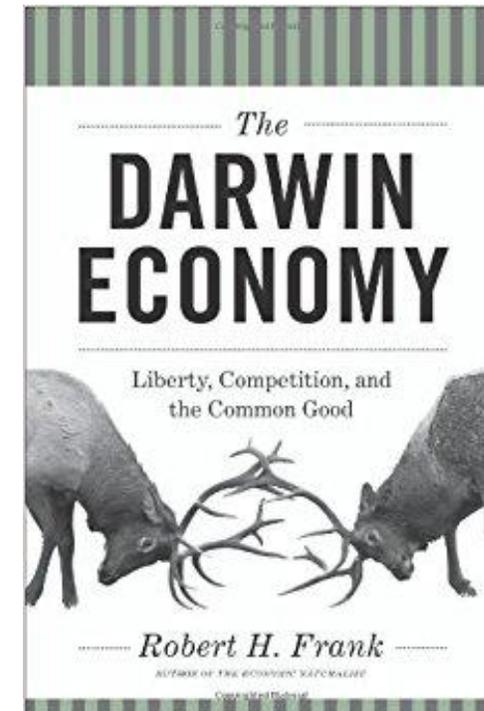
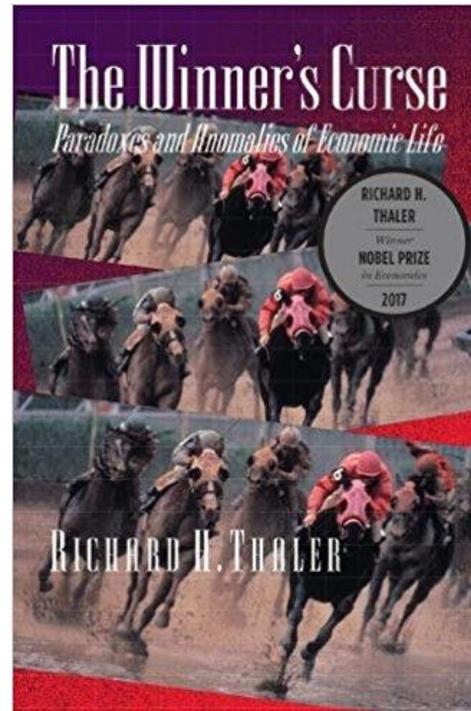
# Another Threat: A Self-Reinforcing, Realist Perspective

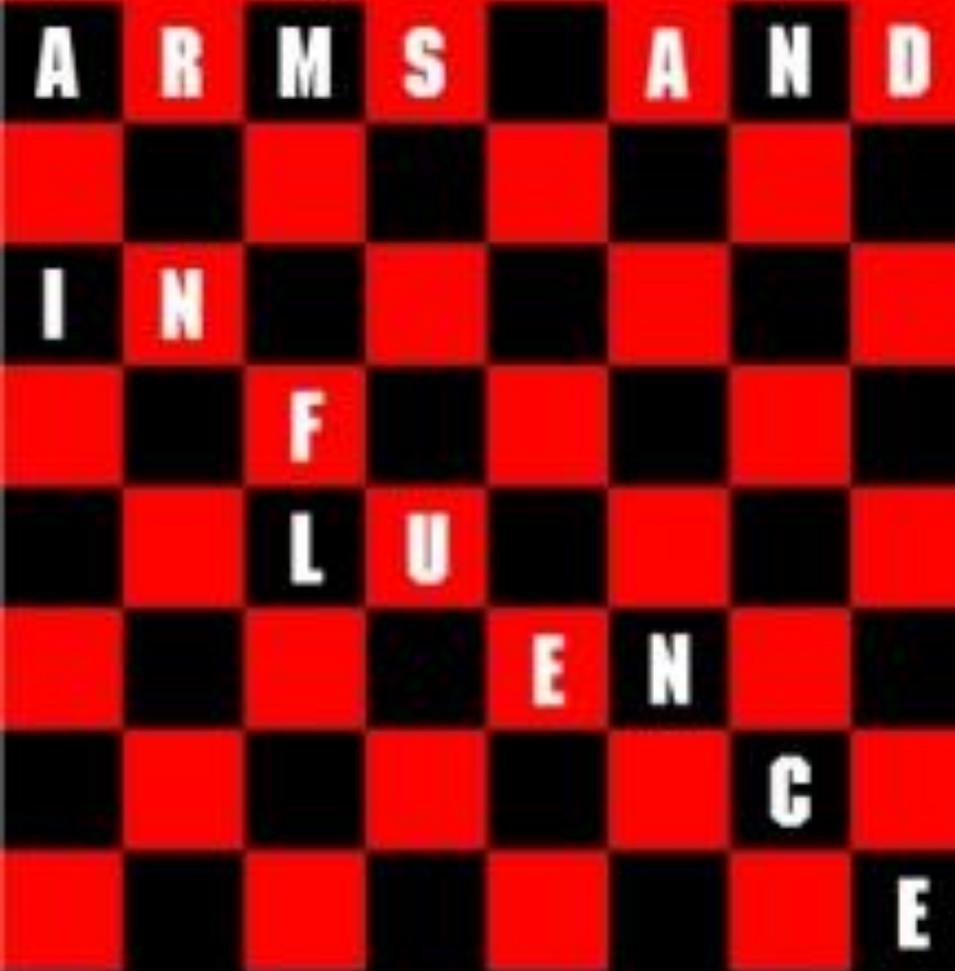
- Warfare is now unrestricted
- Defensive capabilities are easily made offensive, and vice versa
- There will be endless arms races of
  - Surveillance
  - Force-multipliers, including robotics
  - Hacking, to hijack the other side's weaponry or government
  - Other forms of aggression, whether hidden or open



# Problems for the Realist Perspective

- Arms race helps no one
- A recipe for domination by the strongest?
- How realistic or desirable is a Pax Americana/Sinica?
  - Whatever is to be said for the practical advantages of military supremacy, it is not a generalizable principle.
- Perhaps the only way to counter realism is with more realism...





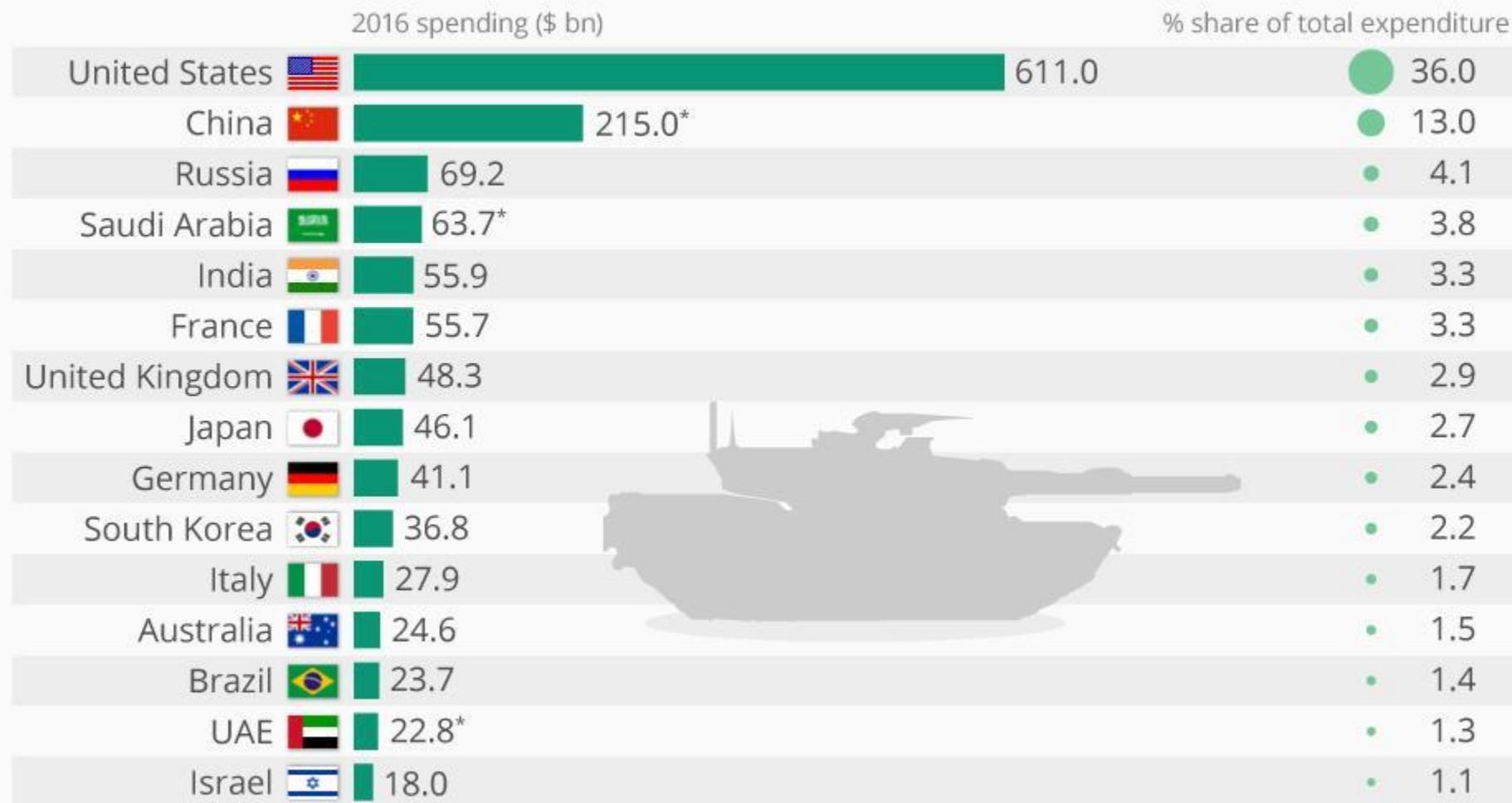
# Schelling on Defense Budgets as Restraint on Arms Buildup

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- “During most of the Eisenhower Administration the American defense budget was a self-imposed restraint on the Western arms buildup.
- “The motivation may well have been mainly economic, but it is a fair judgment that part of the motivation was a desire not to aggravate an arms race.
- “Even when the assumed ‘missile gap’ created grave concern about the vulnerability of American retaliatory forces in 1959 and the Strategic Air Command displayed a lively interest in the rapid enlargement of an airborne alert, the Administration was reluctant to embark on crash military programs.”

# The Top 15 Countries For Military Expenditure in 2016

2016 military expenditure by country and share of global total



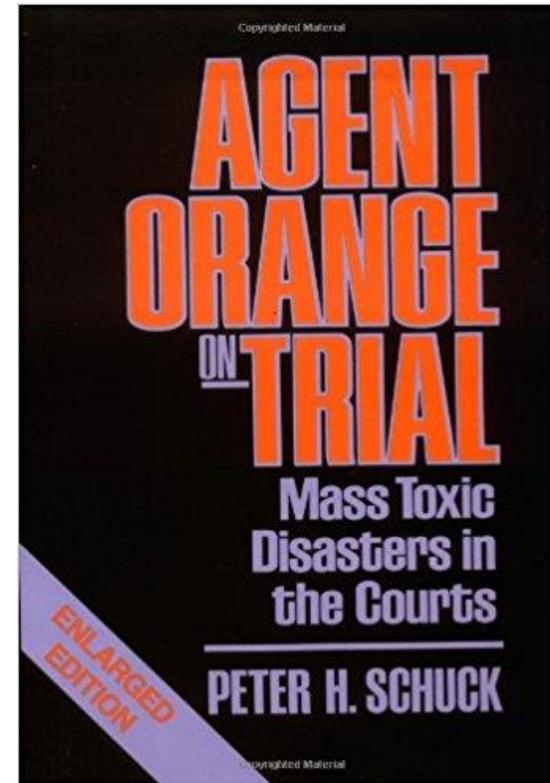
# Genuine Multipolarity

- Reduction in expenditure by top spenders.
  - Military vs. non-military trade-off
  - Recognition of performative aspect of arms race predictions
- Increase in expenditures by laggards.
  - General technical capacity increase.
    - Dual use technology
  - Commitment to self-sufficiency in defense
    - Imagine a NATO without the US as anchor



# Could LAWS be made more costly? Or more rare?

- Increasing liability for accidents
- Taxation of defense contractors
- Reputational risk/cost
- Socially responsible investing
- Reallocation of state budgets toward complementary automation.



# Our Current Path

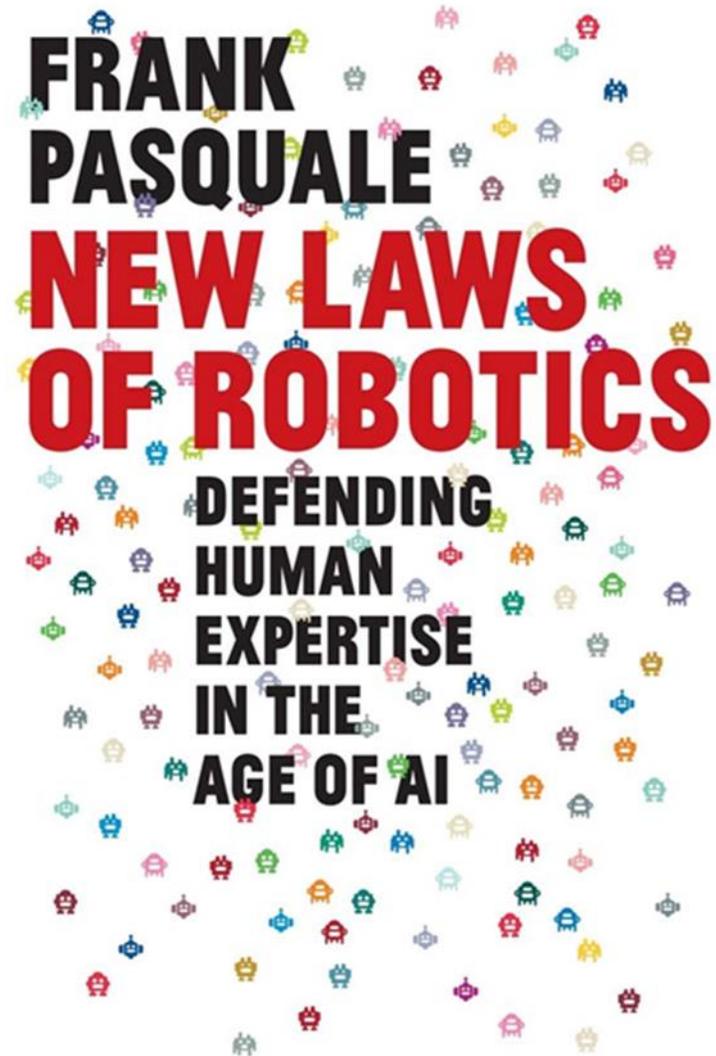
- A self-defeating path
  - Technocratic policymakers are pressing for self-liquidating automation in human services.
  - There is arms race automation in finance and military sectors.
- Both tendencies can be reversed.

# Toward a Nuanced View of Cost and Investment

- By 2012, economist William Baumol argued:
  - The cheapening of technologies generating pollution and destruction was a much greater threat than the "cost disease" in services.
  - Assuming reasonable growth rates, even continual rises in GDP-share taken by the so-called "stagnant sectors" could be supported by developed economies.
- Taking these points further in our context:
  - The foundation of genuine multipolarity in global force projection may be the reduction in military resources available to dominant states.
  - This will happen if these states commit toward
    - Productive, substitutive AI in non-professional sectors
    - Productive, complementary AI in professional sectors

# Bottom Lines

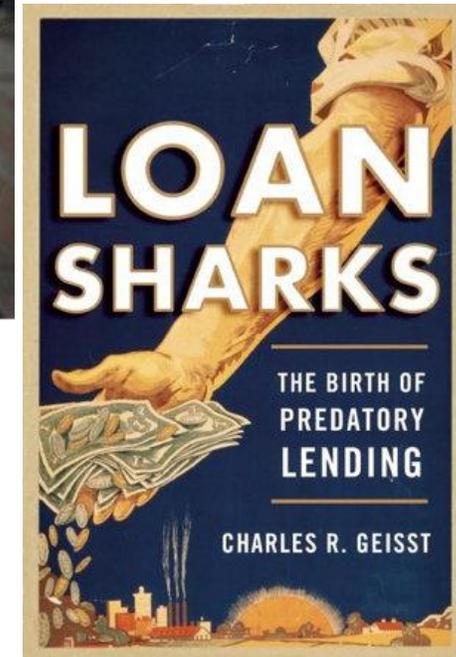
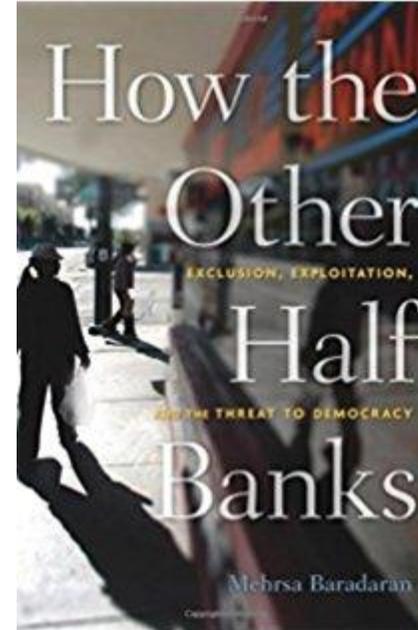
- It's time for a new political economy of automation.
- The new laws of robotics help us focus on:
  - What social goals are most important.
  - What labor we want to replace with machines.
  - What labor we want to make more valuable by complementing it with AI and robotics.





# Is this loan coded a “success” by proprietary algos?

- Joe takes out a 35% APR loan from a lender.
- Desperate to repay it, he does not buy food for his children for a few days, and falls behind on rent.
- The lender is paid back in full and makes a profit.



# Is this a Fair Deal?

- Vina cannot access credit because of a “thin credit file.”
- A new fintech firm gives her a chance to obtain credit on good terms, if she allows it to download/analyze all information on her mobile phone during the term of the loan, and re-sell the data.
- Vina gets a car loan and makes repayments on time.
- She does not know what is done with her data, and cannot find out due to trade secrecy.



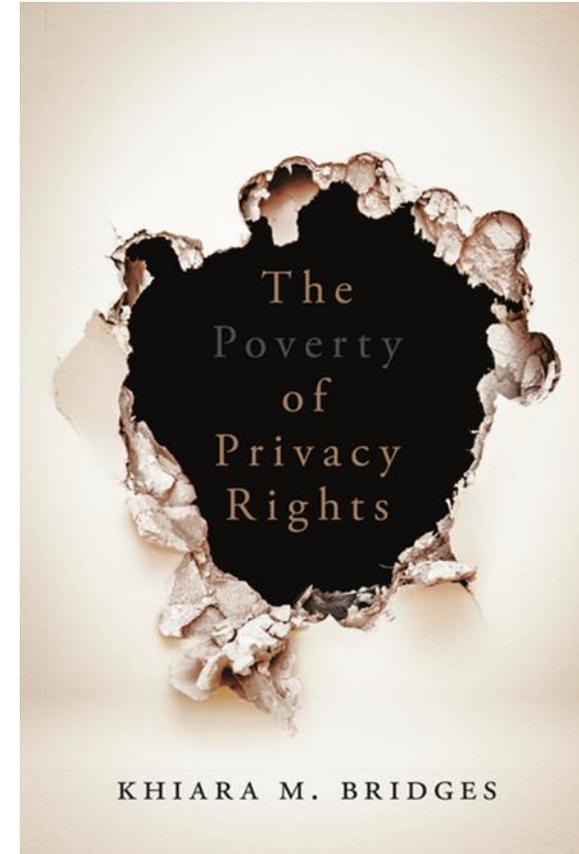
# Are these appropriate tools of evaluation?

- “If lenders see political activity on someone’s Twitter account in India, they’ll consider repayment more difficult & not lend to that individual.”
- “[One firm] analyses the way you fill in a form (in addition to what you say in the form), and how you use a website, on what kind of device, and in what location.”
- Parkinson’s prediction via mouse tremors.



# Data and Bias

- Accuratism frames answer to bias as “more data”
- But critical social science questions that narrative.



# The Dark Side of Financial Inclusion

- Predatory Inclusion
  - Credit enables, debt constrains
    - Seamster & Charron-Chenier
- Creepy Inclusion
  - Creepiness boils down to an intuition of future threat
    - “I am advantaged today, but what about tomorrow”
- Subordinating Inclusion
  - Condition of inclusion is to engage in activity that maintains or entrenches one’s subordinate status

# Matching Problems and Solutions

- Predatory
- Creepy
- Subordinating
- Usury law
- Better outcome coding
- Data limits
- Non-alienability and erasure requirements
- Credit cannot be based on certain action/inaction

# Concluding Thoughts

- As Mireille Hildebrandt has observed, big data, ML, and AI methods are a fundamental challenge to classic concepts of fairness.
- As Zachary Lipton points out, there is still a wide gap between “prediction” (via AI) and “policy” (how it affects the world).
- Our duty is to fill that gap cognizant of basic values, including dignity, fairness, and the rule of law.