

FUTURE OF WORK COMMISSION

Convening 5 Employment and Labor Law in the New Economy

January 16, 2020

**Jacobs Center for Neighborhood Innovation
San Diego, CA**



ABOUT THE INSTITUTE FOR THE FUTURE (IFTF) AND ITS ROLE

The [Institute for the Future \(IFTF\)](#) is working with the California Labor Secretary and larger State Team to coordinate the work of the Commission. IFTF draws on its over 50 years of research and experience in convening discussions of urgent future issues to support the efforts of the Commission to build a strong vision for the future of work in the state. IFTF has been a leading voice in discussions about the future of work for the past decade, seeking positive visions for a workforce undergoing transformational change. As a facilitator of the Commission's work, it will help guide the convenings, helping establish the comprehensive understanding necessary to build a world-class workforce of the future. IFTF will draw on the work of its Equitable Futures Lab to frame these discussions of future jobs, skills, and labor policy in terms of creating an equitable economy where everyone has access to the basic assets and opportunities they need to thrive in the 21st century.

ABOUT IFTF

Institute for the Future is the world's leading futures organization. For over 50 years, businesses, governments, and social impact organizations have depended upon IFTF global forecasts, custom research, and foresight training to navigate complex change and develop world-ready strategies. IFTF methodologies and toolsets yield coherent views of transformative possibilities across all sectors that together support a more sustainable future. Institute for the Future is a registered 501(c)(3) nonprofit organization based in Palo Alto, California. **www.iftf.org**

The work of this Commission is supported in part by The James Irvine Foundation, the Ford Foundation, the Lumina Foundation, and Blue Shield of California Foundation.

For more information on the California Future of Work Commission, please contact
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*All materials printed in house at IFTF

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SCHEDULE OF CONVENINGS

- 1 | **September 10-11, 2019**
Overview: The Present and Future State of Work in California
Location: Sacramento
- 2 | **October 10, 2019**
Technological Change and Its Impact on Work
Location: Palo Alto
- 3 | **November 14, 2019**
Education, Skills, and Job Quality
Location: Riverside
- 4 | **December 12, 2019**
Low-Wage Work and Economic Equity
Location: Los Angeles
- 5 | **January 16, 2020**
Employment and Labor Law in the New Economy
Location: San Diego
- 6 | **February 13, 2020**
Social Policy, Work, and Economic Security
Location: Stockton
- 7 | **March 12, 2020**
Investors, Capital, and the Future of Work
Location: San Francisco
- 8 | **April 2, 2020**
Synthesis
Location: Sacramento

EMPLOYMENT AND LABOR LAW IN THE NEW ECONOMY

Government policy most directly affects work and workers through employment and labor laws that regulate the individual workplace and the labor market as a whole, as well as through the framework for capitalism that is established through regulation. Labor laws set the floor when it comes to wages, hours, basic safety net provisions such as paid sick leave, health and safety standards, protection from retaliation, and the power of the state to enforce these fundamental standards. Labor law also governs how workers can organize and bargain collectively over pay and working conditions. Employment law covers various conditions of the workplace, including prohibitions on harassment, discrimination and abuse as well as training requirements for managers and supervisors to prevent violations.

Our current system of employment and labor law was largely developed in the 1930s and 1940s for an era with a different industrial and occupational structure. The transformation of work through innovations in technology and other practices points to the need to adapt employment and labor law to match the realities of work today and to anticipate the impact of technology and the fundamental organization of work in the future.

The success of employers and the economy as a whole rests on a stable, skilled and secure workforce. The Future of Work Commission has been challenged to consider the role of employers in addition to unions, workers, and government in creating and protecting safe and fair workplaces as well as supporting forms of work that could provide meaningful flexibility for workers. Importantly, a number of corporate leaders and large employers are reassessing their role and responsibility to their employees, as well as other stakeholders, and looking beyond shareholder value in setting their priorities and goals.

Existing employment and labor laws are not well enforced. Despite California's strong scaffolding of worker protections encoded in labor and employment law, existing policy is only as effective as its enforcement. Aggressive and effective enforcement is often impeded by complex schemes designed to cover up violations, lack of trust in government, inadequate resources and ineffective approaches to enforcement. Widespread violations of employment and labor law, most common and egregious in low-wage industries, result in wage theft, abuses of overtime laws, and unsafe working conditions that can result in injury or death. The [U.S. Department of Labor estimated](#) in 2014 that the minimum wage law is violated in California 372,000 times every week—that is, 1 in 8 low-wage workers being paid less than minimum wage.

Employment and labor law do not actually cover all workers in California, including agricultural and domestic workers. Despite efforts to extend basic workplace protections to workers in these jobs, they are subject to dangerous and precarious working conditions without the protections afforded to other workers. The growth of contract work and decentralized work in recent decades has intensified, creating new challenges and opportunities for worker organizing and unionization.

EMPLOYMENT AND LABOR LAW IN THE NEW ECONOMY

New technologies enable new, unregulated forms of worker surveillance. Technology enables companies to monitor worker behavior across industries and workplaces, including productivity in warehouses, customer service centers and retail stores. Increasingly, white-collar workplaces employ technology to monitor and collect data on employees, and can even track movements through an office building, regulating speed of work and bathroom use, as an employee's smartphone connects to different Wi-Fi routers. Mining the data collected on employees could even predict or detect worker pregnancy, as [reported by the Wall Street Journal](#). Current employment law may not adequately cover new practices of worker surveillance that have emerged or anticipate practices that will emerge in the coming years.

The use of data collected on employees raises significant equity issues, as algorithms are increasingly used in hiring and managing workers. As algorithms are increasingly used in hiring decisions and assessments of skills for setting wages and determining promotional opportunities, [the potential for algorithmic bias](#) could lead to [discrimination against specific groups](#). Since algorithmic decision-making largely reproduces past behavior by design, it can also reproduce gender and racial disparities created by past discrimination. The much less transparent processes of hiring and managing by algorithms may require updated regulations and protections that are suited for these practices. Data collection on worker behavior leads to many other questions around the use, value, threats and opportunities of such data. Who owns the vast amounts of data collected on employees, how it is used, who benefits from it, how it is monetized, and the level of transparency related to its collection are all challenges in the future of work.

Artificial intelligence and algorithm-based work require an enormous amount of work by humans that often goes unseen. While artificial intelligence has the potential to transform thousands of jobs and tasks, AI has to be “trained” with existing data and decisions and judgments that are made by human workers, who are also needed to label, tag, and organize data. Much of this work, [described as “automation’s last mile,” is broken down into components and farmed out as piecework for on-demand gig workers](#). On social media platforms, [content moderation is generally contracted out](#) to a low-wage workforce that are not direct employees of the social media companies, raising issues of job quality and the intersection of automation and human well-being. The growth of this work may require new policies to ensure transparency, fair work conditions, and job quality.

Some large employers are articulating an expanded role of corporations beyond shareholder interests. The primacy of shareholder interests—[which holds that the only responsibility of business is to maximize profits](#)—has been deeply entrenched for decades, partly underlying an emphasis on minimizing labor costs as serving the interests of shareholders. A group of large employers, the Business Roundtable, is [promoting a new framework that prioritizes multiple stakeholders](#), including employees, customers, suppliers and communities. In California, large firms with more than 1,000 employees employ 15% of all workers in the state.

ABOUT THE CONVENING

The fifth convening of the Future of Work Commission takes place in San Diego, one of the state's largest metro areas and labor markets. The Commission will hear from external experts in the morning, and the afternoon will be dedicated to substantive discussion among Commissioners.

The convening will begin with a panel on issues related to data in the workplace. Mary Gray (Microsoft Research) will draw on her extensive research on the workforce that performs much of the data work that powers the online economy. Ifeoma Ajunwa (Cornell University) and Pauline Kim (Washington University) will provide perspectives on the limitations of current employment law as it relates to the collection of data on employees and its use by employers. This will be followed by a session on the current system of labor law and its shortcomings with Sharon Block (Harvard Law School), who is leading the Clean Slate Project, a major effort to reform labor law in the U.S.

Building on the session at the previous convening in December with small businesses, the Commission will then have a conversation with Dane Linn (Business Roundtable) on the purpose of corporations in today's economy, from the perspective of large employers. The perspectives of different types of employers is critical to the Commission's success in developing effective cross-sector recommendations. In the afternoon, the Commission will continue its work on defining and developing a shared understanding of the scope of the Commission's work and begin considering proposed solutions.

SOME QUESTIONS TO CONSIDER

1. What changes to existing law should be made or what new laws need to be in place to address shortcomings in existing labor and employment law to ensure workers are protected and have a voice in the workplace?
2. Should California implement a comprehensive policy on how data is collected and used by employers, similar to the EU's General Data Protection Regulation (GDPR), which governs the use of consumer data?
3. What strategies or policies could encourage large employers to pursue a broader set of stakeholder interests and discourage a singular focus on shareholder interests?
4. What strategies or policies could support small- and medium-sized employers who want to pursue a broader set of stakeholder interests but are limited by fierce competition with larger companies and low margins as a result?

SELECTED RESOURCES

Casey Newton. "[The Secret Lives of Facebook Moderators in America.](#)" *The Verge*. February 25, 2019.

Business Roundtable. "[Statement on the Purpose of a Corporation.](#)" August 2019.

Laura Tyson and Lenny Mendonca. "[Making Stakeholder Capitalism a Reality.](#)" *Project Syndicate*. January 6, 2020.

Economic Policy Institute. [Unlawful](#). December 2019.

[Clean Slate project on labor law reform](#), Harvard Law School.

DESIGN PRINCIPLES

The Commission collectively developed the following design principles to create and evaluate recommendations.

Bold: nothing should be excluded on the basis of political feasibility

Forward-Facing: let's not solve for the last war

Work-Adjacent: include work plus housing, transportation, living

Context-Sensitive: take into account implications across gender, race, age, geography

Coalition-Building: bring together multiple stakeholders

Portfolio-Based: easy/fast to hard/long-term

Scalable: achieve high impact

Agile and Iterative: can be prototyped and adapted as needed

Measurable: identify clear areas of potential impact

Actionable and Practical: grounded in real-world solutions that can be implemented

AGENDA

WEDNESDAY, JANUARY 15, 2020

7:00pm Employer Roundtable with Business for Good San Diego and RAISE San Diego Chapter on high road business practices

8:45pm Public Comment

9:00pm Adjourn

THURSDAY, JANUARY 16, 2020

9:30am Arrive

12:10pm Lunch

10:00am Welcome/Opening

12:45pm Redefining the Purpose of Corporations: Perspectives from Large Employers

10:20am Data in the Workplace: A New Frontier of Employment Law

Ifeoma Ajunwa, Assistant Professor, School of Industrial and Labor Relations, Cornell University

Mary Gray, Senior Principal Researcher, Microsoft Research

Pauline Kim, Daniel Noyes Kirby Professor of Law and Co-Director, Center for Empirical Research in the Law, Washington University Law School

*Moderated by **Julie Su**, Secretary, Labor and Workforce Development Agency*

Dane Linn, VP of Workforce & Education, Business Roundtable

*Moderated by **Lenny Mendonca**, Chief Economic and Business Advisor; Director, Governor's Office of Business and Economic Development*

1:30pm Break

1:40pm Commissioner Discussion

*Facilitated by **Lyn Jeffery**, Institute for the Future*

11:20am Labor Law for a New Economy: Fixing a Broken System

Sharon Block, Executive Director, Labor and Worklife Program, Harvard Law School

*Moderated by **Lande Ajoose**, Senior Policy Advisor for Higher Education*

4:30pm Public Comment

NOTE: The Commission may not discuss or take action on any matter raised during the public comment session, except to decide whether to place the matter on the agenda of a future meeting (Government Code sections 11125, 1125.7(a)).

5:00pm Adjourn

PANELISTS

DATA IN THE WORKPLACE: A NEW FRONTIER OF EMPLOYMENT LAW



IFEOMA AJUNWA

Assistant Professor, School of Industrial and Labor Relations
Cornell University
@iajunwa

Dr. Ajunwa is an Assistant Professor of Labor and Employment Law in the Law, Labor Relations, and History Department of Cornell University's Industrial and Labor Relations School (ILR), and Associated Faculty Member at Cornell Law School. She is also a Faculty Associate at the Berkman Klein Center at Harvard Law School. In 2019, Dr. Ajunwa was granted the National Science Foundation (NSF) CAREER Award and in 2018 she received the Derrick Bell Award from the Association of American Law Schools (AALS). Dr. Ajunwa's research interests are at the intersection of law and technology with a particular focus on the ethical governance of workplace technologies. Her research focus is also on diversity and inclusion in the labor market and the workplace. Dr. Ajunwa's scholarly articles have been published or are forthcoming in both top law review and peer review publications. Dr. Ajunwa earned her Ph.D. in Sociology from Columbia University. Her doctoral research on reentry received a grant from the National Science Foundation (NSF) and honorable mention from the Ford Foundation. She also holds a law degree from the University of San Francisco School of Law and has been admitted to the Bar in the states of New York and California. Dr. Ajunwa's forthcoming book, *The Quantified Worker*, will be published by Cambridge University Press in 2020.



MARY GRAY

Senior Principal Researcher
Microsoft Research
@marylgray

Mary L. Gray is the co-author of *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass* released this May. Mary is a Senior Principal Researcher at Microsoft Research and an E.J. Safra Center for Ethics Fellow and Berkman Klein Center for Internet and Society Faculty Affiliate at Harvard University. Mary maintains a faculty position in the School of Informatics, Computing, and Engineering with affiliations in Anthropology and Gender Studies at Indiana University. Mary, an anthropologist and media scholar by training, focuses on how everyday uses of technologies transform people's lives. She sits on several boards, including Public Responsibility in Medicine and Research and Stanford University's One-Hundred-Year Study on Artificial Intelligence (AI100) Standing Committee, commissioned to reflect on the future of AI and recommend directions for its policy implications.



PAULINE KIM

Daniel Noyes Kirby Professor of Law
Co-Director, Center for Empirical Research in the Law
Washington University Law School

Pauline Kim is the Daniel Noyes Kirby Professor of Law at Washington University Law School in St. Louis. She is a nationally recognized expert on the law governing the workplace and has written widely on issues affecting workers, including privacy, discrimination and job security, as well as the impact of technology in the workplace. Her current research focuses on the risks of unfairness and bias as automated decision-processes are incorporated into firms' personnel decision-making and the legal challenges posed by these technological developments. She is studying the role of technological intermediaries in shaping labor markets, and the possibilities for artificially intelligent systems to avoid human biases in making personnel decisions. She is a graduate of Harvard and Radcliffe Colleges and Harvard Law School, and clerked for the Honorable Cecil F. Poole on the Ninth Circuit Court of Appeals. Following her clerkship, she worked as a staff attorney at the Employment Law Center/Legal Aid Society of San Francisco (now Legal Aid at Work).

LABOR LAW FOR A NEW ECONOMY: FIXING A BROKEN SYSTEM



SHARON BLOCK

Executive Director,
Labor and Worklife Program
Harvard Law School
@sharblock

Sharon Block is Executive Director of the Labor and Worklife Program and Lecturer on Law at Harvard Law School. Prior to coming to Harvard Law School in 2017, she was the Principal Deputy Assistant Secretary for Policy at the U.S. Department of Labor and Senior Counselor to the Secretary of Labor. For twenty years, Block has held key labor policy positions across the legislative and executive branches of the federal government. In 2012, President Obama appointed Block to be a member of the National Labor Relations Board. She was senior labor and employment counsel to the Senate Health, Education, Labor and Pensions Committee under Senator Edward Kennedy. While serving in the Obama White House as Senior Public Engagement Advisor for Labor and Working Families, Block led the historic White House Summit on Worker Voice. Block serves on a number of labor-related board and advisory committees, including as a board member of the National Employment Labor Project, advisory committee member for the Harvard T.H. Chan School of Public Health, Education and Research Center, member of the Higher Quality Jobs Advisory Council of the Federal Reserve Bank of Boston and more. In addition, she writes frequently on labor and employment issues and is a senior contributor to OnLabor.org. Block received her B.A. from Columbia University and her J.D. from Georgetown University Law Center, where she received the John F. Kennedy Labor Law Award.

REDEFINING THE PURPOSE OF CORPORATIONS: PERSPECTIVES FROM LARGE EMPLOYERS



DANE LINN

Vice President, Workforce
& Education
Business Roundtable

Dane Linn is a Vice President for the Business Roundtable. In this role, he oversees the Education & Workforce Committee, advancing the BRT's positions on education reform, U.S. innovation capacity and workforce preparedness. He is also the lead staff member for the Immigration Committee, promoting an approach to immigration reform that will help drive U.S. economic growth and keep the American workforce globally competitive. Linn joins the BRT most recently from The College Board, where he served as Executive Director of state policy. In addition, Linn has led national efforts to ensure more students are college- and career-ready and worked on issues related to STEM, early childhood, Perkins and the Workforce Investment Act, and high school redesign. Linn is a Ph.D. candidate at Virginia Polytechnic Institute and State University, and holds a master's degree in Education Administration from West Virginia Graduate College and bachelor's degree in Elementary Education and Special Education from Cabrini College.

COMMISSIONERS



ROY BAHAT

Venture Capitalist
Bloomberg Beta
@roybahat

Roy Bahat invests in the future of work as a venture capitalist, with a focus on machine intelligence. Prior to his life as a VC, Bahat founded start-ups, served as a corporate executive at News Corp., and worked in government in the office of New York City mayor Michael Bloomberg. As the head of Bloomberg Beta, an investment firm with 150 million dollars under management, Bahat and his team have invested in areas like automation, data, robotics, media, productivity tools, and many others. Fast Company named Bahat one of the Most Creative People in Business and noted “Bahat is a natural innovator ... one of the most candid people you’ll ever meet (check out his LinkedIn profile).” He organized “Comeback Cities,” where he leads groups of venture capitalists and members of Congress on bus tours to find the untapped beds of talent and entrepreneurship in America. He also co-chaired the Shift Commission on Work, Workers, and Technology, a partnership between Bloomberg and think-tank New America to look at automation and the future of work 10 to 20 years from now.



DOUG BLOCH

Political Director
Teamsters Joint Council 7
@TeamsterDoug

Doug Bloch has been political director at Teamsters Joint Council 7 since 2010.

In this capacity, he works with over 100,000 Teamsters in Northern California, the Central Valley, and Northern Nevada in a variety of industries. He was the Port of Oakland campaign director for Change to Win from 2006 to 2010 and a senior research analyst at Service Employees International Union Local 1877 from 2004 to 2006. Mr. Bloch was statewide political director at the California Association of Community Organization for Reform Now (ACORN) from 2003 to 2004 and ran several ACORN regional offices, including Seattle and Oakland, from 1999 to 2003. He was an organizer at the Non-Governmental Organization Coordinating Committee for Northeast Thailand from 1999 to 2003.



DR. SORAYA M. COLEY

President
Cal Poly Pomona
@PresColeyCPP

Dr. Soraya M. Coley, a veteran administrator with more than 20 years of experience in higher education, became the sixth president of Cal Poly Pomona in January 2015. Coley transitioned to Cal Poly Pomona from Cal State Bakersfield, where she was the provost and vice president for academic affairs from 2005 to 2014. She also served as interim vice president for university advancement in 2011–12. Her experience includes serving as Cal State Fullerton’s dean of the College of Human Development and Community Service, as administrative fellow, and professor and department chair for the human services department. She was the system-wide provost and vice president for academic affairs at Alliant International University, from 2001 to 2003. Coley earned a bachelor’s in sociology from Lincoln University, a master’s in social planning and social research from Bryn Mawr, and a doctoral degree in social planning and policy from Bryn Mawr. She is married to Ron Coley, Lt. Col. (Ret.) USMC, who after his military service, enjoyed a distinguished career in public service and higher education administration, including six years as Senior County Administrator in Orange County, California, and multiple senior positions at the University of California.



LLOYD DEAN

Chief Executive Officer
CommonSpirit Health
@LloydHDean

Lloyd Dean is chief executive officer of CommonSpirit Health, a newly created national health care system formed by Dignity Health and Catholic Health Initiatives. He is co-chair of the California Future Health Workforce Commission, chair of the Board of Directors for the Committee on Jobs in San Francisco, and a member of the McDonald’s Board of Directors. Dean holds degrees in sociology and education from Western Michigan University and received an honorary Doctor of Humane Letters degree from the University of San Francisco. A strong advocate for health care reform, he has been actively engaged with President Obama and the White House Cabinet on healthcare issues.



JENNIFER GRANHOLM

Former Governor
State of Michigan
@JenGranholm

Jennifer Granholm served two terms as Michigan's 47th governor from 2003 to 2011, and was the Michigan Attorney General from 1998-2002. As Governor, Granholm led the state through a brutal economic downturn that resulted from the Great Recession and a meltdown in the automotive and manufacturing sectors. She worked relentlessly to diversify the state's economy, strengthen its auto industry, preserve the manufacturing sector, and add new, emerging sectors, such as clean energy, to Michigan's economic portfolio. After leaving office, Granholm served as an advisor to Pew Charitable Trusts' Clean Energy Program, where she led a national campaign for clean energy policies. She also hosted Current TV's political news analysis show "The War Room with Jennifer Granholm" and co-authored *A Governor's Story: The Fight for Jobs and America's Economic Future*, which tells how Michigan pioneered ways out of an economic storm and offers proven advice for a nation desperate to create jobs. Currently, Granholm is a contributor to CNN, a Senior Advisor to the progressive political groups Media Matters and American Bridge, is head of the sustainability practice at Ridge-Lane, and sits on numerous private sector and non-profit boards.



LANCE HASTINGS

President
California Manufacturers & Technology Association
@lance_hastings

Hastings has held several leadership roles at MillerCoors the past 15 years. He served most recently as Vice President of National Affairs for MillerCoors. Prior to that he served as Head of Regulatory & Tax Affairs for SABMiller. He also represented Miller Brewing Company and MillerCoors in Sacramento as Director of State Government Affairs, where he served on CMTA's Board of Directors. Before his long career as a manufacturing executive Hastings was the Vice President and Director of Government Relations from 1998 to 2003 at the California Grocers Association. Hastings also worked in the California State Legislature for almost a decade as a chief consultant, starting in 1989. Hastings has a Bachelors of Arts in Economics and a Minor in Government from California State University at Sacramento.



MARY KAY HENRY, CO-CHAIR

International President
Service Employees International Union (SEIU)
@MaryKayHenry

Mary Kay Henry is International President of the 2 million-member Service Employees International Union (SEIU), and her leadership is rooted in a deep-seated belief that when individuals join together they can make the impossible possible. Under her leadership, SEIU has won major victories to improve working families' lives by strengthening and uniting healthcare, property services, and public sector workers with other working people across the United States, Canada and Puerto Rico. In 2010, Mary Kay Henry became the first woman elected to lead SEIU, after more than 30 years of helping unite healthcare workers. By 2015, she was named one of the 100 most creative leaders by Fast Company magazine and was included in the top 50 visionaries reshaping American politics by Politico magazine for SEIU's innovative leadership in propelling the fight for living wages embodied in the historic movement known as the "Fight for \$15." Henry believes that to better fulfill the promise of a just society America has always aspired to be, we must fight for justice on all fronts including defending the gains accomplished for access to affordable healthcare for all families under the Affordable Care Act, comprehensive immigration reform and a path to citizenship for all hardworking immigrant families, and safety and justice in all communities of color across the country.

COMMISSIONERS



CARLA JAVITS

President & CEO
Roberts Enterprise Development Fund (REDF)
@cjavitsredf

Carla Javits is President and CEO of REDF (The Roberts Enterprise Development Fund), a pioneering venture philanthropy galvanizing a national movement of social enterprises—purpose-driven, revenue-generating businesses that help people striving to overcome employment barriers get good jobs, keep those jobs, and build better lives. Through her stewardship, REDF has invested in 183 social enterprises in 26 states. These businesses have generated \$755 million in revenue and employed 37,700 people—and counting. REDF's goal is to see 50,000 people employed by 2020, contributing their skills and talents to our communities and helping to build a stronger, more inclusive society.



SARU JAYARAMAN

President
ROC United & ROC Action, Director of the Food Labor Research Center
@SaruJayaraman

Saru is the President of One Fair Wage, Co-Founder of the Restaurant Opportunities Centers United (ROC United), and Director of the Food Labor Research Center at the University of California, Berkeley. Saru is a graduate of Yale Law School and the Harvard Kennedy School of Government. She was profiled in the New York Times "Public Lives" section in 2005, named one of Crain's "40 Under 40" in 2008, was 1010 Wins' "Newsmaker of the Year" and New York Magazine's "Influentials" of New York City. She was listed in CNN's "Top10 Visionary Women" and recognized as a Champion of Change by the White House in 2014, and a James Beard Foundation Leadership Award in 2015. Saru authored *Behind the Kitchen Door* (2013), a national bestseller, and has appeared on CNN with Soledad O'Brien, Bill Moyers Journal on PBS, Melissa Harris Perry and UP with Chris Hayes on MSNBC, Real Time with Bill Maher on HBO, the Today Show, and NBC Nightly News with Brian Williams. Her most recent book is *Forked: A New Standard for American Dining* (2016). In 2019, she was named the San Francisco Chronicle Visionary of the Year.



TOM KALIL

Chief Innovation Officer
Schmidt Futures

Tom Kalil has been Chief Innovation Officer at Schmidt Futures since 2017. He was deputy director of the White House Office of Science and Technology Policy for President Obama from 2009 to 2017. Kalil was special assistant to the Chancellor for Science and Technology at the University of California, Berkeley from 2001 to 2008 and was chair of the Global Health Working Group for the Clinton Global Initiative in 2007 and 2008. He also served on the White House National Economic Council from 1993 to 2001 and from 2000 to 2001, was deputy assistant to President Clinton for technology and economic policy.



ASH KALRA

Assemblymember
California Assembly District 27
@Ash_Kalra

Assemblymember Ash Kalra was elected to represent the 27th California State Assembly District in 2016, and was appointed Chair of the Assembly Committee on Labor and Employment and sits on the Aging and Long Term Care, Education, Judiciary, Water, Parks, and Wildfire committees. Assemblymember Kalra has established himself as a leader on issues ranging from the environment and conservation, to criminal justice reform, health care sustainability, housing affordability, growing our transportation infrastructure, and expanding economic opportunity to all Californians. Previously, Kalra served as a San Jose City Councilmember, and as a deputy public defender in Santa Clara County. Kalra earned a Juris Doctor degree from the Georgetown University Law Center and is the first Indian-American to serve in the California Legislature.



STEPHANE KASRIEL

Chief Executive Officer

Upwork
@skasriel

Stephane Kasriel has been Chief Executive Officer of Upwork Inc. since

2015, after being Vice President of product at Upwork's predecessor company oDesk, and subsequently Senior Vice President of Product and Engineering from 2012 to 2015. He held multiple positions at PayPal from 2004 to 2010, including Managing Director for PayPal France, Global Head of Consumer Products and Global Head of Mobile Business Development. Kasriel serves as co-chair for the World Economic Forum's Council on the New Social Contract and previously served as Co-chair for the World Economic Forum's Council on Education, Gender and Work. Kasriel earned a Master of Business Administration degree from Institut Européen d'Administration des Affaires (INSEAD) and a Master of Science degree in computer science from Stanford University.



FEI-FEI LI

Co-Director and Professor
Human-Centered AI Institute,
Stanford University
@drfeifei

Dr. Fei-Fei Li is the inaugural Sequoia Professor in the Computer Science Department at Stanford University, and Co-Director of Stanford's Human-Centered AI Institute. She served as the Director of Stanford's AI Lab from 2013 to 2018. During her sabbatical from Stanford from January 2017 to September 2018, she was Vice President at Google and served as Chief Scientist of AI/ML at Google Cloud. Dr. Fei-Fei Li's main research areas are in machine learning, deep learning, computer vision and cognitive and computational neuroscience. She has published nearly 200 scientific articles in top-tier journals and conferences, including *Nature*, *PNAS*, *Journal of Neuroscience*, *CVPR*, *ICCV*, *NIPS*, *ECCV*, *ICRA*, *IROS*, *RSS*, *IJCV*, *IEEE-PAMI*, *New England Journal of Medicine*, etc. Dr. Li is the inventor of ImageNet and the ImageNet Challenge, a critical large-scale dataset and benchmarking effort that has contributed to the latest developments in deep learning and AI. In addition to her technical contributions, she is a national leading voice for advocating diversity in STEM and AI. She is co-founder and chairperson of the national non-profit AI4ALL aimed at increasing inclusion and diversity in AI education.



JAMES MANYIKA, CO-CHAIR

Senior Partner

McKinsey & Company

James Manyika is Senior Partner at McKinsey and Company and Director of the McKinsey Global Institute. He was appointed by President Obama as Vice Chair of the Global Development Council at the White House (2012–present), and by US secretaries of commerce to the Digital Economy Board of Advisors (2016) and the National Innovation Advisory Board (2011). He serves on several other boards, including the Council on Foreign Relations, Aspen Institute, and John D. and Catherine T. MacArthur Foundation. He is a non-resident Senior Fellow of Brookings Institution and a Fellow of DeepMind and the Royal Society of Arts. A Rhodes Scholar, he holds a BSc in Electrical Engineering from University of Zimbabwe, and an MSc, MA and DPhil from Oxford University in Robotics, Computation.



JOHN MARSHALL

Senior Capital Markets Analyst
United Food and
Commercial Workers

John Marshall is a Senior Capital Markets Analyst with the United Food

and Commercial Workers' (UFCW) Capital Stewardship Program. At the UFCW, Marshall conducts financial research on public and private companies and works closely with investors and analysts on corporate governance matters. For the past two years, Marshall has been the UFCW staff liaison to the AFL-CIO's Commission on the Future of Work and Unions. Marshall graduated from the University of California at Santa Cruz with a degree in American Studies, received his MBA from the UCLA Anderson School of Management and is a holder of the Chartered Financial Analyst (CFA) designation. Prior to joining the UFCW, Marshall was Research Director for the SEIU Capital Stewardship Program. He has also held positions at Ullico, Inc., SEIU Local 250, and UNITE HERE Local 2.

COMMISSIONERS



ART PULASKI

Executive Secretary-Treasurer
and Chief Officer
California Labor Federation
@ArtPulaski

Art Pulaski is the Executive Secretary-Treasurer and Chief Officer of the California Labor Federation. Since his election in 1996, Pulaski has reinvigorated grassroots activism in unions and championed support for new organizing. Under Pulaski's leadership, the California Labor Federation's achievements have included restoring daily overtime pay, raising the minimum wage, increasing benefits for injured and unemployed workers, creating collective bargaining opportunities for hundreds of thousands of public sector workers, and passing the nation's first comprehensive Paid Family Leave law. In 2010, the Federation led the successful campaign to ensure every California Democrat in Congress voted in favor of the landmark federal health care reform legislation. Pulaski has led the California labor movement in new strategies of political action and economic development. Since he took office at the California Labor Federation in 1996 the labor group has more than doubled in size.

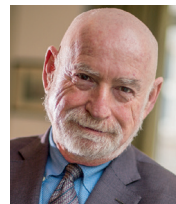


MARIA S. SALINAS

President & CEO
**Los Angeles Area Chamber
of Commerce**
@salinas_ms

Maria S. Salinas is the President & CEO of the Los Angeles Area Chamber of Commerce, the largest business association in Los Angeles County representing more than 1,600-member companies and serving the interests of more than 235,000 businesses across the Los Angeles region. Ms. Salinas took the helm of the organization in August of 2018 and became the first woman and Latina to lead the L.A. Area Chamber in its 130 year history. An accomplished business woman, entrepreneur, and a stalwart community leader, Ms. Salinas' business acumen and financial expertise provides her with the right experience to lead the Chamber. Ms. Salinas is a graduate of Loyola Marymount University (LMU), earning a Bachelor of Science in Accounting in 1987. She is currently Chair of the Board of Regents and member of the Board of Trustees

at LMU, Board Chair of UnidosUS, and member of the founding Board of Directors of Kaiser Permanente School of Medicine. Over the years, she has served numerous esteemed civic and nonprofit organizations and has been recognized for her leadership and community service. Ms. Salinas lives in Pasadena, California, with her husband Raul, a prominent Los Angeles attorney, and their four sons.



PETER SCHWARTZ

Senior Vice President
of Strategic Planning
Salesforce
@peterschwartz2

Peter Schwartz is an internationally renowned futurist and business strategist, specializing in scenario planning and working with corporations, governments, and institutions to create alternative perspectives of the future and develop robust strategies for a changing and uncertain world. As Senior Vice President of Strategic Planning for Salesforce, he manages the organization's ongoing strategic conversation. Peter leads the Salesforce Futures LAB—a collaboration between strategic thinkers at Salesforce and its customers around provocative ideas on the future of business. Prior to joining Salesforce, Peter was co-founder and chairman of Global Business Network. He is the author of several works. His first book, *The Art of the Long View*, is considered a seminal publication on scenario planning. Peter has also served as a script consultant on the films "The Minority Report," "Deep Impact," "Sneakers," and "War Games." He received a B.S. in aeronautical engineering and astronautics from Rensselaer Polytechnic Institute in New York.



HENRY STERN

State Senator
California Senate District 27
@HenrySternCA

Senator Henry Stern was elected to represent the 27th California State Senate District in 2016. He chairs

the Senate Natural Resources and Water Committee and formerly chaired the Elections and Constitutional Amendments Committee. Senator Henry Stern is a sixth-generation Californian and native of this district. He is a former environmental lawyer, lecturer, senior policy advisor and civics teacher. Senator Stern has lectured at UCLA and UC Berkeley, enjoys volunteering at his local Boys & Girls Club and is a member of the Santa Monica Mountains Conservancy Advisory Committee, the Jewish Federation, the American Jewish Committee, and the Truman National Security Project. He earned a Juris Doctor degree from the University of California, Berkeley School of Law.



MARIANA VITURRO

Deputy Director
National Domestic Workers Alliance (NDWA)

Mariana Viturro is the Deputy Director at the National Domestic Workers Alliance (NDWA), the leading organization

working to build power, respect, and fair labor standards for the estimated two million nannies, housekeepers, and elderly caregivers in the United States. She started organizing in the San Francisco Bay Area in 1998. Mariana has been organizing with immigrant communities and communities of color for the last 15 years. Prior to NDWA, as the Co-director of St. Peter's Housing Committee, Mariana guided a programmatic transition from service provision to organizing and then facilitated the organizational merger with a sister organization resulting in the creation of Causa Justa::Just Cause. Since March 2011, she has used her strong operational and organizing skills and a commitment to creating a culture of support and accountability to NDWA.



BETTY T. YEE

Controller
State of California
@BettyYeeforCA

State Controller Betty T. Yee was elected in 2014, following two terms on the California Board of Equalization.

Reelected as Controller in 2018, Ms. Yee is the 10th woman in California history to be elected to statewide office. As the state's chief fiscal officer, Ms. Yee chairs the Franchise Tax Board and is a member of the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) Boards. These two boards have a combined portfolio of more than \$570 billion. Ms. Yee also serves on the Ceres Board of Directors, a nonprofit working to mobilize many of the world's largest investors to advance global sustainability and take stronger action on climate change. Ms. Yee has more than 35 years of experience in public service, specializing in state and local finance and tax policy. Ms. Yee previously served with the California Department of Finance where she led the development of the Governor's Budget, negotiations with the Legislature and key budget stakeholders, and fiscal analyses of legislation. She previously served in senior staff positions for several fiscal and policy committees in both houses of the California State Legislature. Ms. Yee received her BA in sociology from the University of California, Berkeley, and holds a master's degree in public administration.

SUPPLEMENTAL MATERIALS

MARY GRAY

Senior Principal Researcher
Microsoft Research

Ghost Work: [Reader's Guide](#)

[“The Hidden Global Workforce That Is Still Fighting for an Eight-Hour Workday.”](#) *Washington Post*. May 1, 2019.

[“The Humans Working Behind the AI Curtain.”](#) *Harvard Business Review*, January 9, 2017.

PAULINE KIM

Daniel Noyes Kirby Professor of Law
Co-Director, Center for Empirical Research in the Law
Washington University Law School

[“Data Mining and the Challenges of Protecting Employee Privacy Under U.S. Law.”](#) 2019. 40 *Comparative Labor Law & Policy Journal* 405.

IFEOMA AJUNWA

Assistant Professor, School of Industrial and Labor Relations
Cornell University

[“Beware of Automated Hiring.”](#) *New York Times*. October 8, 2019.

[Automated Employment Discrimination.](#) 2019.



GHOST WORK **READER'S GUIDE**

Key Information

***Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass* (HMH 2019) by Mary L. Gray and Siddharth Suri**

This supplement to *Ghost Work* contains chapter summaries, selected facts and statistics, and discussion questions related to the book's main arguments.

Authors:

MARY L. GRAY is a Fellow at Harvard University's Berkman Klein Center for Internet and Society and a Senior Researcher at Microsoft Research. She maintains a faculty position in the School of Informatics, Computing, and Engineering with affiliations in Anthropology, Gender Studies, and the Media School, at Indiana University. Mary studies how technology access, material conditions, and everyday uses of tech transform people's lives and is a leading expert in the emerging field of AI and ethics, particularly research methods at the intersections of computer and social sciences.

SIDDHARTH SURI is a Senior Researcher at Microsoft Research - AI. He is a computational social scientist whose work lies at the intersection of computer science, behavioral economics, crowdsourcing and the gig economy. His early work analyzed the relationship between network topology and human behavior. Since then he became one of the leaders in designing, building, and conducting "virtual lab" experiments using Amazon's Mechanical Turk.

Chapter Summaries

Introduction – Ghosts in the Machine

Today, businesses can source, schedule, manage, ship, and bill a host of tasks through a combination of sophisticated software and the internet. Anywhere the internet connects us, companies, large and small, can turn this technological innovation into platform-driven job boards and labor pools. They mix application programming interfaces (APIs) and artificial intelligence (AI) to call people to tasks as disparate as delivering food, reviewing online content, captioning video, and debugging computer code. The work is done, at times in a matter of seconds, on-demand.

In some cases, people do on-demand information service work that helps industries develop the AI aimed at automating away the tasks in front of them. Software developers can't build software that models human decisions without people helping to improve the "guesses" that AI makes. Developers depend on on-demand workers to provide the best proxies for what humans are, collectively, thinking, such as whether an image is a dog or cat, a search engine result is useful or hate-filled, or an email is an advertisement or spam. Legions of hired hands "clean training data"—fix typos, add descriptive tags to images, and myriad other tasks—to make information intelligible to software programs. From there, engineers create maps of human decision-making to build algorithmic models that can automatically anticipate a reasonable person's next move. Yet, despite the specter of robots poised to take our jobs, replacing people's capacity for creative spontaneity and problem-solving core to most service work is a technically hard problem for computer science.

So, increasingly, people are also hired to jump into the workflow of automated systems that can't be trusted to make decisions on their own. These platforms pool the ability of people to immediately step in where the AI falls short. This new form of task-based work is not a niche job. It is a radical reorganization—arguably the dismantlement—of full-time employment itself.

When companies or consumers elide or fail to recognize people responding to these platform-driven work requests, on-demand jobs can quickly slip into what we call *ghost work*: labor conditions that fail to see or intentionally devalue people's collective contributions to our economy and society.

Chapter One - Humans in the Loop

The first chapter offers an “under-the-hood” peek at API-driven work and the industries that use ghost work to train and fine-tune artificial intelligence or manage larger projects. It begins by telling the story of Amazon Mechanical Turk (MTurk), the first publicly-available platform to sell businesses and individuals access to a standing army of people signed up to do “microtasks” for pennies a task. Microtasks arose in the early 2000s. The term arguably no longer fits the varying size and scope of work delivered via APIs today. But, back in the early aughts, technology giants like Amazon, Microsoft, Google, and Facebook needed to develop automated systems for finding duplicate content, troubleshooting spellcheck, rooting out broken hyperlinks, reviewing flagged content, and responding to customer demands.

By design, many API-managed labor platforms assume that people are interchangeable, anonymous, autonomous agents able to seamlessly plug into any task, anytime, anywhere. This work has been designed by its creators to conceal the humans who are essential to the smooth function of the most popular websites and mobile phone apps. They are latter-day ghosts in the machine, and the machine cannot run without them. However, in practice, actual people with normal constraints on their time -- from childcare to lengthy commutes to full-time service jobs -- do this work. We share what we learned about the lived experience of people doing ghost work in the United States and India. Some perform only a few tasks. Others stick with it for years. Everyone we met had a list of tasks that they preferred or tried to avoid. Most had learned the hard way how to survive the system’s inherent isolation and alienation. We look at what it means to become one’s own boss, though not quite independent or self-employed in ways defined by today’s official laws and employment classifications. In concrete ways, the platform design sets the terms of engagement for workers. Workers, in turn, contort themselves to fit the flow of tasks. This produces a mix of working styles: “Experimentalists” create value by refreshing the ranks and size of a platform’s labor pool, picking up one or two tasks before moving on to other platforms; “Regulars” routinely work; and “Always-on” dedicated workers perform 80% of the tasks.

Chapter Two - From Piecework to Outsourcing: A Brief History of Automation's Last Mile

There are historical precursors to today's ghost work. To understand the needs of those toiling in the wake of AI's advancement, we need to examine the past roots of present day sensibilities around why a job is or is not considered valuable work. It took generations of labor organizing and social norms to define full-time employment as necessary and meaningful. Along the way, technologists and business interests, with a mix of motivations, set their sights on automating as much human labor as possible. Neither those advocating for decent, full-time work nor those building systems to obliterate it noticed the persistence, typically on a contingent, contractual basis, of certain tasks that couldn't be automated. Chapter Two lays out necessary historical background that helps explain how automation's shortcomings – not its advances – have defined the meaning and value of human labor. In the late-1800s, textile mills in Lowell, Massachusetts, paid farm families to hand-fashion cloth pieces into shirt flourishes that were still too delicate to churn out on the factory floor. Similarly, today's companies perfecting search engine queries hire workers to test their latest ranking, relevance, and crawling algorithms. Technological advancement has always depended on expendable, temporary labor pools.

Chapter Three - Algorithmic Cruelty and the Hidden Costs of Ghost Work

Chapter Three focuses on algorithmic cruelty. The APIs and platforms guiding ghost work create frustration for those hiring workers, too. This system, as it currently operates, doesn't work well for anyone. But ghost work can lead to negligent - or downright inhumane- treatment of workers in particular. This chapter explores workers' experiences toiling for a faceless computational process instead of a human boss. We also talk to full-time employees subcontracting out work only to learn that they, too, must take on some of the costs and risks supposedly eliminated by ghost work. Then we talk to workers in the U.S. and India who lost their jobs and final paychecks with no explanation and no opportunity to appeal. Readers will learn that no laws regulate or guide ghost work. We uncover myriad points of inefficient design, including Joan's need to constantly refresh the API's search results to land new tasks; Justin's frustration with sinking unpaid time into web searches to complete tasks ;

Ayesha's constant stress over the timer counting down the Real-Time ID Check task; and the fact that companies decide whether or not workers receive a final payment for tasks completed.

Of course, any freelancer will tell you that getting paid is the hardest part of the job. But, according to a national survey we conducted in partnership with Pew Research, 30 percent of those doing ghost work reported not getting paid for work they performed. At least most traditional freelancers and contractors have a human contact at the company, someone to call or email if an invoice goes unpaid. They may even have a contact who will advocate on their behalf if a payment is late. But the opaque employment terms of ghost work have made collecting one's wages even harder. These common experiences of algorithmic cruelty running roughshod through ghost work make clear why many workers feel that their site of employment doesn't care about them (at best) or is exploitative (at worst).

Chapter Four - Working Hard for (More Than) the Money

Despite the hardships ghost work almost inevitably entails, people have a range of reasons for returning to it day after day, whether they're experimenting with ghost work, doing it routinely, or making it their source of full-time employment. Chapter Four explores the value that people find in ghost work beyond making money. They tell us they are learning something new about themselves, finding future work that might lead to stable employment, feeling productive, and having a chance to control their work schedule and the types of work that they take on. They avoid the grind of commutes and office politics that they associate with previous 9-5 jobs. They can legitimately claim to be part of "the tech world" even if they lived far from Silicon Valley. They feel more independent and accomplished because they know their accumulated reputations were hard-won. And many feel like they are part of a team, some for the first time in their working lives. Many workers create environments for themselves that foster respect, even if not from the companies assigning them jobs and paying them for work. These workers said they were learning new skills that gave them hope that they would branch out their employment opportunities down the road.

Chapter Five - The Kindness of Strangers and the Power of Collaboration

One of the biggest surprises our research revealed was how hard workers strive to add to their lives what the on-demand economy seems bent on deleting - human connection, dignity, and the sense of doing meaningful work. People doing ghost work are not always the atomized, autonomous laborers they are assumed to be. Instead, they often work within a tight social network. As Chapter Five shows, the thing that unites those most successful at ghost work - those 'Always-on' and the 'Regulars' - is their ability to lean on one another. This kind of collaboration flies in the face of the assumptions made by designers of APIs who treat all tasks as equally doable and all humans as interchangeable cogs. Engineers assume that better matching algorithms alone make it easier for workers to complete tasks. Yet, companies cannot eliminate a worker's desire to invest in her job as something more than an economic transaction. The personal stories of these workers prove that no automated system can erase the need for connection, validation, recognition, and feedback. This chapter explores how those doing ghost work rely heavily on each other as a way to cope with being employed by non-human computational processes.

Chapter Six – The Double Bottom Line

On-demand labor does not have to be atomized and alienating. Several platforms are holding themselves accountable for the jobs they create as they build out software-as-a-service. Chapter Six focuses on in-depth stories of two platform-driven services, the social entrepreneurial commercial start-up, LeadGenius, and Amara.org, a not-for-profit site dedicated to captioning and translating video content for many languages. Both on-demand platform services aspire to meet a “double bottom line” of exceptional fiscal gains and positive social impact, offering examples of how this work need not be ghostly and could be done differently today. Unlike the aforementioned tech giants, these two platforms have deeply invested in fostering worker interaction and task collaboration.

For example, LeadGenius built a minimum wage, set hours, created a mentorship system, and support advancement into full-time employment. We meet people who have moved from hourly work to full-time employment in LeadGenius' Bay Area headquarters. Amara allows workers to choose between

volunteering and doing paid work. In these ways, LeadGenius and Amara allow workers to control their own destinies. They offer models for how to support teams that are collaborative, cooperative units, even though they neither rely on sharing the same location or investing in the same number of hours, as traditional coops do. Amara in particular points to a possible future that puts the worker in the driver's seat, able to set her schedule, negotiate wages and profit-sharing opportunities, and make decisions about when and how to contribute her time and effort to projects that she values beyond a pay check. Helping workers connect, fostering rather than ignoring or stifling their collaboration, and rewarding them for teaching each other aren't just the right things to do in ethical terms. They can all improve the quality of work produced via a platform, thus improving customer satisfaction and earnings.

Conclusion – The Task at Hand

Even with innovative platforms designing with the best of intentions, those doing ghost work shoulder a disproportionate share of the costs in the digital economy. The book's concluding chapter considers both technical and cultural changes that could make the difference between a future dominated by bad temp jobs and one full of valued, sustainable employment alongside AI. It imagines how to best approach the paradox of automation's last mile as it exists today and account for the value of the people who fill that void. Platform-driven innovations deliver goods and services to businesses and consumers under the pretense that a magical brew of APIs and artificial intelligence have eliminated what traditional employers used to pay for - namely, recruiting, training, and retaining workers. By spending time with hundreds of people doing ghost work, we saw that automation, far from eliminating those costs, shifts them to workers. If the ghost economy extracts value and saves costs by eliminating the traditional stability and security attached to full-time employment, this workforce will require - and deserves - a different set of benefits and safety nets.

The labor of hardworking people around the world should not be hidden by APIs and presented to consumers as seamless artificial intelligence. . We must reimagine a social safety net detached from the hours and places that we work. As platform economies regularly upend what counts as "skilled" labor, we must rethink how we train and compensate workers and put a higher premium on their willingness to step into the breach at a moment's notice. We need opportunities for workers to control their credentials, identities, and reputations, no matter which platform they use to pick up their next project. Ultimately, we

need to build systems so that the worker, rather than the API, controls her employment opportunities. We should penalize employers for misclassifying, delaying, or failing to pay workers, which remains one of the greatest injustices against freelance workers today.

Selected Facts and Statistics

The Gig Economy and changes in the labor force

According to the U.S. Department of Labor's Bureau of Labor Statistics, only 52 percent of today's employers sponsor workplace benefits of any kind.

- Bureau of Labor Statistics' 2017 Contingent and Alternative Employment Arrangements
- U.S. Census Bureau's May 2017 Current Population Survey (CPS)
- See the Introduction, pg. XXIV.

Per BLS estimates, 10.1 percent of U.S. workers work without an explicit or implicit long-term employment contract.

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In 2017, the BLS reported that at least 31 percent of the U.S. workforce claims that it does some form of alternative work arrangement that includes freelancing or independent contract work for hire.

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If trends continue at the current rate, economists estimate that by the early 2030s, tech innovation could dismantle and semi-automate roughly 38 percent of jobs in the U.S. alone.

- John Hawksworth et al., UK Economic Outlook: Prospects for the Housing Market and the Impact of AI on Jobs (London: PricewaterhouseCoopers, 2017).
- See Introduction, pg. X

The World Bank projects that the professional on-demand digital labor market, delivered through platforms like those we've studied, will grow to a \$25 billion-a-year market by 2020.

- Siou Chew Kuek, Cecilia Paradi-Guilford, Toks Fayomi, Saori Imaizumi, Panos Ipeirotis, Patricia Pina, and Manpreet Singh, "The Global Opportunity in Online Outsourcing," World Bank Group, June 2015
- See Conclusion, pg. 168.

Labor economists Lawrence Katz and Alan Krueger estimate that, in the past decade, temporary and alternative 20 contract-driven work delivered through self-employed workers or those temporarily employed by staffing agencies—the so-called casualization of the workforce—rose from 10 to 16 percent, accounting for all net employment growth in the U.S. economy.

- Lawrence F. Katz and Alan B. Krueger, “The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015” (NBER Working Paper Series, no. 22667, National Bureau of Economic Research, Cambridge, MA, September 2016).
- See Introduction, pg. XXV.

Economist Lawrence Mishel and his research team estimate that between 0.5 and 1 percent of working adults in the U.S., or 1.25 to 2.5 million people, participate in the gig economy. But they come to that number through a very specific study of Uber drivers and the assumption that Uber and other ride-hailing mobile apps make up the bulk of gig work.

- Lawrence Mishel, Elise Gould, and Josh Bivens, Wage Stagnation in Nine Charts (Washington, DC: Economic Policy Institute, 2015), <http://www.epi.org/publication/charting-wage-stagnation/>.
- See Introduction, pg. XXV.

A study produced by the JPMorgan Chase Institute found that 4.3 percent of U.S. adults, or 10.73 million people, had worked an online-platform-economy job at least once between 2015 and 2016.

- Farrell, Diana, and Fiona Greig. The Online Platform Economy: Has Growth Peaked? (JPMorgan Chase Institute, 2017).
- See Introduction, pg. XXV.

In 2016, a Pew survey that found that 8 percent of U.S. working-age adults, roughly 20 million people, earned money doing tasks either offline or on. That means approximately 12 out of every 100 working-age Americans already does some form of on-demand work.

- Smith, Aaron. Gig Work, Online Selling and Home Sharing. Washington, DC: Pew Research Center, 2016.
- See Conclusion, pg. 169.

A 2016 research study estimated that, in the U.S. and the Europe alone, around 25 million people did some form of on-demand gig work online –accepting project-driven tasks from companies that assign, schedule, route, and bill work through websites or mobile apps. If 25 million job opportunities seems small, consider that this type of job did not exist prior to the widespread adoption of web-based application programming interfaces (APIs) in the early 2000s. At this rate of growth, if combined with current trends in the growth of contract staffing and temp agency services, 60 percent of today’s global employment will likely be converted into some form of on-demand gig work by 2055.

- James Manyika et al., Independent Work: Choice, Necessity, and the Gig Economy (Washington, DC: McKinsey Global Institute: October 2016), <http://www.mckinsey.com/global-themes/employment-and-growth/independent-work-choice-necessity-and-the-gig-economy>;
- See Conclusion, pg. 169.

Quick facts about select On-demand Platforms

Among the four platforms studied in *Ghost Work* (MTurk, UHRS, Lead Genius, and Amara), between 46 and 71 percent of the workers listed ‘earning money’ as their primary motivation for doing on-demand work.

- See Chapter 4, pg. 100.

On the other hand, between 29 and 54 percent of workers said their primary motivation was self-improvement, such as gaining experience or learning new skills, or reasons of self-determination, such as utilizing their free time or being their own boss.

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While earning money is important, it’s not the only reason workers do on-demand work.

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MTurk

Almost 70 percent of MTurk workers have completed a bachelor’s degree or higher in educational attainment. MTurk workers also skew young: 76.9 percent are between the ages of 18 and 37, the same bracket of years when people are most actively seeking their first career-defining job.

- See Chapter 1, pg. 10.

Only 4 percent of MTurk workers are skilled, practiced, and lucky enough to earn more than \$7.25 an hour completing tasks.

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75 percent of MTurk workers do on-demand work on other platforms, including Microsoft’s UHRS, Lead Genius, and Amara.

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On MTurk, approximately 98 to 99 percent of all tasks are posted by just 10 percent of the requesters. This means that the markets are extremely concentrated for on-demand work tasks, which in turn exacerbates the power imbalance between workers and requesters.

- See Chapter 3, pg. 92.

Roughly 25 percent of workers in the U.S. and India were referred to MTurk by a friend.

- See Chapter 5, pg. 125.

UHRS

On UHRS, nearly 80 percent of workers are between the ages of 18 and 37.

- See Chapter 1, pg. 18.

More than 70 percent of workers on UHRS are male.

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More than 85 percent of workers on UHRS have a bachelor's degree or higher.

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Lead Genius

Approximately 70 percent of Lead Genius's on-demand workforce—called researchers—have a bachelor's degree or higher.

- See Chapter 1, pg. 23-26

Globally, women make up 49 percent of Lead Genius's workforce, although among a sample of India workers there were 10 percent more men than women.

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84.5 percent of workers on Lead Genius are between the ages of 18 and 37.

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More than 25% of workers came to the Lead Genius platforms through a word-of-mouth employer recommendation.

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Almost 75 percent of workers use Lead Genius and at least one other platform to do on-demand work. More than 60 percent of workers on Lead Genius rely on the platform, in addition to at least one other income stream, to meet their basic needs.

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According to Lead Genius, one out of every three workers supports a household of three or more people.

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All new hires on Lead Genius start out on a 90-day trial. If they make it through the first 90 days, they keep up their requirements by logging in and staying connected to teams for at least 20 hours a week. If they consistently make it to their shifts on time, they get an automatic bump of 8 percent in their hourly pay.

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Amara

In 2015, Amara broke even with earned revenue for the first time. They did it by selling the value of their double-bottom-line strategy.

- See Chapter 1, pg. 26 - 31

The Amara on-demand team that started with roughly 200 members now numbers upwards of 3,000.

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An average of 350 people a month are paid to do captioning and translation work on Amara.

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Reflecting the Pareto distribution, roughly 10 to 20 percent of the people affiliated with Amara do 80 to 90 percent of the work.

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Employment Classification

The BLS estimates that 10.1 percent of U.S. workers work without an explicit or implicit long-term employment contract. Keep in mind that this survey counts only people who hold an alternative employment arrangement as their primary or stand-alone job. If a person does on-demand work while also holding down a nine-to-five job with a single employer for a set salary or hourly wage—a very common trend among the most active workers we met—they are even harder to identify, let alone count.

- Bureau of Labor Statistics' 2017 Contingent and Alternative Employment Arrangements
- U.S. Census Bureau's May 2017 Current Population Survey (CPS)
- See Introduction, pg. XXIV.

At the height of the Great Depression, triggered by the 1929 stock market crash, more than 15 million people, or just over 20 percent of the U.S. adult working population, were unemployed and had no security beyond what their families could provide. By 1930, accidents at industry work sites had killed scores of workers across the country. The 1935 passage of the Wagner Act, officially called the National Labor Relations Act, established the first legal right of most workers, with the notable exception of agricultural and domestic workers, to form labor unions and collectively bargain with employers.

- See Chapter 2, pg. 46

In the late 1980s, Microsoft was thrust into the spotlight, not so much for its status in the growing tech industry as for a troubling trend in its staffing procedures. Microsoft was assigning temporary (or contingent) workers tasks that were virtually identical to what their permanent staff did. These “permatemps” spent years with the same responsibilities, reporting to the same management, and on full-time hours. By 1989 the IRS had grown wary of this arrangement and audited Microsoft’s staffing procedures. The agency ended up deciding that about 600 of Microsoft’s independent contractors should be reclassified as permanent employees, because their work was entirely under Microsoft’s control. In 1992, a group of temporary workers filed a class-action suit (*Vizcaino v. Microsoft*) claiming that they were common-law employees and should receive the same benefits as permanent staff. In 2000, after nearly 8 years of litigation, roughly 8,000 Microsoft permatemps received a settlement of \$97 million. Without a court ruling, the question of what kind of worker these

permatemps were and what kinds of protections they deserved has never been fully resolved.

- See Chapter 2, pg. 56-57

Money Troubles

According to a 2016 national survey that the *Ghost Work* authors conducted in partnership with Pew Research, 30 percent of gig workers reported not getting paid for work they performed at least once.

- See Chapter 3, pg. 90.

In 2015, the Freelancers Union, in the United States, found that 70 percent of those freelancing in the current economy do not get paid by at least one client and 71 percent have struggled to collect payment for work at least once in the course of their career.

- Sara Horowitz, "Special Report: The Costs of Nonpayment," Freelancers UnionBlog, accessed May 8, 2018, <http://blog.freelancersunion.org/2015/12/10/costs-nonpayment/>
- See Chapter 3, pg. 90 - 91

The Federal Reserve Board's annual Report on the Economic Well-Being of U.S. Households found, in 2018, that 40 percent of people in the United States did not have the means to cover a \$400 emergency expense without borrowing money or selling something.

- See Chapter 4, pg. 94.

Factoring in inflation, real wages in the United States were only 10 percent more in 2017 than they were in 1973, putting annual wage growth at a glacial pace of 0.2 percent a year over the past 40 years. The top 1 percent of wage earners have seen their annual pay increase 138 percent since between 1979 and 2013, while the bottom 90 percent of workers saw only a 15 percent increase in their annual pay over the same period. This means that the typical full-time job can't offer enough to be the sole source of income.

- Jay Shambaugh Nantz et al., Thirteen Facts About Wage Growth (Washington, DC: Brookings Institution, September 25, 2017), www.brookings.edu/research/thirteen-facts-about-wage-growth/
- See Chapter 4, pg. 99.

One in six people employed full-time have irregular work schedules and ten percent of workers employed full-or part-time get their work schedules less than a week in advance.

- Board of Governors of the Federal Reserve, Economic Well-Being 2017.
- See Chapter 4, pg. 99.

Discussion Questions

1. What is “ghost work”?
2. Why are most consumers unaware of the existence of people doing ghost work?
3. How did Gray and Suri find the workers who participated in their research study?
4. What does the research method of ethnography bring to the study of ghost work?
5. At several points throughout *Ghost Work*, it is clear that workers are invested in making this job better or, at the very least, making it work for them. In what ways do you see workers organizing to make this happen?
6. The refrain that robots are coming to take our jobs is still common. How do the research and arguments found in *Ghost Work* challenge that assumption? How does *Ghost Work* suggest that there is another way of looking at automation that should be considered when talking about the future of work?
7. Often, on-demand platform jobs and the life of an independent contractor are considered “flexible” yet the research behind *Ghost Work* found people had to be hyper-vigilant about securing work. What do you now know about “flexibility” often associated with online work? How does this relate to the inflexibility of workers behind the scenes of artificial intelligence?
8. Why can’t we automate out the need for people, eventually, once we have data to model a human decision?
9. What is the “paradox of automation’s last mile”?
10. Early in the book, it's asserted that the presence of a ghost workforce is neither inherently a bad nor a good thing. How could this work be made a

more positive experience - for all those involved? Does the opaque nature of ghost work make it inherently precarious?

11. The introduction of the book describes a worker named Joan and her experience, after years of practice, now able to piece together roughly \$40 worth of tasks at the end of a long workday. Does this online marketplace drive down what professionals would otherwise be able to charge for work? How would we improve the pay for people doing ghost work online?

12. As more work transitions online, what are some full-time fields you see transitioning to ghost work, or more "macro-tasks," in the near future?

13. Throughout the book, the history of employment is referenced as evidence that ghost work is not the first instance of a contingent workforce being undervalued, despite its critical role doing something technologies can't do on their own. Is there anything particularly unique about the latest version of this kind of work?

14. How was the Microsoft permatemp case a missed opportunity for organizing contract workers' rights?

15. The book describes an instance when Amazon Mechanical Turk workers pulled together to advocate for better work conditions, driving a letter-writing campaign to Amazon's CEO Jeff Bezos. Do you think that people doing ghost work will begin to mobilize to fight for better conditions and employment rights for fellow on-demand workers?

16. What are the reasons that large, established tech companies, like Microsoft and Amazon, might either fight for or against implementing any of the *Ghost Works's* recommendations to improve services for both companies in need of ghost work and workers picking up the jobs?

17. The subtitle of the book suggests that there is a way to stop Silicon Valley from building a new global underclass. What proposals in the book are the most compelling? What would you suggest?

18. The book's conclusion offers specific recommendations for a better, more sustainable future for ghost work. It suggests that such things as basic healthcare options, control over scheduling and projects, and collaborative tools for teamwork are necessary for a "labor commons" like those produced by platform companies. What are the business reasons that more companies might operate like LeadGenius and Amara, the companies discussed at length in the penultimate chapter, "The Double Bottom Line"? And if businesses don't adopt these approaches will trends continue to shift the burdens of this work life, such as dealing with broken software, the administrative overhead, benefits, learning curves that come with on-demand work, to workers' shoulders?

Global Opinions

The hidden global workforce that is still fighting for an eight-hour workday

By Mary L. Gray

May 1 at 11:30 AM

Mary L. Gray is a senior researcher at Microsoft Research, a fellow at Harvard University's Berkman Klein Center for Internet & Society, and a faculty member at the School of Informatics, Computing, and Engineering at Indiana University. She is co-author of "[Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass](#)."

If you live in the United States, May 1 is generally a typical workday. But in most of the industrialized world, it is a national holiday commemorating the lives lost in the 1886 [Chicago Haymarket massacre](#), which [eventually ushered](#) in the eight-hour workday in the United States and many other countries. Those who enjoy a salary may work more than eight hours if they choose but, thanks to battles fought more than a century ago, they do not have to work more than that to retain their jobs.

Yet that hard-won victory to control work hours is slipping away around the world.

ADVERTISING

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Temporary staffing services that contract workers for projects are [driving significant economic growth](#). Full-time, salaried positions are the [exception](#) in countries such as India, where an estimated [85 percent](#) of the workers are paid in cash. In the United States, where formal employment is still the norm, 1 in 6 people employed full time still contend with irregular work schedules.

But even more pernicious is a new type of on-demand work that we are not looking up from our phones long enough to notice.

As we tap endlessly on those friendly icons to “like” social media content, summon deliveries from favorite restaurants and call rides to the airport, we’re overlooking a global workforce. Millions of workers are doing on-demand work to keep the Internet running smoothly, and they are now fighting for similar rights that full-time employees won decades ago.

Ghost work, the name our team at Microsoft Research has given to work done by this largely invisible labor force, flourishes at the dynamic boundary where human intelligence and technology meet. Computer software can schedule a ride, but a human must drive the car (for the foreseeable future, at least). An app can help you order your food, but only a person can make it up your four-story walk-up and identify your apartment number in a dimly lit hallway. And algorithms can suspect a Facebook photo is pornographic, but often it takes a person to know if a line has been crossed.

Ghost work is ingeniously spun as a job with ultimate flexibility. But our team found just the opposite. Flexibility is an illusion. Ghost work depends on keeping people in the loop, waiting for the moment when the code breaks down or falls short and a consumer needs help. The system rewards workers who are on call 24/7, forcing workers to be hypervigilant if they want to succeed, or just break even for the time they have spent looking for work.

That truth suggests workers are losing the hard-won achievement to contain the workday.

But people doing ghost work will never be able to coordinate a strike quite like the one that resulted in the eight-hour workday. That’s because, unlike in 1886, when [350,000](#) workers and labor advocates galvanized to stop work until their employers gave them better working conditions, workers in the gig-driven ghost economy have no shared workplace, professional identity or voice to call for change.

The good news is that independent contractors doing ghost work are collectively organizing. They connect to learn the ropes, flag bad clients and offer solace at the end of long stretches of tasks. Those with the strongest networks often land better-paying jobs.

We know it’s possible for organized labor to help independent workers find this common cause, thanks to organizations such as [Coworker.org](#), which gives workers a global platform for talking and coordinating actions across work sites, and advocates such as the [National Domestic Workers Alliance](#), which have built [technology](#) to help independent workers collectively voice their needs to their clients.

Of course, relying on independent contractors connecting and voicing their grievances will not be enough to change working conditions. We need new labor laws and organizing strategies that foster workers’ connections and make it much easier for consumers to see ghost work conditions and choose to spend on the labor practices they want to underwrite.

5/1/2019 On May Day, hidden global workforce is still fighting for rights. The Washington Post
This will take stakeholders around the world pushing for policies that value all workers. Perhaps converting ghost work conditions into a decent and dignified livelihood is our generation’s chance to finally achieve what workers everywhere have fought for centuries: the right to have work accommodate our lives rather than have our lives accommodate work.

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[Amber Petrovich: I’m a gig worker. I understand why you don’t give me benefits. But please do.](#)

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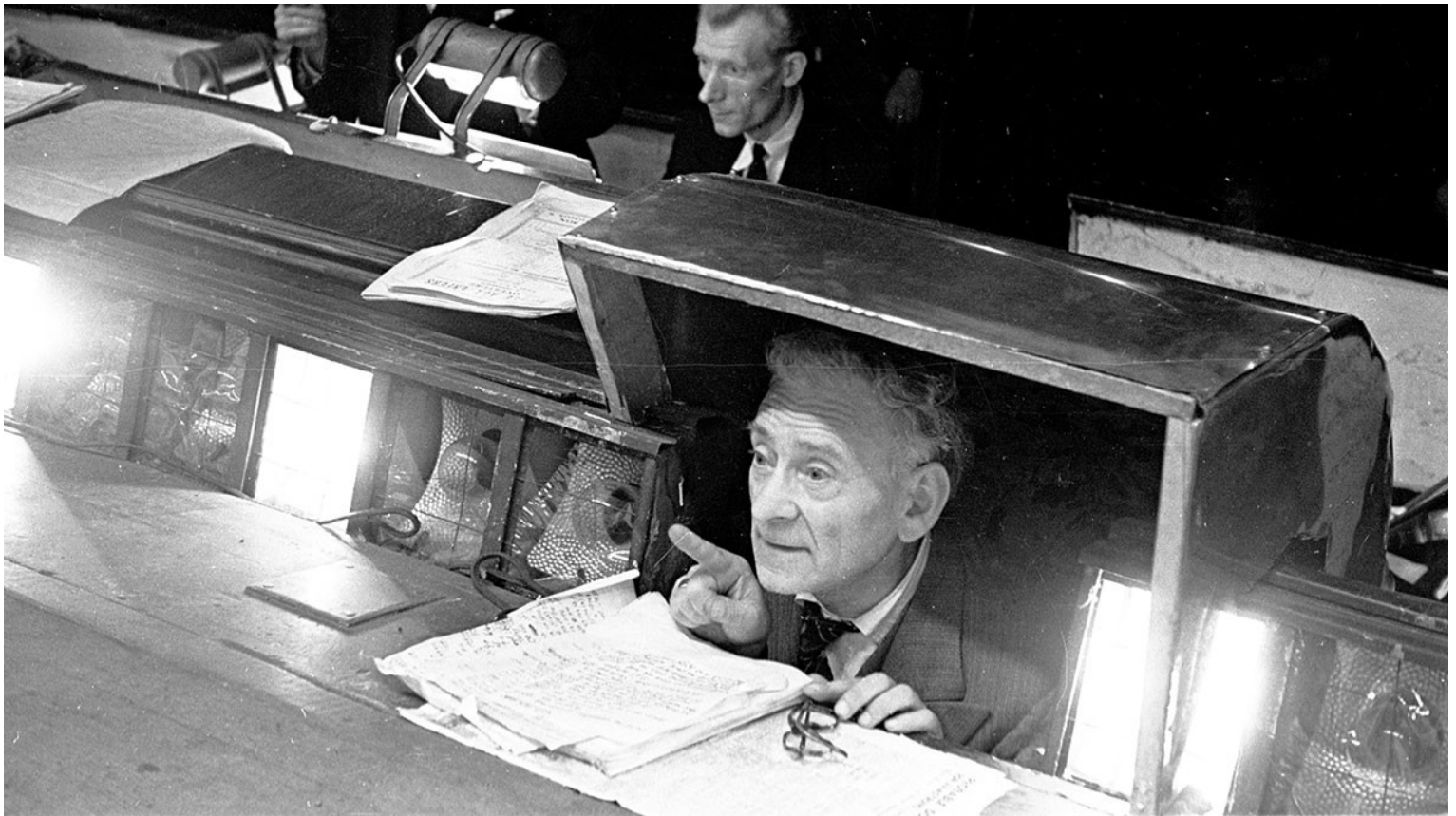
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TECHNOLOGY

The Humans Working Behind the AI Curtain

by [Mary L. Gray](#) and [Siddharth Suri](#)

January 09, 2017



Just how artificial is Artificial Intelligence? Facebook created a PR firestorm last summer when reporters discovered a human “editorial team” – rather than just unbiased algorithms – selecting stories for its trending topics section. The revelation highlighted an elephant in the room of our tech world: companies selling the magical speed, omnipotence, and neutrality of artificial intelligence (AI) often can’t make good on their promises without keeping people in the loop, often working invisibly in the background.

So who are the people behind the AI curtain?

Cut to Bangalore, India, and meet Kala, a middle-aged mother of two sitting in front of her computer in the makeshift home office that she shares with her husband. Our team at Microsoft Research met Kala three months into studying the lives of people picking up temporary “on-demand” contract jobs via the web, the equivalent of piecework online. Her teenage sons do their homework in the adjoining room. She describes calling them into the room, pointing at her screen and asking: “Is this a bad word in English?” This is what the back end of AI looks like in 2016. Kala spends hours every week reviewing and labeling examples of questionable content. Sometimes she’s helping tech companies like Google, Facebook, Twitter, and Microsoft train the algorithms that will curate online content. Other times, she makes tough, quick decisions about what user-generated materials to take down or leave in place when companies receive customer complaints and flags about something they read or see online.

Whether it is Facebook’s trending topics; Amazon’s delivery of Prime orders via Alexa; or the many instant responses of bots we now receive in response to consumer activity or complaint, tasks advertised as AI-driven involve humans, working at computer screens, paid to respond to queries and requests sent to them through application programming interfaces (APIs) of crowdwork systems. The truth is, AI is as “fully-automated” as the Great and Powerful Oz was in that famous scene from the classic film, where Dorothy and friends realize that the great wizard is simply a man manically pulling levers from behind a curtain. This blend of AI and humans, who follow through when the AI falls short, isn’t going away anytime soon. Indeed, the creation of human tasks in the wake of technological advancement has been a part of automation’s history since the invention of the machine lathe.

We call this ever-moving frontier of AI’s development, the *paradox of automation’s last mile*: as AI makes progress, it also results in the rapid creation and destruction of temporary labor markets for new types of humans-in-the-loop tasks. By 2033, economists predict that tech innovation could convert 30% of today’s full-time occupations into augmented services completed “on demand” through a mix of automation and human labor. In short, AI will eliminate some work as it opens up opportunities for

redefining what work humans do best. These AI-assisted augmented services, delivered by people quietly working in concert with bots, are poised to enhance our daily productivity but they also introduce new social challenges.

Much of the crowdwork done on contract today covers for AI when it can't do something on its own. The dirty little secret of many services — from FacebookM to the “automatic” removal of heinous videos on YouTube, as well as many others — is that real live human beings clean up much of the web, behind the scenes. Those magical bots responding to your tweets complaining about your delayed pizza delivery or the service on your flight back to Boston? They are the new world of contract labor hidden underneath a layer of AI. A hybrid of humans and AI is remaking retail, marketing, and customer service. It turns out that AI, just like humans, struggles to make tough decisions about what content should and should not be included in our daily diets of social media, depending on what criteria or values we want to impose.

The real story isn't whether Facebook biased its trending topics by involving human editors; it is that the AI of today can't function without humans in the loop, whether it's delivering the news or a complicated pizza order. Content moderation and curation — from newsfeeds, and search results to adjudicating disputes over appropriate content — involve people hired by technology and media companies to make judgments about what to leave up or take down. Remember that classic moment in the 2012 presidential campaign when Mitt Romney uttered the phrase “binders full of women”? Twitter needed contracted, on-demand workers to figure out, in real-time, why such an obtuse phrase so quickly became such a popular hashtag and whether it was an appropriate thing to post to its trending topics.

Who are these workers behind the AI curtain? Many are like Kala: everyday people, typically paid a low, flat rate, working independently or through temp agencies, many operating outside the United States. It is not common knowledge that the bulk of content moderation is outsourced to contract workers around the globe with little transparency about their training, work environments, or protocols for making editorial decisions. In fact, it is striking, especially after the Facebook “editorial team” incident, that more consumers haven't asked: what are the content moderation practices of

social media? Who has a hand in creating the content that lands on our virtual doorsteps? The incident left only room for speculation about the team's credentials and support for complicated editorial work.

Our team learned from two years of researching the world of paid crowdwork, where content moderation is a steady stream of gig work, that the inside practices of both the largest and the smallest companies in the tech world involve literally thousands of decisions about what content to keep or delete. Contract workers are needed to train algorithms to make some of the most important decisions about content. And, more than we realize, they are charged with stepping in to make snap decisions about what stays on a site, and what's deleted. This is a new form of employment that we should all value, as these people keep the internet from becoming a swampy pool of spam. Companies rely heavily on part-time contract workers hired through crowdsourcing platforms like Crowdfunder and Amazon Mechanical Turk, or vendor management systems like Clickworker.

We need to think seriously about the human labor in the loop driving AI. This workforce deserves training, support and compensation for being at-the-ready and willing to do an important job that many might find tedious or too demanding. A host of future jobs, going far beyond editorial treatments of trending topics, will require the creative efforts of humans to channel the speed, reach, and efficiencies of AI. The first step is to require more transparency from tech companies that have been selling AI as devoid of human labor. We should demand truth in advertising with regard to where humans have been brought in to benefit us — whether it's to curate our news to inform our body politic, or to field complaints about what some troll just posted to our favorite social media site. We should know there's human labor in the loop because we want to have both the capacity to recognize the value of their work, and also to have a chance to understand the training and support that informed their decision-making, especially if their work touches on the public interest.

As consumers, we have a right to know what ingredients and processes are in the AI that compiles our news and media content, in the same way that we should know what's in the food we feed our families. As citizens, we have a need to know where our information comes from. And, as human beings, we should always know when humans are at work, producing what we consume, whether physical or digital. The labor of these hardworking people around the world should not be rendered invisible or

opaque by the shibboleth of AI. Just as we need companies to be accountable for the labor practices that produce our food, clothes, and computers, so, too, do we need accountability to both consumers and workers producing and shaping digital content.

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DATA MINING AND THE CHALLENGES OF PROTECTING EMPLOYEE PRIVACY UNDER U.S. LAW

Pauline T. Kim†

Worker advocates and legal scholars have long been concerned about the impact of employer monitoring and surveillance on employee rights. Tools like RFID badges, GPS tracking devices, and computer monitoring software allow employers to track their employees' movements and activities throughout the day and sometimes during off-work hours as well.¹ As these tools have become more common, concerns have focused on the threats they pose to workers' privacy and autonomy interests. These technologies can be deployed in ways that are excessively intrusive and undermine workers' dignity.² Constant surveillance can increase stress, affecting mental and physical health,³ as well as deterring workers from speaking up about workplace conditions or engaging in other socially valued forms of speech.⁴

Concerns about employee privacy have only intensified with the introduction of data analytic tools in the workplace. While electronic monitoring technologies offer the possibility of continuous surveillance, the application of data mining techniques to employee data raises additional

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1. See Michael L. Tushman et al., *Email and Calendar Data Are Helping Firms Understand How Employees Work*, HARV. BUS. REV. (Aug. 28, 2017), <https://hbr.org/2017/08/email-and-calendar-data-are-helping-firms-understand-how-employees-work?autocomplete=true> (computer monitoring software); see also Kaveh Waddell, *Why Bosses Can Track Their Employees 24/7*, ATLANTIC (Jan. 6, 2017), <https://www.theatlantic.com/technology/archive/2017/01/employer-gps-tracking/512294/> (GPS tracking of employee smart phones through employer-mandated apps); Ceylan Yeginsu, *If Workers Slack Off, The Wristband Will Know. (And Amazon Has a Patent for It.)*, N.Y. TIMES (Feb. 1, 2018), <https://www.nytimes.com/2018/02/01/technology/amazon-wristband-tracking-privacy.html> (RFID devices).

2. See, e.g., Lawrence E. Rothstein, *Privacy or Dignity?: Electronic Monitoring in the Workplace*, 19 N.Y.L. SCH. J. INT'L & COMP. L. 379, 379-412 (2000) (arguing legal protections from electronic surveillance for workers should derive from the concept of human dignity rather than privacy).

3. See Esther Kaplan, *The Spy Who Fired Me: The Human Costs of Workplace Monitoring*, HARPER'S MAGAZINE 31, 31-40 (Mar. 2015); M. J. Smith et al., *Employee Stress and Health Complaints in Jobs With and Without Electronic Performance Monitoring*, 23 APPLIED ERGONOMICS 17, 23-27 (1992) (finding that electronic performance monitoring adversely affected employees' perception of job stressors and levels of physical and psychological strain).

4. See Pauline T. Kim, *Electronic Privacy and Employee Speech*, 87 CHI.-KENT L. REV. 901, 901-32 (2012).

challenges. Data mining is simply the process of analyzing large datasets to uncover patterns in the data.⁵ These techniques can sometimes reveal surprising relationships between variables, allowing the data processor to make inferences about unknown characteristics of individuals based on available data. In the employment context, employers can now readily access detailed data about workers' online behavior or social media activities, purchase background information from data brokers, and collect additional data from workplace surveillance tools.⁶ When data mining techniques are applied to this wealth of data, it is possible to make inferences about worker characteristics and to try to predict future job performance.

Although workforce analytic tools might appear to be merely extensions of previously available monitoring and surveillance techniques, their development raises threats to employee privacy that are different in kind. The inferences drawn from these tools may not always be accurate or may be biased in ways that produce discriminatory employment outcomes, issues that I have explored at length in other work.⁷ Here, I focus on a different challenge, namely that data mining tools can alter the meaning and significance of personal information in ways that render traditional employee privacy protections largely ineffective. As many legal scholars have noted, U.S. law offers few limits on employer monitoring and surveillance.⁸ Nevertheless, it has provided some protection against the most egregious information gathering practices, often by shielding particularly sensitive information from employer access and scrutiny. The application of data mining techniques to employee data, however, renders these traditional approaches largely ineffective.

5. Bart Custers, *Data Dilemmas in the Information Society: Introduction and Overview*, in *DISCRIMINATION AND PRIVACY IN THE INFORMATION SOCIETY: DATA MINING AND PROFILING IN LARGE DATABASES* 3, 9 (Bart Custers, Toon Calders, Bart Schermer & Tal Zarsky eds., 2013).

6. See Kaplan, *supra* note 3; Olivia Solon, *Big Brother Isn't Just Watching: Workplace Surveillance Can Track Your Every Move*, *GUARDIAN* (Nov. 6, 2017), <https://www.theguardian.com/world/2017/nov/06/workplace-surveillance-big-brother-technology>.

7. See, e.g., Pauline T. Kim, *Big Data and Artificial Intelligence: New Challenges for Workplace Equality*, 57 U. LOUISVILLE L. REV. (forthcoming 2019); Pauline T. Kim, *Auditing Algorithms for Discrimination*, 166 U. PA. L. REV. 189, 189-203 (2017), <https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1212&context=penn-law-review-online> (arguing that auditing is an important tool for detecting discriminatory algorithms); Pauline T. Kim, *Data-Driven Discrimination at Work*, 58 WM. & MARY L. REV. 857, 857-936 (2017) (exploring the risks of discriminatory algorithms and how employment discrimination law might apply); Pauline T. Kim & Erika Hanson, *People Analytics and the Regulation of Information Under the Fair Credit Reporting Act*, 61 St. Louis U. L.J. 17, 18-19 (2016) (discussing risks of unfairness from inaccurate information or unjustified inferences).

8. See, e.g., Ifeoma Ajunwa, Kate Crawford & Jason Schultz, *Limitless Worker Surveillance*, 105 CALIF. L. REV. 735, 735-76 (2017) (arguing current laws are insufficient to constrain employer monitoring and tracking of workers); Robert Sprague, *Orwell was an Optimist: The Evolution of Privacy in the United States and Its De-Evolution for American Employees*, 42 J. MARSHALL L. REV. 83, 83-135 (2008) (arguing that privacy doctrine and technology have eroded employees' expectations of privacy not only in the workplace but jeopardized employee privacy in the home).

Electronic monitoring tools can amass vastly more information than a human observer, but by themselves, they are simply data collection tools. Data mining, however, allows that same information to be analyzed to infer *additional* information about the data subjects beyond what is directly observed. For example, an employer might examine workers' social media activities on Facebook, which would reveal their social connections and what they "Liked." When analyzed as part of a larger dataset, however, that information can also be used to infer characteristics like sexual orientation or personality traits.⁹ Similarly, information obtained through workplace wellness programs can be aggregated and analyzed to uncover additional information—for example, if an individual has certain health conditions or is pregnant.¹⁰ Thus, because data analytic tools can be used to draw inferences, the meaning and significance of any given piece of personal information is not fixed, but can change depending upon what other information it is aggregated with and how the larger dataset is analyzed.

With data mining, individual privacy may be threatened not by the types of information actually collected, but because of what can be inferred from that information after it is aggregated and analyzed with other data. This poses a challenge for the law, which often conceptualizes the harm of privacy intrusions in terms of the sensitivity or highly personal nature of information collected or disclosed. This article explores this dilemma by examining three examples of how U.S. legal protection of employee privacy rests on the assumption that privacy entails protecting sensitive or critical information. More specifically, it examines antidiscrimination law's protection of medical and genetic information, the common law privacy tort's protection of embarrassing or humiliating intrusions or disclosures, and the Fair Credit Reporting Act's protection against erroneous data. These strategies rest on the assumption that particular information can be identified as problematic and protected; however, this narrow focus limits the usefulness of these laws in responding to the privacy threats posed by data mining. This article concludes with a brief glance at the differing approach taken by the European Union's General Data Protection Regulation (GDPR),¹¹ which suggests some steps that may help to overcome the limitations of U.S. employee privacy law.

9. Michal Kosinski, David Stillwell & Thore Graepel, *Private Traits and Attributes Are Predictable from Digital Records of Human Behavior*, 110 PROC. NATL. ACAD. SCI. U.S.A. 5802, 5805 (2013) (showing that records of an individual's Facebook "likes" can be used to accurately predict personal characteristics such as race, gender, sexual orientation, religious and political views, and intelligence).

10. See Jay Hancock, *Workplace Wellness Programs Put Employee Privacy at Risk*, CNN (Oct. 2, 2015, 12:37 PM), <http://www.cnn.com/2015/09/28/health/workplace-wellness-privacy-risk-exclusive/>; Valentina Zarya, *Employers Are Quietly Using Big Data to Track Employee Pregnancies*, FORTUNE (Feb. 17, 2016), <http://fortune.com/2016/02/17/castlight-pregnancy-data/>.

11. Regulation (EU) 2016/679, of the European Parliament and the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), 2016 O.J. (L 119) 1.

I. PROTECTING MEDICAL AND GENETIC INFORMATION—THE ADA AND THE GINA

U.S. law seeks to protect employees from discrimination because of a disability or their genetic traits. In doing so, the law not only forbids employers from taking adverse actions based on those protected characteristics, it also limits employers from acquiring or disclosing medical or genetic information. Although these limits are found in antidiscrimination laws, they act as privacy laws, recognizing certain types of information as warranting special protection and regulating their collection and use.

The Americans with Disabilities Act (ADA) was passed in 1990 “to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities,”¹² including in employment.¹³ In seeking to achieve that goal, Congress also limited employer access to medical information,¹⁴ recognizing that medical information could reveal the presence of a disability. Because not all disabilities are immediately visible, restricting medical exams and inquiries could prevent discrimination from occurring at all, or isolate when an applicant’s disability might have influenced the hiring decision.¹⁵ The disability community had also advocated for restrictions on medical inquiries in order to prevent disclosure of disabilities, such as HIV infection, which can carry a social stigma.¹⁶ Thus, in seeking to prevent discrimination on the basis of disability, the ADA treats medical information as particularly sensitive and restricts the circumstances under which employers can make medical inquiries or require medical exams of applicants or employees.¹⁷

The ADA does not wholly prohibit employers from accessing employee medical information. Employers may require new hires to undergo a medical exam after they have received an offer of employment.¹⁸ Additionally,

12. 42 U.S.C. § 12101(b)(1) (2012).

13. Title I of the ADA forbids discrimination against qualified individuals on the basis of disability and requires employers to reasonably accommodate the needs of workers with disabilities. § 12112 (prohibition on discrimination); § 12112(b)(5)(A)-(B) (requirement of reasonable accommodation).

14. § 12112(d) (restriction on medical examinations and inquiries).

15. See Chai Feldblum, *Medical Examinations and Inquiries Under the Americans with Disabilities Act: A View from the Inside*, 64 TEMP. L. REV. 521, 545 (1991) (arguing that individuals with “hidden disabilities” are “best protected by an absolute bar on pre-offer inquiries or exams” to prevent inappropriate consideration of their medical condition); see also *id.* at 533 (explaining that restricting pre-offer medical inquiries but allowing post-offer examinations may result in applicants with disabilities “to isolate, if and when, their disability unjustifiably influenced a hiring practice”).

16. *Id.* at 536, 539.

17. Prior to making an offer, employers are prohibited from requiring applicants to undergo a medical exam and from asking whether the applicant has a disability or about the nature or severity of a disability. § 12112(d)(2)(A). Once an offer has been made, the employer may condition employment on the results of a medical examination, so long as the requirement is imposed on all new hires, not just those with a disability, § 12112(d)(3). Finally, after employment has begun, an employer is not permitted to require medical examinations or to make medical inquiries unless the exam or inquiry is “job-related and consistent with business necessity,” § 12112(d)(4)(A).

18. § 12112(d)(3).

employers may learn about an employee's medical condition as part of the interactive process of determining how to reasonably accommodate a worker's disability. When an employer lawfully obtains employee medical information, the ADA imposes restrictions on its storage and subsequent use, requiring employers to treat the information as a "confidential medical record" and to prevent access by supervisors or managers except to the extent necessary to reasonably accommodate a disability.¹⁹ Medical information can reveal highly personal facts and employees may fear embarrassment, harm to their reputation, stigma or shunning if sensitive information is revealed to those with whom they work. Thus, the statute protects employees' privacy interest not just by restricting the collection of medical information, but also by limiting its subsequent disclosure.

The Genetic Information Nondiscrimination Act (GINA), passed in 2008, also seeks to prevent discrimination—in this case, against individuals based on their genetic characteristics.²⁰ In addition to prohibiting the use of genetic information in hiring, firing and other personnel decisions, it protects the privacy of individuals' genetic information.²¹ Employers may not lawfully "request, require, or purchase genetic information with respect to an employee or a family member of the employee."²² Even if a medical examination is permissible under the ADA, an employer may not seek genetic information as part of that examination.²³ There are a handful of exceptions under which an employer might lawfully acquire genetic information. For example, no violation occurs when genetic testing is part of a program monitoring for the health effects of toxic substances in the workplace or if family medical history—a form of genetic information—is learned from publicly available sources.²⁴ If such information is lawfully acquired, however, the GINA, like the ADA, requires the employer to treat it

19. § 12112(d)(3)(B)-(B)(i). The statute also provides exceptions for disclosure if emergency treatment is required or in case of a government investigation, § 12112(d)(3)(B)(ii)-(iii).

20. 42 U.S.C. § 2000ff-1(a) (2012).

21. Pauline T. Kim, *Regulating the Use of Genetic Information: Perspectives from the U.S. Experience*, 31 COMP. LAB. L. & POL'Y J. 693, 697-701 (2010); Similar to the ADA's restrictions on medical inquiries and tests, protecting the privacy of genetic information helps to prevent genetic discrimination by employers. See *id.* at 700; Pauline T. Kim, *Genetic Discrimination, Genetic Privacy: Rethinking Employee Protections for a Brave New Workplace*, 96 NW. U. L. REV. 1497 (2002).

22. § 2000ff-1(b).

23. There is an exception for "inadvertent" disclosures; however, the receipt of genetic information is not considered inadvertent unless the employer specifically directs the health care provider *not* to provide such information. 29 C.F.R. § 1635.8(b)(1)(i)(A) (2018). Thus, the regulations advise employers to make clear that they do not want genetic information when making otherwise lawful requests for medical information, § 1635.8(b)(1)(i)(B).

24. § 2000ff-1(b). Other examples where no violation occurs include instances when health or genetic services are offered by the employer, including when they are offered as part of a wellness program, and when "the employee provides prior, knowing, voluntary, and written authorization." § 2000ff-1(b)(2)(B).

as “a confidential medical record,” and may not disclose it except under a handful of enumerated circumstances.²⁵

Under both the ADA and the GINA, privacy protections are limited to certain types of personal information that are deemed sensitive or susceptible to misuse for improper purposes. In the case of the ADA, protection extends to “medical examinations and inquiries,”²⁶ thereby protecting all kinds of medical information—at least to the extent that it is revealed through an examination or direct inquiry. The GINA more narrowly limits its protections to genetic information, which it defines to encompass an individual’s genetic tests, the genetic tests of family members and family medical history.²⁷ A genetic test is “an analysis of human DNA, RNA, chromosomes, proteins, or metabolites, that detects genotypes, mutations, or chromosomal changes.”²⁸ The definition does not include medical information about “a manifested disease, disorder, or pathological condition” if it is not genetic information.²⁹ In other words, “ordinary,” nongenetic medical information is not protected.

While the ADA and the GINA shield employees’ medical and genetic information to some extent, both have been criticized as insufficiently protective of employee privacy. Some have argued that the exception in the ADA allowing post-offer medical examinations creates a gap that permits unwarranted intrusions on employees’ medical privacy and creates an opening for disability discrimination to occur.³⁰ Scholars have also criticized the GINA’s definition of protected genetic information as too narrow. As discussed above, the statutory definition excludes medical information about manifested diseases or conditions. Where a disease or condition is known to have a genetic basis, that information might indirectly reveal an individual’s genetic traits. Similarly, tests that entail analysis of proteins or metabolites are permitted, so long as they “[do] not detect genotypes, mutations, or chromosomal changes,”³¹ even though such tests can detect abnormalities known to result from genetic causes. Mark Rothstein and others have argued

25. § 2000ff-5. The statute identifies a handful of permitted disclosures of such information by the employer such as to an occupational or health researcher or in response to a court order. *Id.*

26. 42 U.S.C. § 12112(d) (2012).

27. § 2000ff(4)(A).

28. § 2000ff(7)(A).

29. § 2000ff-9.

30. See Sharona Hoffman, *Preplacement Examinations and Job-Relatedness: How to Enhance Privacy and Diminish Discrimination in the Workplace*, 49 KAN. L. REV. 517, 517-92 (2001); Mark A. Rothstein, Jessica Roberts & Tee L. Guidotti, *Limiting Occupational Medical Evaluations under the Americans with Disabilities Act and the Genetic Information Nondiscrimination Act*, 41 AM. J.L. & MED. 523, 540-43 (2015); Mark A. Rothstein, *Genetic Discrimination in Employment and the Americans with Disabilities Act*, 29 HOUS. L. REV. 23, 53-61 (1992). The statute attempts to mitigate the latter risks by requiring that the pre-employment medical exam must be required of all entering employees in a job category in order to prevent the process from becoming a subterfuge for disability discrimination. § 12112(d)(3)(A).

31. § 2000ff(7)(B).

that segregating genetic information from medical information is nearly impossible given that most diseases and medical conditions have some genetic component.³² As a result, despite the GINA's strong prohibition on acquiring genetic information, employers may be able to learn genetic information indirectly.

This criticism—that the GINA's definition of protected genetic information is too narrow—anticipated the difficulties currently posed by data mining. The critics pointed out the possibility that an employer's access to nongenetic medical information would allow them to infer information about an individual's genetic traits. This possibility of inferring sensitive information has greatly expanded with the growing use of data mining tools in the workplace. Because of the vast amount of personal information available and the power of data analytics, it may now be possible to infer not only genetic risks, but all kinds of medical conditions from nonmedical information such as behavioral and lifestyle data. This problem extends as well to other kinds of information traditionally considered private—such as sexual and financial information—which may be revealed through analysis of large datasets containing information about purchasing habits or online activities. The power of data analytics will make it increasingly difficult to separate “sensitive” from nonsensitive personal information. As a result, the approach taken in the ADA and the GINA—defining certain categories of information as sensitive and protecting them from disclosure—is unlikely to successfully protect the privacy of that information.

II. “HIGHLY OFFENSIVE” INTRUSIONS—THE COMMON LAW INVASION OF PRIVACY TORT

Another source of privacy protection for American workers is the common law invasion of privacy tort. This tort is rooted in Samuel Warren and Louis Brandeis' well-known 1890 article, in which they argued for recognition of a right to privacy.³³ In their view, the right to privacy rested on a principle of “inviolate personality”³⁴ and redressed dignitary harm by compensating for “mental pain and distress.”³⁵ This “right to privacy” eventually came to be conceptualized as four distinct torts.³⁶ The two most relevant here—intrusion on seclusion and public disclosure of private facts—both turn on a showing that the defendant's actions were “highly offensive to

32. See Mark A. Rothstein, *Genetic Exceptionalism and Legislative Pragmatism*, J.L. MED. & ETHICS 59, 61 (2007); see also Rothstein, Roberts, & Guidotti, *supra* note 30, at 542.

33. Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193, 193-220 (1890).

34. *Id.* at 205.

35. *Id.* at 196.

36. William L. Prosser, *Privacy*, 48 CALIF. L. REV. 383, 389 (1960).

a reasonable person.”³⁷ The “highly offensive” requirement captures the flavor of outrage that motivated the early cases. As William Prosser explained: the “ordinary reasonable man” would not take offense at the disclosure of mundane facts about his life, and therefore, liability should attach only for actions “which the customs and ordinary views of the community will not tolerate.”³⁸ These torts are thus aimed at the most serious social breaches, “those which threaten an individual’s identity by withdrawing the deference normally afforded a member of the community.”³⁹ As Robert Post put it, the common law privacy torts afford a remedy when a violation “potentially places the plaintiff outside of the bounds of the shared community.”⁴⁰

This emphasis on indignity and mental suffering means that the common law right to privacy comes into play when the method of gathering information is unduly intrusive or the nature of the information collected is particularly sensitive. For example, in one case, the plaintiff alleged that her landlord installed a listening device in her apartment and eavesdropped on her for over six months. The court acknowledged that some intrusions are “so indecent and outrageous and calculated to cause such excruciating mental pain . . . that it would be a reproach to the law not to allow redress”⁴¹ and permitted her claim for invasion of privacy to proceed. The privacy tort also imposes liability when a disclosure of private information becomes “a morbid and sensational prying into private lives for its own sake” rather than any legitimate public interest,⁴² as when information about an individual’s medical condition or sexual relations are publicized.⁴³

In the workplace context, successful common law privacy claims have generally involved targeted incidents of employer prying or the disclosure of

37. The intrusion on seclusion tort imposes liability on a defendant “who intentionally intrudes, physically or otherwise, upon the solitude or seclusion of another or his private affairs or concerns . . . if the intrusion would be highly offensive to a reasonable person.” RESTATEMENT (SECOND) OF TORTS § 652B (AM. LAW INST. 1977). Liability under the public disclosure tort arises when a defendant “gives publicity to a matter concerning the private life of another . . . if the matter publicized is of a kind that (a) would be highly offensive to a reasonable person, and (b) is not of legitimate concern to the public.” *Id.* § 652D.

38. Prosser, *supra* note 36, at 397.

39. Pauline T. Kim, *Privacy Rights, Public Policy and the Employment Relationship*, 57 OHIO ST. L.J. 671, 692 (1996).

40. Robert C. Post, *The Social Foundations of Privacy: Community and Self in the Common Law Tort*, 77 CALIF. L. REV. 957, 968 (1989).

41. *Roach v. Harper*, 105 S.E.2d 564, 566 (W. Va. 1958); *see also Souder v. Pendleton Detectives, Inc.*, 88 So.2d 716, 716-19 (La. Ct. App. 1956) (ongoing shadowing, eavesdropping, and peeping into windows of plaintiffs); *LeCrone v. Ohio Bell Tel. Co.*, 201 N.E.2d 533-41 (Ohio Ct. App. 1963) (extension placed on plaintiff’s phone line without her knowledge, allowing her separated husband to eavesdrop).

42. *Virgil v. Time, Inc.*, 527 F.2d 1122, 1129 (9th Cir. 1975).

43. *See Horne v. Patton*, 287 So.2d 824 (Ala. 1973) (physician’s disclosure of medical information to employer); *Barber v. Time, Inc.*, 159 S.W.2d 291, 292 (Mo. 1942) (magazine published the plaintiff’s name and photograph along with a description of a medical condition for which she was being treated in a hospital); *see also Michaels v. Internet Entm’t Grp., Inc.*, 5 F.Supp.2d 823 (C.D. Cal. 1998) (dissemination of private sex tape).

particularly sensitive personal information.⁴⁴ Courts have permitted intrusion claims when employers conducted unjustified searches or surreptitious surveillance impinging on bodily privacy,⁴⁵ or traditionally private spaces such as an employee's home or hotel room,⁴⁶ or workplace bathrooms and locker rooms.⁴⁷ Employers have also been held liable for investigating employees' sex lives, health problems, or family relationships,⁴⁸ and for disclosing medical information about an employee to those with no legitimate interest in knowing.⁴⁹ In these cases, the intrusiveness of the searches or the highly sensitive nature of the information disclosed made the employer's actions sufficiently egregious to meet the "highly offensive" requirement.

The application of the common law privacy tort in the workplace is limited, however. Courts find no wrongful intrusion if they conclude that the employee lacked a "reasonable expectation of privacy," and therefore surveillance in semipublic areas like an open workspace or shared office is generally permissible.⁵⁰ When the employer has a legitimate business reason for collecting or disclosing the information, intrusions are unlikely to be considered "highly offensive."⁵¹ For example, employers have avoided

44. See Matthew T. Bodie, Miriam A. Cherry, Marcia L. McCormick & Jintong Tang, *The Law and Policy of People Analytics*, 88 U. COLO. L. REV. 961, 988-92 (2017) (summarizing law regarding employer surveillance and information gathering practices).

45. See *Catalano v. GWD Mgmt. Corp.*, No. CV 403-167, 2005 WL 5519861 at *1, *6 (S.D. Ga. Mar. 30, 2005) (strip search).

46. See *Wal-Mart Stores, Inc. v. Lee*, 74 S.W.3d 634, 634-63 (Ark. 2002) (home); *Sowards v. Norbar, Inc.*, 605 N.E.2d 468, 468-75 (Ohio Ct. App. 1992) (hotel room paid for by employer).

47. *Acuff v. IBP, Inc.*, 77 F. Supp.2d 914, 914-36 (C.D. Ill. 1999) (video surveillance of nurse's office where employees were provided medical treatment); *Doe v. Dearborn Pub. Sch.*, No. 06-CV-12369-DT, 2008 WL 896066 at *1 (E.D. Mich. Mar. 31, 2008) (video surveillance of area that gym teachers used to change clothes); *Johnson v. Allen*, 613 S.E.2d 657, 657-64 (Ga. Ct. App. 2005) (video surveillance of restroom); *Koeppel v. Speirs*, 808 N.W.2d 177, 177-86 (Iowa 2011) (hidden video camera in restroom).

48. *Johnson v. K Mart Corp.*, 723 N.E.2d 1192, 1192-99 (Ill. App. Ct. 2000) (sexual matters, family and health problems); see also *French v. U.S. ex rel. Dept of Human Health & Human Service*, 55 F. Supp.2d 379, 379-84 (W.D.N.C. 1999) (medical information); *Van Jelgerhuis v. Mercury Fin. Co.*, 940 F.Supp. 1344, 1344-70 (S.D. Ind. 1996) (sex lives); *Busby v. Truswal Sys. Corp.*, 551 So.2d 322, 322-29 (Ala. 1989) (sexual propositions and comments about plaintiffs' bodies); *Phillips v. Smalley Maint. Servs., Inc.*, 435 So.2d 705, 705-12 (Ala. 1983) (sex relations with husband); *Guccione v. Paley, No. LLICV054002943S*, 2006 WL 1828363 at *1, *2-3 (Conn. Super. Ct. June 14, 2006) (religious practices and sex life).

49. *E.g.*, *Blackwell v. Harris Chem. N. Am., Inc.*, 11 F.Supp.2d 1302 (D. Kan. 1998) (medical information); *Miller v. Motorola, Inc.*, 560 N.E.2d 900, 900-04 (Ill. App. Ct. 1990) (medical information).

50. See, *e.g.*, *Schmidt v. Devino*, 206 F.Supp.2d 301, 309-10 (D. Conn. 2001) (wiretap on office telephone not an intrusion where office door was kept open and secretary just outside could listen); *Marrs v. Marriott Corp.*, 830 F.Supp. 274, 274-84 (D. Md. 1992) (video surveillance of desk in open office permissible); *Sacramento Cty. Deputy Sheriffs' Ass'n. v. County of Sacramento*, 59 Cal. Rptr. 2d 834, 834-47 (Cal. Ct. App. 1996) (no expectation of privacy in booking area of county jail). See generally *Vega-Rodriguez v. Puerto Rico Tel. Co.*, 110 F.3d 174, 174-84 (1st Cir. 1997) (holding that constant video surveillance of employees in an open work area did not violate the Fourth Amendment because they had no reasonable expectation of privacy).

51. See, *e.g.*, *Eddy v. Brown*, 715 P.2d 74, 74-78 (Okla. 1986) (no invasion of privacy where information re: psychiatric visits were of legitimate concern to supervisor); *Shattuck-Owen v. Snowbird Corp.*, 16 P.3d 555, 559 (Utah 2000) (holding employer showing video of employee's sexual assault to a dozen people justified as part of investigation).

liability for intrusions that were incidental to work-related investigations or that occurred while trying to secure confidential business information.⁵² Similarly, accessing or disclosing medical or mental health information does not trigger liability when the employer has a legitimate interest in doing so.⁵³ And finally, protection does not extend where the information sought or disclosed is not considered private in nature.⁵⁴

By targeting “highly offensive” forms of information gathering, the common law torts miss the real threats to privacy posed by data mining. Although data mining requires lots of data about workers, the information utilized may not be the type typically considered private or sensitive in nature or may be information in which employers have a legitimate business interest. For example, employers routinely ask for information about applicants’ background, education and experience. These materials, as well as publicly available information from social media sites or other online sources, are unlikely to be considered so private that requesting or collecting them constitutes a “highly offensive” intrusion, and yet, when combined with other available data, they can be parsed and analyzed to draw new inferences about workers.

An employer can also harvest metadata about a worker’s online activities, beginning with her initial contacts with the firm. A web-based application form might record when an application was completed, how long it took to complete, what browser was used to access the site, etc. Once workers are employed, additional detailed information can be collected about their activities using geolocation devices, computer monitoring tools, smart badges and the like.⁵⁵ Each individual datum collected appears quite

52. See, e.g., *Sunbelt Rentals, Inc. v. Victor*, 43 F.Supp.3d 1026, 1036 (N.D. Cal. 2014) (not highly offensive to review former employee’s personal Apple account messages synced to work-issued iPhone during post-employment conduct investigation); *Hilderman v. Enea TekSci, Inc.*, 551 F.Supp.2d 1183, 1204 (S.D. Cal. 2008) (intrusion into former employee’s personal matters stored on work computer while trying to protect confidential information was not highly offensive “as a matter of law.”); *Garrity v. John Hancock Mut. Life Ins. Co.*, No. CIV.A. 00-12143-RWZ, 2002 WL 974676 at *1, *2 (D. Mass. May 7, 2002) (employer’s legitimate interest in investigating possible sexual harassment “would likely trump plaintiffs’ privacy interests.”); *Sitton v. Print Direction, Inc.*, 718 S.E.2d 532, 537 (Ga. Ct. App. 2011) (reviewing email as part of investigation of improper employee behavior was not an offensive intrusion).

53. See, e.g., *Fletcher v. Price Chopper Foods of Trumann, Inc.*, 220 F.3d 871, 879 (8th Cir. 2000) (holding employer’s need to know in order to protect public health trumped an employee’s right to privacy of medical information); *Davis v. Monsanto Co.*, 627 F.Supp. 418, 418-23 (S.D.W. Va. 1986) (holding employer had legitimate interest in sharing employee’s mental health assessment and that the disclosures were privileged).

54. See, e.g., *Rogers v. International Business Machines Corp.*, 500 F.Supp. 867, 867-70 (W.D. Pa. 1980) (investigation into plaintiff’s at-work conduct following complaints not an invasion of privacy); *Baker v. Burlington Northern, Inc.*, 587 P.2d 829, 82-35 (Idaho 1978) (disclosure of employee’s criminal history to union and unemployment office is not an invasion of privacy because it is a matter of public record).

55. See Bodie et al., *supra* note 43, at 971 (describing badges equipped with microphones, infrared devices, and a motion detector that collects data on employee movements, interactions with coworkers or clients, and even tone of voice); Lothar Determann & Robert Sprague, *Intrusive Monitoring: Employee Privacy Expectations are Reasonable in Europe, Destroyed in the United States*, 26 BERKELEY TECH. L.J. 979, 981-82 (2011) (explaining use of GPS, RFID chips, keystroke monitoring, webcam monitoring, and

mundane, even trivial, making it difficult to meet the “highly offensive” element necessary for tort liability. For example, one court found no intrusion upon seclusion where the employer monitored the addresses (but not the contents) of websites visited by an employee.⁵⁶ As broad-based monitoring and information gathering practices become normalized, their very ubiquity and ordinariness mean that they are less likely to arouse the concerns about the “outrageous and unjustifiable infliction of mental distress” that initially motivated the privacy torts.⁵⁷

One might argue that it is the *cumulative* effect of all this data aggregation that constitutes an invasion of privacy. The potential for harm does not arise because any particular piece of information collected or disclosed will cause embarrassment or humiliation. Instead, the threat lies in the *uses* to which vast amounts of data can be put, and the possibility that data mining can lay bare aspects of an individual’s life or psyche that she neither intended to share, nor understood could be inferred indirectly. This argument resonates with Warren and Brandeis’ original theory that the common law recognizes a fundamental principle of “an inviolate personality,”⁵⁸ yet, it is not without difficulty. As a practical matter, the common law right to privacy, as interpreted by courts in the United States since Warren and Brandeis wrote, has focused on particular invasions or disclosures—those where the manner of intrusion or the highly sensitive type of information involved rendered them “highly offensive.” Wholly absent from the case law is the suggestion that using data to draw inferences about individuals implicates their privacy interests. Even if the common law doctrine were to expand in this way, conceptual challenges would remain. It would not be practicable to prohibit the drawing of any inferences from data, nor would it be easy to define unacceptable or unlawful uses of data. Whenever someone acts on information, they are implicitly making inferences based on that data. For example, even when an employer relies on traditional hiring criteria like work experience or education, it is using the information to extrapolate information about the individual’s skills and abilities.

The common law torts are simply not geared toward addressing the privacy risks posed by data mining techniques. By focusing on highly offensive intrusions or the collection of sensitive information, the doctrine

email scanning in the workplace); Kaplan, *supra* note 3; Don Peck, *They’re Watching You at Work*, ATLANTIC (Dec. 2013), <http://www.theatlantic.com/magazine/archive/2013/12/theyre-watching-you-at-work/354681/>.

56. Thygeson v. U.S. Bancorp, No. CV-03-467-ST, 2004 WL 2066746, at *22 (D. Or. Sept. 15, 2004); cf. Schibursky v. International Business Machines Corp., 820 F.Supp. 1169, 1183 (D. Minn. 1993) (finding employer surveillance of plaintiff’s computer logins to audit her hours worked was not “utterly intolerable” and rejecting intentional infliction of emotional distress claim).

57. See Prosser, *supra* note 36, at 384.

58. Warren & Brandeis, *supra* note 33, at 205; see also *id.* at 211 (citing “the right to an inviolate personality”).

does not address how data mining can threaten privacy by inferring highly personal information rather than collecting it directly. Because the data gathering and analytic process is routine, bureaucratic, and not highly visible, it is unlikely to arouse concerns about “public indignity” or “humiliation” that originally motivated the privacy torts. Thus, while the common law torts provide an important backstop by protecting against egregious, visible intrusions, they offer little protection against the privacy threats that arise when routinized data collection is combined with data mining technologies in the workplace.

III. PROCEDURAL PROTECTIONS—THE FAIR CREDIT REPORTING ACT

Although not primarily focused on the employment relationship, the Fair Credit Reporting Act (FCRA)⁵⁹ also protects employee privacy by placing restrictions on employers’ information gathering practices. Recognizing that credit reports were playing an increasingly important role in economic life, Congress passed the FCRA in 1970 “to insure that consumer reporting agencies exercise their grave responsibilities with fairness, impartiality, and a respect for the consumer’s right to privacy.”⁶⁰ The FCRA tries to achieve these objectives by regulating how consumer data is handled when it is used to make credit, insurance and employment decisions.⁶¹

When consumer reports are used for employment purposes, both the employer and the consumer reporting agency must follow procedures specified in the statute. The employer is required to give clear notice and obtain written authorization from the applicant or employee before accessing a consumer report.⁶² If it intends to take an adverse action based on the report, it must provide separate notice before doing so, including a copy of the consumer report and information about the consumers’ rights under the statute.⁶³ The credit reporting agencies that sell these reports must also meet certain requirements, such as permitting consumers to review information in their files without charge and investigating alleged inaccuracies.⁶⁴ Thus, the basic provisions of the FCRA emphasize procedural protections—requiring

59. 15 U.S.C. § 1681 (2012).

60. § 1681(a)(4).

61. § 1681b limits consumer reporting agencies to providing reports only for a list of specified purposes. These include circumstances in which the person seeking the report “intends to use the information for employment purposes.” § 1681b(a)(3)(B).

62. § 1681b(b)(2). The disclosure must be “clear and conspicuous” and “in a document that consists solely of the disclosure.” 1681b(b)(2)(A)(i). The employer must also certify to the consumer reporting agency its compliance with the requirements of the statute before receiving any consumer report. 1681b(b)(1).

63. § 1681b(b)(3)(A). After taking an adverse action, the employer must provide additional information pursuant to § 1681m(a).

64. § 1681g (requiring disclosure of the information in a consumer file to the consumer upon request); § 1681i (requiring consumer reporting agencies to reinvestigate disputed information).

notice and consent before using personal information to make employment decisions, and providing data subjects with the opportunity to review their records and to challenge any erroneous information.

These types of procedural protections are unlikely to be effective in addressing the privacy concerns raised by data mining. First, the FCRA has had little practical impact in restricting employers' access to workers' personal information. Workers generally give consent in order to be considered for or to keep a job, and thus, employers can freely access consumer reports, so long as they follow all the procedural requirements.⁶⁵ And the statute does not apply at all if employers receive information from entities falling outside the definition of a "consumer reporting agency,"⁶⁶ or gather data directly from their employees on the job. Apart from a handful of narrow restrictions prohibiting obsolete information in a consumer report,⁶⁷ the FCRA does not meaningfully limit collection of workers' personal information.

A second limitation is that the FCRA assumes that the risk of harm lies in discrete pieces of information about the worker, rather than the total body of data that can be amassed and the inferences that can be drawn from mining that data. By requiring employers to give notice of an adverse employment action, workers are alerted when something in a consumer report has been the basis for their rejection. The worker then has the right to contest the accuracy of the record, prompting the reporting agency to reinvestigate and, if warranted, correct the record.⁶⁸ These rights can be quite helpful when an individual has been stigmatized by a particular piece of erroneous information, such as a false report of a bankruptcy or criminal record.

65. As Lea Shepard explains, when passing the FCRA, Congress left intact the common employer practices of accessing credit reports and addressed only "the procedures governing the industry." Lea Shepard, *Toward a Stronger Financial History Antidiscrimination Norm*, 53 B.C.L. REV. 1695, 1749 (2012).

66. The FCRA defines "consumer reporting agency" as

[A]ny person which, for monetary fees, dues, or on a cooperative nonprofit basis, regularly engages in whole or in part in the practice of assembling or evaluating consumer credit information or other information on consumers for the purpose of furnishing consumer reports to third parties, and which uses any means or facility of interstate commerce for the purpose of preparing or furnishing consumer reports.

§ 1681a(f). Thus, whether an entity is a consumer reporting agency turns on whether it furnishes "consumer reports to third parties." The FCRA defines a "consumer report" as

[A]ny written, oral, or other communication of any information by a consumer reporting agency bearing on a consumer's credit worthiness, credit standing, credit capacity, character, general reputation, personal characteristics, or mode of living which is used or expected to be used or collected in whole or in part for the purpose of serving as a factor in establishing the consumer's eligibility for . . . employment purposes.

§ 1681a(d)(1). There is currently uncertainty regarding how this definition applies to companies that use datamining software to assess workers for employers.

67. § 1681c(a) (prohibiting consumer reports from containing information such as bankruptcy cases over ten years old or civil suits, civil judgments, and arrest records over seven years old).

68. § 1681i(a)(1).

However, where the worker is harmed because of inferences or predictions made based on a data profile, the FCRA offers no way to challenge the conclusions drawn through the data mining process.

More generally, the FCRA is unconcerned with how employers use data that they receive from a consumer reporting agency, so long as they follow all of the procedural requirements by providing the required notices at the proper time and in the proper format.⁶⁹ In one case, an employee was fired because of a false consumer report that he had a felony cocaine conviction, but he was unsuccessful in challenging his employer's decision to discharge him.⁷⁰ In rejecting his FCRA claim, the court held that employers "are under no duty to reinvestigate the facts provided in a consumer report."⁷¹ Thus, the FCRA does not prohibit employers from relying on inaccurate information, and similarly, it leaves them free to use accurate information in any way they see fit. As a result, the statute's procedural requirements will do nothing to restrict or regulate employers when they use data mining techniques to uncover new information about individual workers, through inference or prediction.

IV. CONCLUSION

As seen from the examples discussed in this article, employee privacy protections in U.S. law generally focus on shielding discrete types of information or aspects of personal life. This approach is ill-suited to address current privacy threats in a world in which employers can amass large amounts of personal data and use sophisticated data mining tools to analyze it. These tools allow employers to draw inferences or make predictions that go far beyond the individual pieces of data collected and may reveal highly sensitive information that the worker has not consented to disclose or produce mistaken judgments that result in lost opportunities. The traditional model, which focuses on protecting certain sensitive types of information or allowing data subjects to challenge errors in their records, will do little to protect against these potential harms.

Although U.S. privacy law is often criticized for its narrow sectoral approach, even omnibus data protection regimes, such as the European Union's, struggle to provide robust protections in the current data-rich business environment. The GDPR, newly effective last year, strengthens data

69. The statute does require that an employer requesting a consumer report must certify to the reporting agency that the information "will not be used in violation of any applicable Federal or State equal employment opportunity law or regulation." § 1681b(b)(1)(A)(ii). This provision refers to existing antidiscrimination laws, but the FCRA does not appear to impose an independent duty of nondiscrimination, nor does it provide any mechanism for enforcing the employer's obligation to abide by equal employment laws when using workers' consumer records, and there appears to be little or no litigation enforcing this provision.

70. *Wiggins v. District Cablevision, Inc.*, 853 F.Supp. 484, 484-500 (D.D.C. 1994).

71. *Id.* at 492.

privacy protections in the EU in many ways, and yet, it too has been criticized as inadequate. The same technological developments that have outpaced U.S. law are also challenging the fundamental principles underlying the EU's legal frame for data protection.⁷² While the extent to which the GDPR will meaningfully increase transparency and accountability of automated decision systems is currently strongly debated,⁷³ the Regulation nevertheless takes important steps which are essential if the law is to address threats to privacy and fairness posed by data mining techniques in the workplace. Specifically, the GDPR explicitly recognizes the significance of profiling—the automated processing of personal data—which encompasses data mining (Art. 4). In addition, it gives the data subject certain rights relating to profiling, such as the right to “meaningful information about the logic involved” in these systems (Art. 13(2)(f), Art. 14(2)(g), and Art. 15(1)(h) and a right to object to profiling (Art. 21). It remains to be seen how these provisions in the GDPR will be implemented and what impact they will have; nevertheless, this legal recognition of the significance of profiling, distinct from the mere collection and disclosure of information, is a crucial step that U.S. law will need to take if it is to address current threats to employee privacy.

72. Bart Custers & Helena Ursic, *Worker Privacy in a Digitalized World Under European Law*, 39 COMP. LAB. L. & POL'Y J. 323, 326 (2018) (arguing that the increased use of data and technologies “challenge some key data protection principles”).

73. See, e.g., Bryan Casey, Ashkon Farhangi & Roland Vogl, *Rethinking Explainable Machines: The GDPR's 'Right to Explanation' Debate and the Rise of Algorithmic Audits in Enterprise*, BERKELEY TECH. L.J. (forthcoming), available at <https://ssrn.com/abstract=3143325>; Bryce Goodman & Seth Flaxman, *European Union Regulations on Algorithmic Decision-making and a 'Right to Explanation'*, 38 AI MAGAZINE 50, 50-57 (2017); Andrew D. Selbst & Julia Powles, *Meaningful information and the right to explanation*, 7 INT'L DATA PRIVACY L. 233, 233-42 (2017); Sandra Wachter, Brent Mittelstadt & Luciano Floridi, *Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation*, 7 INT'L DATA PRIVACY L. 76, 76-99 (2017).

Beware of Automated Hiring

It won't end employment discrimination. In fact, it could make it worse.

By Ifeoma Ajunwa

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Algorithms make many important decisions for us, like our creditworthiness, best romantic prospects and whether we are qualified for a job. Employers are increasingly using them during the hiring process out of the belief they're both more convenient and less biased than humans. However, as I describe in a new paper, this is misguided.

In the past, a job applicant could walk into a clothing store, fill out an application and even hand it straight to the hiring manager. Nowadays, her application must make it through an obstacle course of online hiring algorithms before it might be considered. This is especially true for low-wage and hourly workers.

The situation applies to white-collar jobs too. People applying to be summer interns and first-year analysts at Goldman Sachs have their résumés digitally scanned for keywords that can predict success at the company. And the company has now embraced automated interviewing.

The problem is that automated hiring can create a closed-loop system. Advertisements created by algorithms encourage certain people to send in their résumés. After the résumés have undergone automated culling, a lucky few are hired and then subjected to automated evaluation, the results of which are looped back to establish criteria for future job advertisements and selections. This system operates with no transparency or accountability built in to check that the criteria are fair to all job applicants.

As a result, automated hiring platforms have enabled discrimination against job applicants. In 2017, the Illinois attorney general opened an investigation into several automated hiring platforms after complaints that a résumé building tool on Jobr effectively excluded older applicants. The platform had a drop-down menu that prevented applicants from listing their college graduation year or year of a first job before 1980.

Similarly, a 2016 class-action lawsuit alleged that Facebook Business tools “enable and encourage discrimination by excluding African-Americans, Latinos and Asian-Americans but not white Americans from receiving advertisements for relevant opportunities.” Facebook’s former Lookalike Audiences feature allowed employers to choose only Facebook users demographically identical to their existing workers to see job advertisements, thus replicating racial or gender disparities at their companies. In March, Facebook agreed to make changes to its ad platform to settle the lawsuit.

But this is just the tip of the iceberg. Under federal law, employers have wide discretion to decide which qualities are a “cultural fit” for their organization. This allows companies to choose hiring criteria that could exclude certain groups of people and to hide this bias through automated hiring. For example, choosing “lack of gaps in employment” as a cultural fit could hurt women, who disproportionately take leaves from the workplace to tend to children and ailing family members.

Automated hiring has now evolved past simple résumé parsing and culling. According to one lawsuit, a college student with a near-perfect SAT score and a diagnosis of bipolar disorder found himself rejected over and over for minimum-wage jobs at supermarkets and retail stores that were using a personality test modeled after a test

used to diagnose mental illness.

How do we make sure that automated hiring platforms do not worsen employment discrimination?

The first step is to pass laws that let plaintiffs bring suits when they have experienced bias in an automated hiring system. Federal law requires a plaintiff to prove either disparate treatment (that is, “smoking gun” evidence of intentional discrimination) or disparate impact (statistical proof that a group of applicants, for example, racial minorities or white women, were disproportionately rejected for employment). It’s hard for applicants, though, to get either type of proof because employers control the data in hiring platforms.

We should change the law to allow for a third method for plaintiffs to bring suit under the “discrimination per se” doctrine. As I describe in a paper, this new doctrine would allow for the burden of proof to be shifted to the employer.

So when a plaintiff using a hiring platform encounters a problematic design feature — like platforms that check for gaps in employment — she should be able to bring a lawsuit on the basis of discrimination per se, and the employer would then be required to provide statistical proof from internal and external audits to show that its hiring platform is not unlawfully discriminating against certain groups.

In another paper, I argue that we need a federal law that would mandate data retention for all applications (including applications that were not completed) on hiring platforms and that would require employers to conduct internal and external audits so that no groups of applicants are disproportionately excluded. The audits would also ensure that the criteria being used is actually related to job tasks.

This idea has precedence in federal law: Occupational Safety and Health Administration audits are recommended to ensure safe working conditions for employees. Employers that subject their automated hiring platforms to external audits should also receive a certification mark, that would favorably distinguish those employers in the labor market. This type of auditing and certification system recognizes that job applicants should be able to make informed choices about which hiring platforms they will trust with their information.

Unions can help to ensure that automated hiring platforms are fair. Through collective bargaining, unions can work with employers to determine what criteria are actually relevant for determining job fit. Unions can also make sure that applicant data retained by automated hiring platforms is protected, and that it is not sold or transferred to workers’ detriment.

To be sure, human decision-making is clouded by bias. But so is automated decision-making, especially given that human biases can be introduced at any stage of the process, from the design of the hiring algorithm to how results are interpreted.

We cannot rely on automated hiring platforms without adequate safeguards to prevent unlawful employment discrimination. We need new laws and mandates to achieve that goal.

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AUTOMATED EMPLOYMENT DISCRIMINATION

IFEOMA AJUNWA*

ABSTRACT

Employment discrimination may be likened to a many-beaded hydra, even as laws have been enacted to grant equal opportunity to job applicants, new socio-technical developments have ushered in novel mechanisms for discrimination. The high bar of proof to demonstrate a disparate impact cause of action under Title VII of the Civil Rights Act, coupled with the “black box” nature of many automated hiring systems, renders the detection and redress of bias in such algorithmic systems difficult. This Article, with contributions at the intersection of administrative law, employment & labor law, and law & technology, makes the central claim that the automation of hiring both facilitates and obfuscates employment discrimination. That phenomenon and the deployment of intellectual property law as a shield against the scrutiny of automated systems combine to form an insurmountable obstacle for disparate impact claimants.

The first contribution of this Article then is an eye-opening, in-depth examination of how bias is introduced, replicated, and also hidden by automated hiring systems. The second contribution is a hybrid approach to remedies that moves beyond the litigation-based paradigm in employment law to include redress mechanisms from administrative and labor law. To ensure against the identified “bias in, bias out” phenomenon associated with automated decision-making, I argue that the goal of equal opportunity in employment creates an “auditing imperative” for algorithmic hiring systems. This auditing imperative mandates both internal and external audits of automated hiring systems, as well as record-keeping initiatives for job applications. Such audit requirements have precedent in other areas of law, as they are not dissimilar to the Occupational Safety and Health Administration (OSHA) audits in labor law or the Sarbanes-Oxley Act audit requirements in securities law. Conjointly, I propose that employers that subject their automated hiring platforms to external audits could receive a certification mark, “the Fair Automated Hiring Mark,” which would serve to positively distinguish them in the labor market. I also discuss how labor law mechanisms such as collective bargaining could be an effective approach to combating the bias in automated hiring by establishing criteria for the data deployed in automated employment decision-making and creating standards for the protection and portability of said data. The Article concludes by noting that automated hiring, which captures a vast array of applicant data, merits greater legal oversight given the potential for “algorithmic blackballing,” a phenomenon that could continue to thwart an applicant’s future job bids.

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INTRODUCTION

Imagine this scenario. A woman seeking a retail job is informed that the job can only be applied for online. The position is as a sales clerk for a retail company with store hours from 9:00 AM to 9:00 PM. She is interested in the morning and afternoon hours, as she has children who are in school until 3:00 PM. As she completes the application, she reaches a screen where she is prompted to register her hours of availability. She enters 9:00 AM to 3:00 PM, Monday through Friday. No evening hours, no weekend hours. However, when she hits the button to advance to the next screen, she receives an error message indicating that she has not completed the current section. She refreshes her screen, she re-starts her computer, still the same error message remains. Finally, in frustration, she abandons the application. Compare the above to this second scenario: A man is applying for a job that requires a college degree. But when he attempts to complete the application online, he finds that the drop-down menu has college graduation dates that only go back to the year 1995. The automated hiring platform will, in effect, exclude all applicants who are older than forty years old. Keep in mind that if the man chooses to forgo the application like the woman in the previous scenario, most automated hiring systems would retain no record of either of their failed attempts to complete the job application.¹

The vignettes above reflect the real-life experiences of job applicants who must now contend with automated hiring systems in their bid for employment.² These stories also illustrate the potential for automated hiring systems to discreetly and disproportionately cull the applications of job seekers who are from legally protected classes. This is cause for legal concern given that nearly all Global 500 companies now use algorithmic recruitment and hiring tools.³ Algorithmic hiring has also saturated the retail/low-wage market, with the top twenty Fortune 500 companies (mostly retail and commerce companies that boast large numbers of employees) almost exclusively hiring through online platforms.⁴

Given that legal scholars have identified a “bias in, bias out” problem for automated decision-making,⁵ automated hiring as a socio-technical trend for

¹ See CATHY O’NEIL, *WEAPONS OF MATH DESTRUCTION: HOW BIG DATA INCREASES INEQUALITY AND THREATENS DEMOCRACY* (2016).

² Lisa Madigan, *Behind the Scenes, Discrimination by Job Search Engines*, AGE DISCRIMINATION EMP. (Mar. 29, 2017), <https://www.agediscriminationinemployment.com/tag/illinois-attorney-general-lisa-madigan/>.

³ LINDA BARBER, INST. FOR EMP’T STUDIES, *E-RECRUITMENT DEVELOPMENTS* (2006).

⁴ Ifeoma Ajunwa & Daniel Greene, *Platforms at Work: Data Intermediaries in the Organization of the Workplace*, RES. SOC. WORK (forthcoming 2019).

⁵ See, e.g., Sandra G. Mayson, *Bias In, Bias Out*, 128 YALE L.J. 2218 (2019) (arguing that the problem of disparate impact in predictive risk algorithms lies not in the algorithmic system but in the nature of prediction itself); cf. Sonia Katyal, *Private Accountability in the Age of Artificial Intelligence*, 66 UCLA L. REV. 54 (2019) (arguing for private mechanisms to govern AI systems); Andrew Tutt, *An FDA for Algorithms*, 69 ADMIN. L. REV. 83, 87 (2017). “These new family of algorithms hold enormous promise, but also pose new and unusual dangers.” Ajunwa & Greene, *supra* note 4, (arguing that automated hiring systems which have the express design purpose of helping HR managers, “clone their best people,” hold the potential to replicate historical inequalities in the workplace).

the workplace challenges the American bedrock ideal of equal opportunity in employment,⁶ as such automated practices may not only be deployed to exclude certain categories of workers but may also be used to justify the inclusion of other classes as more “fit” for the job.⁷

As I will detail below, although it is undeniable that there could be tangible economic benefits to the adoption of automated decision-making,⁸ the received wisdom of the objectivity of automated decision-making, coupled with an unquestioning acceptance of the results of algorithmic decision-making,⁹ have allowed hiring systems to proliferate without adequate legal oversight. Thus, the goal of this Article is neither to argue against or for the use of automated decision-making in employment, nor is it even to examine whether automated hiring systems are better than human decision-making for hiring.¹⁰ Rather, my aim is to suggest regulatory regimes for automated hiring systems that will ensure that any benefits of automated hiring are not negated by (un)intended outcomes, such as unlawful discrimination on the basis of protected characteristics.

In addition to their diffusion in the workplace, automated hiring systems exist in a plethora of forms, with each iteration presenting distinct legal issues. The range of platforms for automated hiring include applicant tracking systems (ATS), which employ algorithms that parse resumes for keywords,¹¹ to video screening systems, such as HireVue, which provide automated assessments based on facial analysis and vocal indications.¹² To offer a full portrait of the proliferation of automated hiring platforms and associated legal issues, the Appendix offers a survey of extant automated hiring systems in which I detail a sampling of the companies currently using those systems, as well as their associated potentially problematic features.

But first, consider the growing trend towards automated video interview assessment and its potentially exclusionary effects. For some candidates, such video assessments recall a Taylorist approach¹³ to hiring that is reminiscent of Frederik Winslow Taylor’s time series experiments on factory workers.¹⁴

⁶ Title VII of the Civil Rights Act of 1964 guarantees equal opportunity in employment irrespective of race, gender, and other protected characteristics. Title VII of the Civil Rights Act, 42 U.S.C. §§ 2000e to 2000e-17 (2000).

⁷ Ifeoma Ajunwa, *The Paradox of Automation as Anti-Bias Intervention*, 41 CARDOZO L. REV. (forthcoming 2020).

⁸ See *infra* Section I.A.

⁹ See Ajunwa, *supra* note 7.

¹⁰ As Professor Charles Sullivan notes: “The antidiscrimination statutes don’t really care whether any particular selection device actually improves productivity so long as it does not discriminate.” See Charles Sullivan, *Employing AI*, 63 VILL. L. REV. 395, 398 (2018).

¹¹ See, e.g., CLEVERSTAFF, <https://cleverstaff.net> (last visited Sept. 20, 2019).

¹² See HIREVUE, <http://hirevue.com> (last visited Sept. 20, 2019).

¹³ FREDERIK WINSLOW TAYLOR, *PRINCIPLES OF SCIENTIFIC MANAGEMENT* (1911); see also Ifeoma Ajunwa, Kate Crawford & Joel Ford, *Health and Big Data: An Ethical Framework for Corporate Wellness Programs*, 44 J.L. MED. & ETHICS 474 (2016) (positing that workforce science represents an iteration Taylorism in which the focus is on the worker’s body rather than the job task).

¹⁴ Rebecca Greenfield, *The Rise of the Webcam Job Interview: It Honestly Was Pretty Horrible*, CHI. TRIB. (Oct. 17, 2016, 9:30 AM), <https://www.chicagotribune.com/business/ct-careers-webcam-job-interview-20161017-story.html>.

Relating his experience with HireVue, one candidate whose answers were interrupted by a timer noted: “You just see yourself and a stopwatch ticking down.”¹⁵ But the destabilizing effect of timed responses is not the greatest problem associated with automated video interviewing. As researchers have noted, many of these types of systems are trained on white male faces and voices, which poses a problem for any applicant who diverges from that norm.¹⁶ Thus, applicants who are white women or racial minorities may have their facial expressions or tone of voice mischaracterized by automated video interviewing platforms.¹⁷

Other important concerns raised by critics of automated hiring systems, are: the collection of the applicant’s personal data, the “black box”¹⁸ nature of how such information is used, and a lack of worker agency and control over the portability of the data. As Dan Lyons notes in his book, *Lab Rats*:

“HireVue’s robot recruiting system is building a database of deep, rich psychographic information on millions of people. Moreover, the data is not anonymous. Your psychographic blueprint is connected to all of your personal information—name, address, email, phone number, work history, education. And they have you on video. Everything you say in an interview can follow you around for the rest of your life.”¹⁹

Yet, there are no federal regulations as to the collection, storage, or use of data from automated hiring platforms, and in effect, employers have *carte blanche* to adopt self-serving practices.

Given these issues, it is alarming that a recent study conducted by Aaron Smith and Monica Anderson of the Pew Research Center found that most Americans underestimate the diffusion of these automated hiring platforms in the workplace.²⁰ The study revealed that “fewer than half of Americans are familiar with the concept of computer programs that can review job applications without human involvement.”²¹ In fact, 57% of Americans say that they have heard nothing at all about automated hiring platforms in the past.²² Of the respondents who were aware of automated hiring systems, 76% stated

¹⁵ *Id.*

¹⁶ Tess Townsend, *Most Engineers Are White and So Are the Faces That They Use to Train Software*, VOX: RECODE (Jan. 18, 2017, 11:45 AM), <https://www.vox.com/2017/1/18/14304964/data-facial-recognition-trouble-recognizing-black-white-faces-diversity>. “A lack of diversity in the training set leads to an inability to easily characterize faces that do not fit the normal face derived from the training set.” *Id.*

¹⁷ Thor Benson, *Your Next Job Interview Could Be with a Racist Bot*, DAILY BEAST (Apr. 20, 2018, 11:01 PM), <https://www.thedailybeast.com/your-next-job-interview-could-be-with-a-racist-bot>.

¹⁸ See FRANK PASQUALE, *THE BLACK BOX SOCIETY: SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION* (2015) (arguing that unregulated and opaque data collection is contributing to social inequality).

¹⁹ DAN LYONS, *LAB RATS: HOW SILICON VALLEY MADE WORK MISERABLE FOR THE REST OF US* (2019).

²⁰ AARON SMITH & MONICA ANDERSON, PEW RESEARCH CTR., *AUTOMATION IN EVERYDAY LIFE* 49–56 (2017), http://assets.pewresearch.org/wp-content/uploads/sites/14/2017/10/03151500/PI_2017.10.04_Automation_FINAL.pdf.

²¹ *Id.*

²² *Id.*

that they would not want to apply for jobs through such a system.²³ The given reasons for that response were varied, but most commonly, the individuals expressed the belief that computer systems could not capture everything about an applicant.²⁴ One twenty-two-year-old woman wrote, “a computer cannot measure the emotional intelligence or intangible assets that many humans have.”²⁵ Another stated, “I do believe hiring people requires a fair amount of judgment and intuition that is not well automated.”²⁶ On the other side of this spectrum, however, 22% of the individuals surveyed reported that they would want to apply for jobs that use a computer program to make hiring decisions.²⁷ The most common rationale for this response was the belief that software would be less biased than human reviewers.²⁸

In another paper, I argued that a misguided belief in the objectivity of automated decision-making has ushered in automated hiring as an anti-bias intervention.²⁹ I further argue that the framing of discovered bias in automated decision-making systems as a technical problem, rather than a legal problem has stymied attempts at solving the problem.³⁰ Professor Sandra Mayson, in her article *Bias In, Bias Out*, has also argued that “the source of racial inequality in risk assessment [a type of automated decision-making] lies neither in the input data, nor in a particular algorithm, nor in algorithmic methodology per se.”³¹ Rather, she concludes that “the deep problem is the nature of prediction itself. All prediction looks to the past to make guesses about future events. In a racially stratified world, any method of prediction will project the inequalities of the past into the future.”³² For automated decision-making in employment, I argue that not only is the *nature* of prediction problematic (particularly given historical employment discrimination), but also, the *manner* in which such prediction is accomplished further creates opportunities for unlawful discrimination and exclusion.

I identify four major problems with automated hiring: 1) the design features of automated hiring platforms may enable them to serve as culling systems that discreetly eliminate applicants from protected categories without retaining a record; 2) automated hiring systems that allow for the deployment of facially neutral variables that are indeed still proxies for protected categories, like gender or race, may be used to justify employment results as objective; 3) intellectual property law, which protects automated hiring systems from scrutiny, allows such proxy variables to go undetected; and 4) a worker lack of control over the portability of applicant data captured by automated hiring systems increases the chances of repeated employment discrimination, thus

²³ *Id.* at 52.

²⁴ *Id.* at 53.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.* at 49–56.

²⁹ Ajunwa, *supra* note 7.

³⁰ Ajunwa, *supra* note 7.

³¹ See Mayson, *supra* note 5.

³² See Mayson, *supra* note 5.

raising the specter of an algorithmically permanently excluded class³³ of job applicants, meaning that certain classes of applicants might find themselves *algorithmically blackballed*. I argue then that employment law, with its emphasis on litigation as redress for employment discrimination, is limited in its capacity to address the full spectrum of identified problems with automated hiring.

This Article pushes the boundaries of existing employment law scholarship by proposing alternative approaches to solving the issue of bias in automated employment decision-making, in addition to offering methods for strengthening existing litigation redress mechanisms. Alternative approaches to litigation represent an important contribution given that employment discrimination plaintiffs generally do not fare well in court.³⁴ Thus, I argue that administrative measures, such as mandated audits, are a necessary and currently under-utilized means for achieving the bedrock legal principle of equal opportunity in employment. Similarly, labor law processes, such as collective bargaining, have also been found to influence business practices for the better³⁵ and could be instrumental in both clarifying workers' rights and delineating employers' responsibilities under an automated hiring regime.

The Article is then organized as follows. Part I reviews the business case for automated hiring as well as the potential for misuse of automated hiring systems. Part II parses some solutions that focus on some of the technological shortcomings of automated hiring systems and notes the limitations of such techno-solutionist solutions. Part III discusses the gaps in current employment law framework when it comes to addressing bias in automated hiring—notably, disparate impact claims present a high hurdle for plaintiffs, especially in the case of automated hiring systems when the means of proof is solely under the control of the employer. Part IV examines the potential for a hybrid

³³ Richard A. Bales & Katherine V.W. Stone, *The Invisible Web of Work: The Intertwining of A-I, Electronic Surveillance, and Labor Law*, 41 BERKELEY J. LAB. & EMP. L. 1 (forthcoming 2020).

³⁴ See Kevin M. Clermont & Stewart J. Schwab, *How Employment Discrimination Plaintiffs Fare in Federal Court*, 1 J. EMPIRICAL LEGAL STUD. 429 (2004) (claiming that employment discrimination plaintiffs (unlike many other plaintiffs) have always done substantially worse in judge trials than in jury trials); Michael J. Zimmer, *The New Discrimination Law: Price Waterhouse is Dead, Whither McDonnell Douglas?*, 53 EMORY L.J. 1887, 1944 (2004) (“The 5.8 percent reversal rate of defendant trial victories is smaller in employment discrimination cases than any other category of cases except prisoner habeas corpus trials.”); see also Ruth Colker, *The Americans with Disabilities Act: A Windfall for Defendants*, 34 HARV. C.R.-C.L.L. REV. 99, 100 (1999) (looking at reported decisions from 1992-1998 and finding that defendants prevailed in more than 93% of the cases decided at the trial court level and were more likely to be affirmed on appeal); Theodore Eisenberg, *Litigation Models and Trial Outcomes in Civil Rights and Prisoner Cases*, 77 GEO. L.J. 1567, 1567 (1989) (noting that only claims filed by prisoners have a lower success rate than that of employment discrimination plaintiffs); cf. Michael Selmi, *The Evolution of Employment Discrimination Law: Changed Doctrine for Changed Social Conditions*, 2014 WIS. L. REV. 937, 938 (2014) (“Employment discrimination law has long been ripe for updating. Many of the core cases regarding how discrimination is defined and proved arose in the 1970s in a very different era and were designed to address very different kinds of discrimination.”).

³⁵ See Alison D. Morantz, *What Unions Do for Regulation*, 13 ANN. REV. L. & SOC. SCI. 515 (2017) (surveying literature from an array of regulatory domains—antidiscrimination, environmental protection, product quality, corporate governance, law enforcement, tax compliance, minimum wage and overtime protection, and occupational safety and health to show that unions (and collective bargaining practices) do have an impact on regulation).

approach to tackling bias in employment discrimination that combines *ex post* approaches, particularly focusing on internal and external auditing mandates, as well as, *ex ante* approaches, such as contractual protections for employers who rely on vendor representations of bias reduction, fairness by design principles that could be implemented as part of Employment Opportunity Commission (EEOC) guidelines to prevent discrimination in automated hiring, and also collective bargaining that would address both data input into automated hiring systems and worker control over the afterlife of the data created by automated hiring systems.

I. AUTOMATED HIRING AS BUSINESS PRACTICE

In this Section, I discuss the business case for the trend towards automated hiring. I also note the potential for automated hiring systems to be misused to produce unlawful employment discrimination. Furthermore, I describe how such systems may serve to mask employment discrimination or impede its detection.

A. The Business Case

Automated hiring systems have proliferated because they are perceived as both cost-effective and efficient. A *Forbes* article³⁶ notes that AI will quickly emerge as a key tool for human resources (HR) because of current talent scarcity and low unemployment.³⁷ Companies on average spend approximately \$4,000 per candidate on the hiring process, including interviewing, scheduling, and assessments.³⁸ However, the adoption of automated hiring makes the hiring process much less costly. This might be why, according to a Deloitte Bersin report,³⁹ companies that use technologies, such as AI and predictive data analysis, are more successful than those who do not.⁴⁰ For instance, the report indicates that the companies using AI technology show 18% higher revenue and 30% greater profitability compared to those without the tools.⁴¹

A statistics report by Ideal⁴² demonstrates how automated hiring allows companies to be efficient in hiring by detailing the time commitment required for traditional hiring. On average, companies spend fourteen hours per week on manually completing tasks that could be automated. Twenty-eight percent

³⁶ Gal Almog, *Recruiting Isn't Enough: How AI Is Changing the Rules in the Human Capital Market*, FORBES (Feb. 9, 2018, 8:50 AM), <https://www.forbes.com/sites/groupthink/2018/02/09/traditional-recruiting-isnt-enough-how-ai-is-changing-the-rules-in-the-human-capital-market/#729e2624274a>.

³⁷ See *id.*

³⁸ See *id.*; DELOITTE DEVELOPMENT LLC, THE RISE OF THE SOCIAL ENTERPRISE: 2018 DELOITTE GLOBAL HUMAN CAPITAL TRENDS (2018), <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/HumanCapital/gx-hc-trends-rise-social-enterprise.pdf>.

³⁹ See DELOITTE DEVELOPMENT LLC, *supra* note 38.

⁴⁰ See Almog, *supra* note 36; DELOITTE DEVELOPMENT LLC, *supra* note 38.

⁴¹ See DELOITTE DEVELOPMENT LLC, *supra* note 38; Almog, *supra* note 36.

⁴² Ji-A Min, *12 Revealing Stats on How Recruiters Feel about AI*, IDEAL (May 25, 2017), <https://ideal.com/how-recruiters-feel-about-ai/>.

indicate that they spend twenty hours or more, and 11% note that they lose thirty hours or more on such tasks.⁴³ Also, 41% of HR managers say not fully automating their manual hiring processes has led to lower productivity, and 35% have had to experience higher costs for the same reason.⁴⁴ In addition to lower efficiency and productivity, not fully automating manual processes in HR seems to have affected hiring decisions of the best talent, as 17% of HR managers state that it has led to a poor candidate experience.⁴⁵

Other articles also tout the benefits of adopting automated hiring process. For instance, a *LinkedIn Talent Blog* post shows that a recruiting algorithm increases the accuracy of selecting productive employees by more than 50 percent.⁴⁶ An article by Monster.com, a global employment website, indicates that using big data to evaluate candidates has lowered turnover for companies, with a median reduction of 38%.⁴⁷ Furthermore, in the article *In Hiring, Algorithms Beat Instinct*, the authors argue that hiring algorithms produce more objective outcomes than do human decision-makers.⁴⁸ The authors note that although humans are adept at specifying qualifications for a job and drawing out information from candidates, HR managers find it difficult to weigh the results;⁴⁹ according to one analysis, a simple equation performed better than human decisions, regardless of the number of candidates and types of jobs.⁵⁰ Another study found that although hiring managers can be greatly familiar with their organizations and have more insight beyond a two-dimensional job description, HR managers are also easily distracted by marginal things, such as applicants' compliments, and they use information inconsistently.⁵¹ Another study found that a job-screening algorithm "favored 'nontraditional' candidates"⁵² much more than human screeners did, "exhibit[ing] significantly less bias against candidates that were underrepresented at the firm."⁵³ Some other algorithmic studies related to credit applications, criminal justice, public resource allocations, and corporate governance all concluded that

⁴³ See *id.*

⁴⁴ See *id.*

⁴⁵ See *id.*

⁴⁶ See Maren Hogan, *8 Hiring Stats That Will Change the Way You Recruit*, LINKEDIN (Sept. 8, 2016), <https://business.linkedin.com/talent-solutions/blog/trends-and-research/2016/8-hiring-stats-that-will-change-the-way-you-recruit-today>; Roy Maurer, *Using Data to Make Better Hires*, SHRM (Jan. 29, 2016), <https://www.shrm.org/resourcesandtools/hr-topics/talent-acquisition/pages/using-data-make-better-hires.aspx>.

⁴⁷ See John Rossheim, *Algorithmic Hiring: Why Hire by Numbers?*, MONSTER, <https://hiring.monster.com/hr/hr-best-practices/recruiting-hiring-advice/strategic-workforce-planning/hiring-algorithms.aspx> (last visited Sept. 20, 2019).

⁴⁸ Nathan R. Kuncel, Deniz S. Ones & David M. Klieger, *In Hiring, Algorithms Beat Instinct*, HARV. BUS. REV. (May 2014), <https://hbr.org/2014/05/in-hiring-algorithms-beat-instinct>.

⁴⁹ See *id.*

⁵⁰ See *id.* ("Our analysis of 17 studies of applicant evaluations shows that a simple equation outperforms human decisions by at least 25%. The effect holds in any situation with a large number of candidates, regardless of whether the job is on the front line, in middle management, or (yes) in the C-suite.")

⁵¹ See *id.*

⁵² Alex P. Miller, *Want Less-Biased Decisions? Use Algorithms*, HARV. BUS. REV. (July 26, 2018), <https://hbr.org/2018/07/want-less-biased-decisions-use-algorithms>.

⁵³ *Id.*

“[a]lgorithms are less biased and more accurate than the humans they are replacing.”⁵⁴

Given these results, some legal scholars have challenged the focus of legal scholarship on the bias discovered in automated decision-making.⁵⁵ As these legal scholars argue, the original intent of automated decision-making is “to improve upon human decision-making by suppressing biases to make the most efficient and least discriminatory decisions.”⁵⁶ Thus, arguably, there is no implicit promise that automated decision-making could eliminate all bias; rather, the function of automated decision-making is merely to improve upon human decision-making. This assertion should be accepted at face value. My purpose for this Article is not to argue that automated decision-making can or should eliminate all bias in decision-making; rather, my aim is to argue that automated decision-making, even when it does offer some improvement on human decision-making, still merits legal oversight,⁵⁷ particularly when such decision-making controls any individual’s access to earning a livelihood.

B. *How Automated Is Automated Hiring?*

Although this Article uses the term *automated* hiring, I contend that this is a term that can be misleading as it elides the continued role of human input, the human hand. As I have previously noted, to argue against or for automated decision-making versus automated decision-making rests on the false assumption that the two could be wholly disentangled.⁵⁸ As Professor Mayson notes in her Article *Bias In, Bias Out*, automated decision-making is merely a reflection of all past decisions.

All prediction functions like a mirror. Its premise is that we can learn from the past because, absent intervention, the future will repeat it Predictive analysis, in effect, holds a mirror to the past. It distills patterns in past data and interprets them as projections of the future. Algorithmic prediction produces a precise reflection of digital data. Subjective prediction produces a cloudy reflection of anecdotal data. But the nature of the analysis is the same. To predict the future under status quo conditions is simply to project history forward.⁵⁹

I agree here with the conclusion that algorithmic decision-making posits history as the best diviner of the future, but I also urge a better understanding of how human decision-making remains entangled in automated decision-making. Such an understanding, I believe, would help to quell the reification of automated decision-making as better than human decision-making and also to negate what I call *automation exceptionalism*, which is the idea that automated

⁵⁴ *Id.*

⁵⁵ Stephanie Bornstein, *Antidiscriminatory Algorithms*, 70 ALA. L. REV. 519 (2018).

⁵⁶ *Id.* at 520.

⁵⁷ Professor Julie Cohen has extensively made the point that automated systems merit greater legal oversight in her breadth of scholarship. *See, e.g.*, Julie E. Cohen, *Law for the Platform Economy*, 51 U.C. DAVIS L. REV. 133, 189 (2017).

⁵⁸ Ajunwa, *supra* note 7.

⁵⁹ Mayson, *supra* note 5, at 2224.

decision-making is somehow *set apart* and should not be subjected to the same scrutiny or skepticism as human decision-making.

To that aim, consider the findings of an NBER Working Paper, *Discretion in Hiring*, which studied the introduction of job testing technologies across 15 firms and analyzed the consequences of making hiring decisions that deviate from test score recommendations.⁶⁰ In the study, the job test used consisted of an online questionnaire about computer and technical skills, personality, cognitive skills, fit for the job, and various job scenarios.⁶¹ Prior to the introduction of job testing, managers used discretion to make hiring recommendations based on interviews and resumes, but after the adoption, applicant test scores were made available to managers, who were encouraged to factor scores in to hiring decisions.⁶² The study examined the impact of the job test by focusing on job tenure as a key measure of quality. It was because turnover is costly, and it can be considered as a proxy for job match. After quantitative analysis, the researchers found that testing improved job tenures.

When the researchers formalized a model in which firms made hiring decisions with the help of both managers and the job test, they found that there was a “fundamental trade-off inherent in allowing managers discretion over hiring decisions.”⁶³ Although “a manager’s private information may be valuable to the firm, . . . worker quality is hurt by his or her bias.”⁶⁴ The study found that “managers are more likely to make exceptions both when their preferences differ from those of the firm and when they have information which is not captured by the test.”⁶⁵ Based on the findings of a negative relationship between exceptions managers make and the quality of hires, which was shown by durations of hired workers, the researchers conclude that managers make exceptions when they are not only better informed but also biased or mistaken.⁶⁶ What this study illustrates is that there is generally no such thing as fully automated decision-making. Most automated decision-making requires human input at some stage. For the study referenced above, the crucial stage was *ex post*, when human interveners may choose to ignore or make exceptions for the automated result. However, note that for all automated decision-making, there is *always ex ante* human input, when human decision-making directly dictates the design of the automated decision-making system, including deciding what variables should be considered, and deciding how said variables should be measured. Thus, despite some of the proven benefits of automated hiring, there remains the potential for misuse, resulting from the opportunities to introduce human bias at any stage of the automated hiring process—from design to implementation.

⁶⁰ Mitchell Hoffman, Lisa B. Kahn & Danielle Li, *Discretion in Hiring* (Nat’l Bureau of Econ. Research, Working Paper No. 21709, 2017), <https://www.nber.org/papers/w21709.pdf>.

⁶¹ *Id.* at 5.

⁶² *Id.* at 6.

⁶³ *Id.* at 13.

⁶⁴ *See id.*

⁶⁵ *Id.* at 14.

⁶⁶ *See id.*

C. Potential for Misuse

Although automated hiring offers some utility, the potential for the misuse of algorithmic hiring to accomplish an (un)intended unlawful discriminatory result remains. Hiring technologies can play various roles in the process; for example, in the early stages of recruiting, automated predictions can “steer job advertisements and personalized job recommendations to jobseekers from particular demographic groups.”⁶⁷ Also, some tools engage candidates with chat bots and virtual interviews or use game-based assessments to reduce reliance on traditional factors like test scores and GPA.⁶⁸ Employers adopt hiring technology to “increase efficiency, and in hopes that they will find more successful – and sometimes, more diverse – employees.”⁶⁹ Many believe that by making hiring more consistent and efficient, recruiters will be able to make fairer and more holistic hiring decisions because the tools will “reduce bias by obscuring applicants’ sensitive characteristics.”⁷⁰ However, the current focus on bias in the automated hiring systems centers on individual human prejudice, while obviating institutional, structural, and other forms of bias that become systemic in any given organization.⁷¹ To illustrate the historical and structural nature of bias in hiring consider this: “a company that tends to hire from a privileged and homogeneous community and then uses ‘culture fit’ as a factor in hiring decisions could end up methodically rejecting otherwise qualified candidates who come from more diverse backgrounds.”⁷²

The fact remains that there are myriad ways that automated hiring could systematically embed biases that have calcified from organizational practice.⁷³ First, if the training data for a model is itself inaccurate, non-representative, or biased, the resulting model and the predictions could reflect skewed results.⁷⁴ Also, a phenomenon known as “automation bias” occurs when people “give

⁶⁷ MIRANDA BOGEN & AARON RIEKE, UPTURN, HELP WANTED: AN EXAMINATION OF HIRING ALGORITHMS, EQUITY, AND BIAS 3 (2018), <https://www.upturn.org/static/reports/2018/hiring-algorithms/files/Upturn%20-%20Help%20Wanted%20-%20An%20Exploration%20of%20Hiring%20Algorithms,%20Equity%20and%20Bias.pdf>.

⁶⁸ *See id.*

⁶⁹ *Id.* at 6.

⁷⁰ *See id.* at 7.

⁷¹ For example, Professor Pauline Kim argues: “algorithms will not counteract structural forms of workplace bias.” Pauline Kim, *Data-Driven Discrimination at Work*, 58 WM. & MARY L. REV. 857, 860 (2017).

⁷² BOGEN & RIEKE, *supra* note 67, at 7.

⁷³ As other scholars have argued: “It should not be surprising that trying to predict qualities of good future workers based on the qualities of current workers and existing work culture will not lead to change. In other words, people analytics runs the risk of homosocial reproduction, or replacement of workers with workers that look like them, on a grand scale.” Matthew T. Bodie, Miriam A. Cherry, Marcia McCormack & Jintong Tang, *The Law and Policy of People Analytics*, 88 U. COLO. L. REV. 961, 1013 (2017); *see also* Alan G. King & Marko J. Mrkonich, “*Big Data*” and the Risk of Employment Discrimination, 68 OKLA. L. REV. 555, 574 (2016) (“[I]f incumbents are older than applicants, then the social-media profile of this older group may differ markedly from that of younger job applicants. Accordingly, an algorithm highly accurate in sorting incumbents for their proficiency may yield applicants notable only for their ‘retro’ tastes and lifestyles.”).

⁷⁴ BOGEN & RIEKE, *supra* note 67, at 8.

undue weight to the information coming through their monitors.”⁷⁵ A second issue is when algorithms are trained to evaluate the criteria used for selection in a manner that benefits one group of applicants. For example, HireVue is a tool used to conduct virtual interviews, and the claim is that it can identify facial expressions, vocal indications, word choice, and more. However, “speech recognition software can perform poorly” for certain groups of people if the algorithms have not been trained for that group, and “facial analysis systems can struggle to read the faces of women with darker skin.”⁷⁶ We should also question the legitimacy of using physical features and facial expressions that have no proven causal link with workplace success to make hiring decisions.⁷⁷

There are also questions about the causal conclusions of algorithmically derived social media background checks. This practice is fraught for several reasons. First, algorithms have “limited ability to parse the nuanced meaning of human communication.”⁷⁸ Second, such checks could “surface details about an applicant’s race, sexual identity, disability, pregnancy, or health status, which employers should not consider during the hiring process.”⁷⁹

Finally, as the last step of the hiring process, employers make offers to applicants using automated hiring systems. The software programs predict the likelihood a candidate will accept a job offer, and what the employer can do to increase the rate of acceptance. The employer can “adjust salary, bonus, stock options, and other benefits to see in real time how the prediction changes.”⁸⁰ Although these functions could be helpful for an effective hiring process, they might also amplify pay gaps for white women and minority job candidates.⁸¹ Such predictive salary offers also undermine “laws that bar employers from considering candidates’ salary histories.”⁸²

As Rachel Goodman of the American Civil Liberties Union (ACLU) writes, the flaws of automated hiring remain because of limitations in the law. For one, although vendors who market the hiring tools claim that these hiring tools are less biased than humans,⁸³ the software is proprietary and there is currently no way to verify these claims.⁸⁴ As a consequence of this lack of transparency, it is then difficult for job applicants to bring suit based on a disparate impact theory in “failure-to-hire” cases, as they are unable to identify a policy or practice that led to their rejection.⁸⁵ One suggestion is that outside

⁷⁵ *Id.* at 9.

⁷⁶ *Id.* at 37.

⁷⁷ *See id.*

⁷⁸ *Id.* at 40 (quoting NATASHA DUARTE, EMMA LLANSO & ANNA LOUP, CTR. FOR DEMOCRACY & TECH., MIXED MESSAGES? THE LIMITS OF AUTOMATED SOCIAL MEDIA CONTENT ANALYSIS 3 (2017), <https://cdt.org/files/2017/11/Mixed-Messages-Paper.pdf>).

⁷⁹ *Id.*

⁸⁰ *Id.* at 41.

⁸¹ *See id.*

⁸² *Id.*

⁸³ Rachel Goodman, *Why Amazon’s Automated Hiring Tool Discriminated Against Women*, AM. C.L. UNION (Oct. 12, 2018, 1:00 PM), <https://www.aclu.org/blog/womens-rights/womens-rights-workplace/why-amazons-automated-hiring-tool-discriminated-against>.

⁸⁴ *See id.*

⁸⁵ *See id.*

auditors may be able to uncover bias.⁸⁶ However, such research by outside auditors is thwarted by various obstacles, one of them being that federal laws, such as the Computer Fraud and Abuse Act, may criminalize certain types of testing of employment websites for discrimination.⁸⁷ Given these obstacles, there are calls for the EEOC to expand its efforts to govern workplace algorithms.⁸⁸ Later, I will outline some federal measures that could provide true protections for job applicants subjected to an automated hiring regime. But first, I will parse some other solutions that I think fall short of the ultimate goal of equal opportunity for all job applicants.

II. *EX MACHINA*: TECHNO-SOLUTIONIST APPROACHES

Even as legal scholars have called for more transparency⁸⁹ and accountability⁹⁰ for machine learning algorithms, increasingly, attention has shifted towards technological approaches to combating algorithmic capture in employment. These techno-solutionist approaches generally fall into two categories: 1) the adjustment of human job search behavior to “game” machine learning algorithms and 2) the creation of new algorithms that promise to eliminate bias. This section notes the limitations of such approaches and concludes with the caution that techno-solutionist approaches will never be effective for problems that are, at their root, derived from socio-technical interactions arising from structural bias and societal prejudices.⁹¹

A. *Humans Conform to the Machine*

One approach to counteracting the biased effects of hiring algorithms is to cheat the system. Thus, humans devise strategies to hurdle routine machine learning errors and other encoded biases. Consider a LinkedIn article, with the straightforward title: *Modifying Your Resume to Beat ATS Algorithms*.⁹² The author, a recruiting manager, counsels job applicants on how to avoid getting axed by the applicant tracking system (ATS). The article provides advice ranging from appropriate file format for resumes (PDFs are difficult for hiring algorithms to read), to the idea of choosing keywords pulled from the job ad to ensure

⁸⁶ See *id.*

⁸⁷ See *id.*; Sandvig v. Sessions – *Challenge to CFAA Prohibition on Uncovering Racial Discrimination Online*, AM. C.L. UNION (Sept. 12, 2017), <https://www.aclu.org/cases/sandvig-v-sessions-challenge-cfaa-prohibition-uncovering-racial-discrimination-online>.

⁸⁸ See Goodman, *supra* note 83.

⁸⁹ Danielle Keats Citron & Frank A. Pasquale, *The Scored Society: Due Process for Automated Predictions*, 89 WASH. L. REV. 1, 25 (2014) (discussing the need for oversight of algorithms); see also Ayssa M. Carlson, *The Need for Transparency in the Age of Predictive Sentencing Algorithms*, 103 IOWA L. REV. 303, 326 (2017); Maayan Perel & Niva Elkin-Koren, *Accountability in Algorithmic Copyright Enforcement*, 19 STAN. TECH. L. REV. 473, 482 (2016) (discussing the lack of transparency in algorithms).

⁹⁰ Joshua A. Kroll, Joanna Huey, Solon Barocas, Edward W. Felten, Joel R. Reidenberg, David G. Robinson & Harlan Yu, *Accountable Algorithms*, 165 U. PA. L. REV. 633 (2017).

⁹¹ See, e.g., Anupam Chander, *The Racist Algorithm?*, 115 MICH. L. REV. 1023, 1039 (2017).

⁹² Jan Tegze, *Modifying Your Resume to Beat ATS Algorithms*, LINKEDIN (Sept. 10, 2015), <https://www.linkedin.com/pulse/modifying-your-resume-beat-ats-algorithms-jan-tegze/>.

that an unsophisticated algorithm, that is, one lacking the full spectrum of the lexicon for a given field, does not reject the application simply because the algorithm was designed to only recognize a narrow list of words provided for in a keyword search.⁹³

In a similar vein, there are online communities dedicated to cheating the personality tests that have now become ubiquitous features of automated hiring.⁹⁴ Although some question the reliability of personality tests,⁹⁵ the tests remain a popular part of automated hiring systems. Some experts estimate that as many as 60% of workers are now asked to take workplace assessments.⁹⁶ The \$500-million-a-year industry has grown by about 10% annually in recent years.⁹⁷ While many organizations use personality testing for career development, about 22% use it to evaluate job candidates, according to the results of a 2014 survey of 344 Society for Human Resource Management members.⁹⁸ While some lawsuits have sought to eliminate the tests, most workers have resigned themselves to encountering the test as part of the hiring process and have come to rely on online “answer keys” created to beat the tests.⁹⁹ These “answer keys,” however, represent conformity to the unfair practices of automated hiring, rather than a true protest of their potential to discriminate in insidious ways. That is, efforts to cheat or beat the system merely represent the acquiescence of humans to a regime of algorithmically derived worker selection that is fundamentally unfair to protected categories of workers, such as, for example, those with mental illnesses.

B. *Algorithms to the Rescue*

Another technological approach is the development of new algorithmic hiring tools that purport to eliminate biases. A recent swell of start-ups¹⁰⁰ are hawking new ways to automate hiring. Some of these companies also claim that their technological approaches ensure employment decisions that are non-discriminatory.¹⁰¹ Although these start-ups may very well have the good

⁹³ *Id.*

⁹⁴ See Timothy Horrigan, *Some Answers to Unicru Personality Test* (Jan. 27, 2009), <http://www.timothyhorrigan.com/documents/unicru-personality-test.answer-key.html#sthash.N7ryuDqp.vtj4c5Nf.dpbs>; see also Melanie Shebel, *Unicru Answer Key – Read This and Get Hired*, TOUGH NICKEL: FINDING JOB (May 8, 2018), <https://toughnickel.com/finding-job/Unicru>; Astrid Martinez, *How To Pass an Employment Assessment Test – Part 1*, CAREER TALK PRO (Sept. 21, 2011), <http://www.careertalkpro.com/employment-assessment-test-part-1/>.

⁹⁵ Gill Plimmer, *How to Cheat a Psychometric Test*, FIN. TIMES (Apr. 2, 2014), <https://www.ft.com/content/eeda84e4-b4f6-11e3-9166-00144feabdc0>.

⁹⁶ Dori Meinert, *What Do Personality Tests Really Reveal?*, SOC’Y FOR HUM. RESOURCE MGMT. (June 1, 2015), <https://www.shrm.org/hr-today/news/hr-magazine/pages/0615-personality-tests.aspx>.

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ See Shebel, *supra* note 94.

¹⁰⁰ See, e.g., HIREVUE, <http://hirevue.com> (last visited Sept. 20, 2019).

¹⁰¹ Aarti Shahani, *Now Algorithms Are Deciding Whom to Hire, Based on Voice*, NPR: ALL TECH CONSIDERED (Mar. 23, 2015, 4:40 PM),

intention of eliminating human bias in hiring, I argue that the lack of any established internal or external auditing protocols mean that those good intentions cannot be verified in practice, and I remain steadfast in my belief that any solely techno-solutionist attempts at a solution without legal oversight will fall short.

C. *The Perils of Techno-solutionism*

The problem with techno-solutionists' methods is that they fail to address the bias encoded in the business practices deployed in the hiring process. In fact, they may even serve to replicate the shortcomings of human decision-making processes in hiring. For example, although the online websites to beat employment personality tests through "answer keys" may help a handful of people who would otherwise have been rejected, they also ultimately serve to reify the personality tests as part of the job application process and to calcify the same practice as part of business procedure for employers to screen applicants. In effect, such resistance efforts may be futile attempts to combat "algorithmic governmentality," which as one scholar has argued "anticipates our every move, mapping out in advance an apolitical ideal of behaviour and performance . . . to which the subject must adapt and conform without reflection."¹⁰² This suggests a need for remedies that do not unquestioningly privilege technological innovation but which uphold the goals of antidiscrimination laws through careful legal oversight. As other scholars have noted, techno-solutionist approaches to societal problems are foiled by the "bias in, bias out" problem.¹⁰³ That is, techno-solutionist approaches that fail to take into account structural biases encoded in the algorithm or which fail to question the provenance of training data (and how they might bear the taint of historical inequities) are doomed to replicate the same biased results.

III. DO EMPLOYMENT LAWS ADEQUATELY ADDRESS AUTOMATED HIRING?

In this section, I discuss the limitations of employment law in protecting job applicants who experience an adverse impact from automated hiring systems. I review employment law scholarship that offer empirical evidence of the difficulty of proving employment discrimination based on a disparate impact cause of action and the theories proffered by legal scholars as to why this might be the case. Given that the means of proving discrimination by

<http://www.npr.org/sections/alltechconsidered/2015/03/23/394827451/now-algorithms-are-deciding-whom-to-hire-based-on-voice>.

¹⁰² Douglas Spencer, *Proletarianisation Isn't Working*, RADICAL PHIL. (Feb. 2018), <https://www.radicalphilosophy.com/reviews/individual-reviews/proletarianisation-isnt-working>.

¹⁰³ See Anjanette H. Raymond, Emma Arrington Stone Young & Scott J. Shackelford, *Building a Better Hal 9000: Algorithms, the Market, and the Need to Prevent the Engraining of Bias*, 15 NW. J. TECH. & INTELL. PROP. 215 (2018); Robert Brauneis & Ellen Goodman, *Algorithmic Transparency for the Smart City*, 20 YALE J.L. & TECH. 103 (2018); see also Mayson, *supra* note 5.

automated hiring systems remains solely under the control of employers, I argue that there is a necessity for compulsory data retention by employers making use of automated hiring systems and that furthermore (as I argue in a Section IV) such data retention should facilitate both mandated and voluntary audits. Finally, I note the potential for trade secret law to be used as a shield to such audits, and I argue that audits by an independent auditing body would serve to allay any fears as to the misuse of proprietary information. These measures will aid in data retention to help compile the statistical proof required by disparate impact claimants and an independent external auditing mandate would help to maintain the intellectual property law shield for proprietary automated systems. These measures allowing a leveling of the field for disparate impact claimants and eliminates the current Sisyphean climb to proving discrimination on the basis of disparate impact.

A. *The Uphill Climb for Disparate Impact Claims*

As several legal scholars have demonstrated through empirical data, plaintiffs aiming to bring an employment discrimination claim on a theory of disparate impact rather than disparate treatment face an uphill battle.¹⁰⁴ In his article *Was the Disparate Impact Theory a Mistake?*, Professor Michael Selmi assesses the disparate impact theory's legacy.¹⁰⁵ Based on an extensive empirical analysis of court cases,¹⁰⁶ Selmi employs detailed statistics to demonstrate the difficulty of proving disparate impact cases.¹⁰⁷ The disparate impact theory initially arose to deal with specific practices, such as seniority systems and written tests, that were perpetuating intentional discrimination. Even though courts have not restricted the theory to those particular contexts, it has "proved an ill fit for any challenge other than to written examinations."¹⁰⁸

By the end of the first decade of the advent of disparate impact theory, Professor Selmi finds that the Supreme Court "had rejected more challenges than it had accepted, and it had largely limited the theory to its origins – namely testing claims and perhaps some other objective procedures capable of formal validation."¹⁰⁹ The following two decades further confirmed the theory's limited reach.¹¹⁰ This is particularly significant, considering that employment discrimination claims in general are already notoriously difficult to prove.¹¹¹ Selmi notes that "if intentional discrimination is difficult to prove with existing circumstantial evidence, labeling unintended adverse effects as discrimination would prove a far more difficult proposition for society to embrace."¹¹² Based on the belief that the theory was a mistake, Selmi suggests that a broader

¹⁰⁴ See, e.g., Charles A. Sullivan, *Disparate Impact: Looking Past the Desert Palace Mirage*, 47 WM. & MARY L. REV. 911, 989 (2005).

¹⁰⁵ Michael Selmi, *Was the Disparate Impact Theory a Mistake?*, 53 UCLA L. REV. 701 (2006).

¹⁰⁶ See *id.* at 734–37 (regarding the scope of the study).

¹⁰⁷ See *id.* at 738–39.

¹⁰⁸ *Id.* at 705.

¹⁰⁹ *Id.* at 733.

¹¹⁰ *Id.* at 734.

¹¹¹ See *id.*

¹¹² *Id.* at 768.

judicial definition of intent would have “opened our eyes to the persistence of discrimination in a way that the disparate impact theory could not.”¹¹³

Similarly, Professor Sperino provides exhaustive case law evidence of a defendant-friendly bias to the adjudication of disparate impact cases. In the article *Disparate Impact or Negative Impact?: The Future of Non-Intentional Discrimination Claims Brought by the Elderly*,¹¹⁴ Professor Sperino discusses the development of disparate impact law. For example, the Supreme Court in *Griggs v. Duke Power Co.* recognized the disparate impact theory of employment discrimination under Title VII by indicating that “good intent or absence of discriminatory intent does not redeem employment procedures or testing mechanisms that operate as ‘built-in headwinds’ for minority groups and are unrelated to measuring job capability.”¹¹⁵ Later, in *Wards Cove Packing Co. v. Atonio*,¹¹⁶ the Court “tipped the scales in favor of employers” by “placing the burden of persuasion on the plaintiff and by requiring the employer only to articulate a legitimate reason for its conduct.”¹¹⁷ Moreover in *Smith v. City of Jackson*,¹¹⁸ the Supreme Court, while recognizing that disparate impact is a viable claim under the Age Discrimination in Employment Act of 1967 (ADEA), “affirmed the dismissal of the petitioners’ claims, finding that they had not produced enough evidence to prevail on a disparate impact claim.”¹¹⁹ In the *Ward Cove* case, the Court signaled a defendant-friendly analysis by having the plaintiff first establish that the application of a particular employment practice created a disparate impact, then requiring the employer to produce evidence that “its action was based on a reasonable nonage factor,” and lastly mandating the plaintiff to bear the burden of disproving the company’s assertion.¹²⁰

Professor Sperino notes that, in reality, disparate impact claims appear to have been disfavored even before the *Smith* case.¹²¹ Litigants arguing a disparate impact case face significant initial costs that are either absent or less significant in a disparate treatment case; the reliance on statistical evidence “requires plaintiffs to obtain large amounts of data from the defendant and other sources.”¹²² Furthermore, the necessary evidence required by the plaintiff “is largely in the hands of the defendant and must be sought through the discovery process.”¹²³ Because defendants are often reluctant to produce the information voluntarily, the process of collecting and analyzing statistical evidence is “both complex and arduous.”¹²⁴

¹¹³ *Id.* at 782.

¹¹⁴ Sandra F. Sperino, *Disparate Impact or Negative Impact?: The Future of Non-Intentional Discrimination Claims Brought by the Elderly*, 13 ELDER L.J. 339 (2005).

¹¹⁵ *Griggs v. Duke Power Co.*, 401 U.S. 424, 432 (1971); Sperino, *supra* note 114, at 348.

¹¹⁶ *Wards Cove Packing Co. v. Atonio*, 490 U.S. 642 (1989).

¹¹⁷ Sperino, *supra* note 114, at 349.

¹¹⁸ *Smith v. City of Jackson*, 544 U.S. 228 (2005).

¹¹⁹ Sperino, *supra* note 114, at 354.

¹²⁰ *See id.* at 359.

¹²¹ *See id.*

¹²² *Id.* at 360.

¹²³ *Id.* at 360–61.

¹²⁴ *Wilkins v. Univ. of Hous.*, 654 F.2d 388, 390 (5th Cir. 1981); Sperino, *supra* note 114, at 361.

Both Professor Selmi's and Sperino's research offer grist for a re-imagining of redress mechanisms for employment discrimination. First, I concur with Professor Selmi's conclusions here regarding the need for a more expansive definition of intent in proving employment discrimination cases. This is why, in another article, I have proposed a new theory of action, *discrimination per se*,¹²⁵ which takes into account the particular difficulties of proof presented when a plaintiff is seeking to challenge an employer's use of an automated hiring system for employment discrimination. *Discrimination per se* effectively operates as a third cause of action under Title VII.¹²⁶ Per my proposal,

a plaintiff could assert that a hiring practice (for example, the use of proxy variables in automated hiring resulting or *with the potential to result in* adverse impact to protected categories) is so egregious as to amount to *discrimination per se*, and this would shift the burden of proof from the plaintiff to the employer to show that its practice is non-discriminatory.¹²⁷

This burden-shifting eliminates the uphill climb confronting disparate impact claimants during which they must procure sufficient statistical evidence of disproportionate impact.

However, even with the proposed theory of *discrimination per se* as help for the plaintiff, Professor Sperino's point that plaintiffs of employment discrimination cases are disadvantaged by the necessary reliance on the employer to provide the very data they need to prove their case still stands. Given the difficulties of proof for disparate impact applicants and given that in the context of automated hiring the means of proof lie solely within the control of employers, I argue then that fulfilling the spirit of anti-discrimination laws such as Title VII requires record-keeping, data retention, and auditing mandates to be imposed on employers.

B. Intellectual Property Law and the CFAA

Even if record-keeping and data-retention measures were to be instituted for automated hiring regimes, any attempt by plaintiffs to access that data may be stymied by extant laws, such as intellectual property law and the Computer Fraud and Abuse Act (CFAA), both of which have been invoked by the makers of automated decision-making systems as shields to scrutiny.¹²⁸ Corporations,

¹²⁵ Ajunwa, *supra* note 7.

¹²⁶ Title VII of the Civil Rights Act protects the job applicant against discrimination on the basis of sex, race, color, national origin, and religion. *See* U.S. Civil Rights Act of 1964 §7, 42 U.S.C. §2000e (2012). Plaintiffs must establish that "a respondent uses a particular employment practice that causes a disparate impact on the basis of [a protected characteristic] and the respondent fails to demonstrate that the challenged practice is job related for the position in question and consistent with its business necessity." 42 U.S.C. § 2000e-2(k)(1)(A)(i).

¹²⁷ Ajunwa, *supra* note 7.

¹²⁸ Congress enacted the Digital Millennium Copyright Act (DMCA) in 1998. Pub. L. No. 105-304, 112 Stat. 2860 (1998) (codified as amended, in sections of 17 and 28 U.S.C.).

claiming trade secret, have invoked intellectual property law to prevent the disclosure of information related to their proprietary algorithms.¹²⁹ Similarly, the CFAA has been read to protect automated systems from outside audits with the argument that such audits violate the terms of service for the systems.¹³⁰ Although the ACLU has brought suit on behalf of several academic researchers aiming to audit such systems and has alleged that the CFAA is unconstitutionally overbroad,¹³¹ there has yet to be a proposed solution to the

Section 1201 of the DMCA creates liability for hacking or reverse engineering an automated system protected under copyright law. 17 U.S.C. § 1201 (2012); *see also* Perel & Elkin-Koren, *supra* note 89 (noting the chilling effect on researchers who would like to reverse engineer automated processes, given the potential to incur liabilities); Rebecca Wexler, *Life, Liberty, and Trade Secrets: Intellectual Property in the Criminal Justice System*, 70 Stan. L. Rev. 1343 (2018); Rebecca Wexler, *When a Computer Program Keeps You in Jail*, N.Y. TIMES (June 13, 2017), <https://www.nytimes.com/2017/06/13/opinion/how-computers-are-harming-criminal-justice.html> [<https://perma.cc/BMW4-XPQ6>]; Elizabeth E. Joh, *The Undue Influence of Surveillance Technology Companies on Policing*, 92 N.Y.U. L. REV. 102 (2017) (discussing how trade secret law can protect policing algorithms from scrutiny); Sonia Katyal, *supra* note 5 (discussing the same and suggesting a whistleblowing framework to enable disclosure of biased algorithms).

¹²⁹ For example, Nicole Wong in her role as Google Inc's Associate General Counsel, has stated that "Google avidly protects every aspect of its search technology from disclosure". Nicole Wong, *Response to the DoJ Motion*, OFFICIAL GOOGLE BLOG (Feb. 17, 2006), <https://googleblog.blogspot.com/2006/02/response-to-doj-motion.html>.

¹³⁰ 18 U.S.C. § 1030(a)(2)(C) (2012). Circuits have interpreted the CFAA in divergent ways. *Compare* *Brown Jordan Int'l, Inc. v. Carmicle*, 846 F.3d 1167, 1174–75 (11th Cir. 2017), *and* *United States v. John*, 597 F.3d 263, 272 (5th Cir. 2010), *and* *Int'l Airport Ctrs., L.L.C. v. Citrin*, 440 F.3d 418, 420–21 (7th Cir. 2006), *and* *EF Cultural Travel BV v. Explorica, Inc.*, 274 F.3d 577, 583–84 (1st Cir. 2001) (adopting a broad interpretation of "exceed[ing] authorized access"), *with* *United States v. Valle*, 807 F.3d 508, 528 (2d Cir. 2015), *and* *United States v. Nosal*, 676 F.3d 854, 862–63 (9th Cir. 2012), *and* *WEC Carolina Energy Sols. LLC v. Miller*, 687 F.3d 199, 207 (4th Cir. 2012) (rejecting a broader interpretation). Circuits adopting a narrow interpretation of the CFAA are conscientious that the CFAA creates criminal penalties using the same language as used in the civil provisions, 18 U.S.C. § 1030(g), and have criticized broad interpretations—so much so that broad-interpretation circuits have begun to explicitly address that criticism. Just this summer, for example, the Eleventh Circuit acknowledged that the broad approach it adopted nearly a decade ago has been widely critiqued by other circuits. *EarthCam, Inc. v. OxBlue Corp.*, No. 15-11893, 2017 WL 3188453, at *9 n.2 (11th Cir. July 27, 2017) ("We decided *Rodriguez* [628 F.3d 1258] in 2010 without the benefit of a national discourse on the CFAA. Since then, several of our sister circuits have roundly criticized decisions like *Rodriguez* because, in their view, simply defining 'authorized access' according to the terms of use of a software or program risks criminalizing everyday behavior Neither the text, nor the purpose, nor the legislative history of the CFAA, those courts maintain, requires such a draconian outcome. We are, of course, bound by *Rodriguez*, but note its lack of acceptance."). And despite its holding in *Nosal* rejecting a broad interpretation of the CFAA, the Ninth Circuit recently held that continuing to access a website after receiving a cease and desist letter created liability under the CFAA. *Facebook, Inc. v. Power Ventures, Inc.*, 844 F.3d 1058 (9th Cir. 2016) ("But when Facebook sent the cease and desist letter, Power, as it conceded, knew that it no longer had permission to access Facebook's computers at all. Power, therefore, knowingly accessed and without permission took, copied, and made use of Facebook's data."). The Supreme Court recently denied Power Ventures's petition for certiorari; *Power Ventures* would have provided the Court with its first opportunity to bridge the gulf between broad and narrow interpretations of 18 U.S.C. § 1030(a)(2)(C).

¹³¹ *See* Complaint, *Sandvig v. Lynch*, No. 1:16-cv-01368 (D.D.C. June 29, 2016).

argument that trade secret laws may also serve as an impediment to the auditing of decision-making algorithms.¹³²

I argue then that as a pragmatic matter, while it may take time to carve out exceptions to intellectual property law and the CFAA framework,¹³³ an independent third-party auditor, that pledges to keep secret any trade secret information it obtains in the auditing process, and which is buoyed by the labor market preferences of job applicants, may afford a more immediate approach to addressing the issues of transparency and accountability for automated hiring systems. I discuss this in detail below in Section IV.B.

IV. A HYBRID APPROACH

As described above, the problems with automated hiring go beyond the scope of issues that could typically be addressed through litigation. Thus, any attempts to remedy those problems must necessarily adopt a hybrid approach. My proposed hybrid approach allows for measures meant to bolster litigation, as well as alternative methods, such as collective bargaining, that could allow workers to negotiate with employers to cooperatively achieve fair automated hiring practices for the workplace. Thus, in this section, I set forth two proposed measures: 1) Mandated audits (both external and internal, which will enable litigation; 2) Collective bargaining, which could serve three ends: encourage fairness by design for automated hiring systems by pushing for embedded data-retention mechanisms, the use of probative criteria in hiring to ensure that criteria is not merely a stand-in for class membership, and negotiate for data control and checks on data portability to prevent the algorithmic blackballing of employees. I also address some potential objections to these proposed measures.

The auditing of automated decision-making systems is an idea that is gaining ground.¹³⁴ This is especially true in regard to employment decision-

¹³² Wexler, *Life, Liberty, and Trade Secrets*, *supra* note 128.

¹³³ Note that in her Article, Amanda Levendowski, *How Copyright Law Can Fix Artificial Intelligence's Implicit Bias Problem*, 93 WASH. L. REV. 579 (2018), advocates for exceptions to CFAA and to Copyright Law that would allow for scrutiny of decision-making algorithms by third parties without violating the CFAA and also allow for otherwise copyrighted material to be used as part of the training data for algorithmic systems. My approach focuses on the idea of a certified third-party auditor that would alleviate the concerns regarding proprietary information. This approach does not necessarily require a change in existing framework which would be a fraught and contentious process.

¹³⁴ Kim, *Auditing Algorithms*, *supra* note 232 (proposing the retention of audits of automated decision-making to check for discrimination); Julie E. Cohen, *The Regulatory State in the Information Age*, 17 THEORETICAL INQUIRIES L. 369, 372–73 (2016) (“[P]olicymakers must devise ways of enabling regulators to evaluate algorithmically-embedded controls”); Deven R. Desai & Joshua A. Kroll, *Trust But Verify: A Guide to Algorithms and the Law*, 31 HARV. J.L. & TECH. 1, 16–17 (2017) (discussing designing algorithmic systems to enable audits by regulators); Citron & Pasquale, *supra* note 89, at 24–25 (proposing that the FTC audit consumer scoring systems); Frank Pasquale, *Beyond Innovation and Competition: The Need for Qualified Transparency in Internet Intermediaries*, 104 NW. U. L. REV. 105, 169–71 (2010) (calling for monitoring of search engines and considering the possibility of the FTC playing that role); W. Nicholson Price II, *Regulating Black-Box Medicine*, 116 MICH. L. REV. 421, 464 (2017) (calling for greater FDA and third-party scrutiny of medical algorithms); Paul Schwartz, *Data Processing and Government Administration: The Failure of the American Legal Response*

making, as several experts working in the field support the idea of mandated audits for automated hiring systems. One quibble is whether such audits should be internal or external. Meredith Whittaker, co-founder of the AI Now Institute at New York University and founder of Google's Open Research group, notes that "AI is not impartial or neutral" and suggests that "in the case of systems meant to automate candidate search and hiring, we need to ask ourselves: What assumptions about worth, ability and potential do these systems reflect and reproduce? Who was at the table when these assumptions were encoded?"¹³⁵ She also states that because systems like HireVue are proprietary and not open to review, there is no way to validate their claims of fairness and ensure they are not simply tech-washing and magnifying longstanding patterns of discrimination.¹³⁶ Thus, she insists on the need for audits by experts, advocacy groups, and academia.¹³⁷

In response to this concern, Loren Larsen, Chief Technology Officer of HireVue, admits that it is very important to audit the algorithms used in hiring to identify and correct for any bias but argues that "no company doing this kind of work should depend only on a third-party firm to ensure that they are doing this work in a responsible way [I]t is the responsibility of the company itself to audit the algorithms as an ongoing, day-to-day process."¹³⁸

Dipayan Ghosh, a Harvard fellow and former Facebook privacy and public policy official, has no such confidence in an internal review process given past cases of self-certifying companies revealed to be engaging in practices that were harmful to society and certain populations.¹³⁹ According to Ghosh: "The public will have little knowledge as to whether or not the firm really is making biased decisions if it's only the firm itself that has access to its decision-making algorithms to test them for discriminatory outcomes."¹⁴⁰ Ghosh notes that start-ups do not face enough pressure to use third-party audit firms because it is not required by law, costs money, and would "require 'tremendous levels' of compliance beyond what internal audits likely require."¹⁴¹ However, consider the regulation in other jurisdictions, where for example, the European General Data Protection Regulation, denotes algorithm audits as essential for the public

to the Computer, 43 HASTINGS L.J. 1321 (1992) (calling for "independent governmental monitoring of data processing systems"); Rory Van Loo, *Helping Buyers Beware: The Need For Supervision of Big Retail*, 163 U. PA. L. REV. 1311, 1382 (2015) (proposing that the FTC monitor Amazon); Shlomit Yanisky-Ravid & Sean K. Hallisey, "Equality and Privacy by Design": A New Model of Artificial Intelligence Data Transparency Via Auditing, Certification, and Safe Harbor Regimes, 46 FORDHAM URB. L.J. 428, 429 (2019) (proposing "an auditing regime and a certification program, run either by a governmental body or, in the absence of such entity, by private institutions"); see also Kate Crawford & Jason Schultz, *Big Data and Due Process: Toward a Framework to Redress Predictive Privacy Harms*, 55 B.C. L. REV. 93, 121–24 (2014) (considering auditing by public agencies to address predictive privacy).

¹³⁵ Eric Rosenbaum, *Silicon Valley Is Stumped: Even A.I. Cannot Always Remove Bias from Hiring*, CNBC (May 30, 2018, 5:54 PM), <https://www.cnbc.com/2018/05/30/silicon-valley-is-stumped-even-a-i-cannot-remove-bias-from-hiring.html>.

¹³⁶ See *id.*

¹³⁷ See *id.*

¹³⁸ *Id.*

¹³⁹ See *id.*

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

good, particularly for protecting those who are already marginalized citizens.¹⁴² Thus, I propose that corporations employing automated hiring systems should be mandated to engage in *both* internal and external audits of such systems, and I lay out the case for each type of audit in the following sections.

A. *Internal Auditing as Corporate Social Responsibility*

A regime of mandated internal auditing will ensure that companies diligently review the outcomes of automated hiring and correct for any discovered bias. On August 19, 2019, a group of 200 business executives collaboratively working together as the Business Roundtable released a statement¹⁴³ in which they recognized a responsibility beyond merely satisfying shareholders.¹⁴⁴ Rather, the group, which included executives from Walmart, Apple, Pepsi, and others, acknowledged that they must also “invest in their employees, protect the environment and deal fairly and ethically with their suppliers.”¹⁴⁵ Given this acknowledgement, I argue that internal audits to check automated hiring systems for bias are a key part of the corporate social responsibility (CSR) of business firms. Thus, I propose that large corporations and other entities should be required to implement a business system of regular self-audits of their hiring outcomes to check for disparate impact. This system of mandated self-audits would be similar to the mandated self-audits of financial institutions. In an internal audit activity, self-auditing, or self-assessment, a “department, division, team of consultants, or other practitioner(s) [provide] independent, objective assurance and consulting services designed to add value and improve an organization’s operations.”¹⁴⁶ By evaluating and improving the effectiveness of “governance, risk management and control processes” in a systematic and disciplined way, internal auditing helps an organization reach its objectives.¹⁴⁷

¹⁴² See *id.* “In recruiting – a space in which sensitive and life-changing decisions are made all the time in which we accordingly have established strong civil rights protections – algorithmic bias [is] especially important to detect and act against.” *Id.*

¹⁴³ The statement begins: “Americans deserve an economy that allows each person to succeed through hard work and creativity and to lead a life of meaning and dignity. We believe the free-market system is the best means of generating good jobs, a strong and sustainable economy, innovation, a healthy environment and economic opportunity for all.” Statement from Business Roundtable, Statement on the Purpose of a Corporation (Aug. 2019), <https://opportunity.businessroundtable.org/wp-content/uploads/2019/08/BRT-Statement-on-the-Purpose-of-a-Corporation-with-Signatures.pdf>.

¹⁴⁴ See David Gelles & David Yaffe Bellany, *Shareholder Value Is No Longer Everything*, *Top C.E.O.s Say*, N.Y. TIMES (Apr. 19, 2019), <https://www.nytimes.com/2019/08/19/business/business-roundtable-ceos-corporations.html>.

¹⁴⁵ See *id.*

¹⁴⁶ THE INST. OF INTERNAL AUDITORS, STANDARDS FOR THE PROFESSIONAL PRACTICE OF INTERNAL AUDITING 23 (2016), <https://na.theiia.org/standards-guidance/Public%20Documents/IPPF-Standards-2017.pdf>.

¹⁴⁷ *Id.* at 23.

Standards and best practices already exist for conducting an effective internal audit.¹⁴⁸ As an international professional association, the Institute of Internal Auditors (IIA) gives guidance on internal auditing.¹⁴⁹ For an internal audit to be considered effective, it should achieve at least one of the ten Core Principles, which include “Demonstrates competence and due professional care” and “Is insightful, proactive, and future-focused.”¹⁵⁰ Also, as listed in the Code of Ethics, internal auditors are expected to uphold the following principles: integrity, objectivity, confidentiality, and competency.¹⁵¹ The quality of the internal audit activity should also be assured through internal and external assessments, which are public reviews and day-to-day measurement, supervision, and review of the activities and assessment by an independent reviewer from outside of the organization, respectively.¹⁵²

One genre of organizations that follow the standards of IIA comprises bank and financial service companies.¹⁵³ In another law review article,¹⁵⁴ I have compared the fiduciary duties of banks to the fiduciary duties of information fiduciaries (such as platforms) who are information fiduciaries to the job applicants who entrust them with their information. In banks, internal audits are required not only in terms of financial reporting, but also regarding legal compliance and general effectiveness.¹⁵⁵ The independence of these audits has been constantly emphasized by relevant institutions; the 2001 guidelines of the Basel Committee on Banking Supervision, the principal agency establishing international banking standards, and the guidance issued by a subcommittee of the Federal Reserve System underline that a bank’s internal audit must be independent from the everyday internal control process and day-to-day functioning of the bank and that it should have access to all bank activities.¹⁵⁶ In support of this, the manuals of the Federal Deposit Insurance Corporation, Officer of the Comptroller of the Currency, and Federal Financial Institutions Examination Council advocate that internal auditors report “solely and directly” to the audit committee,¹⁵⁷ consisting of outside directors, without reporting to their supervisors, so that the auditing can avoid management interference.

¹⁴⁸ See, e.g., *id.* at 1–25.

¹⁴⁹ *Id.*

¹⁵⁰ See *Core Principles for the Professional Practice of Internal Auditing*, INST. INTERNAL AUDITORS, <https://na.theiia.org/standards-guidance/mandatory-guidance/Pages/Core-Principles-for-the-Professional-Practice-of-Internal-Auditing.aspx> (last visited June 12, 2018).

¹⁵¹ See *Code of Ethics*, INST. INTERNAL AUDITORS (Jan. 2009), https://na.theiia.org/standards-guidance/Public%20Documents/IPPF_Code_of_Ethics_01-09.pdf.

¹⁵² THE INST. OF INTERNAL AUDITORS, *supra* note 146; MATTHEW BENDER, BANKS & THRIFTS: GOVT ENFORCE & RECEIVERSHIP § 5.04 (2018).

¹⁵³ Federal banking regulators suggest that the internal audit function be conducted according to professional standards. see Michael E. Murphy, *Assuring Responsible Risk Management in Banking: The Corporate Governance Dimension*, 36 DEL. J. CORP. L. 121, 136–37 (2011).

¹⁵⁴ See Ifeoma Ajunwa, *Genetic Testing Meets Big Data: Torts and Contract Law Issues*, 75 Ohio St. L.J. 1225 (2014).

¹⁵⁵ See Murphy, *supra* note 153, at 136.

¹⁵⁶ *Id.* at 137–38.

¹⁵⁷ *Id.* at 139; GARY M. DEUTSCH, RISK ASSESSMENTS FOR FINANCIAL INSTITUTIONS § 27A.03 (2017).

Self-auditing is also conducted and recommended in other types of industries, such as manufacturing sectors, because it helps the businesses meet the requirements of relevant laws. For instance, an occupational safety and health and safety (OSH) self-audit is an “assessment of workplace hazards, controls, programs, and documents performed by a business owner or employee”¹⁵⁸ in compliance with OSHA regulations. In their article, *Self-Audit of Lockout/Tagout in Manufacturing Workplaces: A Pilot Study*, Yamin et al. discuss the significance of OHS self-audits in manufacturing companies and suggest ideas to improve inter-rater reliability and accuracy in the process.¹⁵⁹ Furthermore, OSHA allows hiring a consultant within the company to perform self-audits when OSHA is not able to do an inspection immediately.¹⁶⁰

Others have noted that self-audits can enhance corporate social responsibility (CSR).¹⁶¹ The four levels of CSR self-audit allow companies to examine their performance in relation to ad hoc policy, standard policy, planned policy, and evaluated and reviewed policy.¹⁶² Furthermore, self-audits allow for strategic and operational business planning through identification of strengths and prevention of problems.¹⁶³ This genre of CSR self-audit process requires “proper training of self-auditors, allocation of sufficient time to perform the audit, preparation of audit aids, management support, and an adequate follow-up to audit findings.”¹⁶⁴

Also, rather than merely serving as a protectionist tool against employment discrimination lawsuits, self-audits would benefit corporations interested in diversifying their personnel. Business scholars have shown that a workplace with diverse employees is ideal for achieving sought-after business goals such as greater innovation.¹⁶⁵ Thus, the self-audits could provide corporations with a tool to discover their blind spots in regard to preconceived notions of qualification and fit and might even help bring other problems of bias in hiring to the attention of the corporation. For example, the audits could shatter misconceptions as to qualifications by surfacing rejected candidates who nonetheless went on to become stellar employees at other companies. Or, the audits could reveal a rather shallow pool of diverse qualified applicants, indicating either a negative brand image for the company, work climate problems, or the need to establish a sturdier pipeline to the industry for diverse candidates.

¹⁵⁸ Samuel C. Yamin, David L. Parker, Min Xi & Rodney Stanley, *Self-Audit of Lockout/Tagout in Manufacturing Workplaces: A Pilot Study*, 60 AM. J. IND. MED. 504, 504 (2017).

¹⁵⁹ *Id.*

¹⁶⁰ See *Martin v. Bally's Park Place Hotel & Casino*, 983 F.2d 1252 (1993); Olivia K. LaBoda, *Dueling Approaches to Dual Purpose Documents: The Reaches of the Work Product Doctrine After Textron*, 44 SUFFOLK U. L. REV. 727, 737 (2011).

¹⁶¹ See Peter Kok, Ton van der Wiele, Richard McKenna & Alan Bronw, *A Corporate Social Responsibility Audit within a Quality Management Framework*, 31 J. BUS. ETHICS 285, 291–93 (2001).

¹⁶² See *id.*

¹⁶³ See *Self-Audit for Quality Improvement*, 18 STRATEGIC DIRECTION 5, 17 (2002).

¹⁶⁴ *Id.*

¹⁶⁵ See Katherine Phillips, et al., *supra* note 47 (showing that diverse groups outperform homogenous groups because of both an influx of new ideas and more careful information processing); See also, Sheen S. Levine & David Stark, *supra* note 47.

B. *External Auditing: The Fair Automated Hiring Mark*

Given the proprietary nature of hiring algorithms, one approach that balances intellectual property protection concerns with the need for greater accountability is a certification system that operates on external third-party audits by an independent certifying entity. I take as inspiration for this proposed certification system Professor Ayres and Gerarda's framework for corporations to certify discrimination-free workplaces that comply with the Employment Non-Discrimination Act (ENDA).¹⁶⁶ The authors propose:

[B]y entering into the licensing agreement with us, an employer gains the right (but not the obligation) to use the mark and in return promises to abide by the word-for-word strictures of ENDA. Displaying the mark signals to knowing consumers and employees that the company manufacturing the product or providing the service has committed itself not to discriminate on the basis of sexual orientation.¹⁶⁷

Other legal scholars have also proposed certification systems for algorithms. Notably, Andrew Tutt has proposed an "FDA for algorithms,"¹⁶⁸ in which the federal government would establish an agency to oversee different classes of algorithms to ensure that, much like food and medicine marketed for human consumption, those algorithms would pose no harm to those over whom they exercise decision-making power.¹⁶⁹

In *Monitoring in the Surveillance Age*, Professor Rory Van Loo makes a compelling case for regulatory monitoring of platforms that employ automated decision-making.¹⁷⁰ He defines regulatory monitoring as "the collection of information that the [government] agency can force a business to provide even without suspecting a particular act of wrongdoing."¹⁷¹ Professor Van Loo notes that key factors indicating a need for regulatory monitoring include: a public interest in preventing harm, information asymmetries, and a lack of faith in self-regulation.¹⁷² While these three factors are undeniably present in the context of automated hiring, I argue against regulatory monitoring by a government agency and in favor of external monitoring by a third-party agency.

I envision a certification system that could take the form of a non-governmental entity, much like say the Leadership in Energy and

¹⁶⁶ ENDA is legislation proposed in the United States Congress that would prohibit discrimination in hiring and employment on the basis of sexual orientation or gender identity by employers with at least 15 employees. *See generally* Ian Ayres & Jennifer Gerarda Brown, *Mark(et)ing Nondiscrimination: Privatizing ENDA with a Certification Mark*, 104 MICH. L. REV. 1639 (2006).

¹⁶⁷ *Id.* at 1641.

¹⁶⁸ *See* Tutt, *supra* note 5.

¹⁶⁹ *Id.*

¹⁷⁰ Rory Van Loo, *The Missing Regulatory State: Monitoring Businesses in an Age of Surveillance*, VAND. L. REV. (forthcoming).

¹⁷¹ *Id.*

¹⁷² *Id.*

Environmental Design (LEED) certification system. LEED was created by the U.S. Green Building Council (USGBC), which was established in 1993 “with a mission to promote sustainability-focused practices in the building industry.”¹⁷³ Thus, LEED serves as a “green certification program for building design, construction, operations, and maintenance.”¹⁷⁴ The LEED certification involves a formal certification letter, as well as plaques and signage for buildings and an electronic badge that may be displayed on a website.¹⁷⁵

The third-party certification for algorithmic hiring tools I contemplate would involve periodic audits of the hiring algorithms to check for disparate impact on vulnerable populations. Thus, this would not be a one-time audit but an ongoing process of periodic audits to ensure that the corporations/organizations will continue to hew to fair automated hiring practices. In return, the corporation or organization would earn the right to use a Fair Automated Hiring Mark (FAHM; see illustration of a potential mark below) for its online presence, for communication materials, and to display on hiring advertisements to attract a more diverse pool of applicants.



Figure 1: The Proposed Fair Automated Hiring Mark

The decision to propose a non-governmental certification agency, rather than a governmental agency, stems from the recognition of regulatory capture.¹⁷⁶ As history has shown, governmental agencies are vulnerable to regulatory capture,¹⁷⁷ meaning that private influence on the workings of such agencies, as well as political wind shifts, can render such agencies toothless or ineffectual. While there are varying definitions of regulatory capture, “[w]hat is true, however, is that because the top officials of federal regulatory agencies are presidential appointees, interest groups, whether they are industries,

¹⁷³ See *About USGBC*, U.S. GREEN BUILDING COUNCIL, <https://new.usgbc.org/about> (last visited Sept. 21, 2019).

¹⁷⁴ *Id.*

¹⁷⁵ See *Certification*, U.S. GREEN BUILDING COUNCIL, <https://new.usgbc.org/post-certification> (last visited Sept. 21, 2019).

¹⁷⁶ Daniel Carpenter and David Moss define “regulatory capture” as “the result and process by which regulation, in law or application, is consistently or repeatedly directed away from the public interest and towards the interests of the regulated industry, by the action or intent of the industry itself.” DANIEL CARPENTER & DAVID A. MOSS, PREVENTING REGULATORY CAPTURE: SPECIAL INTEREST INFLUENCE AND HOW TO LIMIT IT 19 (2014).

¹⁷⁷ See, e.g., Stavros Gadinis, *The SEC and the Financial Industry: Evidence from Enforcement Against Broker Dealers*, 67 BUS. LAW. 679 (2012) (highlighting the inherent connection between the public and private enforcement of securities laws); David Freeman Engstrom, *Corralling Capture*, 36 HARV. J.L. & PUB. POL’Y 1 (2013) (arguing that the structural conditions that facilitate regulatory capture naturally move legislatures and agencies together).

unions, or consumer or environmental groups influence the regulatory agencies, and one can think of this influence as a kind of capture¹⁷⁸

Examples of regulatory capture abound in American government, including that of the U.S. Securities and Exchange Commission (SEC),¹⁷⁹ the Food and Drug Administration (FDA),¹⁸⁰ and most importantly the EEOC.¹⁸¹ Most recently, an in-depth investigative report by *The New Yorker* revealed the staggering extent of the regulatory capture of the FDA by Purdue Pharma, a privately held company established by the Sackler family and which developed the prescription painkiller OxyContin.¹⁸² The painkiller, which is almost twice as powerful as morphine, has been at the forefront of the current American opioid crisis, as it was extensively marketed for long-term pain relief despite medical evidence of its addictive properties.¹⁸³ The FDA, without corroborating evidence from clinical trials, approved a packaged insert for OxyContin that announced that the drug was safer than competing painkillers—the FDA examiner who approved the package insert, Dr. Curtis Wright, was hired at Purdue Pharma soon after he left the FDA.¹⁸⁴

In the specific context of employment, the EEOC, which is charged with employment regulation, has also been susceptible to administration change. Consider for example that in 2014 President Obama issued a pay data transparency executive order¹⁸⁵ that mandated that private companies with 100 or more employees and federal contractors with fifty or more employees must disclose pay data broken down by race and gender to the EEOC.¹⁸⁶ This executive order was meant to combat gender gaps in pay.¹⁸⁷ However, in 2017 (after a change in administration) the Acting Chair of the EEOC (appointed

¹⁷⁸ CARPENTER & MOSS, *supra* note 176, at 54 (2014).

¹⁷⁹ Other scholars have detailed a revolving door of SEC employees to and from the financial sector and how this has contributed to regulatory capture of the SEC. Stewart L. Brown, *Mutual Funds and the Regulatory Capture of the SEC*, J. BUS. L. (forthcoming).

¹⁸⁰ Patrick Radden Keefe, *The Family That Built an Empire of Pain*, NEW YORKER (Oct. 30, 2017), <https://www.newyorker.com/magazine/2017/10/30/the-family-that-built-an-empire-of-pain> (discussing how one family-owned business through fraud and corruption, coopted the FDA drug certification system).

¹⁸¹ Consider that the Trump administration attempted to rescind a pay data collection rule that had been promulgated by the Obama administration to combat the gender pay gap through transparency in pay. See Alexia Fernandez Campbell, *Trump Tried to Sabotage a Plan to Close the Gender Pay Gap. A Judge Wouldn't Have It*, VOX (Apr. 26, 2019, 10:10 AM), <https://www.vox.com/2019/4/26/18515920/gender-pay-gap-rule-eeoc>.

¹⁸² *Id.*

¹⁸³ *Id.*

¹⁸⁴ *Id.* (detailing how OxyContin lobbied for the insert to increase its market share of drug sales).

¹⁸⁵ See Bourree Lam, *Obama's New Equal-Pay Rules*, ATLANTIC (Jan. 29, 2016), <https://www.theatlantic.com/business/archive/2016/01/eeoc-pay-discrimination-obama/433926/>; see also Press Release, The White House, Office of the Press Sec'y, Fact Sheet: New Steps to Advance Equal Pay on the Seventh Anniversary of the Lilly Ledbetter Fair Pay Act (Jan. 29, 2016), <https://obamawhitehouse.archives.gov/the-press-office/2016/01/29/fact-sheet-new-steps-advance-equal-pay-seventh-anniversary-lilly>.

¹⁸⁶ See Lam, *supra* note 185.

¹⁸⁷ See Press Release, The White House, *supra* note 185.

by President Trump) issued a press release announcing an immediate stay of this executive order via memorandum.¹⁸⁸

A commercial third-party certifying entity, with a business reputation to protect, would be much less susceptible to regulatory capture. For one, as the nature of the relationship between the certifying entity and the employer making use of automated hiring systems is voluntary, there is much less of an impetus for regulatory capture in the first place. Thus, the FAHM mark, rather than representing a mere rubber stamp, will come to serve as a reputable market signal for employers who are truly interested in creating a more diverse workplace. Of note also is that a non-governmental entity would better withstand the sort of vagaries of political wind shifts, as was recently demonstrated by events at Federal Communications Commission (FCC)¹⁸⁹ and the Federal Trade Commission (FTC) regarding net neutrality¹⁹⁰ or the Environmental Protection Agency (EPA) regarding climate change.¹⁹¹

I envision that such a third-party certification entity would be composed of multi-disciplinary teams of auditors comprising both lawyers and software engineers / data scientists who would audit the hiring algorithms employed by corporations and organizations. This would prevent some of the tunnel-vision problems associated with technology that is created without consideration for legal frameworks and larger societal goals. Furthermore, I envision that such a certification system could serve as a feedback mechanism and thus enable the better design of and best practices for fairer automated hiring systems.

One argument against this proposal is that even independent third-party certifying agencies are not immune to capture. As such entities will derive an economic benefit from certifications, there is the danger that such an agency could become a mere rubber-stamping entity without adequate legal teeth to enforce any sanctions against the entities it is certifying. However, given that said agency would operate on the trust of job applicants as consumers, and

¹⁸⁸ See Danielle Paquette, *The Trump Administration Just Halted This Obama-Era Rule to Shrink the Gender Wage Gap*, WASH. POST (Aug. 30, 2017, 2:37 PM), <https://www.washingtonpost.com/news/work/wp/2017/08/30/the-trump-administration-just-halted-this-obama-era-rule-to-shrink-the-gender-wage-gap/>.

¹⁸⁹ See Brian Fung, *The House Just Voted to Wipe Away the FCC's Landmark Internet Privacy Protections*, WASH. POST (Mar. 28, 2017, 7:37 PM), <https://www.washingtonpost.com/news/the-switch/wp/2017/03/28/the-house-just-voted-to-wipe-out-the-fccs-landmark-internet-privacy-protections/>; see also Jeff Dunn, *Trump Just Killed Obama's Internet-Privacy Rules – Here's What That Means for You*, BUS. INSIDER (Apr. 4, 2017, 10:55 AM), <http://www.businessinsider.com/trump-fcc-privacy-rules-repeal-explained-2017-4>.

¹⁹⁰ See Michael Santorelli, *After Net Neutrality: The FTC Is the Sheriff of Tech Again. Is It Up to the Task?*, FORBES (Dec. 15, 2017, 11:44 AM), <https://www.forbes.com/sites/washingtonbytes/2017/12/15/the-game-is-on-the-ftc-tech-regulation-post-net-neutrality/> (noting the FTC's stance against net neutrality).

¹⁹¹ See Brady Dennis & Juliet Ellperin, *How Scott Pruitt Turned the EPA into One of Trump's Most Powerful Tools*, WASH. POST (Dec. 31, 2017), https://www.washingtonpost.com/national/health-science/under-scott-pruitt-a-year-of-tumult-and-transformation-at-epa/2017/12/26/f93d1262-e017-11e7-8679-a9728984779c_story.html; see also Eric Lipton & Danielle Ivory, *Under Trump, EPA Has Slowed Actions against Polluters, and Put Limits on Enforcement Officers*, N.Y. TIMES (Dec. 10, 2017), <https://www.nytimes.com/2017/12/10/us/politics/pollution-epa-regulations.html>.

also given the greater information dissemination afforded by the internet, consumers in the form of job applicants are now able to more forcefully make their voices heard regarding algorithmic bias and could still blow the whistle¹⁹² on any misconduct, thus undermining any certifying mark that does not hold true.

C. Collective Bargaining

While internal and external audits could both enable litigation by generating data to serve as statistical evidence of disparate impact or by uncovering practices that could be considered *discrimination per se*, collective bargaining as a collaborative exercise between employers and worker unions could also set fair standards for automated hiring and secure applicant data. In this section, I argue that collective bargaining provides another avenue to check some of the deleterious effects of automated hiring. Notably, collective bargaining could focus on the role of data collection and usage. Thus, the target of such collective bargaining would be trifold: 1) agreements as to what data will be *digested* by automated hiring systems, that is setting the standards for probative applicant assessment criteria; 2) agreements as to the *end uses* of such data, that is contractual agreements as to what the data collected will be used for, as well as data-retention agreements; and 3) agreements as to the control and portability of the data *created* by automated hiring systems.

While there has been much focus on the data input required for automated decision-making, a focus on the data generated by the automated decision-making process is equally as consequential, if not more so. This is because automated hiring systems hold the potential to create indelible portraits of applicants, which may be used to classify those individuals.¹⁹³ Thus, data submitted by an applicant is deployed not just for one job classification or even presented to just one employer. Rather, applicant-data-generated worker profiles may live on past the snapshot in time when the worker applied for a specific position and may come to haunt the worker during an entirely different bid for employment.¹⁹⁴ Thus, in the following sections, I detail the important role of collective bargaining for not just achieving fair standards for the curation of input data, but also for the portability of the output data.

1. Data Digested and Determining Probative Evaluation Criteria

Arguments over standards of fairness and other approaches to algorithmic accountability tend to neglect the role of data in perpetuating discrimination.

¹⁹² See Katyal, *supra* note 5 (in which Professor Katyal makes a powerful argument for the importance of whistleblowers in rectifying algorithmic bias).

¹⁹³ Professors Rick Bales and Katherine Stone have argued: “The electronic resume produced by A-I will accompany workers from job to job as they move around the boundaryless workplace.” Bales & Stone, *supra* note 33.

¹⁹⁴ *Id.* (“Thus A-I and electronic monitoring produce an invisible electronic web that threatens to invade worker privacy, deter unionization, enable subtle forms of employer blackballing, exacerbate employment discrimination, render unions ineffective, and obliterate the protections of the labor laws.”).

Yet, as several legal scholars have observed, data is not neutral; rather, it is tainted by structural and institutional bias.¹⁹⁵ Collective bargaining regarding what data may be used for assessment as part of algorithmic hiring systems is one necessary approach to curbing employment discrimination. While hiring criteria is typically not a collective bargaining topic—collective bargaining tends to focus on the conditions of employment for workers who have already been hired—I argue that union leaders should not overlook the importance of securing fair data collection and evaluation standards for their members.¹⁹⁶

The first task for unions to tackle is negotiating what data may be digested by hiring algorithms. A crucial issue for this negotiation is the determination of what data is probative of “job fitness” or what data may be even considered job-related. Professor Sullivan notes: “the employer’s reliance on the algorithm may be job-related, but the algorithm itself is measuring and tracking behavior that has no direct relationship to the job performance.”¹⁹⁷ And while some of the information digested by hiring algorithms may be correlated to job success, as other scholars have noted: “if a statistical correlation were sufficient to satisfy the notion of job relatedness, the standard would be a tautology rather than a meaningful legal test.”¹⁹⁸

Rather than rely on flimsy and often times irrelevant correlation patterns excavated by the algorithms, I concur with legal scholars¹⁹⁹ who have argued that the Uniform Guidelines on Employee Selection Procedures²⁰⁰ should apply in negotiating what data will be digested by automated hiring systems. Although these guidelines do not amount to law,²⁰¹ they have been accorded

¹⁹⁵ See Mike Ananny & Kate Crawford, *Seeing Without Knowing: Limitations of the Transparency Ideal and Its Application to Algorithmic Accountability*, 20 NEW MEDIA & SOC’Y 973 (2016); Chander, *supra* note 91.

¹⁹⁶ There are already some extant incidences of this type of union activity. See Marianne J. Koch & Gregory Hundley, *The Effects of Unionism on Recruitment and Selection Methods*, 36 INDUS. REL. 349 (1997); see also Anil Verma, *What Do Unions Do to the Workplace? Union Effects on Management and HRM Policies*, 26 J. LAB. RES. 415 (2005).

¹⁹⁷ See Sullivan, *supra* note 10, at 421.

¹⁹⁸ See Kim, *supra* note 71, at 860.

¹⁹⁹ See Sullivan, *supra* note 10, at 420–22; King & Mrkonich, *supra* note 73.

²⁰⁰ Sullivan, *supra* note 10, at 422 n.108 (“29 C.F.R. § 1607.3(A) (2018) ([T]he hiring, promotion, or other employment or membership opportunities of members of any race, sex, or ethnic group will be considered to be discriminatory and inconsistent with these guidelines, unless the procedure has been validated in accordance with these guidelines”). ‘Selection procedure’ is in turn defined broadly to include ‘[a]ny measure, combination of measures, or procedure used as a basis for any employment decision,’ and includes “the full range of assessment techniques from traditional paper and pencil tests, performance tests, training programs, or probationary periods and physical, educational, and work experience requirements through informal or casual interviews and unscored application forms.’ 29 C.F.R. § 1607.16(Q) (2018).”).

²⁰¹ See *id.* at 422.

deference in case law²⁰² and have been viewed as authoritative in deciding employment discrimination cases.²⁰³ As Professor Sullivan notes²⁰⁴:

While [the Uniform Guidelines] have been used mainly for the validation of traditional paper-and-pencil tests with a disparate impact,¹⁰⁷ the Guidelines broadly apply to any “selection procedure.”¹⁰⁸

The Uniform Guidelines are useful because they set standards for when selection criteria could be considered valid. Thus, the guidelines provide for “three kinds of validation: criterion, content and construct.”²⁰⁵ The aim of all three types of validation is to prompt the employer to provide evidence of a predictive causal relationship between the selection method and the job performance:

Evidence of the validity of a test or other selection procedure by a criterion-related validity study should consist of empirical data demonstrating that the selection procedure is predictive of or significantly correlated with important elements of job performance. Evidence of the validity of a test or other selection procedure by a content validity study should consist of data showing that the content of the selection procedure is representative of important aspects of performance on the job for which the candidates are to be evaluated. Evidence of the validity of a test or other selection procedure through a construct validity study should consist of data showing that the procedure measures the degree to which candidates have identifiable characteristics which have been determined to be important in successful performance in the job for which the candidates are to be evaluated.²⁰⁶

As validation generally requires a job analysis, unions can be actively involved in conducting the job analysis and in thus setting the standards to demonstrate that: 1) the selection criteria for the hiring algorithm relates to important

²⁰² The court in *Griggs* concluded that the original EEOC guidelines should be given “great deference” *Griggs v. Duke Power Co.*, 401 U.S. 424, 433–34, (1971). This conclusion was concurred with by the court in *Albemarle Paper Co. v. Moody*, 422 U.S. 405, 430–31 (1975), which further observed that the “Guidelines draw upon and make reference to professional standards of test validation established by the American Psychological Association” and that while the guidelines were “not administrative ‘regulations’ promulgated pursuant to formal procedures established by the Congress . . . they do constitute [t]he administrative interpretation of the Act by the enforcing agency.” The Uniform Guidelines replaced the original EEOC guidelines in 1978 and it enjoys broader consensus than the EEOC guidelines as it represents the collective view of the EEOC and other federal agencies such as the Department of Labor, the Civil Service Commission, and the Department of Justice. Thus, courts have similarly viewed the Guidelines as authoritative. The court in *Gulino* noted: “Thirty-five years of using these Guidelines makes them the primary yardstick by which we measure defendants’ attempt to validate” a test.” *Gulino v. N.Y. State Educ. Dep’t*, 460 F.3d 361, 383–84 (2d Cir. 2006).

²⁰³ Per the results of a Lexis Advance search: The court in more than 300 cases have applied the guidelines, including a number of Supreme Court decisions per the results of a Lexis Advance search. Sullivan, *supra* note 10, at note 106

²⁰⁴ Sullivan, *supra* note 10, at 422 & nn.107–08.

²⁰⁵ *Id.* at 423 (citing RAMONA L. PAETZOLD & STEVEN L. WILLBORN, *THE STATISTICS OF DISCRIMINATION* §§ 5.13–.17 (2d ed. 2017–2018)).

²⁰⁶ *Id.* (quoting 29 C.F.R. § 1607.5B (2018)) (cross references omitted in original).

aspects of the job, 2) that the data used actually allows for a prediction of future job performance based on the selection, and 3) that the selected candidates are not the result of some nebulous correlation but rather actually have identifiable characteristics that are causally related to better job performance.

But even after the determination of probative data for job fitness, there still remains the problem of biased data. For example, data that may be probative for job fitness, such as test scores, may still bear the taint of past biased decisions. Consider for example that racial housing segregation has resulted in a concentration of better-resourced schools in majority-white neighborhoods where students who attend receive better preparation for taking standardized tests. Thus, although performance on standardized tests may be considered probative of job fitness, the use of such criterion could result in disparate impact. In recognition of the historical taint of structural bias on data that could otherwise be probative, some scholars have called for “algorithmic affirmative action,” which focuses on transparency about the biases encoded in the data and the correction of the data the algorithms use rather than merely in the design of algorithms.²⁰⁷ Also, employers could outright reject the use of such biased data.

For example, employers can design games to determine job performance qualities of applicants, such as “social intelligence, goal-orientation fluency, implicit learning, task-switching ability, and conscientiousness,”²⁰⁸ rather than depending on standardized testing. Savage and Bales demonstrate this by showing that these algorithms, which only identify individual personal qualities, can reduce discrimination in evaluating job applicants.²⁰⁹ Thus, for example, according to some researchers, administering algorithm-based video games in the initial hiring process will not only decrease disparate treatment and disparate impact discrimination, because they test for individual skill sets, but they might also reduce unconscious biases in evaluation of job candidates.²¹⁰

2. Data End Uses and Fairness by Design

One common retort to addressing bias in algorithms is that machine learning algorithms, which are constantly changing, are ungovernable;²¹¹ however, I argue that design features of hiring platforms could enable anti-discrimination ends, thus bringing them under a rule of law. Thus, I argue that fairness can be part of the design of these algorithmic systems from the onset, especially establishing data-retention features as a standard. These machine learning algorithms, which have the capacity to derive new models as they learn from large data sets, are constantly reevaluating the variable inputs to calculations. Some researchers have argued that humans could feasibly lose

²⁰⁷ See Chander, *supra* note 91, at 1039.

²⁰⁸ See David D. Savage & Richard Bales, *Video Games in Job Interviews: Using Algorithms to Minimize Discrimination and Unconscious Bias*, 32 A.B.A. J. LAB. & EMP. L. 211, 222 (2017).

²⁰⁹ *Id.* at 224–26.

²¹⁰ *Id.*

²¹¹ See Kroll et al., *supra* note 90.

their agency over algorithms given their extensive potential for calculations and the amount of data they use.²¹² To limit this reduction in choice-making power, some have exhorted that humans need to set “checks” on algorithms, ensuring that they can inspect both the data that enters the calculation system and the results that exit.²¹³ By doing so, humans might reduce the chance that algorithms grow to be unintelligible to humans over time. For example, IBM’s Watson algorithm allows periodic inspections by presenting researchers with the documents it uses to form the basis for its decisions.²¹⁴

Programmers can reduce discriminatory effects of hiring algorithms by complying with key standards of legal fairness in determining design features such that the algorithms will avoid a disparate impact for protected classes and comply with the principles of laws such as the Civil Rights Act of 1964 or the ADEA.²¹⁵ Mark MacCarthy in *Standards of Fairness for Disparate Impact Assessment of Big Data Algorithms* explains conditions for algorithms to be certified as fair.²¹⁶ According to Professor MacCarthy, algorithms are

fair when they meet one of the following: Fairness Through Blindness (algorithms do not contain or use variables that refer directly to a protected status), Group Fairness (algorithms treat groups equally), Statistical Parity (algorithms equalize positive acceptance rates across protected groups), Equal Group Error Rates (the rate at which algorithms return false positives and false negatives is the same for all protected groups), Individual Fairness (algorithms return the same outcome regardless of an individual’s group membership), Predictive Parity (algorithms equalize positive predictive value across groups), and Similarity Measures (algorithms classify individuals the same when they have similar characteristics relevant to performing a particular task). These conditions cannot all be satisfied at once.²¹⁷

As Professor MacCarthy also notes:

there are disputes about statistical concepts of fairness, especially between group fairness and individual fairness, because some believe that anti-discrimination laws aim at practices that disadvantage certain groups, while others think these laws “target arbitrary misclassification of individuals.”²¹⁸

²¹² Marco Tulio Ribeiro, Sameer Singh & Carlos Guestrin, “Why Should I Trust You?": *Explaining the Predictions of Any Classifier*, ASS’N FOR COMPUTATIONAL LINGUISTICS (2016).

²¹³ *Id.*

²¹⁴ *Id.*

²¹⁵ See Mark MacCarthy, *Standards of Fairness for Disparate Impact Assessment of Big Data Algorithms*, 48 CUMB. L. REV. 67, 78 (2018).

²¹⁶ *Id.*

²¹⁷ *Id.* at 90.

²¹⁸ *Id.* at 68. See generally Reva B. Siegel, *Equality Talk: Antisubordination and Anticlassification Values in Constitutional Struggles over Brown*, 117 HARV. L. REV. 1470 (2004) (providing the background for the development of competing theories on equal protection law); Jack M. Balkin & Reva B. Siegel, *The American Civil Rights Tradition: Anticlassification or Antisubordination?*, 58 U. MIAMI L. REV. 9 (2003) (relating the history of the development and application of two distinct antidiscrimination threads in American law).

Those that support group fairness measure, such as statistical parity²¹⁹ and equal group error rates, try to reduce the subordination of disadvantaged groups by allowing for some sacrifice of accuracy.²²⁰

For instance, King and Mrkonich describe that fair selection algorithms “[rate] members of the majority and protected groups equally.”²²¹ However, those who advocate for individual fairness aim to promote equal accuracy in classification. To them, algorithms are considered fair “when they make equally accurate predictions about individuals, regardless of group membership.”²²² Also, they require that “enforc[ing] similar probabilities of outcomes for two individuals should [be] less than any differences between them”²²³ and that “any two individuals who are similar with respect to a particular task [be] classified similarly.”²²⁴ As notions of fairness diverge, organizations must choose which standard to adopt by considering the context of use as well as normative and legal standards.²²⁵

Legal scholars have called for greater transparency for hiring algorithms,²²⁶ with the belief that “greater disclosure of how [algorithms] operate” will help avoid unfairness.²²⁷ Professor Frank Pasquale, the author of *The Black Box Society*, suggests that a solution to the problem of algorithmic discrimination is transparency; he does so by using the metaphor of “black box” and proposes that algorithms should not operate as black boxes but should be open up for examination.²²⁸ However, some argue that this call for transparency is not sufficient for algorithms to be completely fair in regard to legal standards.²²⁹ This is because transparency alone does not fully explain why a particular decision was made or how fairly the system operates.²³⁰ Rather, those scholars argue that governing algorithms require design principles that provide checks for bias. Kroll et al. in *Accountable Algorithms* suggest technical strategies that

²¹⁹ Proponents of statistical parity argue that it is more desirable because it “equalizes outcomes across protected and non-protected groups.” See Cynthia Dwork, Moritz Hardt, Toniann Pitassi, Omer Reingold & Rich Zemel, *Fairness Through Awareness*, 3 INNOVATIONS THEORETICAL COMPUTER SCI. CONF. 214, 2 (2011).

²²⁰ MacCarthy, *supra* note 215, at 68.

²²¹ King & Mrkonich, *supra* note 73, at 575–76.

²²² See MacCarthy, *supra* note 215, at 69.

²²³ Pauline T. Kim, *Auditing Algorithms for Discrimination*, 166 U. PA. L. REV. 189, 195–96 (2017).

²²⁴ See Dwork et al., *supra* note 219, at 214.

²²⁵ See MacCarthy, *supra* note 215, at 71.

²²⁶ See Citron & Pasquale, *supra* note 89, at 24–25.

²²⁷ Kim, *supra* note 223, at 189.

²²⁸ See Chander, *supra* note 91, at 1039; Frank Pasquale, *Bittersweet Mysteries of Machine Learning (A Provocation)*, LONDON SCH. ECON. & POL. SCI.: MEDIA POL’Y PROJECT (Feb. 5, 2016), <https://blogs.lse.ac.uk/mediapolicyproject/2016/02/05/bittersweet-mysteries-of-machine-learning-a-provocation/>.

²²⁹ See Kroll et al., *supra* note 90.

²³⁰ As some scholars have noted, the need for explainability is especially important in the context of automated hiring. See James Grimmelman & David Westreich, *Incomprehensible Discrimination*, 7 CAL. L. REV. ONLINE 164, 170 (2017) (“Applicants who are judged and found wanting deserve a better explanation than, ‘The computer said so.’”); see also Andrew Selbst & Solon Barocas, *The Intuitive Appeal of Explainable Machines*, 87 FORDHAM L. REV. 1085 (2018) (noting that “algorithmic decision-making has become synonymous with inexplicable decision-making”).

would help overcome hidden biases in the algorithms.²³¹ For instance, they suggest incorporating randomness to maximize the gain of learning from experience; if the hiring algorithms are random such that they hire some candidates who are not predicted to do well, the validity of the initial assumptions can be tested and the accuracy and fairness of the whole system will benefit over time.²³²

I argue that important facets for fairness by design for automated hiring systems are record-keeping and data-retention mechanisms as part of the standard design. As the data from automated hiring systems remain solely in the control of the employer, appropriate record-keeping and data-retention procedures are necessary to enable any disparate impact claims. As it currently stands, the job applicants who do not make it past the hiring algorithm are typically lost to the ether.²³³ Thus, there is no sure way for plaintiffs to compare relative percentages of job applicants from protected categories who were hired against the number who applied as required by the EEOC rule,²³⁴ and there is still no clear method to confirm best hiring outcomes against the actual pool of qualified applicants. Determining disparate impact in hiring algorithms is a relatively simple matter of evaluating the outcomes using the EEOC rule.²³⁵ This rule mandates that a selection rate for any race, sex, or ethnic group that is less than four-fifths (80%) of the rate for the group with the highest rate will generally be regarded by the federal enforcement agencies as evidence of adverse impact.²³⁶

Automated hiring systems that do not retain data when an applicant from a protected category is prevented from completing an application or that may not even retain the data of complete but unsuccessful applications thwart the purpose of the EEOC rule. My proposal for a legal requirement for corporations to deploy only automated hiring systems with data-retention mechanisms will ensure that data from failed job applicants are preserved to be later compared against the successful job applicants, with the aim of discovering whether the data evinces disparate impact regarding the population of failed job applicants.

Consider also that responsible record-keeping and data-retention are necessary for conducting both internal and external audits. The data for internal audits serve two purposes: 1) they will alert employers to any disparate impact created by the automated hiring system, thus allowing them to preemptively correct any imbalances and avoid costly lawsuits; 2) they might also alert employers to more structural issues present in their hiring. Such structural issues might include: 1) mismatched or non-probative selection criteria, 2) a shallow hiring pool for applicants from protected categories, 3) technical or accessibility problems present in the automated hiring platform. Thus, the data from internal audits may represent a direct benefit to employers

²³¹ Kim, *supra* note 223, at 192.

²³² See Kroll et al., *supra* note 90.

²³³ See O'NEIL, *supra* note 1, at [redacted] (Page number, automated hiring chapter).

²³⁴ See *Uniform Guidelines on Employee Selection Procedures*, Biddle Consulting Group, <http://uniformguidelines.com/uniformguidelines.html#18> (last visited Sept. 22, 2019).

²³⁵ See 29 C.F.R. § 1607(A) (2018).

²³⁶ *Id.* (noting original language of the EEOC's "four-fifths rule").

that is separate from their duty not to discriminate.²³⁷ Such a boon should be counted in any cost-benefit analysis²³⁸ of my proposed record-keeping and data-retention measures.

3. Data Control and Portability

Earlier in the Article, I noted the vast expanse of information collected by hiring platforms and also the indelibility of the data profiles created by automated hiring systems. Moreover, these data profiles, some of which are created by third-party automated hiring vendors, contain not just information provided by the job applicant but also data gleaned from online sources (such as social media profiles) and peddled by gray market data brokers.²³⁹ Therefore, such information may include errors or could provide an inaccurate portrait of the applicant as misconstrued from erroneous data.²⁴⁰ Even if the information contained in the profile is accurate, there is also the issue of “context collapse,”²⁴¹ wherein information the applicant provided in the context of

²³⁷ See, e.g., Richard Thompson Ford, *Bias in the Air: Rethinking Employment Discrimination Law*, 66 STAN. L. REV. 1381 (2014) (arguing that employment law imposes a duty of care on employers to refrain from practices that go against equal opportunity in employment); see also Robert Post, Lecture, *Prejudicial Appearance: The Logic of American Antidiscrimination Law*, 88 CALIF. L. REV. 1 (2000) (arguing that antidiscrimination law aims to achieve positive interventions in social practices as opposed to solely dictating prohibitions). Other professors have also used a “duty of care” framework to propose remedial measures for employment discrimination. See David Benjamin Oppenheimer, *Negligent Discrimination*, 141 U. PA. L. REV. 899 (1993); Noah D. Zatz, *Managing the Macaw: Third-Party Harassers, Accommodation, and the Disaggregation of Discriminatory Intent*, 109 COLUM. L. REV. 1357 (2009). I later discuss why the duty not to engage in practices that negate equal opportunity supports my external audit proposal.

²³⁸ Cf. Laurence H. Tribe, *Seven Deadly Sins of Straining the Constitution Through a Pseudo-Scientific Sieve*, 36 HASTINGS L.J. 155, 161 (1984) (arguing that there is a “pernicious tendency” for cost-benefit analysis to “dwarf soft variables” in constitutional law).

²³⁹ See, e.g., *Web Scraping as a Valuable Instrument for Proactive Hiring*, DATAHEN (Apr. 5, 2017), <https://www.datahen.com/web-scraping-valuable-instrument-proactive-hiring/> (“What can recruiters do to use this huge advantage to their benefit? They can scrape or crawl data off of those kind of job portals and run analytics through it. By doing so they are able to determine the likelihood of filling a particular position in a specified location based on historical data patterns. Everything is relevant and important here and can impact the results of the research. Every little nuance, like the day of the week, certain types of jobs should be posted or other kinds of factors that will influence the decision making of the prospective candidate.”)

²⁴⁰ Consider the case of *Thompson v. San Antonio Retail Merchants Association* (SARMA), where the Fifth Circuit found that SARMA had erred in its creation of a profile for Thompson, automatically “capturing” the incorrect social security number for his profile and erroneously reporting the bad credit history of another man by the same common name. *Thompson v. San Antonio Retail Merchs. Ass’n*, 682 F.2d 509 (1982); see also *Spokeo v. Robins*, 136 S. Ct. 1540, 1546 (2016) (in which a “people search engine” provided incorrect personal information about a consumer to employers and the Supreme Court ruled that this established concrete injury to the consumer, by damaging his employment prospects).

²⁴¹ Scholars have used the term “context collapse” to describe the phenomenon when communication that is meant for one particular audience is transported to another (dissimilar) audience without context or translation resulting in misunderstanding or

applying for one specific job position may inappropriately be revived to evaluate the candidate for another job position.

Given these problems, applicant control and agency over both data collection and the portability of any created applicant profiles are crucial matters. Thus, as part of collective bargaining, unions should negotiate with employers regarding how applicant data will be handled. There is some tension here between data retention for the purpose of facilitating audits and applicants' control of their data. But that tension is easily resolved by data anonymization and aggregation. The relevant data for audits here is demographic data. And even then, such demographic data is limited to those that reveal protected characteristics. Unions can negotiate with firms not to retain or trade in applicant profiles that contain not just demographic data but sensitive personal information, as well as evaluations about applicant fitness.

4. Preventing "Algorithmic Blackballing"

Negotiations regarding the retention of subjective applicant profiles or evaluations are necessary to avoid what I term *algorithmic blackballing*. When applicant profiles are allowed to live on past their shelf life, such profiles may come to haunt the applicant in a different bid for work, whether with the same employer or, if traded, with another employer.²⁴² Consider this scenario: John applies for work through the hiring platform of a major corporation. This platform creates profiles of all applicants. From those profiles, the employer chooses a subset of applicants to invite for interviews and rejects the rest. However, the corporation still retains the profiles of all job applicants. This data is used internally; whenever the applicant applies again for a job, even if it is a different job from the initial attempt, this applicant profile is revived and is once again the basis for a rejection. This is unfair for various reasons. First, the continued retention and use of applicant profiles misappropriates applicant data—when applicants submit an application, they intend for the information they provide to be used solely for establishing their fitness for the target job position. It is not commonly understood that applicant data submitted at one snapshot in time could once again, potentially many years later, be used as evidence of whether an applicant is fit for another job. Second, retention and re-use of an applicant profile is unfair because it denies the applicant a chance to present herself in a manner that is more competitive for the job. For example, the applicant could have achieved tangible assets like a new credential, but also he could have attained less quantifiable benefits such as better communication skills.

Further exacerbating the problem is that there are no laws prohibiting automated hiring platforms from selling applicant data. This means that applicant data created for one audience, a specific employer, could be transported for the use of a completely different audience, another employer.

acrimony. See Alice E. Marwick & Danah Boyd, *I Tweet Honestly, I Tweet Passionately: Twitter Users, Context Collapse, and the Imagined Audience*, 13 NEW MEDIA & SOC'Y 114 (2011).

²⁴² Professors Rick Bales and Katherine Stone have argued: "The electronic resume produced by A-I will accompany workers from job to job as they move around the boundaryless workplace." Bales & Stone, *supra* note 33.

Thus, an applicant rejected by one employer could also, lacking leave to submit amendments to their profile, continue to be rejected by multiple employers. I term this type of exclusion *algorithmic blackballing*. The algorithmic blackballing of applicants thwarts the goals of anti-discrimination law. While an applicant may not be right for a specific job at a specific point in time, using the same information that made that determination and applying that to a different job, even if at the same company, is antithetical to the bedrock legal doctrine of equal opportunity for all job applicants.

D. *The Employer's Burden*

Any opposition to my proposals will largely be economical ones; however, those types of arguments ignore that the overarching aim of employment antidiscrimination law is to preserve equal opportunity for all job applicants and that anti-discrimination imposes a duty on employers to work towards that end.²⁴³ It is true that audits cost both time and money. Thus, employers could argue that mandated audits pose an undue economic burden and would negate the cost-saving benefits of automated hiring. However, as legal scholars like Professor Charles Sullivan have recognized:

antidiscrimination laws simply do not require shareholder value maximization; that's a goal that must be reconciled with various legal requirements, including antidiscrimination laws, which may sometimes tend to reduce profits. The statutes do not accommodate productivity concerns by allowing neutral practices with a disparate impact to be justified by business necessity.²⁴⁴

Professor Richard Ford's position ever more forcefully supports the argument for employers to shoulder the burden of checking for bias in algorithmic hiring systems.²⁴⁵ Professor Ford argues that employment discrimination law

imposes a duty of care on employers to avoid decisions that undermine social equality. This suggests that attempts to improve employment discrimination law by making it more attentive to "the facts"—for instance, refining causation in mixed-motives cases using quantitative empirical methods or defining discriminatory intent according to innovations in social psychology—are unlikely to be successful, because these facts are not really at the center of the dispute. Instead, we could better improve employment discrimination law—making it more successful as an egalitarian intervention and less intrusive on legitimate employer prerogatives—if we abandoned attempts to precisely define concepts such as "objective causation" and

²⁴³ Cf. Solon Barocas & Helen Nissenbaum, *Big Data's End Run around Anonymity and Consent*, in *PRIVACY, BIG DATA, AND THE PUBLIC GOOD: FRAMEWORKS FOR ENGAGEMENT* 44, 44 (Julia Lane et al. eds., 2014) (noting that "data commit to record details about human behavior, they have been perceived as a threat to fundamental values, including everything from autonomy, to fairness, justice, due process, property, solidarity").

²⁴⁴ See Sullivan, *supra* note 10.

²⁴⁵ Ford, *supra* note 237.

“discriminatory intent” and instead *focused on refining the employer’s duty of care to avoid antiegalitarian employment decisions*.²⁴⁶

If, as Professor Ford argues, employment discrimination law already imposes a duty of care on employers to ensure that their employment decisions are not discriminatory, then calling for mandated audits of algorithmic hiring systems does not equate to imposing a new burden; rather, it is merely delineating exactly how that duty of care should be fulfilled. Mandated audits are in keeping with the duty of care to verify that employment decisions are not unlawfully discriminatory. Moreover, self-audits need not be prohibitively costly. If, as I detail above, the automated hiring system has already been designed in such a way to retain and easily produce the information needed for the audits, the process of conducting self-audits should in reality pose no added economic burden.

CONCLUSION

In a previous article, I detailed how automated hiring has been perceived as a panacea for human bias in employment decision-making.²⁴⁷ However, as I argued in that article, automated hiring may in actuality represent a misguided Gordian knot approach to the systemic problem of employment discrimination. As automated decision-making cannot be fully disentangled from human decision-making, the former action cannot then be an antidote for the noxious effects of the latter action. The fact remains that the human hand, and its attendant bias, remains present in automated decision-making. One concern then is that automated hiring represents a Trojan horse;²⁴⁸ although it appears as a time- and money-saving gift to corporations inundated by a deluge of job applications, in reality, it may conceal amplified bias and replicate unlawful discrimination, all disguised as artificial intelligence. The problems with automated hiring as identified defy the parameters of litigation redress mechanisms. This is true particularly considering the onerous proof requirements of anti-discrimination law. Thus, to enjoy any benefits of automated hiring systems, without further exacerbating the existing problem of bias, I advocate for a hybrid approach that deploys mechanisms from labor law and administrative law. This necessitates the recognition of an auditing imperative with record-keeping mandates, and that includes *ex ante* non-adversarial interventions, such as collective bargaining, to set standards for data collection. Working in tandem, these measures will get us closer as a society towards the American ideal of equal opportunity in employment.

²⁴⁶ *Id.* at 1381 (emphasis added).

²⁴⁷ Ajunwa, *supra* note 7.

²⁴⁸ My thanks to Professor Ryan Calo for providing this particular analogy during my paper workshop at the Privacy Law Scholars Conference.

APPENDIX

Table 1: An Evaluation of Extant Hiring Algorithms

Automated Hiring Platform/Software Program	Year created	Companies using them	Some features
ADP Workforce Now	2009	-More than 20,000 clients by 2011	- Presents candidate data in proprietary dashboard -“Benchmarking” insights used to determine compensation etc.; bills data as “decision-quality”
ApplicantPro	2007	-Goodwill -JC Resorts -New York State Psychiatric Institute	-Automated screening -Integrated behavioral assessments -Integrated background checks -Automates tracking of compliance data
Arya (LeoForce)	2013	???	-Purports to be “unbiased” on company website -Mimics searches of company’s most successful recruiters -Automated sourcing -Predicts whether candidates are likely to move jobs -Data includes things like “growth in the companies they have worked for”
Ascentis	~2007?	-Bel Brands USA -BevMo! -Calibre -Cancún Resort Las Vegas -Ghirardelli -Level 3 Communications -LaForce -Proficio Bank -Voxellab -Visit Philadelphia	-Advertises itself as defense to discrimination lawsuits and seeks to automate EEO/OFCCP compliance -Social media integration -Can track demographic trends in applicant sourcing
AssessFirst	2003	-Air France -Burger King -Olympus -Ingenico Group -AXA -BNP Paribas -SMCP	-Predicts recruiting success with psychometrics -Can pre-select candidates -Algorithm compares job profile to candidate profiles to source applicants

BALANCEtrak (Berkshire Associates)	2010	<ul style="list-style-type: none"> -Sodexo -FCS Financial -84 Lumber -Baltimore City Community College -Atlas Copco -Spangler Candy -Admiral Beverage Company -AgChoice Farm Credit 	<ul style="list-style-type: none"> -Screening and scoring features -Tracks jobseeker activity -Background check integration
BirdDogHR	2010	<ul style="list-style-type: none"> -Utz -CF Evans Construction -Iowa DOT -Martin Marietta Materials -Optima Tax Relief -Surgical Specialties Corporation 	<ul style="list-style-type: none"> -Automated screening and scoring -Integrated drug testing and background check results
Breezy HR	2014	<ul style="list-style-type: none"> -Shipt -Linium -Microsoft -Personnel -Docebo -Appcues -Telus -Piksel -Zapier -Freshii -Johnson & Johnson -SweetIQ -Dodge Data & Analytics -Knock -T-Mobile 	<ul style="list-style-type: none"> -Pre-recorded applicant video interviews -Standardized guides for interviewing and scoring quantify (and therefore “justify”) subjective evaluations -Sources candidates based on where recruiters previously sourced -Generates EEO/OFCCP compliance report, which could be problematic
Bullhorn	1999	<ul style="list-style-type: none"> -Vet2Tech -The Chatham Group -Perma-Seal -BVS Trans Tech -Ecotech -EXILANT Technologies -Medsys Group -Adams Consulting Group -Apex Systems -ALKU -HCS Healthcare -Allen Recruiting 	<ul style="list-style-type: none"> -Predictive intelligence suggests who to contact, when to contact them, and how to take action -Captures info from the Web to source candidates -Encourages “run[ning] your business by the numbers”

ClearCompany	2004	<ul style="list-style-type: none"> -Borden -MetaBank -Goodwill -Jackson Hospital -Arizona Supreme Court -Sandhills Community College -PSCU Financial Services -Philips -Edible Arrangements -Applied Technical Systems 	<ul style="list-style-type: none"> -Predictive performance data and quality of hire reports -Pre-recorded video interviewing -Enables text messaging with candidates, then attaches those conversations to profile -Automates background and reference checks; can make authorizations less explicit -Passive candidate sourcing -Gives current employees referral tools - Lets users organize applicants by any metric -Comes with automatic “interview guides” to suggest what should be asked -One-click background check
CleverStaff	2014	<ul style="list-style-type: none"> -Kama Games -Conscencia -Verta Media -Svitla Systems -Avon -RSM 	<ul style="list-style-type: none"> -Suggests “appropriate” candidates -Resume parsing
Comeet	2012	<ul style="list-style-type: none"> -Gartner -Gett -Fiverr -SodaStream -SironSource -AppsFlyer -Zoom -Chegg -Matomy Media Group -Playbuzz -Playtika -Redislabs 	<ul style="list-style-type: none"> -Assessment analytics -App guides interviewers -Sourcing includes social media profiles
COMPAS for Staffing	2008	<ul style="list-style-type: none"> -TEEMA -Cypress -Talener -David Aplin Group 	<ul style="list-style-type: none"> -Assessments -Recruiting intelligence analytics -Social integration -Automated sourcing
Crelate Talent	2012	???	<ul style="list-style-type: none"> -Detailed candidate profiles -Candidate analytics in reports -Generates EEO/OFCCP compliance report, which could be problematic -Prescreening questions

Entelo	2010	<ul style="list-style-type: none"> -Hubspot -Splunk -Intel -Wayfair -Lyft -PG&E -Cisco -United Airlines -Netflix -EA -PayPal -Sony -Amgen -Schneider Electric -Slack -Genetech -Target -Asana -Northrop Grumman -Hot Topic 	<ul style="list-style-type: none"> -Predicts best candidates using hundreds of variables -Candidate social media automatically available -Predicts whether currently employed candidates are likely to move -While it allows users to sort candidates from underrepresented groups to the top, that also implies a user could sort those candidates out
Exelare	1999	<ul style="list-style-type: none"> -Arrow International -Global Rhymes -ERIMAX -Teachers R Us -BlueSky Technology Partners -Operation Homefront 	<ul style="list-style-type: none"> -Resume harvesting
Firefish	2010	<ul style="list-style-type: none"> -Nine Twenty -Lancaster & Duke -Purcon -Revoco -Avantus -T-Impact -Baobab Sales 	<ul style="list-style-type: none"> -Color-codes candidates to rank them -Records all communication with candidates, from text to VOIP, for everyone in company to use
Glider	2015	<ul style="list-style-type: none"> -Tavant Technologies -DataRPM -Inmobi -TATA Consultancy Services -TATA Power -KPMG -Facebook -Nutanix -Novopay -Fortinet -EFI -LeadSquared -Student Loan Hero -Versa Networks -ThoughtSpot -Molecular Connections -Darkmatter 	<ul style="list-style-type: none"> -AI “stack ranks” candidates and sends personalized messages -Auto-scores screening, allowing people with no technical knowledge to evaluate performance on technical tasks -One-way video interviewing -Tracks if candidates opened emails

Greenhouse	2012	<ul style="list-style-type: none"> -Airbnb -Evernote -Pinterest -Red Ventures -Twilio -Vimeo -SurveyMonkey -DocuSign -Golden State Warriors -Lyft -J.D. Power 	<ul style="list-style-type: none"> -Attempts to standardize interviews with Interview Kits -Tracks to generate insights on candidates -“Data-driven hiring” -Compares company hiring metrics to industry standards, reinforcing status quo
HireCentric (ExactHire)	2007	<ul style="list-style-type: none"> -Kreig Devault -Endeavor Robotics -Navy Army Community Credit Union -Wabash Valley Power -Bluestone Properties -Central Restaurant Products 	<ul style="list-style-type: none"> -Social media integration -Screening and scoring -Integrated background checks -Touts compliance

HireVue	2004	<ul style="list-style-type: none"> -Singapore Airlines -TJX -Honeywell -Intel -Mount Sinai -IBM -Vodafone -Urban Outfitters -Under Armour -Hilton -Unilever -Rackspace -Atlanta Public Schools -Carnival -Boston Red Sox -Ocean Spray -Shipt -Mercedes-Benz -Maxis -Tiffany & Co -GEICO -Blackbaud -Dunkin Brands -Cathay Pacific -Children's Healthcare of Atlanta -Oracle -HBO -Dow Jones -Adventist Health System -Thurgood Marshall College Fund -Power Design -Sequoia -TMX Finance -Stance -Murphy Oil Corporation -CDW -Healthsouth -BASF -Brigham Young University -CARFAX -Church & Dwight Co., Inc. -Ciber -ConocoPhillips -Devon -Discovery Communications -FranklinCovey -Harland Clarke -New Belgium -Overstock -Scotts -Panda Express -Qantas -Penguin Random House -TJX -Trinity Health 	<ul style="list-style-type: none"> -Predictive people analytics -Uses "video intelligence" to make automated assessments based off video interviews (verbal response, intonation, nonverbal communication, and other data) and predict skills, fit, and performance - Micro-facial analysis for traits such as veracity and trustworthiness -Acquired MindX (psychometric games) to further develop assessment capabilities -Structured interviews
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		-WakeMed	
Hyrell	2007	-City of Pittsfield (MA) -NFSTC -D.L. Evans Bank -FASTSIGNS -Primrose Schools -National Cattlemen's Beef Association	-Pre-scores applicants -Provides analytics on applicants
iCIMS	1999	-Foot Locker -Dentsu Aegis -Dish Network -Ketchum -AmTrust -Trilogy -Gannett Fleming -NorthStar -Mohawk -Southeastern Grocers -Enterprise Holdings -HD Supply -Bayada -Southwest -Tiffany & Co. -Rite-Aid -Dollar General -Lloyds Bank -7-Eleven -BBVA Compass -Sony Music -Allstate	-Automated communication with candidates -Recruits through social media; applying via Facebook means they can access candidate's Facebook -Facilitates employee referrals, reinforcing historical hiring patterns -Screening and assessment results
JazzHR	2016	-Mashable -Speck -Red Bull -GoGo Squeez -Wedding Wire -R/GA	-Like many, automates some communication -Guided interviews -Evaluation templates with automated scoring
JobDiva	2003	-Telesis Corporation -Tech Firefly -Trantor Software -FEV Inc. -Essnova Solutions	-Pre-screening and sorting based on answers -Can refine by geography, education, and "other" -Automates resume sorting
Jobjet	2016	-Cisco -Amazon -Korn Ferry -Synechron -Zoom -Parsons -AMN Healthcare -Kaiser Permanente	-Finds personal emails and mobile phone numbers for candidates, even if they didn't apply with them -Also finds professional history, even if not disclosed -Uses "Big Data" to source and qualify candidates -Brands on speed—"20x faster"

JobScore	2006	<ul style="list-style-type: none"> -Dialpad -Bleacher Report -Parc -Gracenote -Edmunds -Hearst -Sesame Workshop 	<ul style="list-style-type: none"> -ROI analytics on applicant sources -Employee referral integration -Social media integration -Automated compliance -Standardized interviewing/templates -Turns resumes into weighted scores -Sorts interviewed candidates by “thumbs up/down” rankings -Claims to reduce hiring risk with data that originates with a ranked list of what the company finds important
Jobsoid	2013	<ul style="list-style-type: none"> -Shift Technology -Destinations of the World -The Fern Hotels & Resorts -VIB -PBS Worldwide BVBA -Voglis Co. Ltd. -English Lakes Hotels, Resorts and Venues -BiOZEEN -Waman Hari Pethe Jewelers -Axtrum Solutions -Keley Consulting 	<ul style="list-style-type: none"> -Social integration -Sourcing with “advanced intelligence” -Interview scoring -Video screening
Jobvite	2006	<ul style="list-style-type: none"> -Weight Watchers -JCPenney -LinkedIn -Blizzard Entertainment -Education First -Havas Group -Universal Music Group -Partners in Health -Seneca -Trek -Wayfair 	<ul style="list-style-type: none"> -Referral emphasis -Filters out candidates -Emphasizes time and costs saved -One-way video for recorded assessments
Lever	2012	<ul style="list-style-type: none"> -Quora -Reddit -Lyft -Hot Topic -KPMG -Wieden + Kennedy -Netflix -Success Academy Charter Schools -Eventbrite -Soylent -Affirm -Lowe’s -Shopify -Kickstarter -UCSF Health 	<ul style="list-style-type: none"> -Automated sourcing -Assessments built-in -Predictions and recommendations -Encourages fast decisions as “data-driven” -Features to automate nurturing top talent

LinkedIn Talent Insights	2017	-Nestlé -Amazon -Dropbox -Siemens	-Predicts candidate interest in company/industry, how candidates will work with current employees, and who would relocate -Tracks LinkedIn user searches, connections, follows, publications, and likes to generate data for recruiters -Uses factors like candidate city or school in reports on how to find talent
Loxo	2012	-Valor Partners -Ingenium -Contract Recruiter -Robinson Resource Group -The Carolan Group -Indigo Partners -Dental Team Finder	-Finds personal contact info on candidates -Automates sourcing
Mya	2017	-Adecco Group	-Automates sourcing, screening, and scheduling -Sends data from “conversations” directly to ATS -Machine learning means her interactions are based on past candidates -Can only interact with candidates who apply online; thus, candidates who apply in-person cannot be hired
Newton	2009	???	-Built-in EEO/OFCCP compliance could raise concerns
Oleco	2018 (1995 as WCN)	-Bank of America -Morgan Stanley -NBCUniversal -WPP -Marks & Spencer -UK Civil Service	-Claims to eliminate bias by automating every step -Prescriptive hiring recommendations -Clients can apply via social profiles -Sorting in/out based on skills -Auto-scoring of applicants
Olivia (Paradox)	2017	-CVS Health -Staples -Sprint -Delta Air Lines -DXC Technology -Alorica -Pilot Flying J	-Assistive intelligence recruiting assistant that “talks” to interested candidates and creates data on them -Machine learning means her interactions are based on past candidates

Oracle Taleo	2012 (Taleo existed before, but acquired by Oracle then)	-Western Union -Hitachi Consulting -Hill International -NMDP -Chubb -Chicago Public Schools -JPMorgan Chase -Wegmans -Honda	-Social media and referral sourcing
PeopleFluent	1997	-Altair -American Cancer Society -Aon -Avaya -Blue Cross Blue Shield -Citrix -Family Dollar -Hertz -McDonald's -Nationwide	-Integrates recruiting software with other talent management platforms (learning, compensation, collaboration, etc.) -Vendor Management Software gives control over contingent/contract labor
QJumpers	2006	-Toyota -Avis/Budget -Briscoe Group -Bupa -Calder Stewart -Skyline -New Zealand Avocado -Marra Building Solutions -Elms Hotel	-Automatically ranks candidates -Will soon automate searching for top talent
Recruitee	2015	-Greenpeace -Vice -Taco Bell -Hotjar -Hudson's Bay -Sky -Zomato -QWILR -Scotch & Soda -Lacoste -Growth Tribe -Arcadia	-Imports passive candidates from social media sites -Can set default reasons for disqualification
Recruiterbox	2009	-Wolfram -The Onion -Makita -Swift Capital -Olark	-Prospecting of candidates -Assessment templates
Recruiterflow	2017	-FusionCharts -Ixigo -Canvas Search Group -Khosla Labs -ParallelDots -E2X	-Structured interviewing and scoring -Automated sourcing

SkillSurvey	2001	<ul style="list-style-type: none"> -Clemson University -DocuSign -Penn Medicine -Talbots -L.L. Bean -Burlington Coat Factory -Brown-Forman -Adidas -Keurig -MedOptions -Adecco Group -Babson -University of Colorado -Randstad Sourceright 	<ul style="list-style-type: none"> -Online reference-checking -Claims predictive technology reduces bias -Physician peer-referencing online (unique service) -Automates tracking of pipeline candidates
SmartRecruiters	2010	<ul style="list-style-type: none"> -Optimizely -Colliers International -Berkshire Healthcare -Associa -Atlassian -Foster Farms -FishNet Security -Smaato -Equinox 	<ul style="list-style-type: none"> -Metrics aim to focus recruiting to historically effective sources -Assessment tools -Measures performance and fit -Aims to make interviewing “objective” with scorecards (yet this merely quantifies subjective assessments)
Talenthire (CEIPAL)	2013	???	<ul style="list-style-type: none"> -Social media integration -Vendor management integration for contingent labor -Target sourcing
Teamtailor	2012	<ul style="list-style-type: none"> -Tenant & Partner -Arken Zoo -Notified -SATS -Vårdkraft -Ingenjörer utan gränser -Paradox Interactive -Servicefinder 	<ul style="list-style-type: none"> -Screening questions for applicants, sortable by candidate answers -ROI-driven analytics discourage innovative recruiting
TextRecruit	2014	<ul style="list-style-type: none"> -UPS -Six Flags -Ford -Whole Foods -USAA -The Cheesecake Factory -Amazon -Kindred Healthcare -Supercuts -VMware -Con-way Freight 	<ul style="list-style-type: none"> -AI texting/online messaging chatbot performs “sentiment analysis” to determine candidate satisfaction during conversations (also does this for current employees) -Integrates with ATS

VidCruiter	2009	<ul style="list-style-type: none"> -Liberty Mutual -Axiom Law -KIPP -University of Hawai'i at Mānoa -IT Convergence -Miratel Solutions -Olameter -Wondersitter -UBC Sauder School of Business -iPacesetters -Startx -SilverBirch Hotels & Resorts -Etech -Kellstrom Aerospace 	<ul style="list-style-type: none"> -Automates interviewing with one-way video using predetermined questions -Automatically ranks candidates based on pre-recorded interviews -Website advertises that it "protect[s]" from discrimination lawsuits by using structured interviews -Partnered with Checkr (background check app) to give immediate background check reports right in the recruitment platform -Specifically promotes ability to see what candidates look like before interviewing -Gamification of skills testing ("engag[ing]," "interesting")
Whozwho	2017	<ul style="list-style-type: none"> -Kids Village -Nightowl -Sales Coaching International -Simple 	<ul style="list-style-type: none"> -Attempts to use behavioral science to determine cultural fit -Ranks on personality, in addition to assessments of skills, experience, and education
Workable	2012	<ul style="list-style-type: none"> -Cognizant -Porsche -Ryanair -Sears -Sephora -Wyndham Hotel Group -Upwork -Basecamp -Zapier -Merrill Corporation -Make-A-Wish -Goodwill -Domino's 	<ul style="list-style-type: none"> -Sourcing tool aggregates social profile data to create candidate profiles -Facilitates employee referrals -Structured interviews and scorecards
Workday	2005	<ul style="list-style-type: none"> -Cannot determine which companies specifically use the recruiting module of Workday, just companies that use any Workday module 	<ul style="list-style-type: none"> -Import social media profiles -Encourages shifting of talent spending to what software determines is working -Top-talent focus
Workpop	2014	<ul style="list-style-type: none"> -Fresh Brothers -The Melting Pot -Giant Eagle -Sprinkles -Ashley Homestore -WCG Hotels 	<ul style="list-style-type: none"> -Automated sourcing -Algorithm based on millions of applications sets starting bids for each position on job boards -Grows applicant pool by having applicants add co-workers as references; the references themselves are then in the pool -Automates rankings of candidates with Smart Rank

Zoho Recruit	1996	<ul style="list-style-type: none"> -DreamWorks -Manning Global -Columbia University School of Professional Studies -Tata Projects -Urban Eats -RBL Bank -Sterlite Power -GEP -Scientific Games -International School of London Qatar 	<ul style="list-style-type: none"> -Social media candidate sourcing -Allows reformatting of parsed resumes; can delete candidate resume information before sharing with rest of company
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Table 2: Strategies for Beating Automated Hiring Platforms

Method	Description	Source
“Key Word” Usage	Look at employer’s job description and try to include in your resume as many of the exact buzz words it uses. Avoid synonyms—use exact language.	Trudy Steinfeld, <i>Decoding the Job Search: How to Beat the ATS</i> , Forbes (May 2016). ²⁴⁹
Avoid Over-Complication	These systems can get confused by over-complication (including fancy fonts, colors, and graphics), so they will not select a resume if it contains these elements.	Trudy Steinfeld, <i>Decoding the Job Search: How to Beat the ATS</i> , Forbes (May 2016). ²⁵⁰
Follow-Up	People are sorted out of AHPs so often that recruiters may not know which candidates are genuinely interested and which simply “dropped” their resumes there. If you are genuinely interested, one of the best ways to beat the AHP is to follow up with a recruiter via LinkedIn or other sites.	Trudy Steinfeld, <i>Decoding the Job Search: How to Beat the ATS</i> , Forbes (May 2016). ²⁵¹
Relevant Keywords	Keywords are rated higher by algorithms when they appear in a relevant	See <i>How to Beat Automated Resume Screening</i> , Workopolis (June 2017). ²⁵²

²⁴⁹ Trudy Steinfeld, *Decoding the Job Search: How to Beat the ATS (Applicant Tracking System)*, FORBES (May 31, 2016), <https://www.forbes.com/sites/trudysteinfeld/2016/05/31/decoding-the-job-search-how-to-beat-the-ats-applicant-tracking-system/>.

²⁵⁰ *Id.*

²⁵¹ *Id.*

²⁵² See *How to Beat Automated Resume Screening*, WORKOPOLIS (June 28, 2017), <https://careers.workopolis.com/advice/beat-automated-resume-screening/>.

	paragraph (with related text), so if you can add this to your resume in a section about your accomplishments, you should.	
Use Free Screening Tools	Applicants can check to see how well their resume will scan by using free sites like jobscan.com.	<i>How to Beat Automated Resume Screening</i> , Workopolis (June 2017). ²⁵³
Full Titles and Acronyms	Some AHPs will look for the acronym of a title/certification (CPA, for example), while others will look for the spelled-out form of the title (Certified Public Accountant). Be sure to include both on your resume.	Mark Slack & Erik Bowitz, <i>Beat the Robots: How to Get Your Resume Past the System & Into Human Hands</i> , The Muse (2018). ²⁵⁴
Avoid Spelling Mistakes	Many AHPs will terminate your application immediately if you have spelling mistakes, because they will not understand what you're trying to say.	Mark Slack and Erik Bowitz, <i>Beat the Robots: How to Get Your Resume Past the System & Into Human Hands</i> , The Muse (2018). ²⁵⁵
Avoid Headers and Footers	Headers and footers will "jam" algorithms, meaning that the algorithm will not be able to process your resume further. Avoid these!	Peter Cappelli, <i>How to Get a Job? Beat the Machines</i> , Time (June 2012). ²⁵⁶
Submit Resume in Text Format	While many people opt to send their resumes in PDF format, this leaves the parser open to making more errors. Typically, the easiest format for the scanner to read is in Text Format.	Peter Cappelli, <i>How to Get a Job? Beat the Machines</i> , Time (June 2012). ²⁵⁷
Include Postal Address	Most scanners will automatically screen out your resume if it does not include a postal address. Just remember – don't include this information in a header or footer, as it will not be screened!	Pamela Skillings, <i>How to Get the Applicant Tracking System to Pick Your Resume</i> ,

²⁵³ *Id.*

²⁵⁴ Mark Slack & Erik Bowitz, *Beat the Robots: How to Get Your Resume Past the System & Into Human Hands*, MUSE, <https://www.themuse.com/advice/beat-the-robots-how-to-get-your-resume-past-the-system-into-human-hands> (last visited Sept. 22, 2019).

²⁵⁵ *Id.*

²⁵⁶ Peter Cappelli, *How to Get a Job? Beat the Machines*, TIME (June 11, 2012), <http://business.time.com/2012/06/11/how-to-get-a-job-beat-the-machines/>.

²⁵⁷ *Id.*

		Big Interview (Mar. 2015). ²⁵⁸
Pay Attention to Font	Avoid serif fonts (such as Times New Roman), because some screeners reject resumes with these fonts. You can find a list of sans-serif fonts: here . ²⁵⁹	Melanie Pinola, <i>Format Your Resume So It Gets Past Applicant Screening Software</i> , LifeHacker (Feb. 2013). ²⁶⁰
Stick to “Orthodox” Sections	Name your sections “Work Experience” and “Education” instead of “Career Achievements” or “Training,” because AHPs are trained to search for specific information under specific sections (usually, Education, Work Experience, Skills and Contact Information).	See <i>Is Your Resume Ready for Automated Screening?</i> , Resume Hacking (Jan. 2016). ²⁶¹
Apply Early	Some AHPs charge employers by the applicant, so it’s cheaper for companies to review the first 50 applicants than to review every applicant who applies. Thus, late applicants are sometimes discarded without even being screened.	See <i>Is Your Resume Ready for Automated Screening?</i> , Resume Hacking (Jan. 2016). ²⁶²
Be Average on Personality Tests	“Score somewhere between the 40 th and 60 th percentiles” and “try to answer as if you were like everyone else is supposed to be.” Basically, try to answer questions in the most average way as possible.	William H. Whyte, <i>The Organization Man</i> , Sixth Printing (1956), 405. ²⁶³

²⁵⁸ Pamela Skillings, *How to Get the Applicant Tracking System to Pick Your Resume*, BIG INTERVIEW (Mar. 2015), <https://biginterview.com/blog/2015/03/applicant-tracking-system.html>.

²⁵⁹ See *List of Sans Serif Typefaces*, WIKIPEDIA, https://en.wikipedia.org/wiki/List_of_sans_serif_typefaces (last visited Sept. 22, 2019).

²⁶⁰ Melanie Pinola, *Format Your Resume So It Gets Past Applicant Screening Software*, LIFEHACKER (Feb. 26, 2013, 2:00 PM), <https://lifehacker.com/5987055/format-your-resume-so-its-compatible-with-applicant-screening-software>.

²⁶¹ See *Is Your Resume Ready for Automated Screening?* RESUME HACKING (Jan. 2, 2016), <http://www.resumehacking.com/ready-for-automated-resume-screening>.

²⁶² *Id.*

²⁶³ WILLIAM H. WHYTE, *THE ORGANIZATION MAN* 405 (6th prtng. 1956).

When Asked for Word Associations...	“When asked for word associations or comments about the world, give the most conventional, run-of-the-mill, pedestrian answer possible.”	William H. Whyte, <i>The Organization Man</i> , Sixth Printing (1956), 405. ²⁶⁴
Incline to Conservatism	When asked about your values on personality tests, read closely through all questions to look for patterns. In some tests, the “right” or “most conservative” answers will be located in the same multiple-choice position for each question.	William H. Whyte, <i>The Organization Man</i> , Sixth Printing (1956), 408. ²⁶⁵
When it Comes to Hypothetical Judgment Questions, Don’t Reflect	Many personality tests include hypothetical situations that are followed by questions about how the respondent would act if faced with that scenario. Research has shown that it is best not to reflect on the question before answering, and that respondents should answer as quickly as they can to avoid giving off the sense that they are confused about what steps they would take.	William H. Whyte, <i>The Organization Man</i> , Sixth Printing (1956), 409. ²⁶⁶
Add Buzz Words in White Ink	To “trick” the algorithm into sorting you through, some applicants have suggested including more buzz words throughout their resumes, but in white ink so that they are not visible to the human eye. Thus, their application will be automatically screened into the “yes” pile without having to awkwardly force buzz words into their documents.	Osas Obaiza, <i>Hack Your Resume to Fool Keyword-Hunting Robots & Land Yourself More Interviews (The Evil Way)</i> , Wonder How To (May 2013). ²⁶⁷

²⁶⁴ *Id.*

²⁶⁵ *Id.* at 408.

²⁶⁶ *Id.* at 409.

²⁶⁷ Osas Obaiza, *Hack Your Resume to Fool Keyword-Hunting Robots & Land Yourself More Interviews (The Evil Way)*, WONDER HOW TO (May 16, 2013, 2:16 PM), <https://jobs-resumes.wonderhowto.com/how-to/hack-your-resume-fool-keyword-hunting-robots-land-yourself-more-interviews-the-evil-way-0146824/>.

