EMPLOYED ALGORITHMS: A LABOR MODEL OF CORPORATE LIABILITY FOR AI

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ABSTRACT

The workforce is digitizing. Leading consultancies estimate that algorithmic systems will replace 45 percent of human-held jobs by 2030. One feature that algorithms share with the human employees they are replacing is their capacity to cause harm. Even today, corporate algorithms discriminate against loan applicants, manipulate stock markets, collude over prices, and cause traffic deaths. Ordinarily, corporate employers would be responsible for these injuries, but the rules for assessing corporate liability arose at a time when only humans could act on behalf of corporations. Those rules apply awkwardly, if at all, to silicon. Some corporations have already discovered this legal loophole and are rapidly automating business functions to limit their own liability risk.

This Article seeks a way to hold corporations accountable for the harms of their digital workforce: some algorithms should be treated, for liability purposes, as corporate employees. Drawing on existing functional characterizations of employment, the Article defines the concept of an "employed algorithm" as one over which a corporation exercises substantial control and from which it derives substantial benefits. If a corporation employs an algorithm that causes criminal or civil harm, the corporation should be liable just as if the algorithm were a human employee. Plaintiffs and prosecutors could then leverage existing, employee-focused liability rules to hold corporations accountable when the digital workforce transgresses.

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"A robot must obey orders given it by human beings."

—The Second Law of Robotics[1]

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1. ISAAC ASIMOV, I, ROBOT 40 (1950).

INTRODUCTION

Robots and algorithms will replace almost half of existing jobs in the coming decade.[2] Truck drivers,[3] warehouse personnel,[4] assembly line workers,[5] and office staff[6] are among those whose trades face the greatest threat of obsolescence. High-skill professions are not immune either. Algorithms that review documents,[7] trade stocks,[8] and diagnose patients[9] are knocking at the door of legal, investment, and medical services. The human toll of this mass labor displacement could be

2. Michael Chui, James Manyika & Mehdi Miremadi, *Where Machines Could Replace Humans—and Where They Can't (Yet)*, MCKINSEY Q. (July 8, 2016), https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet [https://perma.cc/Q24J-3RRU] ("[C]urrently demonstrated technologies could automate 45 percent of the activities people are paid to perform . . . ."). This Article uses "robot" and "algorithm" almost interchangeably. Technically, robots have physical form, whereas algorithms do not. For present purposes, that distinction does not matter. It influences the type of injury each can cause, but not whether they can injure.

3. Patrice Taddonio, *Could the Rise of Artificial Intelligence Put Truckers' Jobs in Peril?*, PBS (Nov. 5, 2019), https://www.pbs.org/wgbh/frontline/article/could-the-rise-of-artificial-intelligence-put-truckers-jobs-in-peril [https://perma.cc/ZF96-UVPH].

4. Jeffrey Dastin, *Exclusive: Amazon Rolls Out Machines That Pack Orders and Replace Jobs*, REUTERS (May 13, 2019), https://www.reuters.com/article/us-amazon-com-automation-exclusive/exclusive-amazon-rolls-out-machines-that-pack-orders-and-replace-jobs-idUSKCN1SJ0X1 [https://perma.cc/SF4R-FQKY].

5. Alana Semuels, *Millions of Americans Have Lost Jobs in the Pandemic—and Robots and AI Are Replacing Them Faster Than Ever*, TIME (Aug. 6, 2020), https://time.com/5876604/machines-jobs-coronavirus [https://perma.cc/D3WN-9KWS] ("[A] recycling company in Virginia[] purchased four AMP robots in 2019 for its Roanoke facility, deploying them on assembly lines to ensure the paper and plastic streams were free of misplaced materials.").

6. Will Knight, *AI Is Coming for Your Most Mind-Numbing Office Tasks*, WIRED (Mar. 14, 2020, 7:00 AM), https://www.wired.com/story/ai-coming-most-mind-numbing-office-tasks [https://perma.cc/8CSN-JP6W] ("Simple software automation is eliminating some particularly repetitive jobs, such as basic data entry . . . .").

7. Lauri Donahue, Commentary, *A Primer on Using Artificial Intelligence in the Legal Profession*, JOLT DIG. (Jan. 3, 2018), https://jolt.law.harvard.edu/digest/a-primer-on-using-artificial-intelligence-in-the-legal-profession [https://perma.cc/ZF56-D3D5] ("[L]egal work that depends on collating and analyzing historical data such as past judicial decisions, including legal opinions or evaluating likely litigation outcomes, will become the dominion of AI.").

8. William Baldwin, *The Artificially Intelligent Investor: AI and the Future of Stock Picking*, FORBES (Dec. 9, 2019, 6:00 AM), https://www.forbes.com/sites/baldwin/2019/12/09/connecting-a-million-dots [https://perma.cc/2ZHJ-2J8R] ("EquBot, which says its funds are the only actively managed ETFs using AI, won't have this turf to itself for long. IBM is selling AI up and down Wall Street.").

9. Ohad Oren, Bernard J. Gersh & Deepak L. Bhatt, *Artificial Intelligence in Medical Imaging: Switching from Radiographic Pathological Data to Clinically Meaningful Endpoints*, 2 LANCET DIGIT. HEALTH (Sept. 2020), https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30160-6/fulltext [https://perma.cc/CH6S-HECK] ("The enhanced reading performance of AI could be exploited to improve patient selection for intervention by identifying mild structural or dynamic changes that correlate with worse outcomes.").

staggering as tens of millions of workers find themselves with no paycheck and no professional calling. Labor scholars have sounded the alarm, calling for aggressive retraining programs to prepare workers for a new technological landscape.[10]

Even if, as some economists predict, automation creates one new job for every job lost,[11] the fact remains that the workforce is becoming increasingly digital. Humans work alongside algorithms—sometimes independently, sometimes overseeing them, sometimes overseen by them. These corporate algorithms constitute a growing digital workforce, and this workforce is creating another public threat that has received far less attention. As the human element plays a shrinking role in corporate activity, corporations will become increasingly immune from liability for harms they cause. Unshackled from the law's disciplinary influence, corporations cannot be trustworthy stewards of our economies, lives, and livelihoods.

Corporate algorithms can and do hurt people. "As robotics and artificial intelligence systems increasingly integrate into our society, they will do bad things."[12] For proof, one need look no further than current headlines. Algorithmic discrimination has probably grabbed the most news space, as when federal agencies uncovered corporate hiring algorithms that assign lower scores to applicants with Black-sounding names or degrees from women's colleges.[13] But corporate

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10. Edward L. Rubin, *Beneficial Precaution: A Proposed Approach to Uncertain Technological Dangers*, 22 VAND. J. ENT. & TECH. L. 359, 391 (2020) ("[T]here will be massive job displacement and a corresponding need to retrain unemployed workers for those positions that are available in the new economy."); Joshua La Bella, *Hey Siri, What Is California Doing To Prepare for the Growth of Artificial Intelligence?*, 51 U. PAC. L. REV. 315, 317 (2020).

11. *See* WORLD ECON. F., THE FUTURE OF JOBS REPORT 8–9 (2018), http://www3.wefor um.org/docs/WEF_Future_of_Jobs_2018.pdf [https://perma.cc/BGC6-NWBT] (finding "extensive evidence of accelerating demand for a variety of wholly new specialist roles related to understanding and leveraging the latest emerging technologies: AI and Machine Learning Specialists, Big Data Specialists, Process Automation Experts, Information Security Analysts, User Experience and Human-Machine Interaction Designers, Robotics Engineers and Blockchain Specialists").

12. Mark A. Lemley & Bryan Casey, *Remedies for Robots*, 86 U. CHI. L. REV. 1311, 1311 (2019).

13. *See* Khari Johnson, *Feds Warn Against Discriminatory Hiring Algorithms*, WIRED (May 16, 2022, 10:25 AM), https://www.wired.com/story/ai-hiring-bias-doj-eecc-guidance [https://per ma.cc/NEN9-GLTU]; *see also* Robin Nunn, *Discrimination and Algorithms in Financial Services: Unintended Consequences of AI*, DAVIS WRIGHT TREMAINE LLP (Mar. 6, 2018), https://www. dwt.com/blogs/financial-services-law-advisor/2018/03/discrimination-and-algorithms-in-financial -service [https://perma.cc/33KN-NJ4F] (discussing "AI's so called 'white guy problem'").

algorithms have also manipulated stock markets,[14] colluded over prices,[15] and caused traffic deaths.[16] As algorithms become more sophisticated and occupy even larger economic and social roles, the scope and severity of algorithmic misconduct will continue to grow.

Corporate law is not equipped to handle the evolving sources of corporate harm. The general law of corporate liability originated in an age when only humans could act on behalf of corporations. For a corporation to be liable, the law requires that a corporate employee cause harm while intending to benefit the corporation and while acting within the scope of their employment.[17] Algorithms are not employees. Nor do algorithms have intentions or scopes of employment. So current law falls short when corporate algorithms, rather than employees, cause harm. Corporations can escape accountability for harmful algorithmic conduct—like traffic accidents[18] and discriminatory lending[19]—for which they would ordinarily be liable.

There is no easy fix for this growing gap in corporate accountability. Forcing corporations to limit their use of algorithms would unacceptably restrain innovation and technological progress.[20] It would also hobble domestic corporations in the fierce race with foreign competitors for dominance over the next stage of economic

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14. Enrique Martínez-Miranda, Peter McBurney & Matthew J. Howard, *Learning Unfair Trading: A Market Manipulation Analysis from the Reinforcement Learning Perspective*, KING'S COLL. LONDON (2015), https://arxiv.org/pdf/1511.00740.pdf [https://perma.cc/58BN-XFX3]; Renato Zamagna, *The Future of Trading Belongs to Artificial Intelligence*, MEDIUM (Nov. 15, 2018), https://medium.com/datadriveninvestor/the-future-of-trading-belong-to-artificial-intelligence-a4 d5887cb677 [https://perma.cc/TYX3-Y7WD].

15. Greg Rosalsky, *When Computers Collude*, NPR (Apr. 2, 2019, 7:30 AM), https://www.npr.org/sections/money/2019/04/02/708876202/when-computers-collude [https://perma.cc/WGG5-3B84].

16. Bryan Pietsch, *2 Killed in Driverless Tesla Car Crash, Officials Say*, N.Y. TIMES (Nov. 10, 2021), https://www.nytimes.com/2021/04/18/business/tesla-fatal-crash-texas.html [https://perma.cc/ZSP4-CCHX].

17. *See* 27 AM. JUR. 2D *Employment Relationship* § 356 (2022).

18. *See, e.g.*, Angie Schmitt, *Uber Got Off the Hook for Killing a Pedestrian with Its Self-Driving Car*, STREETSBLOG USA (Mar. 8, 2019), https://usa.streetsblog.org/2019/03/08/uber-got-off-the-hook-for-killing-a-pedestrian-with-its-self-driving-car [https://perma.cc/HHN7-F3A4].

19. Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact*, 104 CALIF. L. REV. 671, 711–12, 726 (2016).

20. Jacques Bughin, Jeongmin Seong, James Manyika, Michael Chui & Raoul Joshi, *Notes from the AI Frontier: Modeling the Impact of AI on the World Economy*, MCKINSEY GLOB. INST. (Sept. 4, 2018), https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy [https://perma.cc/YPN7-YR2L] ("AI has the potential to deliver additional global economic activity of around $13 trillion by 2030 . . . . This amounts to 1.2 percent additional GDP growth per year. If delivered, this impact would compare well with that of other general-purpose technologies through history.").

development.[21] Simply using current law more creatively will not close the gap either. Plaintiffs and prosecutors relying on current law to hold corporations accountable must find a culpable employee and trace liability through them to the corporation.[22] Sometimes this is possible, as when an employee negligently designs or purposely misuses an algorithm. However, even today, it is often impossible to find such an employee behind algorithmic harm.[23] Smart algorithms can misbehave even if all humans involved act innocently and responsibly.[24] As algorithms become more intelligent and autonomous, the link between algorithmic harm and any identifiable human deficiency will become increasingly tenuous.

Simply designing algorithms that are more obedient will not work either because, contrary to Isaac Asimov's Second Law of Robotics, algorithms should not inflexibly obey human orders. Of course, to the extent some algorithmic harms are foreseeable, software developers can and should hardcode preventive measures.[25] But the awesome potential of today's most advanced algorithms is their *unpredictability*.[26] Machine learning performs so well because it does not follow a sequence of human commands; instead, through training on vast data sets, a smart algorithm learns to accomplish the task it is

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21. Daniel Castro, Michael McLaughlin & Eline Chivot, Ctr. for Data Innovation, Who Is Winning the AI Race: China, the EU, or the United States 1 (Aug. 19, 2019), https://www2.datainnovation.org/2019-china-eu-us-ai.pdf [https://perma.cc/XY92-4RM4] ("Many nations are racing to achieve a global innovation advantage in artificial intelligence (AI) because they understand that AI is a foundational technology that can boost competitiveness, increase productivity, protect national security, and help solve societal challenges.").

22. Mihailis E. Diamantis, *The Body Corporate*, 83 Law & Contemp. Probs. 133, 151–55 (2021).

23. Mihailis E. Diamantis, *The Extended Corporate Mind: When Corporations Use AI To Break the Law*, 91 N.C. L. Rev. 893, 910–11 (2020) [hereinafter Diamantis, *The Extended Corporate Mind*].

24. Kevin Petrasic, Benjamin Saul, James Greig, Matthew Bornfreund & Katherine Lamberth, White & Case, Algorithms and Bias: What Lenders Need To Know 1 (2017), https://www.whitecase.com/sites/whitecase/files/files/download/publications/algorithm-risk-thought-leadership.pdf [https://perma.cc/RQ4Z-PPLM] ("[A] perfectly well-intentioned algorithm may inadvertently generate biased conclusions that discriminate against protected classes of people."); Barocas & Selbst, *supra* note 19, at 729 ("[E]rrors may . . . be the result of entirely innocent choices made by data miners.").

25. *See* Ass'n for Computing Mach., *ACM Code of Ethics and Professional Conduct* § 1.2, https://www.acm.org/code-of-ethics [https://perma.cc/2MTA-XDLS] (stating that computing professionals have a duty to "avoid harm" stemming from their work).

26. Lemley & Casey, *supra* note 12, at 1335 ("[T]he unpredictability inherent in machine learning is also one of its greatest strengths.").

given.[27] Machine learning finds better ways to achieve goals than human intelligence could anticipate or even understand.[28] That is the power of AI. The necessary correlate of unpredictable solutions is unpredictable problems. If developers cannot foresee the ways algorithms might injure us, they cannot always hardcode preventive measures. The devil's pact that we make with AI is that, by freeing it from the constraints of low-level programming, it will both help and harm in ways we cannot foresee.

The key to holding corporations accountable when their algorithms hurt people is to recognize that the challenge of corporate AI is a modern take on a very old problem—a problem the law solved long ago. From a corporate compliance perspective, artificial and organic intelligence are not so different. Both are crucial to corporate productivity. Attempting to fully control either, even were that possible, would entail unacceptable costs.[29] Unpredictability can enhance labor's value because a workforce that obeys orders mechanically and inflexibly will cause more harm than one that interprets and adapts commands with a dose of common sense. Consequently, both humans and advanced algorithms will end up inflicting unexpected harm some of the time. But the inevitability of harm does not mean that the law should stay its hand—doing so would deny justice to victims and withhold efficient incentives from corporations to exercise due care.[30]

Corporate law's longstanding solution for the human workforce was to recognize that corporations bear a special accountability relationship for some of their workers.[31] The hallmarks of that relationship are the control corporations exercise and the benefit

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27.   *See A Beginner's Guide to Neural Networks and Deep Learning*, PATHMIND: A.I. WIKI, http://wiki.pathmind.com/neural-network [https://perma.cc/P59K-RJ45].

28.   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, 638 (2017) ("[E]ven experts often struggle to understand what software code will do.").

29.   Armen A. Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 AM. ECON. REV. 777, 780–81 (1972).

30.   Larry D. Thompson, *The Blameless Corporation*, 47 AM. CRIM. L. REV. 1251, 1255 (2010).

31.   V.S. Khanna, *Is the Notion of Corporate Fault a Faulty Notion?: The Case of Corporate Mens Rea*, 79 B.U. L. REV. 355, 369–70 (1999) ("[F]ederal courts use respondeat superior to impute *one agent's* acts and mens rea to the corporation.").

corporations derive.[32] So long as workers act within the scope of that relationship, corporations are accountable for the harms they cause.[33] The central concept tying this legal scheme together is "employment."

Over time, courts have doubled down on this general liability framework to overcome abusive corporate efforts to avoid paying for harms they cause.[34] Decades before corporations started replacing employees with algorithms, they turned to contract workers.[35] Contractors do the same jobs as employees and receive a wage. Legally speaking, though, contractors work for themselves or through an agency.[36] Through this formalistic sleight of hand, many corporations hope to conjure some immunity from liability when their workers, now contractors rather than employees, commit crimes and torts.[37] Many lawmakers have seen through the trick.[38] They have responded by emphasizing the functional characteristics of employment—benefit and control—and determined that some contractors are more like employees. Accordingly, corporations could be liable when those contractors-cum-employees break the law.

This Article offers a structurally identical solution to address algorithmic misconduct. Some algorithms and corporations bear a special relationship to each other, also characterized by corporate benefit and control. According to the "Labor Model" offered here, the law should treat such algorithms as corporate employees for liability purposes. Like contractors, these "employed algorithms" are not paradigmatic employees. But employed algorithms do fit squarely

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32. Mihailis E. Diamantis, *Algorithms Acting Badly: A Solution from Corporate Law*, 89 GEO. WASH. L. REV. 801, 832–33, 842–43 (2021) [hereinafter Diamantis, *Algorithms Acting Badly*].

33. 27 AM. JUR. 2D *Employment Relationship* § 356 (2022).

34. *See infra* Parts II.C, III.C.

35. *See generally* Keith Cunningham-Parmeter, *From Amazon to Uber: Defining Employment in the Modern Economy*, 96 B.U. L. REV. 1673 (2016) (tracing the development of corporations using contract workers).

36. *Id.* at 1682–87.

37. Heather Huston, *Beware of Tort Exceptions to Limited Liability*, WOLTERS KLUWER (Jan. 24, 2022), https://www.wolterskluwer.com/en/expert-insights/beware-of-tort-exceptions-to-limited-liability [https://perma.cc/5LEQ-8XF9] ("An employer also may be able to avoid liability for its agents or employees through the use of independent contractors.").

38. *See* Dynamex Operations W., Inc. v. Superior Ct., 416 P.3d 1, 35, 37 (Cal. 2018) (adopting a standard that presumes all workers are employees instead of independent contractors and shifts the burden on the entities to establish that independent contractor is the proper classification for the individual, and noting that, in some circumstances, "the workers' role within the hiring entity's usual business operations is more like that of an employee than that of an independent contractor").

within the broader legal sense of "employ": "to make use of"; "[t]o use as . . . [a] substitute in transacting business"; and "[t]o . . . entrust with the performance of certain acts or functions."[39] As the Supreme Court has acknowledged, "The definition of 'employ' is broad."[40] By recognizing that corporations employ algorithms, the Labor Model could allow the law of corporate liability to keep pace with an evolving and increasingly digital corporate workforce.

This Article is the culmination of a series of articles I have recently published about corporate liability and algorithms. In them, I have identified vicarious corporate liability as the only realistic way to address the broader algorithmic accountability gap, which arises because algorithms hurt people but are not cognizable defendants.[41] I have also developed models for attributing the statutory and common law elements of liability—culpable mental states and harmful acts—to corporations when corporate algorithms hurt people.[42] Both of those models emphasize the structural similarities between how corporations (mis)use algorithms and how they (mis)use employees. This Article draws those threads together to offer employed algorithms as a legal innovation for packaging and implementing corporate responsibility for algorithmic harms. In short, the Labor Model maintains that if a corporation and an algorithm share the hallmarks of an employment relationship—substantial benefit and substantial control—then the algorithm should be deemed an employed algorithm for whose harms the corporation could be liable.

One point bears emphasis early on because it will help avoid potential confusion.[43] Algorithms are not employees, nor should they be regarded as such. Human employees have rights, responsibilities, justified expectations, subjective points of view, rich life experiences, and dignity interests that machines never will. Or so I believe. However, the Labor Model does not turn on that assumption, nor on its negation. One of the Labor Model's key advantages is that it allows

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39.	*Employ*, BLACK'S LAW DICTIONARY (11th ed. 2019).

40.	Rutherford Food Corp. v. McComb, 331 U.S. 722, 728 (1947).

41.	Mihailis E. Diamantis, *Vicarious Liability for AI*, *in* CAMBRIDGE HANDBOOK OF AI AND LAW (Kristin Johnson & Carla Reyes eds., forthcoming 2023) (manuscript at 3) (on file with author) [hereinafter Diamantis, *Vicarious Liability for AI*].

42.	For further details on these models of liability, see generally Diamantis, *The Extended Corporate Mind*, *supra* note 23 (offering a model for attributing mental states to corporations by way of their algorithms) and Diamantis, *Algorithms Acting Badly*, *supra* note 32 (offering a model for attributing algorithmic behavior to corporations).

43.	I am grateful to Pauline Kim for emphasizing the importance of making this clarification early on.

us to remain agnostic on the deep philosophical question about the moral status of smart silicon vis-à-vis smart carbon. The argumentative framework below analogizes human employees and employed algorithms only to the extent that both present similar productive opportunities for corporations and similar compliance challenges. It is a totally separate question, and one I am inclined to answer in the negative, whether algorithms should be considered people in any richer sense.

Part I begins with some necessary stage setting by clarifying terminology and establishing an evaluative framework. Part II describes three motivations for analogizing the compliance challenge presented by algorithms to that presented by human employees: 1) corporations use algorithms to perform employee functions, 2) the justifications for holding corporations liable for employee misconduct also apply to algorithmic misconduct, and 3) algorithms are relevantly similar to contractors, whom courts sometimes already treat as employees for liability purposes. These three threads motivate the Labor Model offered in Part III. As Part IV demonstrates, the Labor Model performs well on the evaluative framework advanced in Part I.

I. PRELIMINARIES

This Part provides detailed examples to illustrate how automated systems help corporations avoid civil and criminal liability. The Part then defines some key terms—like "autonomy" and "algorithm"—before laying out a six-point framework for evaluating proposed solutions to the problem. As argued in the final Section, the solutions other scholars have offered perform poorly in light of that framework.

A. *Too Many Hands, Too Few Hands, and the Problem of Corporate Immunity*

This section uses examples to illustrate how corporate immunity arises. As explained above, the law of corporate liability relies on an antiquated assumption about how corporations work: that they can only act through individual human employees.[44] Accordingly, plaintiffs and prosecutors hoping for justice must find some employee whose

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44. *See* W. Robert Thomas, *Corporate Criminal Law Is Too Broad—Worse, It's Too Narrow*, 51 ARIZ. ST. L. REV. 199, 234 (2021) ("[A] tight connection between organizational responsibility and individual responsibility is precisely what respondeat superior requires of corporate criminal law." (citations omitted)); Mihailis E. Diamantis, *Corporate Identity*, *in* EXPERIMENTAL PHILOSOPHY OF IDENTITY AND THE SELF 203, 205 (Kevin Tobia ed., 2022).

deficient conduct somehow contributed to the algorithmic harm they allege. Because algorithms serve as complex causal intermediaries between what employees do and what victims experience, plaintiffs and prosecutors can face two types of barriers.

The first barrier is the "Many Hands Problem." Corporate operations often occur at such a scale and complexity that they require many employees to be involved. Automated corporate operations are no exception. Distributed teams of hundreds or thousands of employees design and run corporate algorithms.[45] One bad actor can turn a corporate function to harmful ends, whether on purpose (e.g., by bribing a public official) or through negligence (e.g., by failing to run adequate quality control on manufactured products). A Many Hands Problem is an evidentiary roadblock that arises when it is difficult or impossible to prove that such an employee exists.[46] Investigating and reconstructing the acts of the corporation that led to a harm is notoriously difficult. Since the corporation will likely face liability if a responsible employee is uncovered, it has little motivation to cooperate.[47] Individual employees, who also potentially face liability for their own misconduct, have every incentive to point their fingers in different directions and confound the narrative. The Many Hands Problem partially explains why the Department of Justice consistently fails to indict individuals within large corporate criminals.[48] It also explains why special tort doctrines—like the law of product liability—sometimes dispense entirely with the requirement that plaintiffs find a

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45.   *See* Marta Infantino & Weiwei Wang, *Algorithmic Torts: A Prospective Comparative Overview*, 28 TRANSNAT'L L. & CONTEMP. PROBS. 309, 318 (2019).

46.   Memorandum from Sally Quillian Yates, Deputy Att'y Gen., U.S. Dep't of Just., to all Component Heads & U.S. Att'ys, Individual Accountability for Corporate Wrongdoing 2 (Sept. 9, 2015) [hereinafter Yates Memorandum], https://www.justice.gov/archives/dag/file/769036/download [https://perma.cc/7J5F-2BTM] ("In large corporations, where responsibility can be diffuse and decisions are made at various levels, it can be difficult to determine if someone possessed the knowledge and criminal intent necessary to establish their guilt beyond a reasonable doubt."); Amanda M. Rose & Richard Squire, *Intraportfolio Litigation*, 105 NW. U. L. REV. 1679, 1684 (2011) ("In some situations it may be impossible for victims to discover or prove which particular employees within a firm caused their injuries.").

47.   *See* Jennifer Arlen, *The Failure of the Organizational Sentencing Guidelines*, 66 U. MIA. L. REV. 321, 324 (2012) ("[C]orporate efforts to help the government could hurt the firm by increasing its probability of being held criminally liable.").

48.   In response to this problem, the Department of Justice had to update its policies to force prosecutors to pursue all leads against individuals before resolving a case against a corporation. *See* Yates Memorandum, *supra* note 46 ("Department attorneys should not resolve matters with a corporation without a clear plan to resolve related individual cases . . . .").

single responsible employee by allowing them to hold the entire corporation directly liable.[49]

The second barrier plaintiffs and prosecutors can encounter is the "No Hands Problem." It arises because complex corporate operations can sometimes go awry even if every employee behaves responsibly.[50] Organizational scientists have long known that bad organizational systems, rather than bad people within those systems, can sometimes be the true problem.[51] For example, a broken channel of communication may prevent important information from flowing between two well-intentioned employees.[52] In one famous case, a bank failed to file mandatory anti-money-laundering reports because the system for letting compliance personnel know that a report-triggering event had occurred was not operational.[53] Corporate algorithms can exacerbate the No Hands Problem. Technologists have shown that an algorithm can misbehave even if everyone who programmed and operated it behaved faultlessly.[54] As discussed above and in more detail below, today's most advanced algorithms necessarily incorporate a certain degree of unpredictability. Thus, when a No Hands Problem arises, plaintiffs and prosecutors cannot find a culpable employee because no such employee exists.

Several recent incidents show how the Many Hands Problem and the No Hands Problem help corporations elude justice when their algorithms cause harm. In some incidents, the stakes are extremely high. In 2015, a robot at a car plant bypassed safety protocols, entered an unauthorized area, and crushed employee Wanda Holbrook's head.[55] In a vivid illustration of the Many Hands Problem, her husband

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49.   *See, e.g.*, Kim v. Toyota Motor Corp., 424 P.3d 290, 298 (Cal. 2018) ("Strict products liability, unlike negligence doctrine, focuses on the nature of the product, and not the nature of the manufacturer's conduct.").

50.   *See* Mihailis E. Diamantis, *The Corporate Insanity Defense*, 111 J. CRIM. L. & CRIMINOLOGY 1, 37–40, 56–58 (2021) [hereinafter Diamantis, *The Corporate Insanity Defense*] (demonstrating how the normative significance of joint action can be very different from the normative significance of every individual contribution to the joint action).

51.   *See* Brent Fisse & John Braithwaite, *The Allocation of Responsibility for Corporate Crime: Individualism, Collectivism and Accountability*, 11 SYDNEY L. REV. 468, 479 (1988) ("Organisations are systems . . . not just aggregations of individuals.").

52.   *See generally* Mihailis E. Diamantis, *Functional Corporate Knowledge*, 61 WM. & MARY L. REV. 319 (2019) [hereinafter Diamantis, *Functional Corporate Knowledge*] (discussing corporate compliance and information systems).

53.   United States v. Bank of New Eng., 821 F.2d 844, 847, 855–56 (1st Cir. 1987).

54.   Barocas & Selbst, *supra* note 19, at 729.

55.   Conner Forrest, *Robot Kills Worker on Assembly Line, Raising Concerns About Human-Robot Collaboration*, TECHREPUBLIC (Mar. 15, 2017, 7:15 AM), https://www.techrepublic.com/

struggled to find a suitable defendant. He initially sued five U.S. robotics corporations—Prodomax, Flex-N-Gate, FANUC, Nachi, and Lincoln Electric—for wrongful death.[56] Each had a hand in installing, integrating, engineering, servicing, controlling, and/or manufacturing the robot and/or its safety devices.[57] It proved very difficult for Holbrook's husband to make even a prima facie case that any of them, let alone some employee within one of them, was responsible. The court dismissed his suit as to four of the defendants.[58] The case lingers on today against the remaining defendant who is confident enough to refuse settlement.[59]

A notorious example of the No Hands Problem arose in 2018, when one of Uber's self-driving cars struck and killed pedestrian Elaine Herzberg as she was crossing the street.[60] Prosecutors decided not to press charges against Uber or any individual Uber employee.[61] As one reporter noted, it is hard to answer "[w]ho killed Elaine Herzberg."[62] A National Transportation Safety Board ("NTSB") investigation identified several defects in Uber's algorithm, including that it failed to categorize Herzberg as a pedestrian or apply maximum

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article/robot-kills-worker-on-assembly-line-raising-concerns-about-human-robot-collaboration [https://perma.cc/QC82-JP5A].

56.   Harriet Agerholm, *Robot 'Goes Rogue and Kills Woman on Michigan Car Parts Production Line,'* INDEPENDENT (Mar. 15, 2017, 11:37 AM), https://www.independent.co.uk/news/world/americas/robot-killed-woman-wanda-holbrook-car-parts-factory-michigan-ventra-ionia-mains-federal-lawsuit-100-a7630591.html [https://perma.cc/V6R4-4CCS].

57.   Complaint and Jury Demand at 3, Holbrook v. Prodomax Automation, Ltd., No. 17-cv-00219 (W.D. Mich. Mar. 7, 2017).

58.   Order Granting Defendant Nachi Robotic's Motion for Summary Judgment at 3–4, *Holbrook*, No. 17-cv-00219 (W.D. Mich. Aug. 26, 2019) (granting summary judgment to Nachi Robotics because its machine was not involved in the accident); Stipulated Order of Dismissal of Defendant, the Lincoln Electric Company, Without Prejudice at 1, *Holbrook*, No. 17-cv-00219 (W.D. Mich. July 24, 2020) (dismissing Lincoln Electric); Stipulated Order Dismissing Counts VI and XI of Plaintiff's First Amended Complaint with Prejudice at 2, *Holbrook*, No. 17-cv-00219 (W.D. Mich. Apr. 26, 2021) (dismissing the res ipsa loquitur and concert of action claims); Stipulated Order of Dismissal at 1, *Holbrook*, No. 17-cv-00219 (W.D. Mich. June 18, 2021) (dismissing FANUC).

59.   As of this writing, one defendant remains in the litigation. *See* Holbrook v. Prodomax Automation Ltd., No. 1:17-cv-219, 2021 WL 4260622, at *1, *8 (W.D. Mich. Sept. 20, 2021).

60.   Daisuke Wakabayashi, *Self-Driving Uber Car Kills Pedestrian in Arizona, Where Robots Roam*, N.Y. TIMES (Mar. 19, 2018), https://www.nytimes.com/2018/03/19/technology/uber-driverless-fatality.html [https://perma.cc/RA9N-WHZB].

61.   Ray Stern, *Prosecutor: No Crime by Uber in Self-Driving Death; Crash Still Under Scrutiny*, PHX. NEW TIMES (Mar. 5, 2019, 3:45 PM), https://www.phoenixnewtimes.com/news/uber-committed-no-crime-self-driving-crash-tempe-prosecutor-11231539 [https://perma.cc/V6B2-SNYK].

62.   Schmitt, *supra* note 18.

brake pressure.[63] The NTSB also blasted Uber's inadequate safety culture.[64] To date, no one has identified an individual at Uber who was single-handedly responsible for any of it. The problem is that "[a]utonomous vehicle design involves an almost incomprehensible combination of engineering tasks including sensor fusion, path planning, and predictive modeling of human behavior. But despite the best efforts to consider all possible real-world outcomes, things can go awry."[65]

Adding insult to injury, prosecutors investigating Herzberg's death clearly felt pressure to take *some* action. So they filed charges against Rafaela Vasquez, the backup driver in the car that hit Herzberg.[66] Since Vasquez is an independent contractor, not an Uber employee, Uber must have been happy to throw her under the bus.[67] Many critics see Vasquez—a forty-seven-year-old, Hispanic, transgender woman—as a convenient scapegoat whom Uber used to divert attention from itself.[68] Vasquez's case is an example of what anthropologist Madeleine Claire Elish calls a "moral crumple zone[]."[69] Vasquez became a "largely totemic human[] whose central role [was to] soak[] up fault, even if they had only partial control of the system."[70]

The prosecutor alleged that Vasquez—whose job was to sit by and take control of the car if necessary—was not paying attention at the

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63. NAT'L TRANSP. SAFETY BD., NTSB/HAR - 19/03, COLLISION BETWEEN VEHICLE CONTROLLED BY DEVELOPMENTAL AUTOMATED DRIVING SYSTEM AND PEDESTRIAN, TEMPE, ARIZONA, MARCH 18, 2018, at 15 tbl., 40, 57–58 (2018) [hereinafter NTSB REPORT], https://www.ntsb.gov/investigations/AccidentReports/Reports/HAR1903.pdf [https://perma.cc/9W6X-H5XR].

64. *See id.* at 58.

65. Henry Grabar, *Uber Crash in Arizona Kills Woman in First Pedestrian Death Caused by a Self-Driving Car*, SLATE (Mar. 19, 2018, 9:00 AM), https://slate.com/technology/2020/10/uber-self-driving-car-death-arizona-vs-vasquez.html [https://perma.cc/58EY-RJWR].

66. Ray Stern, *Uber Backup Driver Indicted in 2018 Self-Driving Crash That Killed Woman*, PHX. NEW TIMES (Sept. 15, 2020, 2:50 PM), https://www.phoenixnewtimes.com/news/uber-back up-driver-in-phoenix-indicted-over-fatal-self-driving-car-crash-in-18-11494111 [https://perma.cc/V39L-JAVV].

67. I discuss independent contractors extensively below, *infra* Part II.C.

68. Ray Stern, *Trial Delayed for Backup Driver in Fatal Crash of Uber Autonomous Vehicle*, PHX. NEW TIMES (May 12, 2021) [hereinafter Stern, *Trial Delayed*], https://www.phoenixnew times.com/news/uber-crash-arizona-vasquez-herzberg-trial-negligent-homicide-charge-11553424 [https://perma.cc/9EEQ-NUL7].

69. Madeleine Clare Elish, *When Your Self-Driving Car Crashes, You Could Still Be the One Who Gets Sued*, QUARTZ (July 25, 2015), https://qz.com/461905/when-your-self-driving-car-cra shes-you-could-still-be-the-one-who-gets-sued [https://perma.cc/TH2H-P9YA].

70. *Id.*

time of the crash.[71] Vasquez disputes this.[72] Even if the prosecutor is right, Vasquez seems herself to have been a victim of a well-documented phenomenon called "automation-induced complacency," which psychologists identified nearly three decades ago.[73] Human beings, both expert and naive, naturally lose focus if they are overseeing highly automated systems.[74] The NTSB report pointed the finger of blame at Uber because its cars had no "effective countermeasures to control the risk of operator disengagement."[75]

Examples of the Many Hands and No Hands Problems abound for nonlethal harms too. Though there are often insufficient public facts available to say for sure which of the two problems is at issue, the practical consequence for plaintiffs and prosecutors is the same. One of the best documented examples is algorithmic discrimination.[76] In these cases, algorithms make important decisions about employment or credit using proxies for protected characteristics.[77] Human employees making similar decisions would clearly be breaking the law.[78] For example, a recruiting algorithm at Amazon demonstrated a preference for male candidates[79]; crime prediction algorithms in Chicago and New Orleans targeted Black neighborhoods[80]; and a consumer credit algorithm at Apple disfavored women.[81] One thing

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71.   Stern, *Trial Delayed*, *supra* note 68.

72.   *Id.*

73.   Raja Parasuraman, Robert Molloy & Indramani L. Singh, *Performance Consequences of Automation-Induced 'Complacency,'* 3 INT'L J. AVIATION PSYCH. 1, 2 (1993).

74.   Raja Parasuraman & Dietrich H. Manzey, *Complacency and Bias in Human Use of Automation: An Attentional Integration*, 52 HUM. FACTORS 381, 382 (2010) (discussing study indicating that highly experienced airline captains blamed complacency for accidents).

75.   NTSB REPORT, *supra* note 63, at 44.

76.   For an excellent discussion of the true harm of algorithmic discrimination, as well as a provocative solution for mitigating it, see Deborah Hellman, *Measuring Algorithmic Fairness*, 106 VA. L. REV. 811, 834–42, 861–62 (2020).

77.   *See generally* Anya E.R. Prince & Daniel Schwarcz, *Proxy Discrimination in the Age of Artificial Intelligence and Big Data*, 105 IOWA L. REV. 1257 (2020) (discussing the threat of proxy discrimination in algorithmic decision-making).

78.   *See infra* Part III.C.

79.   Miranda Bogen, *All the Ways Hiring Algorithms Can Introduce Bias*, HARV. BUS. REV. (May 6, 2019), https://hbr.org/2019/05/all-the-ways-hiring-algorithms-can-introduce-bias [https://perma.cc/R7KY-XSVZ].

80.   Rashida Richardson, Jason M. Schultz & Kate Crawford, *Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice*, 94 N.Y.U. L. REV. ONLINE 192, 208–14 (2019).

81.   Liz O'Sullivan, *How the Law Got It Wrong with Apple Card*, TECHCRUNCH (Aug. 14, 2021, 10:15 AM), https://techcrunch.com/2021/08/14/how-the-law-got-it-wrong-with-apple-card [https://perma.cc/U7CU-NRUB].

that unites these cases is that victims have trouble finding an employee within the organization who had a discriminatory purpose—either because there is no such employee or because he is hidden in the crowd. Consequently, victims of algorithmic discrimination struggle to hold organizations accountable, even though the harm they suffer is no different than one they could suffer at the hands of human employees.[82] Structurally similar challenges emerge when hedge funds' trading algorithms learn to manipulate stock[83] or retailers' price-setting algorithms learn to collude.[84] Though individual traders and consumers experience harm as a result, corporate liability has been hard to come by.[85]

B. *Some Key Concepts: Liability, Algorithm, and Autonomy*

This Section clarifies some key concepts. As deployed here, each concept has a core meaning, and the arguments that follow are most forceful with respect to that core. Each concept also has multiple peripheral meanings. The arguments often apply to them as well, though perhaps with less force. With respect to the peripheral meanings, the proposal developed below may sometimes be expedient rather than strictly necessary for promoting corporate accountability.

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82. Barocas & Selbst, *supra* note 19, at 726.

83. *See generally* Tom C.W. Lin, *The New Market Manipulation*, 66 EMORY L.J. 1253 (2017) (discussing the capacity of new financial technologies, such as stock trading algorithms, to destabilize markets); Hilary J. Allen, *The SEC as Financial Stability Regulator*, 43 J. CORP. L. 715, 745 (2018) ("While humans are certainly involved in programming [high frequency trading] algorithms, once the algorithm has been set, the trading is self-executing—there is no time to apply human judgment to individual decisions about whether to trade or not.").

84. Greg Rosalsky, *When Algorithms Collude*, NPR: PLANET MONEY (Apr. 2, 2019, 7:30 AM), https://www.npr.org/sections/money/2019/04/02/708876202/when-computers-collude [https://perma.cc/U957-ELY8]; Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò & Sergio Pastorello, *Artificial Intelligence, Algorithmic Pricing, and Collusion*, CTR. FOR ECON. POL'Y RSCH.: VOXEU (Feb. 3, 2019), https://voxeu.org/article/artificial-intelligence-algorithmic-pricing-and-collusion [https://perma.cc/B27T-ATQP]; Ariel Ezrachi & Maurice E. Stucke, *Artificial Intelligence & Collusion: When Computers Inhibit Competition*, 2017 U. ILL. L. REV. 1775, 1782.

85. The exceptions have been cases where neither the Many Hands Problem nor the No Hands Problem arose, for example, where identifiable employees purposely developed algorithms that would collude on pricing. *See, e.g.*, Andrew C. Finch, Former Principal Deputy Assistant Att'y Gen., U.S. Dep't of Just., Keynote Address at Annual Conference on International Antitrust Law and Policy (Sept. 14, 2017), https://www.justice.gov/opa/speech/acting-assistant-attorney-general-andrew-finch-delivers-keynote-address-annual-conference [https://perma.cc/4WTM-AT6D].

1. *Corporate Liability*.   The law considers corporations to be "people."[86] In principle, plaintiffs and prosecutors can sue corporations for any violation, civil or criminal.[87] Formally speaking, the corporation itself is the defendant in such cases.[88] Employees and shareholders are (and should be) separately liable for any violations they commit personally, but they do not directly pay any judgment rendered against the corporation.[89]

As used in this Article, the paradigmatic instance of "corporate liability" is criminal liability for violations with a mens rea element of purpose or knowledge. Criminal harm calls most compellingly for accountability that can secure justice and prevention. When liability turns on a demanding, subjective mental state like purpose or knowledge, the Many Hands and No Hands Problems are more likely to arise. These mens rea require plaintiffs to peer into an individual's head and to exclude alternative explanations for their behavior, like ulterior motives and mistaken beliefs. Corporate liability also includes civil liability and liability premised on objective mental states like negligence. The arguments below apply to such liability too, though they may be less urgent or needed less frequently. The arguments are weakest with respect to strict liability civil violations, where fault standards are most permissive and therefore most likely to encompass algorithmic harms.

2. *Algorithm*.   An "algorithm" is a "mathematical or logical process consisting of a series of steps, designed to solve a specific type of problem."[90] Technically speaking, a cake recipe counts as an algorithm. However, for this Article, "algorithm" refers specifically to computer software. It does not matter whether the algorithm runs on a

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86.   Dictionary Act, 1 U.S.C. § 1 (defining "person" to "include corporations"); Int'l Shoe Co. v. Washington, 326 U.S. 310, 316 (1945) ("[T]he corporate personality is a fiction, although a fiction intended to be acted upon as though it were a fact.").

87.   One exception is sexual offenses, though, as Professor Erin Sheley has persuasively argued, this exception is a conceptual and policy mistake. Erin L. Sheley, *Tort Answers to the Problem of Corporate Criminal Mens Rea*, 97 N.C. L. REV. 773, 777 (2019).

88.   N.Y. Cent. & Hudson River R.R. v. United States, 212 U.S. 481, 495 (1909) ("[There is] no valid objection in law, and every reason in public policy, why the corporation . . . shall be held punishable by fine because of the knowledge and intent of its agents to whom it has [e]ntrusted authority to act . . . .").

89.   *See generally* Miriam Hechler Baer, *Governing Corporate Compliance*, 50 B.C. L. REV. 949, 955–56 (2009) ("One of the great challenges for policymakers, then, is to craft rules and regulations that force firms to internalize the long-term costs of their wrongdoing without crowding out individual incentives to disclose information.").

90.   *Algorithm*, BLACK'S LAW DICTIONARY (11th ed. 2019).

stationary system (like a desktop computer or smart phone) or a physically mobile one (like a self-driving car). Both can harm other people, though perhaps in different ways.

Computer algorithms exhibit a broad range of sophistication. Some algorithms are static because they consist of series of pre-coded steps that remain constant across inputs.[91] The same inputs always produce the same outputs: if the applicant's salary is over $100,000, current debt is $0, credit score is greater than 750, and house purchase value is less than $400,000, then approve mortgage with 20 percent down. Other, more powerful algorithms use what is known as "machine learning" to find patterns in massive amounts of data and then dynamically improve their code as they encounter new inputs.[92] Programmers for a bank might use millions of historical mortgage default records to preliminarily "train" a machine learning algorithm to evaluate credit risk. Then, as the bank puts the algorithm to work in approving mortgages, the algorithm evaluates its own performance and improves.[93] The resulting code might balance thousands of data points for each mortgage in a web of contingencies that is too complex and convoluted for any human intelligence to comprehend.[94] Many people think that "machine learning" is synonymous with "artificial intelligence," but technically, there is a difference. Even static systems count as artificially intelligent if they seem "smart" enough.[95]

When this Article refers to "artificial intelligence," it refers specifically to machine learning artificial intelligence. The arguments below have the greatest bite for the algorithms that are most likely to

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91. Paul E. Black, *Deterministic Algorithm*, NAT'L INST. OF STANDARDS & TECH. (Jan. 14, 2009), https://xlinux.nist.gov/dads/HTML/deterministicAlgorithm.html [https://perma.cc/XF8T-DA85].

92. Karen Hao, *What Is Machine Learning?*, MIT TECH. REV. (Nov. 17, 2018), https://www.technologyreview.com/2018/11/17/103781/what-is-machine-learning-we-drew-you-another-flowchart [https://perma.cc/NJ74-WLMV]; Emily Berman, *A Government of Laws and Not of Machines*, 98 B.U. L. REV. 1277, 1285 (2018) ("[Machine learning algorithms] generate their own computer models and (if well-constructed) improve automatically with experience—they learn.").

93. *See* Eban Escott, *What Are the 3 Types of AI? A Guide to Narrow, General, and Super Artificial Intelligence*, CODEBOTS (Oct. 24, 2017), https://codebots.com/artificial-intelligence/the-3-types-of-ai-is-the-third-even-possible [https://perma.cc/QX9Q-PHUP].

94. *See* Cynthia Rudin & Joanna Radin, *Why Are We Using Black Box Models in AI When We Don't Need To? A Lesson from an Explainable AI Competition*, HARV. DATA SCI. REV. (Nov. 22, 2019), https://hdsr.mitpress.mit.edu/pub/f9kuryi8/release/8 [https://perma.cc/55N4-DPE9].

95. Bernard Marr, *What Is the Difference Between Artificial Intelligence and Machine Learning*, FORBES (Dec. 6, 2016, 2:24 AM), https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/?sh=49b626262742 [https://perma.cc/HP55-QQ22].

give rise to the Many Hands and No Hands Problems, and these tend to be machine learning algorithms. Traditional employee-focused doctrines of corporate liability will more often suffice when harm results from static algorithms because every line of code is more directly connected to a human coder. Machine learning algorithms, by contrast, program themselves. They are inscrutable. And they incorporate some inherent arbitrariness in how they model data.[96] All three of these features mean that errors can arise in machine learning algorithms—an innocent pedestrian struck or a mortgage improperly declined—without any identifiable human who is responsible. Accordingly, the core sense of "algorithm" throughout this Article refers to machine learning algorithms, though the motivating concerns and proposed solutions could also be helpful in some contexts involving static algorithms.

   3. *Autonomy*.   An "autonomous" algorithm is one that makes decisions on its own without continuous direction or intervention from humans. Autonomous algorithms are becoming "the new normal" because they often adopt better strategies than their human counterparts.[97] Autonomous algorithms manage retail stores, trade stocks, drive cars, package boxes,[98] and even serve as corporate board members.[99]

   There is no settled definition of algorithmic autonomy. Rather than wander into the technological and philosophical weeds, this Article adopts a functional characterization. On this understanding, autonomy exists on a spectrum depending on how much human intervention an algorithm requires. For purposes of this Article, an algorithm is autonomous if it could raise a No Hands Problem. In other words, if an algorithm could cause harm for which no human is morally responsible, then it qualifies as autonomous. The more likely such a situation is to arise, the more autonomous the algorithm is. A fully

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   96.   Kroll et al., *supra* note 28, at 653.

   97.   Michael Schrage, *4 Models for Using AI To Make Decisions*, HARV. BUS. REV. (Jan. 27, 2017), https://hbr.org/2017/01/4-models-for-using-ai-to-make-decisions [https://perma.cc/DF3Q-N6FA].

   98.   Jeffrey Dastin, *Amazon Rolls Out Machines That Pack Orders and Replace Jobs*, REUTERS (May 13, 2019, 5:32 PM), https://www.reuters.com/article/us-amazon-com-automation-exclusive/exclusive-amazon-rolls-out-machines-that-pack-orders-and-replace-jobs-idUSKCN1SJ0X1 [https://perma.cc/7LN8-3DVG].

   99.   *See generally* Sergio Alberto Gramitto Ricci, *Artificial Agents in Corporate Boardrooms*, 105 CORNELL L. REV. 869, 871 (2020) ("[A]rtificial intelligence and algorithms have somewhat already made it into some corporate boardrooms around the world.").

autonomous algorithm is one that is just as likely as a human to cause harm for which no other entity is morally responsible. The arguments throughout this Article apply with greater force and urgency to more autonomous algorithms.

C. *A Six-Point Evaluative Framework*

Corporations are a natural place to turn when algorithms hurt people. The algorithms themselves are not cognizable defendants.[100] Algorithms could not pay even if a court entered judgment against them. Nor would threatening algorithms with sanctions change how they behave; they do not have the interests and wants necessary for deterrent incentives to take hold. Since corporations generally design, own, and operate the world's most impactful algorithms, there will usually be at least one corporation that is associated (in a loose sense) with algorithmic harm. So, the law could conceivably substitute corporations as vicarious defendants when their algorithms cause harm. Unlike algorithms, corporations are purpose-driven, hierarchical organizations with pocketbooks. In other words, they are the type of entities that make sense as defendants because they can give satisfaction for victims and have incentives that liability can target in its effort to improve future performance.

Just because the law *could* substitute corporations as defendants in place of their algorithms, that does not necessarily mean doing so would be a good idea. Corporations and algorithms are complex entities that drive many of the social and economic systems on which we rely. We must be sure to avoid potentially catastrophic unanticipated consequences, such as an unduly hobbled or dangerously emboldened technology sector.

To evaluate the advisability of corporate accountability for algorithmic harm, I propose below six basic criteria against which any model of corporate accountability should be measured: (1) identify which corporation is liable, (2) foreclose opportunities for gamesmanship, (3) provide efficient incentives, (4) generate fair outcomes, (5) be easy to implement, and (6) promote programming

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100.   I have argued extensively elsewhere against any legal change that would recognize algorithms as cognizable defendants. *See* Joanna J. Bryson, Mihailis E. Diamantis & Thomas D. Grant, *Of, for, and by the People: The Legal Lacuna of Synthetic Persons*, 25 A.I. & L. 273, 275 (2017) (arguing against recognizing the legal personhood of artificial intelligence).

values.[101] Any model of vicarious corporate liability for algorithmic harms that satisfies these criteria stands a good chance of improving the status quo. We can also compare competing models by assessing how well they perform across the criteria. I lay out the criteria below and unpack some of the nuanced challenges this Article seeks to overcome.

Criterion 1. *Identify Which Corporation(s) Will Be Liable.* There are often many corporations behind the most important algorithms.[102] One corporation may have designed a module for an algorithm that a second assembled. A third corporation may have tested the algorithm. A fourth may have marketed it to a fifth that owns and licenses it to a sixth that operates it on hardware owned by a seventh. A harmful defect could arise in an algorithm at any step or from interaction effects between steps.[103] Any approach for holding corporations accountable for algorithmic harms must be able to say which of these corporations should pay and why.

Criterion 2. *Be Robust Enough to Avoid Gamesmanship.* As a corollary to the first criterion, whatever mechanism the model uses to identify liable corporations should not be manipulable. Businesses are masters at managing liability.[104] If there is a liability loophole, they (or their savvy attorneys) will find it.[105] For example, if the rule is that owners of harmful algorithms are liable, large corporations will simply transfer formal ownership to underfunded shells, subsidiaries, or

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101. The discussion in this section summarizes work from Diamantis, *Vicarious Liability for AI*, *supra* note 41, at 3–12. More detailed discussion of the criteria is available there.

102. *See* Infantino & Wang, *supra* note 45, at 340–41 (noting that potential defendants in an algorithmic tort range "from start-ups and stand-alone software developers, to governments, state-owned enterprises, and research institutions, to producers, distributors, and users of algorithmic products and services, to large corporations with worldwide branches").

103. *Id.* at 353–54.

104. Douglas C. Michael, *To Know a Veil*, 26 J. CORP. L. 41, 55 (2000) ("[O]ne of the corporation's central purposes is the limitation of liability.").

105. *See* Henry Hansmann & Reinier Kraakman, *The Essential Role of Organizational Law*, 110 YALE L.J. 387, 390 (2000) (arguing that the primary purpose of corporate law practice of asset partitioning is "the shielding of the assets of the entity from claims of the creditors of the entity's owners or managers"); Henry Hansmann & Reinier Kraakman, *Toward Unlimited Shareholder Liability for Corporate Torts*, 100 YALE L.J. 1879, 1913–15 (1991) [hereinafter Hansmann & Kraakman, *Unlimited Shareholder Liability*] (noting that a savvy corporate actor could use financial restructuring in order to spread liability among many less resourced entities); Mark J. Roe, *Corporate Strategic Reactions to Mass Tort*, 72 VA. L. REV. 1, 39–40 (1986) (listing incorporation strategies an entity could use in order to minimize risk from mass tort judgments).

partners, or perhaps even to the users of the algorithms, while ensuring the benefits for the algorithms' work continue to flow to them.[106]

Criterion 3. *Give Efficient Incentives to All Parties Involved.* Corporate liability for algorithmic harms is an efficiency balancing act. By imposing too little liability, the law presently fails to incentivize corporations to take due care in developing and monitoring their algorithms.[107] By imposing liability too severely or too often, the law could make many algorithms too expensive, thereby depressing corporate investment and suppressing technological innovation.[108] This would be a net social loss. Some algorithms take lives, but they have the capacity to save many more.[109] Some may discriminate, but they have the potential to make decisions more objective.[110] Some may manipulate markets, but they could also help markets operate more efficiently.[111]

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106.   Daryl J. Levinson, *Collective Sanctions*, 56 STAN. L. REV. 345, 393 (2003) ("Firms may externalize liability costs by spinning off risky operations into undercapitalized subsidiaries, as when owners of taxi enterprises incorporate each cab separately."); Hansmann & Kraakman, *Unlimited Shareholder Liability*, *supra* note 105, at 1913–15; Roe, *supra* note 105.

107.   OLIVER WENDELL HOLMES, JR., THE COMMON LAW 106–07 (Harv. Univ. Press 2009) (1881) ("[T]he safest way to secure care is to throw the risk upon the person who decides what precautions shall be taken.").

108.   Rebecca Crootof, *The Internet of Torts: Expanding Civil Liability Standards To Address Corporate Remote Interference*, 69 DUKE L.J. 583, 663 (2019) (noting that "[i]ncreasing corporate liability may chill innovation" and calling on the legislature to weigh the costs and benefits of expanding liability for internet-based torts).

109.   *See, e.g.*, Bernard Marr, *AI That Saves Lives: The Chatbot That Can Detect a Heart Attack Using Machine Learning*, FORBES (Dec. 21, 2018, 12:23 AM), https://www.forbes.com/sites/bernardmarr/2018/12/21/ai-that-saves-lives-the-chatbot-that-can-detect-a-heart-attack-using-machine-learning [https://perma.cc/24CW-LMBL] (describing an AI tool that uses speech recognition to identify whether an emergency call concerns a cardiac arrest).

110.   *See* Pauline T. Kim, *Data-Driven Discrimination at Work*, 58 WM. & MARY L. REV. 857, 865 (2017) ("Proponents of workforce analytics argue that data models can avoid reliance on biased human decision-making . . . . [E]mployers and researchers can [also] use data to diagnose where and how cognitive or structural biases are currently operating in ways harmful to disadvantaged groups."); Stephanie Bornstein, *Antidiscriminatory Algorithms*, 70 ALA. L. REV. 519, 533–37 (2018) (describing the potential for algorithmic discrimination and identifying proposals to improve these algorithms).

111.   *See* ONNIG H. DOMBALAGIAN, CHASING THE TAPE: INFORMATION LAW AND POLICY IN CAPITAL MARKETS 16, 166 (2015) (describing how automated systems increase the liquidity of data and information flows in securities trading); Terrence Hendershott, Charles M. Jones & Albert J. Menkveld, *Does Algorithmic Trading Improve Liquidity*, 91 J. FIN. 1, 3 (2011) ("We find that [algorithmic trading] does in fact improve liquidity for large-cap stocks.").

Victims' incentives matter for efficiency too.[112] They are the mirror image of corporate incentives. Too much liability for corporations could incentivize carelessness in people who interact with algorithms, and too little corporate liability could incentivize undue wariness.[113] Both are suboptimal from a social welfare standpoint. If potential victims know that they have some skin in the game too—for example, if they are contributorily negligent—they will take care to avoid unnecessary injury.

Criterion 4. *Produce Fair Outcomes.* Justice is also a balancing act. Corporate liability should extend far enough to be fair to victims without doing so much that it is unfair to corporations. The march of digital progress will generate massive social benefits, as well as many unanticipated social costs when things go wrong.[114] Continuing to leave victims to bear the costs of algorithmic harms would clearly tip the scales of justice far beyond equipoise. Perhaps less intuitive is the fact that it would be equally unacceptable from a fairness perspective to force defendants, even for-profit corporations, to pay for every algorithmic harm. Costs to faceless business entities are often too easy to discount. However, those costs impose far-reaching effects on the livelihoods of innocent flesh-and-blood individuals who do have an indisputable claim to a fair outcome.[115] These individuals include shareholders and employees who stand just behind the corporation and bear the brunt of any corporate sanction.[116] Just one step further, there are the many other corporate stakeholders—creditors, consumers, community members, etc.—who can be impacted.[117]

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112. Richard A. Posner & William M. Landes, *The Positive Economic Theory of Tort Law*, 15 GA. L. REV. 851, 868–70 (1980) (discussing the efficiency of the tort system in terms of inputs of care from both the victim and the injurer).

113. *See id.* at 883–916 (discussing different forms of tort liability in terms of the incentives for victims and injurers).

114. Only just over one-third of technologists think that "the net overall effect of algorithms [will] be positive for individuals and society." Lee Rainie & Janna Anderson, *Code-Dependent: Pros and Cons of the Algorithm Age*, PEW RSCH. CTR. (Feb. 8, 2017), https://www.pew research.org/internet/2017/02/08/code-dependent-pros-and-cons-of-the-algorithm-age [https:// perma.cc/5HY6-5TML].

115. John Hasnas, *The Centenary of a Mistake: One Hundred Years of Corporate Criminal Liability*, 46 AM. CRIM. L. REV. 1329, 1339 (2009).

116. *See* Albert W. Alschuler, *Two Ways To Think About the Punishment of Corporations*, 46 AM. CRIM. L. REV. 1359, 1366–67 (2009).

117. *Id.* at 1367 ("[C]reditors, customers, and communities sometimes feel the pinch [of corporate liability] too."); Margaret M. Blair & Lynn A. Stout, *A Team Production Theory of Corporate Law*, 85 VA. L. REV. 247, 278 (1999) ("[A] public corporation is a team of people who

Criterion 5. *Have Low Barriers to Implementation*. The more disruptive a proposed legal reform is, the lower its prospects for implementation. Lobbying by adversely affected parties is one potential source of trouble, and greater deviations from the status quo are apt to galvanize more opposition.[118] By contrast, broad support builds more reliably for incremental changes and reforms that draw on preexisting legal frameworks.[119] Familiarity can smooth implementation by lawmakers.[120] Political economy matters if there is to be any real hope for change.

Criterion 6. *Promote Programming Values*. Philosophers, political scientists, and sociologists have been sounding alarm bells over how algorithms can and do infringe human dignity, undermine democracy, and perpetuate socioeconomic disparities.[121] Technoethicists propose several programming values—like respecting human autonomy, ensuring human oversight, avoiding deception, and preserving user privacy—to guide programmers in developing socially responsible algorithms.[122] Falling short of these values would not always violate the law, but it would be a missed opportunity not to use corporate liability to foster them.

One salient programming value is transparency.[123] According to it, decisions impacting human interests should have an accessible and comprehensible justifying logic.[124] An algorithm that is not transparent is called a "black box" algorithm.[125] Transparency is central to human

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enter into a complex agreement to work together for their mutual gain. Participants—including shareholders, employees, and perhaps other stakeholders such as creditors or the local community—enter into a '*pactum subjectionis*.'").

118.   *See generally* Richard L. Hasen, *Lobbying, Rent-Seeking, and the Constitution*, 64 STAN. L. REV. 191 (2012) (discussing the impact of interest group lobbying); Todd Zywicki, *Rent-Seeking, Crony Capitalism, and the Crony Constitution*, 23 SUP. CT. ECON. REV. 77 (2015) (discussing the economics of rent-seeking through lobbying).

119.   Saul Levmore, *Interest Groups and the Problem with Incrementalism*, 158 U. PA. L. REV. 815, 816–17 (2010).

120.   *See* GUIDO CALABRESI, A COMMON LAW FOR THE AGE OF STATUTES 3–4 (1982).

121.   *See* Spyros Makridakis, *The Forthcoming Artificial Intelligence (AI) Revolution: Its Impact on Society and Firms*, 90 FUTURES 46, 50–52 (2017).

122.   HIGH-LEVEL EXPERT GRP. ON A.I., EUROPEAN COMM'N, ETHICS GUIDELINES FOR TRUSTWORTHY AI 2–3, https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai [https://perma.cc/58DQ-2YNP].

123.   *See generally* Danielle Keats Citron, *Technological Due Process*, 85 WASH. U. L. REV. 1249 (2008) (arguing the importance of algorithmic transparency).

124.   *See generally* Hannah Bloch-Wehba, *Access to Algorithms*, 88 FORDHAM L. REV. 1265 (2020) (arguing that the law of access could help promote algorithmic transparency).

125.   *See* Rudin & Radin, *supra* note 94.

dignity interests vis-à-vis algorithms because people deserve to know *what* decisions affect them and *why* those decisions were made.[126] This allows people to ensure that the decisions were principled, rather than based on inaccurate information or influenced by prejudice.

<div align="center">*   *   *</div>

While these six criteria should guide the search for a model of corporate liability for algorithmic harm, they alone will not always say which of two similar models is preferable. Multifactor tests are notorious for producing different outcomes depending on how one weighs individual, conflicting factors.[127] This is especially true when, as with the criteria above, the factors are comparative rather than binary.[128] For example, while Criterion 3 says the model should be efficient, it does not make sense to assess whether a mechanism is efficient or inefficient in itself; models can only be *more* or *less* efficient when compared to some benchmark or to each other.

Ideally, we could move beyond a multifactor balancing test and use a fully determinate test for comparing models. However, that would require much more precise criteria and formulas for combining them into a single numerical value, which is not a feasible option (at least not for this Article). Fortunately, a fully determinate test is unnecessary for present purposes. Part III demonstrates that the Labor Model would be the unambiguous frontrunner among available models on any approach to weighing the criteria. Only the Labor Model satisfies all six.

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126. This type of dignity-affirming transparency goes beyond what audits checking for algorithmic discrimination can provide. *See* Kroll et al., *supra* note 28, at 660–62 (discussing the advantages and limitations of auditing algorithms). At the same time, it is also important to acknowledge that "[t]echnical tools alone cannot reliably prevent discriminatory outcomes because the causes of bias often lie not in the code, but in broader social processes." Pauline T. Kim, *Auditing Algorithms for Discrimination*, 166 U. PA. L. REV. ONLINE 189, 191 (2017).

127. *See* Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Blinking on the Bench: How Judges Decide Cases*, 93 CORNELL L. REV. 1, 41 (2007) ("Although multifactor tests are ubiquitous, they are imperfect . . . . [M]ultifactor or balancing tests may be indeterminate, and applying or weighing some of the factors within the test may require intuition.").

128. *See* Gaines Pet Foods Corp. v. Martin Bros. Int'l, 692 F. Supp. 912, 915 (N.D. Ill. 1988) ("Factors can be assigned 'weights' to reach any result; . . . every case can be distinguished from every other case, and the distinction can justify a different balance, and hence a different result.").

II. MOTIVATING THE EMPLOYMENT ANALOGY

More than a decade ago, technoethicist Joanna Bryson offered what today stands as one of the only serious analogies between algorithms and labor. She argued that "[r]obots should be slaves."[129] Her proposal is not metaphorical or flippant. She sees deep social, political, and moral peril looming in the psychological tendency that many people have, and that many technologists encourage, to anthropomorphize robots. Individuals and institutions who view robots as people will misdirect resources to them, even when those resources could benefit human beings. More relevant to the concerns of this Article, Bryson also believes that anthropomorphizing robots can obscure who ultimately is responsible for bad outcomes. While it is hard to blame an inanimate tool like a hammer, it is far more natural to try to scapegoat an algorithm that seems more like an independently responsible entity. Bryson's recommended antidote: "[R]obots should be built, marketed and considered legally as slaves."[130] Categorizing robots as slaves would, she believes, firmly cement their status in our psyche as subhuman artifacts.[131]

Bryson proposes slavery because her goal is to counteract any tendency we might have to anthropomorphize algorithms. However, there are moral, technological, and pragmatic reasons to reject Bryson's slavery analogy. To begin: slavery in all its forms is moral anathema. As she says, there is no *real* ethical problem with subjugating mere artifacts. But slavery has unacceptable associations and implications, particularly when its justification is to restrict the category of persons of moral concern.[132] That is why the Thirteenth Amendment categorically banishes non-punitive "slavery" simpliciter,

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129. Joanna J. Bryson, *Robots Should Be Slaves*, *in* CLOSE ENGAGEMENTS WITH ARTIFICIAL COMPANIONS: KEY SOCIAL, PSYCHOLOGICAL, ETHICAL, AND DESIGN ISSUES 63, 63 (Yorick Wilks ed., 2010).

130. *Id.*

131. *Id.* at 64.

132. *See* Scott v. Sandford, 60 U.S. (19 How.) 393, 407 (1857) (enslaved party) ("[African Americans] had for more than a century before been regarded as beings of an inferior order, and altogether unfit to associate with the white race, either in social or political relations; and so far inferior, that they had no rights which the white man was bound to respect . . . ."), *superseded by constitutional amendment*, U.S. CONST. amend. XIV; Girardeau A. Spann, *Disparate Impact*, 98 GEO. L.J. 1133, 1162 (2010) ("Historically, the things that we have done to each other in the name of race always seemed legitimate to the white majority at the time that they were being done. . . . Slavery was legitimate because white supremacy made slaves subhuman.").

without any qualifications depending on the subject of servitude.[133] We should explore every other option before reviving that institution as a working legal and social category. Another concern is that Bryson's proposal would undermine algorithms' most important benefits. As explained at the start of this Article, Asimov's Second Law of Robotics—that robots should follow human orders—is not what we want of today's most advanced algorithms. The power of machine learning algorithms is precisely that they do not work slavishly.[134] Their creative capacity to learn allows them to outperform any series of commands a human could offer.[135] Lastly, there is a risk that treating robots as slaves would backfire. Bryson's objective is to prevent us from anthropomorphizing robots. But psychologists have found that abusing robots is one powerful way to provoke empathetic responses from human subjects.[136] So treating algorithms like slaves could stir a deeper impulse to see them as people.

Nevertheless, this Part explores one implication of Bryson's proposal. If we view robots as slaves, then we also conceive of them as a type of labor. Clearly, algorithms have productive capacities. We design them for precisely that purpose: to do things for us that we cannot or would rather not. This Part asks: What type of labor do/should algorithms best resemble?

A different labor analogy is available for the use corporations make of algorithms: employment. Abstracting away from the legal particularities of labor law, employment broadly refers to making use

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133.   U.S. CONST. amend. XIII, § 1 ("Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States.").

134.   *See* Shlomit Yanisky Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: An Alternative Model for Patent Law at the 3A Era*, 39 CARDOZO L. REV. 2215, 2220 (2018) ("AI advanced systems are becoming capable of creating unpredictable, innovative outcomes independently, rather than merely by following digital orders.").

135.   *See* Jo De Boeck, *Are AI Systems About To Outperform Humans?*, FORBES (Oct. 3, 2019, 8:40 AM), https://www.forbes.com/sites/forbestechcouncil/2019/10/03/are-ai-systems-about-to-outperform-humans [https://perma.cc/83K2-JKBC].

136.   *See generally* KATE DARLING, THE NEW BREED: HOW TO THINK ABOUT ROBOTS 203–88 (2021) (describing human reactions to violence directed at robots); Kate Darling, Palash Nandy & Cynthia Breazeal, *Emphatic Concern and the Effect of Stories in Human-Robot Interaction*, PROC. IEEE INT'L WORKSHOP ON ROBOT & HUM. COMMC'N (2015) (finding that empathic participants were more likely to hesitate before striking a robot that had been given a humanizing story); Charles Q. Choi, *Brain Scans Show Humans Feel for Robots*, IEEE SPECTRUM (Apr. 24, 2013), https://spectrum.ieee.org/brain-scans-show-humans-feel-for-robots [https://perma.cc/LS K6-5X6T].

of something.[137] Nothing in the broad concept of employment limits the employment relationship to human beings. Unlike "slavery," which entails "ha[ving] absolute power over the life, fortune, and liberty of another,"[138] "employment" connotes a constructive relationship. It better captures the creative cooperation that exists between corporations and algorithms while avoiding the moral and psychological pitfalls of the slavery analogy.

The three sections that follow offer further motivations for thinking of the relationship between corporations and their algorithms as a type of employment.

A. *Fungibility of Employee and Algorithmic Labor*

The most straightforward reason for thinking that corporations employ algorithms is the modern history of how corporations use them. Corporations self-consciously replace human employees with algorithms that perform identical functions. Algorithms now evaluate credit card applications, trade stocks, package boxes—all jobs that only human employees had not long ago. Algorithms may not count as "employees" in the labor law sense of the term—they are not under contract, and they need no wage or benefits.[139] But if corporations *employ* human beings, it stands to reason that corporations employ the algorithms that fulfill the exact same functions as human beings.

Pretending that corporations only employ humans and not algorithms opens the door to a destructive form of corporate gamesmanship. Corporations have many legitimate reasons for using algorithms. Well-designed algorithms often perform tasks more efficiently[140] and accurately[141] than their human counterparts. When corporations use such algorithms, society benefits overall. But not

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137. *Employ*, OXFORD ENGLISH DICTIONARY (3d ed. 2014).

138. *Slavery*, BLACK'S LAW DICTIONARY (11th ed. 2019).

139. *Employee*, BLACK'S LAW DICTIONARY (11th ed. 2019) ("Someone who works in the service of another person (the employer) under an express or implied contract of hire, under which the employer has the right to control the details of work performance.").

140. *See* Sonia K. Katyal, *Private Accountability in the Age of Artificial Intelligence*, 66 UCLA L. REV. 54, 65 (2019) ("Algorithms hold tremendous value. Big data promises significant benefits to the economy, allowing consumers to find and sort products more quickly, which in turn lowers search costs.").

141. *See* Matthew Adam Bruckner, *The Promise and Perils of Algorithmic Lenders' Use of Big Data*, 93 CHI.-KENT L. REV. 3, 23 (2018); Jason Kreag, *Prosecutorial Analytics*, 94 WASH. U. L. REV. 771, 773–74 (2017); Chris Anderson, *The End of Theory: The Data Deluge Makes the Scientific Method Obsolete*, WIRED (June 23, 2008, 12:00 PM), https://www.wired.com/2008/06/pb-theory [https://perma.cc/Q5QJ-EH42].

every corporate motivation for using algorithms is so laudable. Corporations also use algorithms to avoid accountability when things go wrong.[142] Under the general doctrine of corporate liability, corporations are only liable for harms that arise through employment.[143] If employment relationships only extend to human beings, corporations can reduce their liability risk by using algorithms instead.

This sort of immunity for algorithmic harms benefits corporations, but it reduces net social welfare and harms individuals in and out of the corporation. When corporations limit their liability but not the harmfulness of their conduct, they externalize some of the true costs of their operation. As every economist would predict, this means corporations will use algorithms even when, from a net social welfare standpoint, it would be best if they refrained.[144] In real-world terms, corporations will (and do) roll out algorithms prematurely, before risks of harm to others have been responsibly minimized.[145] They might, for example, use the streets of Phoenix as a proving ground for their self-driving cars.[146] By swapping to an algorithm, corporations can remove a potential liability—a human employee for whose misconduct the

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142.   Microsoft President and Chief Legal Officer Brad Smith has remarked, "We don't want to see a commercial race to the bottom. Law is needed." Cade Metz, *Is Ethical A.I. Even Possible?*, N.Y. TIMES (Mar. 1, 2019), https://www.nytimes.com/2019/03/01/business/ethics-artif icial-intelligence.html [https://perma.cc/DL9P-N27J]; *see also* Frank Pasquale, *Toward a Fourth Law of Robotics: Preserving Attribution, Responsibility, and Explainability in an Algorithmic Society*, 78 OHIO ST. L.J. 1243, 1244–45 (2017) (describing North Carolina's attempt to prohibit legal software manufacturers from attaining a lower standard of liability than attorneys, and the Federal Trade Commission and Department of Justice's criticism of North Carolina's decision).

143.   Product liability is a common exception to this general rule. Manufacturers are strictly liable when their defective products harm consumers. RESTATEMENT (SECOND) OF TORTS § 402A (AM. L. INST. 1965) (noting that strict products liability applies even though "the seller has exercised all possible care in the preparation and sale of his product"). As I have stated elsewhere, product liability will not apply to most algorithmic harms. Diamantis, *Algorithms Acting Badly*, *supra* note 32, at 823–26. Some courts, like the one deciding Wanda Holbrook's wrongful death case, have held that algorithms can qualify as products, even when they are not for general commercial distribution. Holbrook v. Prodomax Automation Ltd., No. 1:17-cv-219, 2021 WL 4260622, at *6 (W.D. Mich. Sept. 20, 2021). It bears noting, though, that such decisions are the exception. *Id*. at *6–*7 (discussing the conflict between applicable state law and the general rules reflected in the Restatement of Torts).

144.   *See* A.C. PIGOU, THE ECONOMICS OF WELFARE 184–86 (4th ed. 1938).

145.   *See, e.g.*, Kate Conger, *Uber's Driverless Cars Return to the Road After Fatal Crash*, N.Y TIMES (Dec. 20, 2018), https://www.nytimes.com/2018/12/20/technology/uber-driverless-cars-return.html [https://perma.cc/FW22-PT7Q] (noting that Uber's cars were still failing ten out of seventy safety tests as it got close to returning the cars to the road).

146.   *Uber Self-Driving Cars Are Being Tested in Arizona*, TECH. AZ (Oct. 14, 2019), https://techaz.org/uber-self-driving-cars-arizona [https://perma.cc/4LGM-6N5V].

corporation might have to pay. Algorithms either obscure liability or fail as a matter of law to transmit liability when they mess up. This algorithmic accountability gap mitigates the downside risk to corporations of the rush to automate—"Move fast and break things."[147] But using algorithms in this way is socially suboptimal. Hasty automation is bad for human employees because it unnecessarily accelerates their redundancy. And it is bad for victims of corporations because they are more likely to be left footing the bill for injuries that algorithms cause.

Corporations take advantage of this liability loophole and increasingly will as algorithms open new productive opportunities.[148] Human employees, victims of corporate harm, and society deserve better. The way to plug the liability loophole is to modernize the law of corporate liability for the coming age of automation. Corporations use human employees and algorithms for the same sorts of productive tasks. This should translate into parity between employees and algorithms when deciding the harm for which corporations must pay.

B. *Overlapping Enforcement Landscape*

From a corporate enforcement perspective, there are important structural similarities between human employees and algorithms that motivate abandoning any deep discontinuity in how corporate liability works with respect to them. The general law of corporate liability presently only holds corporations responsible for the misconduct of human employees.[149] Corporate doctrine responds to a familiar set of

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147. This is Facebook's unofficial motto and a rallying cry for much of Silicon Valley. David Kushner, *Facebook Philosophy: Move Fast and Break Things*, IEEE SPECTRUM (June 1, 2011), https://spectrum.ieee.org/facebook-philosophy-move-fast-and-break-things [https://perma.cc/H4NK-GCWY].

148. *See* Tom Barratt, Alex Veen & Caleb Goods, *How Algorithms Keep Workers in the Dark*, BBC (Aug. 27, 2020), https://www.bbc.com/worklife/article/20200826-how-algorithms-keep-workers-in-the-dark [https://perma.cc/65KM-HJGC] ("[I]t is almost impossible to complain about the decisions of the algorithm."); Sylvia Lu, *Algorithmic Opacity, Private Accountability, and Corporate Social Disclosure in the Age of Artificial Intelligence*, 23 VAND. J. ENT. & TECH. L. 99, 102 (2020) ("Algorithms are becoming a primary source of decision-making power, but are often privately owned and inscrutable, which allows them to hide from legal regimes and prevents regulators from understanding and reviewing them."); Madeleine Clare Elish, *Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction*, 5 ENGAGING SCI. TECH. & SOC'Y 40, 42 (2019) ("[A]ccountability appears to be deflected off of the automated parts of the system (and the humans whose control is mediated through this automation) and focused on the immediate human operators, who possess only limited knowledge, capacity, or control.").

149. *See generally* Thomas, *supra* note 44 (discussing the limitations of respondeat superior as applied to algorithmic decision-making).

enforcement challenges that employee misconduct creates. But algorithmic misconduct raises the same challenges. Similar problems call for similar solutions.

One goal of holding corporations accountable for employee misconduct is justice for victims. When a corporate employee harms someone, the most direct cause of action would ordinarily lie against the individual employee.[150] However, pursuing individual employees is a very uncertain route to securing justice for victims or preventing future harm. For one thing, individual employees are often judgment-proof. This means they lack adequate resources to compensate victims for the wrongs they suffered,[151] and financial penalties are unlikely to provide much of an incentive.[152] Even if liability could motivate employees, they are often not in the best position to prevent future corporate harms because they are not the true causal course behind the harm.[153] Environmental factors beyond an individual's control critically shape how employees behave.[154] A criminogenic business culture, inadequate training, and unrealistic performance quotas all increase the chances that otherwise upstanding employees will break the law.[155]

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150.   *See* United States v. Wise, 370 U.S. 405, 407 (1962) (holding that a corporate employee who broke the law is liable in his personal capacity even though he acted as a corporate agent).

151.   V.S. Khanna, *Corporate Criminal Liability: What Purpose Does It Serve?*, 109 HARV. L. REV. 1477, 1496 n.104 (1996) ("[A]lternatives to corporate liability, such as individual criminal liability for the agent, would also overcome the problem of judgment-proof agents.").

152.   *See* Rose & Squire, *supra* note 46, at 1683–84 ("[S]ince many employees are judgment proof, holding employers liable for employee conduct enhances deterrence by encouraging the employers to take measures that limit the costs their employees impose on third parties.").

153.   *See* Eli Lederman, *Models for Imposing Corporate Criminal Liability: From Adaptation and Imitation Toward Aggregation and the Search for Self-Identity*, 64 BUFF. CRIM. L. REV. 641, 688 (2000) ("[P]ersonnel changes will seldom lead to real changes in the organization's behavior and work processes."); *see also* M. David Ermann & Richard J. Lundman, *Corporate and Governmental Deviance: Origins, Patterns, and Reactions*, *in* CORPORATE AND GOVERNMENTAL DEVIANCE: PROBLEMS OF ORGANIZATIONAL BEHAVIOR IN CONTEMPORARY SOCIETY 3, 15–16 (M. David Ermann & Richard J. Lundman eds., 5th ed. 1996) (noting that while the U.S. intelligence community and cabinet members opposed Japanese internment in World War II, their opinions did not affect the president's decision).

154.   *See* JAMES S. COLEMAN, FOUNDATIONS OF SOCIAL THEORY 427 (1990); FIONA HAINES, CORPORATE REGULATION 25 (1997) ("Organizational culture forms the 'touchstone' by which individuals behave and act.").

155.   *See* Pamela H. Bucy, *Corporate Ethos: A Standard for Imposing Corporate Criminal Liability*, 75 MINN. L. REV. 1095, 1099–1101 (1991) (discussing how corporate ethos can "encourage" employee behavior); Cindy R. Alexander & Mark A. Cohen, *The Causes of Corporate Crime: An Economic Perspective*, *in* PROSECUTORS IN THE BOARDROOM 11, 17 (Anthony S. Barkow & Rachel E. Barkow eds., 2011) ("Instead of focusing on individual actions, we can consider crime as the outcome of company-level decisions."); Martin L. Needleman & Carolyn Needleman, *Organizational Crime: Two Models of Criminogenesis*, 20 SOC. Q. 517, 520–

True prevention would require addressing those. Corporate liability can be the legal cure to both problems. The deeper pockets of corporate employers are better suited to paying victims their full due.[156] And corporations are better positioned to change the organizational features that can induce individual employees to misbehave.[157]

The same concerns arise when there is no reliable pathway from algorithmic harms to corporate liability. While employees are practically judgment proof because they have shallow pockets, algorithms are not even cognizable defendants.[158] Victims of algorithmic misconduct often have no legal recourse at all. This can also mean that there is no direct way for victims and prosecutors to induce algorithms to behave. Once again, corporate liability provides a solution: a path to justice for victims and a defendant with the power to effectuate change.

Even after deciding that corporations should be liable for employee and algorithmic misconduct, overlapping justice and preventive challenges arise. At the heart of the justice challenge for employee misconduct is the fact that corporate liability is vicarious— an employee misbehaves and a different person, the corporate employer, has to pay.[159] While vicarious liability is a familiar part of both civil and criminal law, it is fraught with potential ethical pitfalls.[160]

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22 (1979) (introducing and exploring the concept of crime-facilitative corporate systems in which participants are not compelled to perform illegal acts, but rather face extremely tempting structural conditions that encourage or facilitate crime).

156.   Charles J. Walsh & Alissa Pyrich, *Corporate Compliance Programs as a Defense to Criminal Liability: Can a Corporation Save Its Soul?*, 47 RUTGERS L. REV. 605, 636 (1995) ("Prosecuting the corporate entity can allocate responsibility to a party able to be penalized or pay compensation, even where an individual wrongdoer cannot be identified.").

157.   *See* Mihailis E. Diamantis, *Clockwork Corporations: A Character Theory of Corporate Punishment*, 103 IOWA L. REV. 507, 565–68 (2018); Jennifer Arlen & Reinier Kraakman, *Controlling Corporate Misconduct: An Analysis of Corporate Liability Regimes*, 72 N.Y.U. L. REV. 687, 702 (1997) ("Firms can structure their compensation and promotion policies to encourage or discourage many forms of misconduct.").

158.   Thomas Beardsworth & Nishant Kumar, *Who To Sue When a Robot Loses Your Fortune*, BLOOMBERG (May 5, 2019, 8:00 PM), https://www.bloomberg.com/news/articles/2019-05-06/who-to-sue-when-a-robot-loses-your-fortune [https://perma.cc/42QB-3KGY] ("Robots are getting more humanoid every day, but they still can't be sued.").

159.   John C. Coffee, Jr., *Does "Unlawful" Mean "Criminal"?: Reflections on the Disappearing Tort/Crime Distinction in American Law*, 71 B.U. L. REV. 193, 195 (1991) ("[C]orporate criminal liability (at least as recognized in the United States) is a species of vicarious criminal liability; that is, the principal is held liable for the acts of its agent—even when the principal makes a substantial good faith attempt to monitor the agent and prevent the illegality.").

160.   Alschuler, *supra* note 116.

As a general rule, sanctioning one party for another's misconduct violates the moral principle that fault is personal.[161] Vicarious liability can be justified, but only in limited circumstances and by special considerations. For example, parents may be vicariously liable for the torts of their minor children because of the unique role parents have in shaping their children and the social unity of the family structure.[162] The law takes on a similar justificatory burden when it holds corporations vicariously liable for employee misconduct.

The basic preventive challenge to holding corporations liable for employee misconduct is that corporations are not in full control of what employees do. The familiar economic phenomenon of agency costs means that corporations can never perfectly monitor or direct employee behavior.[163] From an enforcement perspective, this means that no compliance program can ever be perfect.[164] There will always be some space for employees to exercise undetected discretion. In that space, economically rational employees will act in their personal interest,[165] sometimes even if that means breaking the law.[166] Since corporations cannot always control what employees do, they cannot

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161. *See* Scales v. United States, 367 U.S. 203, 224–25 (1961) ("In our jurisprudence guilt is personal . . . ."); DAN B. DOBBS, PAUL T. HAYDEN & ELLEN M. BUBLICK, 2 THE LAW OF TORTS § 425 (2d ed. 2011) ("[Vicarious liability] is an important exception to the usual rule that each person is accountable for his own legal fault but in the absence of such fault is not responsible for the actions of others."); Shawn Bayern, *Three Problems (and Two Solutions) in the Law of Partnership Formation*, 49 U. MICH. J.L. REFORM 605, 622–23 (2016) ("To the contrary, in the usual case, parties are not legally responsible for the actions of others; it requires an exceptional doctrine . . . to cause one party to be liable for another's actions.").

162. *See* RESTATEMENT (SECOND) OF TORTS § 316 (AM. L. INST. 1965) ("[The father] is responsible for [his children's] conduct in so far as he has the ability to control it. This duty is not peculiar to a father. It extends to the mother also in so far as her position as mother gives her an ability to control her child.").

163. *See* Alchian & Demsetz, *supra* note 29, at 780; Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 313 (1976).

164. Peter J. Henning, *Corporate Criminal Liability and the Potential for Rehabilitation*, 46 AM. CRIM. L. REV. 1417, 1430 (2009) ("No compliance program is perfect . . . .").

165. Zohar Goshen & Richard Squire, *Principal Costs: A New Theory for Corporate Law and Governance*, 117 COLUM. L. REV. 767, 775 (2017) ("[Employees have a] natural incentive to advance their personal interests even when those interests conflict with the goal of maximizing their firm's value.").

166. *See generally* Cindy R. Alexander & Mark A. Cohen, *Why Do Corporations Become Criminals? Ownership, Hidden Actions, and Crime as an Agency Cost*, 5 J. CORP. FIN. 1 (1999) (discussing corporate crime as an agency cost).

guarantee that employees will always obey the law. No legal threat can overcome that economic conundrum.[167]

Structurally similar justice and preventive challenges would arise if corporations were held liable for algorithmic harms, especially where autonomous, machine learning algorithms are concerned. Since such algorithms can behave "on their own" in unexpected ways, they can resemble independent entities rather than mere tools of production.[168] If that is right, policymakers would owe corporations a solid rationale to overcome the prima facie injustice of vicarious liability. Furthermore, since there is some measure of unpredictability inherent in advanced algorithms, nothing corporations can do could ever guarantee that their algorithms will not hurt anyone.[169] So, the law would need to explain how corporate liability can help prevent algorithmic harm.

The overlapping corporate enforcement landscape—goals and challenges—for employees and algorithms strengthens the case for treating the two similarly in the law. The next Part lays out how the law currently achieves its enforcement goals and meets the challenges of holding corporations accountable for what individual employees do. As argued below, the same strategies could meet the enforcement challenges for algorithms. First, though, the next Section offers a brief history of how corporations have exploited a formalistic understanding of employment to shield themselves from liability.

C. *The Precedent of Contract Workers*

The strategy of shifting functions away from employees to avoid liability is an old page out of a longstanding corporate playbook. While corporations have always needed labor, they have also always been adept at finding advantageous ways to reclassify the sort of labor they have. By manipulating the line between who counts as an employee, corporations have managed to avoid responsibility to and for their

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167.   Irwin Schwartz, *Toward Improving the Law and Policy of Corporate Criminal Liability and Sanctions*, 51 AM. CRIM. L. REV. 99, 112 (2014) ("No organization—private or government—can prevent all misconduct by all employees, all of the time.").

168.   Ravid & Liu, *supra* note 134, at 2225 ("[Autonomy] is one of the most important [features] to understand in order to grasp AI systems in general and their departure from the framework of current patent law.").

169.   Anat Lior, *The AI Accident Network: Artificial Intelligence Liability Meets Network Theory*, 95 TUL. L. REV. 1103, 1108 (2021) ("Much of the legal discussion surrounding AI entities derives from our basic fear as a society to be susceptible to injuries and damages from these unpredictable entities.").

workers. As detailed in this Section, there has been a long-standing push and pull between corporations and legal reformers over which people count as employees: temp workers, contract workers, gig workers. In the modern retelling of this story, corporations draw increasingly on automated systems and thereby re-create familiar problems of using nonemployee labor.

"Employment laws by their very terms depend on the identification of an employee and an employment relationship."[170] Behind that seeming tautology lies a strategic opportunity that corporations learned to exploit over a century ago. Not all people who do work for corporations qualify as their "employees." Alternative work arrangements have had many forms and gone by many names over the decades: contract workers, temps, independent contractors, gig workers, etc. They cover every major industry, from transportation, construction, and hospitality, to office work, medicine, and information technology.[171] By strategically delegating operations to nonemployee workers, corporations can eliminate legal liabilities they would face if employees had undertaken identical tasks.[172] This maneuver leaves workers and society materially worse off. Legislative, judicial, and scholarly responses pave a path that could also work for current corporate efforts to replace employees with algorithms.

There are several reasons corporations might want nonemployee workers. The most economically legitimate reason is that it is easier to expand and contract a nonemployee workforce in response to market demand.[173] Temp agencies and gig workers are quick to fill any labor shortage, and labor contracts end when corporate need peters out. The less savory reason that many corporations prefer nonemployees is to eliminate many of the obligations that employers ordinarily owe. On average, legally mandated employee benefits and protections account for about 30 percent of an employee's cost.[174] These benefits include

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170. Richard R. Carlson, *Why the Law Still Can't Tell an Employee When It Sees One and How It Ought To Stop Trying*, 22 BERKELEY J. EMP. & LAB. L. 295, 296 (2001).

171. KATHERINE LIM, ALICIA MILLER, MAX RISCH & ELEANOR WILKING, INDEPENDENT CONTRACTORS IN THE U.S.: NEW TRENDS FROM 15 YEARS OF ADMINISTRATIVE TAX DATA 38 (2019) (visualizing the prevalence of independent contractors across industries).

172. *See* Carlson, *supra* note 170, at 304–06, 314–15.

173. STANLEY NOLLEN & HELEN AXEL, MANAGING CONTINGENT WORKERS 22 (1996).

174. *See* U.S. BUREAU OF LAB. STAT., USDL-21-1094, EMPLOYER COSTS FOR EMPLOYEE COMPENSATION — MARCH 2021, at 1 (2021) (finding that the average cost to employers for civilian workers averaged $39.01 per hour with wages accounting for $26.84); *see also* Barbara Weltman, *How Much Does an Employee Cost You?*, U.S. SMALL BUS. ASS'N (Aug. 22, 2019), https://www.sba.gov/blog/how-much-does-employee-cost-you [https://perma.cc/V3UN-QSTM]

401k and retirement plan contributions, unemployment insurance, health insurance, and paid time off for vacation, parental leave, and sick days.[175] Employee protections include nondiscrimination, workplace safety, collective bargaining rights, and the like.[176] Of particular concern for this Article, one important liability that corporations can also avoid by using nonemployees is liability for worker torts[177] and crimes.[178] Corporations jealously guard this legal immunity for nonemployee misconduct.[179]

The back and forth between corporations trying to avoid responsibility for workers and lawmakers reasserting corporate accountability has lasted nearly a century. When corporations start to abuse the so-called "contractor defense," courts and lawmakers respond by expanding the definition of "employment" to include certain contract workers. Early corporate attempts to manipulate the contractor defense in the late nineteenth century were rather simplistic. One corporation tried to set the stage for the defense by simply prohibiting a worker from using its name in interactions with

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("There's a rule of thumb that the cost [of an employee] is typically 1.25 to 1.4 times the salary, depending on certain variables.").

   175.   *See* Weltman, *supra* note 174 (noting the mandatory added costs of an employee include payroll costs such as the employer's share of FICA, federal unemployment tax (FUTA), and state unemployment taxes); *see also* Julia Tomassetti, *The Contracting/Producing Ambiguity and the Collapse of the Means/Ends Distinction in Employment*, 66 S.C. L. REV. 315, 327–28 (2014) (discussing the myriad of protections granted by employment status: "access to social insurance and welfare benefits; protection against discrimination . . . ; the right to a healthy and safe workplace; rights to a minimum wage and overtime pay; protected family and medical leave; workplace organizing and collective bargaining rights; and certain privacy rights").

   176.   *See generally* AFL-CIO, YOUR RIGHTS AT WORK 2–30 (2013) (describing substantive legal protections for employees).

   177.   Daryl J. Levinson, *Collective Sanctions*, 56 STAN. L. REV. 345, 393 (2003) ("Employers, likewise, may avoid vicarious liability for the torts of their employees by hiring fewer employees and more (potentially insolvent) independent contractors."); Alan O. Sykes, *The Economics of Vicarious Liability*, 93 YALE L.J. 1231, 1261–71 (1984); Sproul v. Hemmingway, 31 Mass. (14 Pick.) 1, 5 (1833).

   178.   Stevens v. Spec, Inc., 637 N.Y.S.2d 979, 979 (1996) (absolving nightclub of liability for assault perpetrated on guest by independent contractor); 2 CORPORATE COUNSEL GUIDELINES § 5:5 (2020) (describing the general rule for corporate criminal liability for conduct by an employee and one exceptional case, United States v. Parfait Powder Puff Co., 163 F.2d 1008 (7th Cir. 1947), where a court held a corporation liable for crimes of an independent contractor).

   179.   *See* Anderson v. Marathon Petroleum Co., 801 F.2d 936, 942 (7th Cir. 1986) (finding no liability for a large corporation for an accident resulting from the negligent sandblasting of an independent contractor); Huddleston v. Union Rural Elec. Ass'n, 841 P.2d 282, 285–86 (Colo. 1992) (en banc) (concerning a claim by an electric utility that they were not liable for a deadly plane crash caused by an independent contractor pilot).

customers.[180] The Supreme Court determined that corporations would have to try harder; merely manipulating surface features of the employment relationship would not suffice to reclassify employees as contractors.

In the early twentieth century, corporations became more sophisticated by layering intermediary relationships between themselves and their workers. Garment manufacturers would, for example, contract with sweatshops to produce their products.[181] Several other industries would utilize middlemen who employed children.[182] In so doing, corporations hoped to distance themselves legally and reputationally from violations of worker protection and child welfare laws. The intermediaries who directly employed these workers were often judgment-proof and cared little for their public image.[183] New Deal legislators responded to such abuses in 1938 by passing the Fair Labor Standards Act, which defined "employ" expansively as "to suffer or permit to work."[184] The goal was to hold end-user corporations to account for workplace violations even if they used intermediary firms.[185] Accordingly, the Supreme Court found in *Rutherford Food Corp. v. McComb*[186] that the Act applied "to many persons and working relationships, which [beforehand] were not deemed to fall within the employer-employee category."[187]

The next major thrust and parry between corporations and workers over the definition of employment came about in the 1970s with the rise of "contingent labor."[188] Corporations were feeling increasingly burdened by the various New Deal labor laws that

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180.   Singer Mfg. Co. v. Rahn, 132 U.S. 518, 523–24 (1889) ("The provision of the contract that Corbett shall not use the name of the company . . . does not and cannot affect its responsibility to third persons injured by his negligence, in the course of his employment.").

181.   Cynthia Estlund, *Who Mops the Floors at the Fortune 500? Corporate Self-Regulation and the Low-Wage Workplace*, 12 LEWIS & CLARK L. REV. 671, 688–89 (2008).

182.   Antenor v. D & S Farms, 88 F.3d 925, 929 n.5 (11th Cir. 1996).

183.   Brishen Rogers, *Toward Third-Party Liability for Wage Theft*, 31 BERKELEY J. EMP. & LAB. L. 1, 20 (2010).

184.   29 U.S.C. § 203(g).

185.   Bruce Goldstein, Marc Linder, Laurence E. Norton II & Catherine K. Ruckelshaus, *Enforcing Fair Labor Standards in the Modern American Sweatshop: Rediscovering the Statutory Definition of Employment*, 46 UCLA L. REV. 983, 1015–18 (1999).

186.   Rutherford Food Corp. v. McComb, 331 U.S. 722 (1947).

187.   *Id.* at 729.

188.   George Gonos, *Evolution of the Law of Temporary Work in America*, 10 EMP. RTS. & EMP. POL'Y J. 233, 234 (2006).

extended new protections to employees.[189] Temporary work agencies offered a solution. They facilitated triangular work relationships in which the temp agencies formally served in the role of "employers" who assigned their "employees" to work for end-user corporations.[190] Temp agencies paid the workers, while end-user corporations supervised their work.[191] This allowed corporations to benefit from the workers' labor while "avoid[ing] most of the legal, social and contractual obligations they held toward direct employees."[192] Workers who felt their rights were being violated were largely limited to suing the temp agencies who formally employed them, as were plaintiffs and prosecutors alleging worker torts and crimes.[193] The suits against temp agencies were often to no avail. Many temp agencies would go bankrupt or simply disappear when trouble came knocking.[194] Today, approximately sixteen million people work for temp agencies.[195]

As corporations disclaimed responsibility for temp workers, some courts, regulators, and scholars pushed back by recharacterizing temp workers as employees of end-user businesses. Scholars have proposed various strategies for liberalizing the definition of employment to accomplish this goal.[196] Over the years, some courts have obliged. For example, in 1992, temp workers sued Microsoft alleging that they performed the same work as full employees and should be classified as

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189.   Kati L. Griffith, *The Fair Labor Standards Act at 80: Everything Old Is New Again*, 104 CORNELL L. REV. 557, 559–66 (discussing the cat-and-mouse game between business and regulators in enforcement of the FLSA).

190.   *"Renting" Workers to Industry*, FORTUNE, Sept. 1960, at 254 (describing the triangular work relationships that arose in the mid-twentieth century).

191.   Yuval Feldman, *Ex-Ante vs. Ex-Post: Optimizing State Intervention in Exploitative Triangular Employment Relationships*, 30 COMPAR. LAB. L. & POL'Y J. 751, 752 (2009).

192.   Gonos, *supra* note 188, at 240.

193.   Noah D. Zatz, *Working Beyond the Reach or Grasp of Employment Law*, in THE GLOVES-OFF ECONOMY: WORKPLACE STANDARDS AT THE BOTTOM OF AMERICA'S LABOR MARKET 31, 37–42 (Annette Bernhardt, Heather Boushey, Laura Dresser & Chris Tilly eds., 2008) (discussing the difficulties faced by employees in challenging actions by employers who have spread their functions across multiple interlocking contractors).

194.   Jonathan P. Hiatt, *Policy Issues Concerning the Contingent Workforce*, 52 WASH. & LEE L. REV. 739, 743 (1995).

195.   *See Annual Temporary and Contract Staffing Employment in the United States from 2000 to 2019*, STATISTA (Aug. 2020), https://www.statista.com/statistics/220682/us-total-annual-temp orary-employment [https://perma.cc/4S98-LTSU].

196.   Stephen F. Befort, *The Regulatory Void of Contingent Work*, 10 EMP. RTS. & EMP. POL'Y J. 245, 253 (2006) (defining employee to include "workers who labor under subordinate circumstances"); Cunningham-Parmeter, *supra* note 35, at 1704–14 (proposing a broader understanding of "control").

such for benefits purposes.[197] Microsoft settled the suit in 2000 for $97 million.[198] Courts have helped by recognizing the possibility of joint employment relationships where the temp agency and the end-user corporation could both count as employers of temp workers. For example, in 2015, the Fourth Circuit determined that a temp worker who performed the same tasks for a corporate end-user as other employees could be considered an employee of the end-user in a Title VII harassment claim.[199] In 2016, the Department of Labor agreed, committing itself to pursuing more joint employment claims against end-user corporations who are "clearly playing games, and clearly trying to shift responsibility [to temp agencies]."[200] In 2020, a federal court validated that approach.[201]

The most recent and sweeping corporate effort to reclassify workers as nonemployees centers on the mushrooming "gig economy."[202] Gig workers are independent contractors who perform on-demand services.[203] From Uber drivers to Airbnb hosts to Instacart

197. Dave Wilson, *Microsoft To Pay $97 Million To End Temp Worker Suit*, L.A. TIMES (Dec. 13, 2000, 3:00 AM), https://www.latimes.com/archives/la-xpm-2000-dec-13-fi-64817-story.html [https://perma.cc/R2VC-QFT6] (noting that "the U.S. 9th Circuit Court of Appeals found that employers must make the same retirement benefits available to everyone" and those "who worked for Microsoft for at least five months a year [were] entitled to money they would have received if they had been able to purchase the company's stock at a discount").

198. *Id.*

199. Butler v. Drive Auto. Indus. of Am., 793 F.3d 404, 415 (4th Cir. 2015). In *Faush v. Tuesday Morning, Inc.*, the Third Circuit reached a similar result for a temp worker claiming the protections that Title VII extends to employees against race-based hostility. Faush v. Tuesday Morning, Inc., 808 F.3d 208, 218–19 (3d Cir. 2015).

200. Lydia DePillis, *Department of Labor Sends Warning Shot to Clients of Temp Staffing Agencies*, WASH. POST (Jan. 20, 2016, 8:57 AM), https://www.washingtonpost.com/news/wonk/wp/2016/01/20/department-of-labor-sends-warning-shot-to-clients-of-temp-staffing-agencies [https://perma.cc/BNX2-JYJH] (discussing U.S. Dep't of Lab., Wage & Hour Div., Opinion Letter on Joint Employment Under the Fair Labor Standards Act and Migrant and Seasonal Agricultural Worker Protection Act (Jan. 20, 2016), 2016 WL 284582).

201. *See* New York v. Scalia, 490 F. Supp. 3d 748, 793 (S.D.N.Y. 2020) (determining the Department of Labor's 2020 departure from the 2016 interpretation was arbitrary and capricious because the department did not justify the inconsistency).

202. Noam Scheiber, *A Middle Ground Between Contract Worker and Employee*, N.Y. TIMES (Dec. 10, 2015), https://www.nytimes.com/2015/12/11/business/a-middle-ground-between-contract-worker-and-employee.html [https://perma.cc/55MR-8TQ5].

203. SARAH A. DONOVAN, DAVID H. BRADLEY & JON O. SHIMABUKURO, CONG. RSCH. SERV., R44365, WHAT DOES THE GIG ECONOMY MEAN FOR WORKERS? 1 (2016), https://www.fas.org/sgp/crs/misc/R44365.pdf [https://perma.cc/9XFF-F7V8] ("[G]ig workers enter into formal agreements with on-demand companies (e.g., Uber, TaskRabbit) to provide services to the company's clients.").

shoppers, the gig economy has exploded since the Great Recession[204] to include fifty-five million independent contractors, or more than one-third of the total workforce.[205] Far from considering these workers as employees, corporations advance a narrative under which gig workers are entrepreneurs who work only for themselves.[206] Though Uber recruits hundreds of thousands of "driver-partners" every month,[207] it claims that it "does not employ drivers or own any vehicles."[208] Corporations who rely on gig workers can exploit their classification as independent contractors to save a lot of money.[209] The law has largely accepted the independent contractor narrative, which immunizes Uber and other corporations from having to offer basic employment rights and benefits.[210] Uber claims this same defense immunizes it from

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204.   Marcin Zgola, *Will the Gig Economy Become the New Working-Class Norm?*, FORBES (Aug. 12, 2021), https://www.forbes.com/sites/forbesbusinesscouncil/2021/08/12/will-the-gig-econ omy-become-the-new-working-class-norm/?sh=5983ba86aee6 [https://perma.cc/6JMR-UM9Z].

205.   Nandita Bose, *U.S. Labor Secretary Supports Classifying Gig Workers as Employees*, REUTERS (Apr. 29, 2021, 11:50 AM), https://www.reuters.com/world/us/exclusive-us-labor-secre tary-says-most-gig-workers-should-be-classified-2021-04-29 [https://perma.cc/U4BQ-S7QF] ("As many as 55 million people in the United States were gig workers - or 34% of the workforce - in 2017, according to the International Labor Organization, and the total was projected to rise to 43% in 2020."); TJ McCue, *57 Million U.S. Workers Are Part of the Gig Economy*, FORBES (Aug. 31, 2018, 5:30 PM), https://www.forbes.com/sites/tjmccue/2018/08/31/57-million-u-s-workers-are-part-of-the-gig-economy [https://perma.cc/73J2-U2BS] ("More than one third (36 percent) of U.S. workers are in the gig economy, which works out to a very large number of approximately 57 million people.").

206.   *Drive With Uber: An Alternative to Traditional Driving Jobs*, UBER, https://www.uber.com/us/en/drive [https://perma.cc/TNF5-KCW9] (discussing the benefits of driving for Uber in terms of the flexibility to work when you choose).

207.   Prahjeet Singh, *Keeping Driver Partners at Heart*, UBER (Dec. 20, 2018), https://www.uber.com/en-IN/newsroom/keeping-driver-partners-at-heart [https://perma.cc/NW 89-TXJE]; *see also* Ellen Huet, *Uber Is Adding 'Hundreds of Thousands' of New Drivers Every Month*, FORBES (June 3, 2015, 11:05 PM), https://www.forbes.com/sites/ellenhuet/2015/06/03/ uber-adding-hundreds-of-thousands-of-new-drivers-every-month [https://perma.cc/SDV2-F6DH] ("Uber is adding 'hundreds of thousands' of drivers globally every month . . . and has 26,000 active drivers in New York, 15,000 in London, 10,000 in Paris and 22,000 in San Francisco, the company said.").

208.   Goldberg v. Uber Techs., Inc., No. 14-14264-RGS, 2015 WL 1530875, at *1 (D. Mass. Apr. 6, 2015).

209.   Cunningham-Parmeter, *supra* note 35, at 1689–90; Rogers, *supra* note 183, at 15.

210.   Natasha Singer, *In the Sharing Economy, Workers Find Both Freedom and Uncertainty*, N.Y. TIMES (Aug. 16, 2014), https://www.nytimes.com/2014/08/17/technology/in-the-sharing-economy-workers-find-both-freedom-and-uncertainty.html [https://perma.cc/9BFA-NGAD] (explaining that companies that rely on gig workers "require [them] to work as independent contractors and, as such, the workers don't qualify for employee benefits like health insurance, payroll deductions for Social Security or unemployment benefits"); Orly Lobel, *We Are All Gig Workers Now: Online Platforms, Freelancers & the Battles over Employment Status & Rights During the Covid-19 Pandemic*, 57 SAN DIEGO L. REV. 919, 934 (2020) ("While gig companies

liability for harm that Uber drivers cause, from physical injury to passengers[211] to discrimination against disabled customers.[212]

Once again, scholars', regulators', and courts' solution to the corporate accountability gap in the gig economy has been to recognize that many corporations actually do *employ* their gig workers.[213] According to one leading scholar, "there is a way to correct this growing asymmetry [between corporations and gig workers], and it begins by reassessing what it means to employ workers today."[214] The U.S. labor secretary seems to agree; earlier this year, he announced his support for classifying gig workers as employees,[215] as the United Kingdom already has done.[216]

Some courts are already pushing in that direction. The Ninth Circuit and Kansas Supreme Court found in 2014 that drivers whom FedEx classified as independent entrepreneurs were actually

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profit from the increase in demand, gig workers have been typically classified as independent contractors, working without health care benefits or sick leave options. Independent contractors are also generally not covered by federal and state health and safety regulations.").

211. *E.g.*, Search v. Uber Techs., Inc., 128 F. Supp. 3d 222, 232 (D.D.C. 2015) (rejecting Uber's argument that it did not employ a tortfeasor-driver); Anthony Juzaitis, *The Liability Impact of Gig Worker Status*, BLOOMBERG L. (Nov. 14, 2019), https://news.bloomberglaw.com/bloomberg-law-analysis/analysis-the-liability-impact-of-gig-worker-status [https://perma.cc/Z25C-4MAR] ("Classifying workers as employees helps protect consumers, too. The tort doctrine of *respondeat superior*, for example, holds employers liable for injuries caused by their employees' negligence . . . . Uber and other companies in the gig economy are trying to change all that."); *cf.* RESTATEMENT (SECOND) OF TORTS § 409 (AM. L. INST. 1965) ("Except as stated in [listed section numbers], the employer of an independent contractor is not liable for physical harm caused to another by an act or omission of the contractor or his servants.").

212. *E.g.*, Ramos v. Uber Techs., Inc., No. SA-14-CA-502, 2015 WL 758087, at *5 (W.D. Tex. 2015) ("Uber argues that it is not a place of public accommodation as a matter of law."); *see also* Agnieszka A. McPeak, *Sharing Tort Liability in the New Sharing Economy*, 49 CONN. L. REV. 171, 174 (2016) ("Uber classifies its drivers as independent contractors (and not employees) and maintains that it is not a common carrier—classifications that save Uber from complying with regulatory mandates and alter the liability analysis under tort law.").

213. Perhaps seeing the writing on the wall, some tech companies are pro-actively reclassifying their gig workers as employees. John Utz, *What Is a "Gig"? Benefits for Unexpected Employees*, 62 PRAC. L. 19, 33 (2016) ("[T]here may be some modest trend toward intermediaries in the gig economy choosing to treat gig workers as employees, including for employee benefit plan purposes.").

214. Cunningham-Parmeter, *supra* note 35, at 1677.

215. Bose, *supra* note 205 ("We are looking at it but in a lot of cases gig workers should be classified as employees . . . ." (quoting Marty Walsh, U.S. Sec'y of Lab.)).

216. Uber BV v. Aslam [2021] UKSC 5, [92] (appeal taken from Eng.) ("[T]he findings of the employment tribunal justified its conclusion that, although free to choose when and where they worked, at times when they are working drivers work for and under contracts with Uber (and, specifically, Uber London).").

employees.[217] "[I]f a worker is hired like an employee, dressed like an employee, supervised like an employee, compensated like an employee, and terminated like an employee," then they are an employee regardless of academic corporate machinations.[218] More recently, California courts recognized that Uber and Lyft drivers are employees entitled to benefits that the ride-sharing companies had denied them.[219] The California courts drew from a landmark 2018 precedent, *Dynamex Operations West, Inc. v. Superior Court*,[220] which held the definition of "employee" must be "interpreted and applied broadly to include . . . all individual workers who can reasonably be viewed as 'working in the [hiring entity's] business.'"[221] In light of this standard, Uber's and Lyft's classification of their drivers as independent contractors "fl[ew] in the face of economic reality and common sense . . . . To state the obvious, drivers are central, not tangential, to Uber and Lyft's entire ride-hailing business."[222]

The preceding discussion begs the question of what the legal test for employment is. For more than a century, courts evaluating employment relationships have been prepared to look through corporations' proffered narrative. In 1914, Judge Learned Hand wrote of a coal company that purported to lease mining rights to independent miners from whom it then purchased coal: "It is absurd to class such a

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217. Slayman v. FedEx Ground Package Sys., Inc., 765 F.3d 1033, 1047 (9th Cir. 2014); Craig v. FedEx Ground Package Sys., Inc., 335 P.3d 66, 92 (Kan. 2014).

218. *Craig*, 335 P.3d at 81.

219. People v. Uber Techs., Inc., 270 Cal. Rptr. 3d 290, 312–15 (2020), *aff'g* No. CGC-20-584402, 2020 WL 5440308 (Cal. Super. Ct. Aug. 10, 2020), *review denied* (Feb. 20, 2021) (affirming the trial court's preliminary injunction requiring Uber and Lyft to treat its employees under the FLSA on the grounds that California was likely to succeed on the merits of its statutory claim).

220. Dynamex Operations W., Inc. v. Superior Ct., 416 P.3d 1 (Cal. 2018).

221. *Id.* at 32 (emphasis omitted) (quoting Martinez v. Combs, 231 P.3d 259, 281 (Cal. 2010)).

222. People v. Uber Techs., Inc., No. CGC-20-584402, 2020 WL 5440308, at *3 (Cal. Super. Ct. Aug. 10, 2020). This decision was not the end of the saga over Uber and Lyft drivers in California. In response to the decision, Uber and Lyft and other tech companies spent a record $205 million to lobby for a ballot measure in California, Proposition 22, that would have characterized drivers as independent contractors. Though the measure passed, many voters felt they had been misled. Faiz Siddiqui & Nitasha Tiku, *Uber and Lyft Used Sneaky Tactics To Avoid Making Drivers Employees in California, Voters Say. Now, They're Going National.*, WASH. POST (Nov. 17, 2020, 7:00 AM), https://www.washingtonpost.com/technology/2020/11/17/uber-lyft-prop22-misinformation [https://perma.cc/7M9Y-XQTW]. In August 2021, a California trial court ruled that Proposition 22 violated the California constitution and was unenforceable. Castellanos v. State, No. RG21088725, 2021 WL 3730951, at *2–5 (Cal. Super. Ct. Aug. 20, 2021), *appeal docketed*, No. A163655 (Cal. Ct. App. Sept. 22, 2021); Justin Ray, *Prop. 22 Is Ruled Unconstitutional: What It Means, How Apps Reacted and What Happens Next*, L.A. TIMES (Aug. 23, 2021, 9:10 AM), https://www.latimes.com/california/newsletter/2021-08-23/proposition-22-lyft-uber-decision-essential-california [https://perma.cc/GE2T-HU5H].

miner as an independent contractor . . . . He has no capital, no financial responsibility . . . . By him alone is carried on the company's only business; he is their 'hand,' if any one is."[223] Today, courts use several different tests for employment, depending on the legal right being asserted.[224] While the details of the tests vary, the control that a corporation exercises over a worker from whom it benefits has emerged as a defining element.[225] Even in overcoming the general rule that corporations are only liable for the torts and crimes of employees, courts will treat independent contractors as employees where corporations exercise sufficient control.[226] In assessing the extent of corporate control over a contractor, courts look through formalities to consider "all of the incidents of the relationship"[227] and assess the "economic reality"[228] of the situation.

As this Section has shown, corporations have a long history of manipulating the formal definition of "employment" to benefit from workers' labor but to avoid liability for it. For over a century, corporations have transferred productive capacity to nonemployees like temp and gig workers who in many respects are functionally identical to employees. This allowed corporations to immunize themselves from legal requirements to respect employee rights and benefits and, more importantly for purposes of this Article, to avoid liability for workers' torts and crimes. Now, by rapidly transferring functionality to algorithms, corporations can recreate the same immunities. For contract workers, the solution scholars and lawmakers hit upon is to extend the law's understanding of the employment relationship to cover some independent contractors and the corporations who ultimately control and benefit from their work. As

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223.   Lehigh Valley Coal Co. v. Yensavage, 218 F. 547, 552–53 (2d Cir. 1914).

224.   Grant E. Brown, Comment, *An Uberdilemma: Employees and Independent Contractors in the Sharing Economy*, 75 Md. L. Rev. Endnotes 15, 17 (2016) ("These inconsistent tests [for employment] are a result of the many different bodies of employment law.").

225.   Lisa J. Bernt, *Suppressing the Mischief: New Work, Old Problems*, 6 Ne. U. L.J. 311, 319 (2014).

226.   *See* Beil v. Telesis Constr., Inc., 11 A.3d 456, 466–67 (Pa. 2009); *see also* Bowers v. Trinity Groves, No. 3:21-CV-0411-B, 2021 WL 3710564, at *1 (N.D. Tex. Aug. 20, 2021) (dismissing Plaintiff's claims without prejudice against the corporation that owned and operated the property on which a valet company's attendant allegedly stole a patron's property).

227.   NLRB v. United Ins. Co. of Am., 390 U.S. 254, 258 (1968).

228.   Souder v. Brennan, 367 F. Supp. 808, 813 (D.D.C. 1973) ("Economic reality is the test of employment . . . ."); Real v. Driscoll Strawberry Assocs., Inc., 603 F.2d 748, 754–55 (9th Cir. 1979) (adopting a definition of "employee" that considers the economic realities of the work relationship); Goldstein et al., *supra* note 185, at 1008 ("[C]ourts have used the economic reality test to determine whether a putative employer has employed a worker . . . .").

proposed next, a similar approach could work for the algorithms that are rapidly supplanting employees in today's corporate workforce.

III. THE LABOR MODEL AND EMPLOYED ALGORITHMS

This Part proposes a concrete doctrine for making good on the analogy between employees and algorithms: to assess corporate liability for harms to third parties, the law should treat corporate algorithms as though they were employees. This "Labor Model" would allow plaintiffs and prosecutors to slot algorithms into corporate law's existing employee-focused liability rules. The Labor Model maintains that employees and what it calls "employed algorithms" should be legally interchangeable when assessing civil and criminal corporate liability. If a corporation would be liable under existing law when a human employee causes some harm, the corporation should also be liable when an algorithm causes the harm instead. As argued below, corporations are presently liable for employee misconduct when the corporation expected to benefit from and exercised control over the employee's efforts. The Labor Model would extend those same two elements of corporate liability—benefit and control—to algorithmic harms.

A. Assessing Existing Models

Before broaching the complexities of the Labor Model offered below, it is worth considering whether a simpler model could suffice. Scholars have proposed two primary competing approaches. The Strict Liability Model would automatically hold corporations accountable any time one of their algorithms causes harm.[229] The Negligence Model would instead require evidence of negligence before forcing a corporation to pay for algorithmic harm.[230] Unfortunately, both models perform poorly across the six criteria offered above: identify which corporation is liable, foreclose opportunities for gamesmanship,

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229.   *See, e.g.*, David C. Vladeck, *Machines Without Principals: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 117, 146 (2014) (proposing a strict liability system to respond to the problem of accidents involving autonomous vehicles); Anuj Puri, *Moral Imitation: Can an Algorithm Really Be Ethical?*, 48 RUTGERS L. REC. 47, 47 (2020) ("I highlight the grave cost of masking algorithmic injustices with ethical justifications and argue for strict liability for any firm deploying algorithms in the public policy realm.").

230.   *See, e.g.*, Ryan Abbott & Alex Sarch, *Punishing Artificial Intelligence: Legal Fiction or Science Fiction*, 53 U.C. DAVIS L. REV. 323, 382 (2019) ("Very few laws specifically address AI-generated harms, which means civil liability must usually be established under a traditional negligence or product liability framework . . . .").

provide efficient incentives, generate fair outcomes, be easy to implement, and promote programming values.[231]

The Strict Liability Model falls short on all six criteria. To start, it does not say which of the many corporations typically involved with an algorithm should pay (Criterion 1). Any simple answer—for example, always the owner of the algorithm or always its developer—would likely be manipulable by large, sophisticated corporations who are anxious to shift liability risk to smaller, economically stressed, underfunded, or less sophisticated partners (Criterion 2). Since the Strict Liability Model promises to hold corporations liable for *all* algorithmic harms (even if the harm is a fluke and perhaps if the victim too may have been at fault), it risks overdeterring corporate investment in algorithm innovation and unfairly punishing innocent corporations (Criteria 3 and 4). Strict liability would also be a dramatic shift in the fundamentals of corporate liability, likely to provoke significant political challenges from corporations whose interests would be impeded (Criterion 5).[232] Finally, by treating all algorithms the same, the no-fault approach risks encouraging corporations to ignore important programming values (Criterion 6). If transparent processes are just as likely to lead to liability as opaque processes, corporations will use whichever algorithms are cheaper and better protect business secrets.[233] These tend to be black box algorithms.

The Negligence Model performs better than the Strict Liability Model, but only marginally. It does have a built-in method for identifying which corporation in the chain of production and operation to hold liable: any corporation whose negligence contributed to the algorithmic harm of concern (Criterion 1). However, the Negligence Model performs poorly on the remaining criteria. As I and others have extensively argued, corporate mental states, including negligence, are inherently manipulable.[234] As discussed above in connection with the

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231.   *See supra* Part I.C.

232.   The no-fault approach does have some similarities to strict products liability. However, as I have argued elsewhere, algorithms are typically not "products" within the meaning of that liability scheme. Diamantis, *Algorithms Acting Badly*, *supra* note 32, at 823–26.

233.   *See* Ben Dickson, *The Dangers of Trusting Black-Box Machine Learning*, TECHTALKS (July 27, 2020), https://bdtechtalks.com/2020/07/27/black-box-ai-models [https://perma.cc/SQE2-Y5FN] ("There are many cases where companies hide the details of their AI systems for commercial reasons, such as keeping the edge over their competitors. But the problem with this business model is that . . . it does nothing to minimize the harm and damage it does to the end user . . . .").

234.   *See, e.g.*, Mihailis E. Diamantis, *Corporate Criminal Minds*, 91 NOTRE DAME L. REV. 2049, 2050–51 (2016) (describing a case where "the court found the corporation not guilty"

No Hands Problem, corporations can parcel out responsibilities among several employees so that none possesses the mental state that would trigger liability (Criterion 2).[235] This means the Negligence Model could incentivize corporations to strategically circumscribe employee functions rather than to develop and operate their algorithms more responsibly (Criterion 3). Consequently, victims will often find themselves without recourse when they suffer algorithmic harms (Criterion 4). Even though it allows for corporate gamesmanship, the Negligence Model would likely still provoke stiff corporate opposition since it would represent a decided shift toward more permissive norms of corporate liability (Criterion 5). Currently, many corporate offenses, including the most common corporate criminal offenses, require more demanding mental states like purpose or knowledge.[236] Finally, as with the Strict Liability Model, the Negligence Model focuses on the corporate defendant (was the defendant negligent?) and not on the corporate algorithm. This means it has no way to selectively promote algorithms that incorporate programming values like transparency (Criterion 6).

B. *Three Important Caveats*

Before describing the Labor Model in detail, drawing explicit attention to three scope limitations of the Model may avoid some possible confusion. First, the Model applies *only* in the context of determining corporate liability for harms. Outside of that context, the Labor Model assumes that algorithms will be regarded as the inanimate mechanisms that they are. For example, the Labor Model offers no basis for granting algorithms any of the rights and protections due to human employees, such as wages and benefits under labor law[237] or fair treatment under antidiscrimination law.[238] To emphasize this

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because "no individual employee was so sloppy as to have been grossly negligent"); Victor H. Kramer, *Criminal Prosecutions for Violations of the Sherman Act: In Search of a Policy*, 48 GEO. L.J. 530, 540 (1960) ("[R]esponsibility in the modern corporation is diffused among so many executives that it is difficult, if not impossible, to fix personal responsibility for the corporation's crime.").

235.   *See* Diamantis, *Functional Corporate Knowledge*, *supra* note 52, at 341–42; ALEXANDER SARCH, CRIMINALLY IGNORANT: WHY THE LAW PRETENDS WE KNOW WHAT WE DON'T 231, 252 (2019).

236.   *See* Diamantis, *Functional Corporate Knowledge*, *supra* note 52, at 322–23.

237.   *See, e.g.*, 29 U.S.C. § 206 (establishing the federal minimum wage).

238.   *See, e.g.*, 42 U.S.C. § 2000e-2(a) (outlawing adverse employment actions based on "race, color, religion, sex, or national origin").

limitation, the Labor Model refers to corporate algorithms that satisfy its criteria as "employed algorithms" rather than "employees."

The second caveat is that the Labor Model fills a gap in corporate legal accountability but does not replace existing doctrines. If corporations or individuals would be liable for some harm, algorithmic or otherwise, under a legal theory available in current law, they would remain liable under the same theory even after implementing the Labor Model. For example, product liability laws would remain unchanged. Where an algorithm could be characterized as both a product and an employed algorithm, parties whom the algorithm injures could pursue multiple theories of liability. Longstanding experience dictates that some legal redundancy is helpful for holding corporations accountable.[239]

As a third and final caveat, it should be noted that the Labor Model does not purport to be a stand-alone doctrine of corporate liability. It relies on existing liability law. The Labor Model simply states when those liability laws could extend to algorithmic harms, rather than solely those caused by employees. As will become clearer in the next Part, the Labor Model's reliance on existing doctrine is one of its key strengths. But it also means that the Labor Model needs a background framework to translate some elements of existing liability rules to the algorithmic context. For example, it is clear what act elements and mental state elements mean when human employees are the source of harm: the law attributes to corporations the acts and mental states of employees.[240] But what do they mean for algorithms? I have offered answers in prior work that, because they also draw heavily on a comparison between algorithms and employees, would resonate well with the Labor Model.[241]

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239.   *See* David M. Uhlmann, *The Pendulum Swings: Reconsidering Corporate Criminal Prosecution*, 49 U.C. DAVIS L. REV. 1235, 1271–82 (2016) (arguing that the "prosecution of corporations is warranted even when individuals are prosecuted"); *see also* Darryl K. Brown, *Criminal Enforcement Redundancy: Oversight of Decisions Not To Prosecute*, 103 MINN. L. REV. 843, 907 (2018) ("U.S. strategies of enforcement redundancy have a relatively strong track record for some crimes such as public corruption.").

240.   Michael W. Tankersley, *The Corporate Attorney-Client Privilege: Culpable Employees, Attorney Ethics, and the Joint Defense Doctrine*, 58 TEX. L. REV. 809, 831 (1980) ("The doctrine of *respondeat superior* is then usually invoked to attribute the employee's culpable acts to the corporation."); Abbott & Sarch, *supra* note 230, at 351 ("[R]espondeat superior . . . allows mental states possessed by an agent of the corporation to be imputed to the corporation itself . . . .").

241.   *See* Diamantis, *Algorithms Acting Badly*, *supra* note 32, at 844–49 (offering an account of what it means for a corporation to "act" through an algorithm); Diamantis, *The Extended Corporate Mind*, *supra* note 23, at 918–23 (offering an account of what it means for a corporation to have mental states, like purpose and knowledge, through an algorithm).

C. *Introducing the Labor Model*

Under the Labor Model, corporations would be liable for the harms of their employed algorithms just as they presently are for the harms of their human employees. The key to the Model will be to define what it means for a corporation to employ an algorithm. As Part II.B argued, employees and algorithms present overlapping corporate enforcement challenges. The law already has solutions to those challenges so far as employees are concerned. Therefore, a natural starting point in defining employed algorithms is the current law of corporate liability for employee misconduct. The hope is that extending the principles behind current law to the algorithmic context will offer an attractive solution to the enforcement challenges of algorithmic misconduct too.

The general rule for attributing civil and criminal violations of employees to corporations is respondeat superior.[242] The doctrine has been flexible enough to survive two thousand years, from Roman times through the Middle Ages and the Industrial Revolution and on to the advent of the modern corporation.[243] Perhaps it can handle the digital era, too.

Respondeat superior has two requirements. At the time of the violation, the employee 1) must have intended to benefit the corporation and 2) must have been working within the scope of their employment.[244] Each requirement responds to one of the two enforcement challenges discussed in Part II.B: the justice challenge and the preventive challenge.

The justice challenge of holding corporations liable for employee misconduct is to overcome the presumptive unfairness of vicarious

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242. W. Robert Thomas, *Why Corporations Became (and Remain) Persons Under the Criminal Law*, 45 FLA. ST. U. L. REV. 479, 489 (2018). In light of my hesitancy over Joanna Bryson's proposal that algorithms should be slaves, it may be ironic that respondeat superior originated in ancient Roman slave law. *See* HOLMES, *supra* note 107, at 15–17. Meaning "let the master answer," the doctrine held slaveholders to account when their slaves hurt someone. Christine W. Young, Comment, *Respondeat Superior: A Clarification and Broadening of the Current "Scope of Employment" Test*, 30 SANTA CLARA L. REV. 599, 599–601, 599 n.1 (1990).

243. *See* Young, *supra* note 242, at 600–11.

244. *See, e.g.*, Parker v. Carilion Clinic, 819 S.E.2d 809, 819 (Va. 2018) ("[A]n employer is liable for the tortious act of his employee if the employee was performing his employer's business and acting within the scope of his employment." (quoting Kensington Assocs. v. West, 362 S.E.2d 900, 901 (Va. 1987))); Lundberg v. State, 255 N.E.2d 177, 179 (N.Y. 1969) ("An employee acts in the scope of his employment when he is doing something in furtherance of the duties he owes to his employer and where the employer is, or could be, exercising some control, directly or indirectly, over the employee's activities." (citations omitted)).

liability. Respondeat superior's intent-to-benefit requirement does this. Vicarious liability is most concerning when the agent's and principal's interests diverge.[245] But respondeat superior assures that a corporation will not be liable for a violation if its employee's only possible motivation was to benefit themselves or harm their employer.[246] For example, if an employee embezzles corporate assets, they have committed a crime, but generally not one that respondeat superior would attribute to the corporation.[247] By ensuring that the employee was working *for* the corporation, respondeat superior limits itself to cases where the employee was intuitively acting *as* the corporation.[248] This alignment of purposes generates an overlapping practical identity between the employee and the corporation. Respondeat superior thereby limits itself to cases where employees seem less like third parties and more like direct corporate embodiments.[249]

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245.   *See, e.g.*, Osborne v. Lyles, 587 N.E.2d 825, 832, 834 (Ohio 1992) (Holmes, J., dissenting) (criticizing the majority's application of respondeat superior to an assault by an off-duty police officer motivated by personal animus); Xue Lu v. Powell, 621 F.3d 944, 951–54 (9th Cir. 2010) (Bybee, J., concurring in part and dissenting in part) (criticizing the majority for applying respondeat superior in the case of an asylum officer who sexually harassed an applicant on the grounds that the harassment fell far outside the interests of the agency); Hollinger v. Titan Cap. Corp., 914 F.2d 1564, 1579–83 (9th Cir. 1990) (en banc) (Hall, J., dissenting) (criticizing the application of respondeat superior in the case of securities fraud committed by an employee acting in the scope of his personal interest); *see also* Barbara Black, *Application of Respondeat Superior Principles to Securities Fraud Claims Under the Racketeer Influenced and Corrupt Organizations Act (RICO)*, 24 SANTA CLARA L. REV. 825, 833–36 (1984) (discussing the challenges associated with applying respondeat superior liability in securities fraud cases where the principal had no knowledge of the fraud).

246.   *See* RESTATEMENT (THIRD) OF AGENCY § 7.07(2) (AM. L. INST. 2006) ("An employee's act is not within the scope of employment when it occurs within an independent course of conduct not intended by the employee to serve any purpose of the employer.").

247.   Puskala v. Koss Corp., 799 F. Supp. 2d 941, 947 (E.D. Wis. 2011) ("It is true that Sachdeva was committing fraud against the company rather than on behalf of it, and that therefore her fraud cannot be imputed to the company under respondeat superior.").

248.   *See* ERNEST J. WEINRIB, THE IDEA OF PRIVATE LAW 186 (rev. ed. 2012) ("[R]*espondeat superior* construes (indeed, constructs) the doer as a composite: the-employer-acting-through-the-employee. When the conditions that permit this construction of the doer are present, 'the enterprise may be regarded as a unit . . . Employee's acts sufficiently connected with the enterprise are in effect considered as deeds of the enterprise itself.'" (quoting Fruit v. Schreiner, 502 P.2d 133, 141 (Alaska 1972))).

249.   *See* N.Y. Cent. & Hudson River R.R. Co. v. United States, 212 U.S. 481, 495 (1909) ("We see no valid objection in law, and every reason in public policy, why the corporation, *which profits by the transaction, and can only act through its agents and officers*, shall be held punishable by fine because of the knowledge and intent of its agents . . . ." (emphasis added)); RESTATEMENT (THIRD) OF AGENCY § 7.07 cmt. b (AM. L. INST. 2006) ("When an employee commits a tort with the sole intention of furthering the employee's own purposes, and not any purpose of the employer, it is neither fair nor true-to-life to characterize the employee's action as that of a representative of the employer.").

Focusing solely on corporations and their employees leaves out another group that has a justice stake in corporate liability outcomes: the shareholders and other corporate stakeholders who feel the brunt of any corporate sanction.[250] As a functional matter, respondeat superior also forces them to pay vicariously for employee misconduct. The intent-to-benefit requirement has a response to them, too. The corporate enterprise is a productive undertaking for corporate stakeholders, and, like any business venture, it carries some risk of loss.[251] Costs attributable to employee misconduct are no different from any other business costs, so long as they come paired with a potential upside.[252] Respondeat superior's intent-to-benefit requirement ensures that employees are working to promote corporate welfare (and, by extension, corporate stakeholder welfare) before asking corporate stakeholders to pay for harms employees cause. "Just as liability for damage can be equitably balanced against the defendant's fault, so it can be equitably balanced against his benefit."[253] Indeed, *not* forcing corporate stakeholders to pay would produce even greater unfairness. "[I]t would be unjust to permit an employer to gain from the intelligent cooperation of others without being responsible for the mistakes, the errors of judgment and the frailties of those working under his direction and for his benefit."[254]

The preventive challenge of corporate liability for employee misconduct is to justify corporate liability on preventive grounds when, due to agency costs, corporations can never guarantee that their employees will behave. This is where respondeat superior's scope-of-employment requirement comes into play. Respondeat superior does

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250. *See* John C. Coffee, Jr., *"No Soul To Damn: No Body To Kick": An Unscandalized Inquiry into the Problem of Corporate Punishment*, 79 MICH. L. REV. 386, 401 (1981) ("[W]hen the corporation catches a cold, someone else sneezes."); BARNALI CHOUDHURY & MARTIN PETRIN, CORPORATE DUTIES TO THE PUBLIC 194 (2019) ("Fundamentally, it is impossible to punish a corporation without indirectly affecting its individual stakeholders.").

251. *See The Reality of Investment Risk*, FINRA, https://www.finra.org/investors/learn-to-invest/key-investing-concepts/reality-investment-risk [https://perma.cc/KZ9K-9ATT] ("The level of risk associated with a particular investment or asset class typically correlates with the level of return the investment might achieve.").

252. *See* Sara Sun Beale, *A Response to the Critics of Corporate Criminal Liability*, 46 AM. CRIM. L. REV. 1481, 1484–85 (2009) ("There is nothing wrong with recognizing that it was Siemens, not simply some of its officers or employees, who should be held legally accountable. . . . The shareholders of Siemens benefitted from its success when it used bribery and kickbacks to obtain contracts that generated billions of dollars of profit.").

253. Glanville Williams, *Vicarious Liability and the Master's Indemnity*, 20 MOD. L. REV. 220, 230 (1957).

254. RESTATEMENT (SECOND) OF AGENCY § 219 cmt. a (AM. L. INST. 1958).

not demand that corporations do the impossible. It just requires that corporations exercise control where they have it. "An employee acts within the scope of employment when performing work assigned by the employer or engaging in a course of conduct subject to the employer's control."[255] The scope-of-employment requirement is a proxy for assuring that corporations will only be liable for conduct they had the power to prevent. This incentivizes corporations to implement compliance measures—better monitoring, training, discipline, and productivity metrics—to reduce the chance that employees will break the law while on the job.[256]

Respondeat superior may have solved the enforcement challenges of employee misconduct, but it does not currently apply to algorithms. The doctrine "requires an employment relationship at the time of the injury and with regard to the transaction resulting in it."[257] Since algorithms are not employees, respondeat superior does not even get off the ground. Even if the doctrine were to apply, no algorithm would satisfy either of its elements. Algorithms cannot intend to benefit any corporations because, lacking minds, algorithms cannot intend anything. Without an employment relationship, algorithms never operate within the scope of employment.

By limiting respondeat superior to human employees, the law adopts a superficial understanding that overlooks the doctrine's true flexibility. Deeper principles are at work in respondeat superior. For centuries, these principles manifested themselves in specific doctrinal requirements tailored to an assumption about the nature of corporate production—that it proceeds only through human effort. That assumption no longer holds in the present era, where algorithms are rapidly replacing human labor. By recovering the principles behind respondeat superior, more generalized versions of its two elements come into view that could flexibly apply to human and digital labor alike.

The Labor Model of corporate liability requires two innovations. The first is to recognize that corporations can employ algorithms. Whatever formal limits there are on who or what can be an employee in other contexts, for purposes of assessing corporate liability, the legal

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255. RESTATEMENT (THIRD) OF AGENCY § 7.07(2) (AM. L. INST. 2006).

256. *See* Fleming James, Jr., *Vicarious Liability*, 28 TUL. L. REV. 161, 168 (1954) ("Pressure of legal liability on the employer therefore is pressure put in the right place to avoid accidents.").

257. 30 C.J.S. *Employer-Employee Relationship* § 221, Westlaw (database updated Aug. 2022).

concept of employment should extend to cover "employed algorithms." The second innovation is to define what employed algorithms are by generalizing respondeat superior's two elements. Since the elements can meet the enforcement challenges in the context of human employees, they may be able to resolve the structurally similar enforcement challenges of algorithms.

The generalized version of respondeat superior is what I have elsewhere called the "beneficial-control test." The beneficial-control test derives from deeper principles that are at play in the intent-to-benefit and scope-of-employment elements of respondeat superior. The general idea is that these elements are designed to ensure that a corporation is only liable for an employee violation if the corporation expected to benefit from and controlled the employee's conduct at the time of the violation. Where human employees are concerned, the two elements are serviceable proxies for benefit and control. Since the elements are inapplicable to algorithms, courts would need to inquire directly into whether a corporation claims substantial benefits from the algorithm's operation and exercises substantial control over it. In assessing the benefits a corporation claims from an algorithm, courts should avoid overlooking indirect benefits.[258] Even if an algorithm does not provide an immediate revenue stream, it might boost corporate profitability by making operations more efficient or providing data to help inform business strategies. Measuring corporate control over algorithms requires a multifaceted approach. Relevant powers include the power to design the algorithm, terminate its operation, modify it, monitor it, and override it. None of these powers standing alone is necessarily determinative of corporate control over an algorithm, but the more powers a corporation has, the more control it has.

In sum, the Labor Model of corporate liability for algorithmic harms largely mirrors respondeat superior's approach to employee harms. Corporations are potentially liable for the harms that their employed algorithms cause. A corporation employs an algorithm if it exercises beneficial control over it. The only remaining question is whether the Labor Model is an appealing solution to the corporate accountability gap and the enforcement challenges that algorithms introduce. The next Part evaluates the Labor Model.

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258. GEORGE E. DANNER, THE EXECUTIVE'S HOW-TO GUIDE TO AUTOMATION 139–48 (2019) (discussing the value of algorithms, how companies like Google and Uber have monetized their algorithms, and the various ways companies can monetize their algorithms).

IV. STRENGTH OF THE LABOR MODEL ACROSS ALL SIX EVALUATIVE CRITERIA

The fact that the Labor Model *could* close the algorithmic accountability gap does not necessarily mean that it is an appealing way to do so. Part I.C offered six criteria by which to evaluate proposals for holding corporations accountable for algorithmic harms. In Part III.A, I showed that two prominent models—the Strict Liability Model and the Negligence Model—perform very poorly. By contrast, as this Part demonstrates, the six criteria show the Labor Model in a decidedly favorable light.

Criterion 1. *Identify Which Corporation(s) Will Be Liable.* The Labor Model has a built-in method for identifying which corporations could be liable when an algorithm harms someone—only corporations that employ the algorithm. As defined above, a corporation employs an algorithm if the corporation claims substantial benefits from and exercises substantial control over the algorithm's operation. This would be a fact-intensive inquiry. For the benefits prong, fact finders would need to trace out both direct monetization (e.g., subscription fees) and indirect monetization (e.g., data collection and resale) of the algorithm at issue. For the control prong, they would need to balance the various indicia of control discussed in the previous part.

In most cases of significant algorithmic harm, there will be at least one corporation that employed the algorithm. Corporations that satisfy either the control or benefits test with respect to an algorithm will usually satisfy the other test too. This is because of corporations' profit motives. If they control a process, they will generally turn it to their advantage (or, where that is not possible, terminate it). If they benefit from a process, they will generally seek to control and amplify those benefits.[259] Sometimes there may even be multiple corporations that count as employing an algorithm.[260] Under the Labor Model, all of them would be jointly liable for its harms in both criminal and civil law.[261]

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259.   Dodge v. Ford Motor Co., 170 N.W. 668, 684 (1919) ("A business corporation is organized and carried on primarily for the profit of the stockholders.").

260.   *See* Stewart v. Hudson Hall LLC, No. 20 Civ. 885, 2020 WL 8732875, at *4 (S.D.N.Y. Oct. 19, 2020) ("[A]n individual may be employed by more than one entity.").

261.   *Cf.* New York v. Scalia, 490 F. Supp. 3d 748, 757 (S.D.N.Y. 2020) ("Joint employers are jointly and severally liable for damages for FLSA violations.").

There will be some algorithmic harms to which the Labor Model would not apply, but in such cases, corporate liability would be unnecessary or counterproductive. For example, where malicious individuals or syndicates develop the sort of malware that has filled recent headlines, there is usually no affiliated corporation.[262] However, since individual malware developers purposely design their algorithms to inflict criminal and civil harm, existing liability principles suffice for holding them directly liable.[263] There may also be rare instances where there are corporate actors affiliated with a harmful algorithm but none that would count as employing the algorithm under the Labor Model. As explained with respect to Criteria 3 and 4 below, these are cases where corporate liability would undermine either fairness or efficiency.

Criterion 2. *Be Robust Enough to Avoid Gamesmanship*. The Strict Liability and Negligence Models discussed in Part III.A would open new strategies for corporations to continue business as usual while avoiding liability for algorithmic harms. This is because neither model appreciates just how flexible corporations can be. The Strict Liability Model would hold a corporation that owns or operates an algorithm liable for all harms the algorithm causes. Ownership and operation are the types of formalistic relationships that creative corporations can work around using licensing agreements and business partnerships. The Negligence Model would require plaintiffs and prosecutors to prove that a corporation's negligence contributed to the algorithmic harm they allege. However, as explained above, corporate mental states like negligence are inherently manipulable through careful tailoring of employee functions and information flow.[264] This can make corporate mental states difficult or impossible to prove.

A key advantage of the Labor Model is that it shuns formalistic criteria in favor of functional tests that track "economic reality" rather than surface appearances.[265] This Article has repeatedly emphasized the functional similarities between human employees and corporate

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262.   *See, e.g.*, Raphael Satter, *Up to 1,500 Businesses Affected by Ransomware Attack, U.S. Firm's CEO Says*, REUTERS (July 6, 2021), https://www.reuters.com/technology/hackers-demand-70-million-liberate-data-held-by-companies-hit-mass-cyberattack-2021-07-05 [https://perma.cc/QM64-REFG] (describing an attack by a group of hackers).

263.   Abbott & Sarch, *supra* note 230, at 369–73.

264.   *See supra* Part I.A.

265.   Martin v. Sprint United Mgmt. Co., 273 F. Supp. 3d 404, 422 (S.D.N.Y. 2017) ("As to the functional control test, the Second Circuit has identified a number of factors pertinent to determining whether a person or entity, even if lacking formal control, exercised 'functional control' over an employee.").

algorithms. The Labor Model taps into those similarities. With respect to individual employees, "the [Supreme] Court has instructed that the determination of whether an employer-employee relationship exists . . . should be grounded in 'economic reality rather than technical concepts,' determined by reference not to 'isolated factors, but rather upon the circumstances of the whole activity.'"[266] Accordingly, the Labor Model looks beyond manipulable surface features to the substance of corporations' relationships to their algorithms. Corporations can easily change ownership of an algorithm without materially altering their true involvement with it. That is not true of the relationships of benefit and control that the Labor Model tracks. Courts applying the Labor Model would not recite wooden elements to define employment[267] but would instead follow the California Supreme Court's lead in *Dynamex*, a case that recognized that many independent contractors can nonetheless be employees.[268] To manipulate the Labor Model, a corporation would have to forgo either the benefits of an algorithm or its control over the algorithm—direct and indirect. No mere legalistic turn of phrase could accomplish that.

Criterion 3. *Give Efficient Incentives to All Parties Involved.* Since the Labor Model draws on the existing framework for corporate liability, it leverages efficiencies that are already present in that system. These include the balance of responsibilities struck between victims and wrongdoers to avoid harm. With respect to potential corporate wrongdoers, recall that the goal is to induce corporations to implement efficient levels of compliance. Even though agency costs mean corporations can never guarantee employees will obey the law, appropriate training and monitoring can reduce the probability of a violation. Machine learning algorithms present a similar challenge—there are no guarantees that they will never hurt someone. The Labor Model meets that challenge for algorithms just as respondeat superior meets it for employees—by incentivizing better compliance. In the context of algorithms, better compliance means diversifying the body

266.   Barfield v. N.Y.C. Health & Hosps. Corp., 537 F.3d 132, 141 (2d Cir. 2008) (citations omitted) (first quoting Goldberg v. Whitaker House Coop., Inc., 366 U.S. 28, 33 (1961); and then quoting Rutherford Food Corp. v. McComb, 331 U.S. 722, 730 (1947)).

267.   *Barfield*, 537 F.3d at 143 ("[There is] no rigid rule for the identification of an FLSA employer.").

268.   Dynamex Operations W., Inc. v. Superior Ct., 416 P.3d 1, 39 (Cal. 2018) ("[A] business cannot unilaterally determine a worker's status simply by assigning the worker the label 'independent contractor' or by requiring the worker, as a condition of hiring, to enter into a contract that designates the worker an independent contractor.").

of engineers writing algorithms,[269] more careful initial programming,[270] more mindful selection of training data sets,[271] more extensive pre-rollout testing,[272] regular post-rollout quality audits,[273] routine run-time compliance layers,[274] effective monitoring,[275] and continuous software updates to address problems as they arise.[276] None of these steps can guarantee that a machine learning algorithm will follow the law, but they can reduce the probability that it will go astray.[277] By holding

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269. *See* Kate Crawford, *Artificial Intelligence's White Guy Problem*, N.Y. TIMES (June 25, 2016), https://www.nytimes.com/2016/06/26/opinion/sunday/artificial-intelligences-white-guy-problem.html [https://perma.cc/HZ8J-MWK3].

270. *See* Mark A. Geistfeld, *A Roadmap for Autonomous Vehicles: State Tort Liability, Automobile Insurance, and Federal Safety Regulation*, 105 CALIF. L. REV. 1611, 1634–36 (2017) (contemplating coding errors that cause crashes of autonomous vehicles).

271. *See* Barocas & Selbst, *supra* note 19, at 677; Oscar H. Gandy, Jr., *Engaging Rational Discrimination: Exploring Reasons for Placing Regulatory Constraints on Decision Support Systems*, 12 ETHICS & INFO. TECH. 29, 30 (2010) (discussing how bad data can bias automated systems).

272. Geistfeld, *supra* note 270, at 1651–54; *see* Dave Cliff & Linda Northrop, The Global Financial Markets: An Ultra-Large-Scale Systems Perspective 29 (2012) (unpublished conference paper) (discussing the need for testing trading algorithms using simulations).

273. *See* Balázs Bodó, Natali Helberger, Kristina Irion, Frederik Zuiderveen Borgesius, Judith Moller, Bob van de Velde, Nadine Bol, Bram van Es & Claes de Vreese, *Tackling the Algorithmic Control Crisis—The Technical, Legal, and Ethical Challenges of Research into Algorithmic Agents*, 19 YALE J.L. & TECH. 133, 142–44 (2017) (describing audits of algorithms); James Guszcza, Iyad Rahwan, Will Bible, Manuel Cebrian & Vic Katyal, *Why We Need To Audit Algorithms*, HARV. BUS. REV. (Nov. 28, 2018), https://hbr.org/2018/11/why-we-need-to-audit-algorithms [https://perma.cc/QXD6-LB8L]. *See generally* 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"); Shea Brown, Jovana Davidovic & Ali Hasan, *The Algorithm Audit: Scoring the Algorithms That Score Us*, 8 BIG DATA & SOC. 1 (2021) (proposing a framework for ethically assessing algorithms).

274. *See* Felippe Meneguzzi & Michael Luck, *Norm-Based Behaviour Modification in BDI Agents*, PROC. 8TH INT'L CONF. ON AUTONOMOUS AGENTS & MULTIAGENT SYS. 177, 177–78 (2009); Louise Dennis, Michael Fisher, Marija Slavkovik & Matt Webster, *Formal Verification of Ethical Choices in Autonomous Systems*, 77 ROBOTICS & AUTONOMOUS SYS. 1, 2–3 (2016).

275. Thomas C. King, Nikita Aggarwal, Mariarosaria Taddeo & Luciano Floridi, *Artificial Intelligence Crime: An Interdisciplinary Analysis of Foreseeable Threats and Solutions*, 26 SCI. & ENG'G ETHICS 89, 110–12 (2019) (discussing four possible monitoring mechanisms for algorithms).

276. *See* NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., FEDERAL AUTOMATED VEHICLES POLICY: ACCELERATING THE NEXT REVOLUTION IN ROADWAY SAFETY 16 (2016), https://www.hsdl.org/?view&did=795644 [https://perma.cc/C9V6-K86D] (envisioning manufacturers of self-driving cars will update software regularly to improve safety).

277. *See generally* William D. Smart, Cindy M. Grimm & Woodrow Hartzog, *An Education Theory of Fault for Autonomous Systems*, 2 NOTRE DAME J. ON EMERGING TECHS. 33 (2021) (describing ways to reduce educational failures in algorithms). For a detailed treatment on how bias can arise in algorithms, see Nizan Geslevich Packin & Yafit Lev-Aretz, *Learning Algorithms*

corporations liable for algorithmic harms, the Labor Model would induce corporations to take preemptive care with their algorithms so as to avoid the greater expense of liability down the road.

The Labor Model recognizes that more compliance is not always better from an efficiency perspective. The efficient level of compliance is a moving target that ultimately depends on balancing two costs: the costs of the potential harm and the often substantial costs of implementing compliance to prevent that harm.[278] Lawmakers strike a balance between under- and overincentivizing corporate compliance by tailoring liability standards.[279] One central technique for adjusting liability standards is to use more or less demanding mens rea requirements. At the lowest end are strict liability standards, which incentivize aggressive and sweeping compliance programs. More demanding mens rea, like purpose, give corporations more leeway to gauge what type and how much compliance is appropriate. A review of the statutes that corporations commonly confront reveals a wide range of mens rea, from strict liability to purpose and everything in between. No single one of these mens rea would be appropriate in all circumstances. That is part of why the Strict Liability and Negligence Models fall short. The Labor Model has the potential to strike a more efficient balance because it preserves current law's liability standards and extends them to the algorithmic context.[280]

Some scholars might find fault in the Labor Model's reliance on current law. Many believe that the present system of corporate liability is inefficient. Criticisms range from arguing that it induces corporations to invest too little in compliance to arguing that it forces far too

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and Discrimination, *in* RESEARCH HANDBOOK ON THE LAW OF ARTIFICIAL INTELLIGENCE 88, 91 (Woodrow Barfield & Ugo Pagallo eds., 2018).

278. *See* William S. Laufer, *A Very Special Regulatory Milestone*, 20 U. PA. J. BUS. L. 391, 408–09 (2019) (discussing the "public-private sector compliance relationship" as a "regulatory equilibrium"); Hui Chen & Eugene Soltes, *Why Compliance Programs Fail—and How To Fix Them*, 96 HARV. BUS. REV. 116, 118–19 (2018) ("Many executives are rightly frustrated about paying immense and growing compliance costs without seeing clear benefits. And yet they continue to invest—not because they think it's necessarily productive but because they fear exposing their organizations to greater liability should they fail to spend enough.").

279. *See generally* Diamantis, *The Corporate Insanity Defense*, *supra* note 50 (discussing the influence of definitions of mens rea on corporate investment in compliance).

280. *See* Daniel R. Fischel & Alan O. Sykes, *Corporate Crime*, 25 J. LEGAL STUD. 319, 341 (1996) (arguing that the imposition of criminal liability on corporations lacking the necessary mens rea will force corporations to overinvest in precautions and forgo beneficial activities).

much.[281] Even assuming one side is right, the problem they point to would be a much bigger feature of the U.S. approach to corporate liability, not a defect of the Labor Model in particular. Any proposal that would make the current law of corporate liability more efficient would automatically improve the Labor Model, too. For example, some commentators advocate a due diligence defense, which would allow corporations to defeat criminal liability by demonstrating that they had reasonable compliance systems in place at the time of the alleged crime.[282] Were such a defense implemented, it would apply to criminal liability for algorithmic harms too.

Criterion 4. *Produce Fair Outcomes.* The Labor Model generates fair outcomes that mirror the balance of equities already struck in the existing law of corporate liability. The law owes due consideration both to victims of algorithmic misconduct and to corporations that might be liable for such misconduct. By treating algorithmic harms like those committed by employees, the Labor Model updates current law to give plaintiffs and prosecutors the same reasonable path to satisfaction for algorithmic misconduct that they presently have for employee harms. At the same time, since the Labor Model only pairs anticipated corporate liabilities with anticipated corporate benefits, it is fair to corporate stakeholders. The risk of loss that corporate stakeholders face from liability for algorithmic harms resembles the generic business risk that accompanies any gainful venture.

As with efficiency, not everyone agrees that the current law of corporate liability is fully fair. Again, criticisms exist at both poles—that the law puts a thumb on the justice scale in favor of corporations or against them.[283] This is not the place to arbitrate which side is right. Any existing faults are not particular to the Labor Model. Since the Labor Model draws on the general law of corporate liability, it would automatically incorporate any improvements to the law's fairness.

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281. Jennifer Arlen & Reinier Kraakman, *Controlling Corporate Misconduct: An Analysis of Corporate Liability Regimes,* 72 N.Y.U. L. REV. 687, 742 (1997) (arguing that a civil liability system would be more efficient than the current system of criminal liability for firms).

282. Ellen S. Podgor, *A New Corporate World Mandates a "Good Faith" Affirmative Defense*, 44 AM. CRIM. L. REV. 1537, 1537–38 (2007).

283. *Compare* William S. Laufer, *The Missing Account of Progressive Corporate Criminal Law*, 14 N.Y.U. J.L. & BUS. 71, 79–80 (2017) (discussing legal structures that protect corporations from real accountability), *with* Hasnas, *supra* note 115, at 1329 (arguing that corporate liability is unfair to corporations).

Criterion 5. *Have Low Barriers to Implementation*. The Labor Model's pragmatic virtues extend to the ease with which it could be implemented. As explained in Part III, the Labor Model derives from the same legal principles as the current general law of corporate liability. Since judges developed that law with human employees in mind, they could extend its internal logic to cover the newly evolving digital workforce. The Strict Liability and Negligence Models are more radical departures from current law that would likely require legislative intervention. If the recent history of fractious and deadlocked politics teaches us anything, it is that legislation is an unreliable path to progress.

Even if the Labor Model would require congressional action, it should face fewer political barriers than the alternatives. Any change to the status quo will provoke opposition from those upon whom the burdens of the change fall. Corporations that use algorithms will mobilize against any effort to hold them liable, but they would mobilize more determinedly against the Strict Liability and Negligence approaches. These would both lower the bar for the many causes of action against corporations that require something more than negligence. The Labor Model brings the existing texture of the current corporate liability landscape to algorithmic harms. Forward-looking corporations may even endorse the compromises implicit in the Labor Model.[284] Doing so could fill the space left by the algorithmic accountability gap before political pressure materializes for a more aggressive alternative.

Criterion 6. *Promote Programming Values*. Corporate liability should encourage corporations to integrate programming values like transparency into the planning for their algorithms. Recall that algorithmic transparency is the property of having an internal logic that human onlookers can understand and use to reconstruct and evaluate an algorithm's decisions. Many machine learning algorithms are programmed using techniques that turn them into incomprehensible black boxes. Neither the Strict Liability nor the Negligence Model has any mechanism for distinguishing between transparent and black box algorithms. Both models focus on the corporation and the harm, but

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284. *See* Kirsten Lucas, Marcel Hanegraaff & Iskander De Bruycker, *Lobbying the Lobbyists: When and Why Do Policymakers Seek To Influence Advocacy Groups in Global Governance?*, 8 INT. GRPS. & ADVOC. 208, 211–12 (2019) (noting that policy makers may work with advocacy groups "in an effort to alter or moderate the advocacy groups' stance").

not on the algorithm itself. Without any sensitivity to the properties of the algorithm, neither model can selectively promote transparent algorithm design.

One way to address that deficiency would be to mandate transparency for certain types of algorithms. This heavy-handed approach, which the European Union may soon adopt,[285] overlooks the nuance of programming values. While transparency is, all things equal, preferable to opacity, it does come with costs. Some of these costs are just business expenses for the higher price tag that can come with developing transparent algorithms. More concerning are the costs to potential victims. Because of the different programming techniques involved, transparent algorithms can be less accurate than black box algorithms for certain tasks.[286] When algorithms are in charge of approving home mortgages and driving cars, inaccurate decisions can have devastating consequences. A one-size-fits-all approach to transparency will not always maximize welfare. Rather than require transparency, the law should induce corporations to weigh the desirability of transparency on a case-by-case basis. The challenge is to get corporations' profit-driven assessments to align with outcomes that promote social welfare.

The Labor Model would incentivize corporations to balance transparency and accuracy in socially desirable ways. To see why, it will help first to consider how corporations respond to traditional allegations of misconduct, where an employee is the source of harm. For example, plaintiffs may present evidence of a discriminatory pattern of lending practices that originates with a particular corporate employee. In defense, the corporation would likely call on the employee to testify that the pattern is a coincidental result of legitimate business justifications, not discriminatory purposes. The corporation would be at a significant disadvantage if its employee were unavailable. The employee is in the best position to dispel suspicion by explaining their own thought processes. Without that explanation, the suspicious conduct must stand for itself in the eyes of judge and jury.

A well-designed transparent algorithm can give corporations the same courtroom advantage as a credible employee witness. If a lending

285.   *See Commission Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts*, COM (2021) 206 final (Apr. 4, 2021).

286.   Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 HARV. J.L. & TECH. 889, 893–94 (arguing that creating transparent algorithms will come at the cost of decreased functionality).

algorithm generates what, by coincidence rather than design, looks like a discriminatory pattern of decisions, the corporation could, as it were, put a transparent algorithm on the stand. Since a transparent algorithm's decision process is available and humanly comprehensible, others can see whether it relied directly or indirectly on applicants' protected characteristics.[287] A black box algorithm is like an employee who refuses to testify.[288] Suspicious conduct becomes much harder to explain away. Because the Strict Liability and Negligence Models flatten all liability standards to a uniformly low threshold, they leave corporations with very little opportunity to mount a defense to alleged algorithmic harm. The Labor Model preserves the rich texture of current civil and criminal law. Where the law requires heightened levels of fault, like purpose or knowledge, the explanation that transparency allows can be a powerful defense to liability.

The Labor Model would also induce corporations to balance accuracy against transparency in socially desirable ways. Corporations have a self-interest in ensuring that their algorithms make accurate decisions (e.g., ones not premised on racial criteria), since errors can lead to injuries (e.g., racial discrimination), and injuries to lawsuits (e.g., under fair lending laws). Even under the Labor Model, corporations will opt for black box algorithms when doing so could yield a significant boost to accuracy. This might lower the prospect of being sued in the first place. When achieving transparency does not overly compromise accuracy, corporations will pursue transparency in order to avail themselves of legal defenses when things go wrong. This is the sort of tradeoff between accuracy and transparency that would promote social welfare.

CONCLUSION

"Liability is one of the big unspoken-about issues here . . . . We want to ensure there's responsibility at the end of the day and that they are not just passing that along to someone else."[289] That is how Lorena

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287. Maayan Perel & Niva Elkin-Koren, *Black Box Tinkering: Beyond Disclosure in Algorithmic Enforcement*, 69 FLA. L. REV. 181, 221 (2017) (arguing for a robust methodology for understanding the way that algorithmic decisions are made).

288. *Id.* at 188–90 (discussing the barriers to understanding algorithmic decision-making).

289. Greg Bensinger, *Uber: The Ride-Hailing App that Says It Has 'Zero' Drivers: The Silicon Valley Company's Word Games Help Shelter It from Liability in Lawsuits*, WASH. POST (Oct. 14, 2019, 1:16 PM), https://www.washingtonpost.com/technology/2019/10/14/uber-ride-hailing-app-that-says-it-has-zero-drivers [https://perma.cc/N3Z8-LK23] (quoting Lorena Gonzalez, Cal. Assemblywoman).

Gonzalez, a California assemblywoman, described her motivation just two years ago for crafting bill AB5, which reclassified much of the gig workforce in California as employees. Large tech companies in California like Uber and Amazon use independent contractors to perform high-risk jobs like driving passengers and delivering packages. In so doing, these corporations avoid millions in liabilities for civil and criminal injuries they would have to pay had they used employees instead.[290] Legislators,[291] regulators,[292] and judges[293] are pushing back against this corporate gambit, and its availability as a tool to hide from victims of business torts and crimes may not last long.

But corporations have already uncovered the next frontier of liability management. Independent contractors are not the only source of nonemployee labor. Algorithms are increasingly capable of performing tasks that corporations assigned to employees just a decade ago. Since algorithms are not employees, doctrines for holding corporations liable when people get hurt apply awkwardly, if at all. Corporations are increasingly taking advantage of this liability loophole. Assemblywoman Gonzalez's words and motivations could just as easily apply to the digital workforce of corporate algorithms as to gig workers.

Similar solutions often work for similar problems. Or so this Article has argued. The leading proposals for addressing corporate abuses of the gig workforce all involve reclassifying certain independent contractors as employees. The Labor Model advanced here would do the same for corporate algorithms. Corporate liability generally requires employee misconduct. For purposes of assessing whether a corporation is liable for a civil or criminal harm caused by an algorithm, the Labor Model recognizes that some algorithms should count as corporate employees. Drawing on the principles embedded in the existing doctrines of corporate liability, the Labor Model defines an employed algorithm as one from which a corporation derives substantial benefits and over which it exercises substantial control. With this approach, there would be parity between algorithmic and employee harms. Corporations would be liable for the former just as

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290. Kevin Alden, *Strict Liability for the Information Age*, 46 B.Y.U. L. REV. 1619, 1620 (2021) ("[Amazon] has been able to avoid liability for the ten deaths and sixty other 'serious injuries' caused by their vehicles by placing a legal firewall between itself and the drivers . . . .").

291. 2019 Cal. Legis. Serv. ch. 296 (West) (Assembly Bill No. 5).

292. Bose, *supra* note 205.

293. Dynamex Operations W. v. Superior Ct., 416 P.3d 1, 39 (Cal. 2018).

they presently are for the latter. The Labor Model would induce corporations to develop algorithms responsibly while recognizing that robots, like employees, are most valuable when they do not strictly follow orders given by human beings.