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Robots in American Law

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This article closely examines a half century of case law involving robots—just in time for the technology itself to enter the mainstream. Most of the cases involving robots have never found their way into legal scholarship. And yet, taken collectively, these cases reveal much about the assumptions and limitations of our legal system. Robots blur the line between people and instrument, for instance, and faulty notions about robots lead jurists to questionable or contradictory results.

The article generates in all nine case studies. The first set highlights the role of robots as the objects of American law. Among other issues, courts have had to decide whether robots represent something “animate” for purposes of import tariffs, whether robots can “perform” as that term is understood in the context of a state tax on performance halls, and whether a salvage team “possesses” a shipwreck it visits with an unmanned submarine.

The second set of case studies focuses on robots as the subjects of judicial imagination. These examples explore the versatile, often pejorative role robots play in judicial reasoning itself. Judges need not be robots in court, for instance, or apply the law robotically. The robotic witness is not to be trusted. And people who commit crimes under the robotic control of another might avoid sanction.

Together these case studies paint a nuanced picture of the way courts think about an increasingly important technology. Themes and questions emerge that illuminate the path of robotics law and test its central claims to date. The article concludes that jurists on the whole possess poor, increasingly outdated views about robots and hence will not be well positioned to address the novel challenges they continue to pose.

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INTRODUCTION

“Robots again.” So begins Judge Alex Kozinski’s dissent from the Ninth Circuit’s decision not to rehear *Wendt v. Host International* en banc.¹ “Robots,” because *Wendt* involved animatronic versions of two popular television characters that, the actors said, violated their rights of publicity.² “Again,” because, just a few years before, the Ninth Circuit decided *White v. Samsung*, in which Vanna White sued the electronics giant Samsung for featuring a robot version of the game show host in an advertisement.³

Robots appear in surprising number and variety in American law. *White* and *Wendt* are fairly well known. But most of the cases to involve robots have never made their way into legal scholarship. This article closely examines six decades of courts struggling with robots—just in time for the technology itself to enter the mainstream. This detailed examination leads to a simple thesis: robots confront courts with unique legal challenges that judges are not well positioned to address.

¹ *Wendt v. Host Int’l, Inc.*, 197 F.3d 1284 (9th Cir. 1999) (Kozinski, J., dissenting from denial of petition for rehearing).

² *Wendt v. Host Int’l, Inc.*, 125 F.3d 806, 809 (9th Cir. 1997).

³ *White v. Samsung Elec. Am, Inc.*, 971 F.2d 1395 (9th Cir. 1992), *cert. denied*, 508 U.S. 951 (1993).

The challenges robots pose will only become more acute in light of the explosive growth of the robotics industry over the next decade. Today robots are leaving the factory and theatre of war and entering our roads, skies, offices, and homes. We are in the midst of a robotics revolution.⁴ Popular technology companies are investing billions in robotics and artificial intelligence.⁵ Patent filings for robots are skyrocketing.⁶ Hardly a day goes by without a national headline devoted to driverless cars or drones.⁷

In previous work, I examined what the mainstreaming of robotics might mean for American law and legal institutions.⁸ I grounded the discussion in the legal and policy fallout from the last transformative technology of our time, the Internet. The Internet has a set of core qualities that tended to pose challenges for law. For example, the Internet allows for instant exchange of goods and services across borders, which invited courts to revisit the rules of jurisdiction.⁹ Robotics, I argued, has a different set of core qualities than the Internet and, accordingly, will generate new puzzles for law.¹⁰

Robotics and the Lessons of Cyberlaw drew several thoughtful responses.¹¹ Yale Law professor Jack Balkin agrees that robots will generate interesting new legal puzzles but questions whether we can know what these might be in advance.¹² Balkin observes that the only reason we can point to the legally relevant features of the Internet is that we have two

⁴ See Gill A. Pratt, *Is a Cambrian Explosion Coming for Robotics?*, 29 J. ECON. PERSP., 51, 51 (2015) (“Today, technological developments on several fronts are fomenting [an] explosion in the diversification and applicability of robotics.”).

⁵ Google, Amazon, Facebook, IBM, and many other companies are each investing millions or billions of dollars in these technologies. See, e.g., John Markoff, *Google Puts Money On Robots, Using the Man Behind Android*, N.Y. TIMES, Dec. 4, 2013; John Letzing, *Amazon Adds That Robotic Touch*, WALL ST. J., Mar. 20, 2012. Some recent investments outside of the United States are even more dramatic. See, e.g., *EU launches world’s largest civilian robotics programme*, EUROPEAN COMMISSION, June 3, 2014, http://europa.eu/rapid/press-release_IP-14-619_en.htm; Kelvin Chan, *China’s robot revolution is happening*, ASSO. PRESS, Sep. 23, 2015.

⁶ See “World Intellectual Property Report: Breakthrough Innovation and Economic Growth,” WORLD INTELLECTUAL PROPERTY ORGANIZATION, 120-35 (2015) (discussing surge in patent and other intellectual property activity).

⁷ A search of Westlaw revealed well over four thousand news stories where drones or driverless cars appeared in the headline in 2015 alone.

⁸ Ryan Calo, *Robotics and the Lessons of Cyberlaw*, 103 CALIF. L. REV. 513 (2015).

⁹ *Id.* at 520-21.

¹⁰ See generally *id.*

¹¹ For example, bestselling science fiction writer Cory Doctorow responded to the article by calling into question whether there can be any legal distinction between robots and computers. Cory Doctorow, *Why it is not possible to regulate robots*, THE GUARDIAN, Apr. 2, 2014.

¹² Jack M. Balkin, *The Path of Robotics Law*, 6 CALIF. L. REV. CIRCUIT 45, 49 (2015).

decades of experience with theorists and courts writing about cyberlaw.¹³ For Balkin, we will have to wait and see what path robotics law will follow. Or perhaps look to science fiction, where the laws of robotics are familiar.¹⁴

Professor Balkin's helpful critique led to this article's animating question: Are we in the same place today with robotics that we found ourselves at the dawn of cyberlaw? I submit that we are not. Courts and law professors in the 1990s had very limited experience with the Internet; it was brand new.¹⁵ Robots, in contrast, have played a role in American society since at least the 1950s. And, like most technologies, they have been involved in legal disputes. What do those disputes tell us today, as robots enter a new golden age? And how should courts and other jurists think about contemporary robotics?

We should not be surprised that American courts have had to make decisions involving robots. People have been thinking about robots for thousands of years. The sixth century manuscript *Shai Shih t'u Ching* catalogues mechanical orchestras and other automata that predate the birth of Christ.¹⁶ Since at least the 1980s, robots have been instrumental in keeping American factories competitive.¹⁷ In the past two decades, the United States government has embraced robotics in its effort to overhaul the most powerful military in the world.¹⁸

What *is* surprising is how difficult and complex these cases turn out to be, and what they wind up saying about the law itself. This article canvasses hundreds of decisions concerning robots over half a century, generating nine new case studies for the burgeoning field of robotics law. The first six consist of archetypes of a particular kind of problem that robots pose as objects. Among other issues, courts have had to decide whether robots represent something "animate" for purposes of import tariffs,¹⁹ whether robots can "perform" as that term is understood in the context of a state tax on performance halls,²⁰ and whether a salvage team "possesses" a

¹³ *Id.* at 48.

¹⁴ *Id.* at 60.

¹⁵ See Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207, 207 (calling attention to legal scholars' lack of experience with the Internet).

¹⁶ See Pau Alsina, *Arte, CIENCIA, Y TECNOLOGIA* 85 (2007) (discussing the *Shai Shih t'u Ching* or "Book of Hydraulic Excellencies"). See also IBN AL-RAZZAZ AL-JAZARI, *The Book of Knowledge of Ingenious Mechanical Devices* (Donald R. Hill, trans. 1974).

¹⁷ [cite]

¹⁸ See PETER W. SINGER, *WIRED FOR WAR: THE ROBOTICS REVOLUTION AND CONFLICT IN THE TWENTY-FIRST CENTURY* (2009).

¹⁹ *E.g.*, *Louis Marx & Co. v. United States*, 40 Cust. Ct. 610, 1958 WL 8607 (1958). See also *infra*.

²⁰ *Comptroller of the Treasury v. Family Entertainment Center of Essex, Inc.*, 519 A.2d 1337 (Md. 1987). See also *infra*.

shipwreck by visiting it with an unmanned submarine.²¹

Robots also play an interesting role as the subjects of judicial imagination. The article's remaining three case studies explore the versatile, often pejorative role robots play in judicial reasoning itself. Judges need not be robots in court, for instance, or apply the law robotically.²² The robotic witness is not to be trusted.²³ People who commit crimes under the robotic control of another might avoid sanction.²⁴

Together these case studies paint a nuanced picture of the way courts think about an increasingly important technology. Themes and questions emerge that illuminate the path of robotics law and test its central claims to date. We can see already how robots begin to blur the line between people and instrument, and how faulty assumptions about robots lead jurists to questionable or contradictory results. The article concludes that jurists on the whole possess poor, increasingly outdated views about robots and hence will not be well positioned to address the novel challenges they continue to pose. A more comprehensive understanding of robotics and the diversification of sources of robotics law to include legislators and regulators may help—hopefully in enough time to make a difference.

The article proceeds as follows. Part I discusses robots as the objects of law, i.e., as things in the world that occasion legal disputes, placing particular emphasis on the role of robots as surrogates for people.²⁵ We begin with *White* and *Wendt* but quickly turn to less-examined legal territory. Part II investigates the role of robots subjects in judicial reasoning, i.e., as metaphors or analogies that actually drive the decisions of courts. The concept of a robot in these cases is not a mere passing reference but a part of the central holding, an idea cited by later courts for its binding or persuasive effect. Part III unites the past of American robot law with its likely future—a crucial exercise given the rapid mainstreaming of drones, driverless cars, surgical robots, home robots, and other robotics technology. This Part examines whether past cases shed light on existing puzzles,

²¹ *Columbus-America Discovery Group, Inc. v. Abandoned Vessel*, S.S. Central America, 1989 A.M.C. 1955 (1989). *See also infra*.

²² *E.g.*, *Commonwealth of Williams v. Local Union 542*, 388 F. Supp. 155 (1974); *Allen v. State*, 290 Ala. 339 (1973) (“The trial judge is a human being, not an automaton or a robot.”). *See also infra*.

²³ *E.g.*, *Rong Lin v. Mukasey*, 299 F. App'x 10 (2d Cir. 2008). *See also infra*.

²⁴ *E.g.*, *Frye v. Baskin*, 231 S.W. 2d 630 (Mo. App. 1950). *See also infra*.

²⁵ Woodrow Hartzog offers this helpful term. Balkin also talks about the notion of a “substitution effect” where robots stand in for people. Balkin, *supra* note 12, at 55. In previous work, I speak in terms of the social valence of robots, i.e., the unique status of robots as an artifact that feels like an animate being. Calo, *supra* note 8, at 545-49. The tendency is so strong that soldiers have reportedly risked their lives on the battlefield to rescue a robotic member of the team. *Id.* at 515.

generates new questions for scholars including around race and gender, and discusses the role of courts, legislators, regulators, and others in setting the path of robotics law going forward. A final section concludes.

I. ROBOTS AS LEGAL OBJECTS

This Part consists of six case studies generated by an analysis of over two hundred cases involving robots and analogs. More specifically, my research assistants and I searched Westlaw for opinions that mention robots and close synonyms such as “robotics” and “automaton.” For the case to be a candidate for analysis, the word could not appear merely in the body of the decision but had to appear in the syllabus or headnotes. In this way, the research attempts to filter out hundreds of other cases in which the term “robot” appears but does not meaningfully factor into the factual or legal dispute.²⁶

The concept of a robot is not without controversy. In my previous work, I embrace a definition of a robot as a machine with three qualities: (1) a robot can sense its environment, (2) a robot has the capacity to process the information it senses, and (3) a robot is organized to act directly upon its environment.²⁷ I feel this definition—to which the literature refers as the “sense, think, act” paradigm—best reflects how robots differ from previous or constituent technologies such as a laptop.²⁸ For the purposes of this article, however, I did not use my own definition to screen out any technology. Rather, I looked for the court to use the word robot or a close synonym. However, I did exclude cases—such as *CNET Networks, Inc. v. Etlize, Inc.*—where the “robot” at issue referred exclusively to a software program running in the background of a server of website.²⁹ The robots that follow tend to be embodied, physically, in the real world.

Even with these various heuristics in place, the role of the robot in the majority of cases is best characterized as incidental. By incidental, I mean that the case would likely have come out exactly the same way were the technology at issue not a robot but some other object or concept. Maybe it’s a copyright case where robots happen to figure into the plot that the plaintiff alleges was unlawfully copied.³⁰ Or perhaps it is a case of medical

²⁶ This is an admittedly imperfect heuristic. I acknowledge the limitations of using headnotes and syllabi, written not by the courts themselves, but by lawyers after the fact.

²⁷ Calo, *supra* note 8, at 529-32.

²⁸ *Id.* at 529.

²⁹ See *CNET Networks, Inc. v. Etlize, Inc.*, 547 F. Supp. 2d 1055, 1065 (N.D. Cal. 2008) (defining the term “crawler” in the context of a patent dispute).

³⁰ E.g., *FASA Corp. v. Playmates Toys, Inc.*, 869 F. Supp. 1334 (N.D. Ill. 1994) (finding that “robot-like battle machines” are familiar themes not subject to copyright protection).

malpractice where the surgeon operated on the plaintiff with a surgical robot.³¹ The movie plot could involve aliens or the surgery happen manually and present the court with the identical legal issue.

Many of these incidental cases are quite interesting. In *Robotic Vision Systems, Inc. v. Cybo Systems, Inc.*, for instance, a client of a robotics firm sued because, rather than send human technicians to resolve an installation problem, the robotics firm sent two robots named Al Bove and Al Treu.³² The client found the robots annoying and unhelpful and sued for breach of contract. In *Reinhardt v. Fuller*, a criminal defendant fired four shotgun blasts at a police robot during his arrest.³³ Robotic props have repeatedly caused injuries on stage and film by behaving unexpectedly, including on the set of a movie *about machines that came alive and hurt people*.³⁴ These are colorful facts. Nevertheless, the issues tend to turn on standard principles of contract, criminal, and tort law. What distinguishes the cases that follow is that they turn in some way on the unique features of robots.

In short, I used a particular heuristic to sort cases that involve robots into two categories: cases where the existence of a robot was incidental and cases where the robot was arguably instrumental. From the latter I generated the six case studies that follow.³⁵ In this Part, I present these cases and offer commentary on the court's analysis.

³¹ *E.g.*, *Balding v. Tarter*, 3 N.E.3d 794 (Ill. 2014) (denying an appeal from a medical malpractice case involving robot-assisted prostate surgery).

³² 17 F.Supp.2d 151 (E.D.N.Y. 1998).

³³ 2008 WL 5386802 (E.D. Cal. 2008).

³⁴ “[O]n the set of a motion picture entitled *Maximum Overdrive*,” the plaintiff “sustained severe and permanent damage to his ‘shooting eye’ when a remote controlled powered lawnmower lost control.” *Nannuzzi v. King et al.*, 660 F. Supp. 1445, 1446 (S.D.N.Y. 1987) (remanding action to state court). *See also* *Provenzano v. Pearlman, Apat, & Futterman LLP*, 2008 WL 4724581 (E.D.N.Y. 2008) (unreported legal malpractice case where plaintiff failed to recover against manufacturer when robotic camera struck her in the head); Paul McCann, *TV robot injuries studio workers*, THE N.Y. TIMES, Jan. 8, 2000 (“During filming recently, a 170 lb robot came to life after it was switched off and careered out of control, injuring a stage technician. He needed stitches for an ankle wound caused by sharp spikes on the robot.”).

³⁵ The closest set of methodology commitments to my approach are likely grounded theory, which recommends approaching a data set without a preconceived hypothesis, and thematic network analysis. For a discussion of grounded theory, see ANSELM STRAUSS & JULIET CORBIN, *GROUND THEORY METHODOLOGY: AN OVERVIEW*, IN *HANDBOOK OF QUALITATIVE RESEARCH* (1994). For a discussion of thematic network analysis, see JENNIFER ATTRIDE-STIRLING, *THEMATIC NETWORKS: AN ANALYTIC TOOL FOR QUALITATIVE RESEARCH*, *QUALITATIVE RESEARCH* 1:3, 385-405 (Dec. 2001). I am grateful to Meg Jones for these suggestions.

A. Appropriation by Robot

I have already mentioned what is perhaps the most visible case involving a robot, that of *White v. Samsung*.³⁶ In the early 1990s, the electronics giant Samsung ran an amusing series of print ads speculating about the future. One depicted a “female-shaped robot ... wearing a long gown, blonde wig, and large jewelry” standing on what appeared to be the set of the game show *Wheel of Fortune*.³⁷ The caption read “Longest-running game show. 2012 A.D.”³⁸ The host of *Wheel of Fortune*, Vanna White, sued Samsung in federal district court for violating her right of publicity and falsely implying an endorsement. The trial court rejected her claims on summary judgment and White appealed.

The Ninth Circuit reversed. The appellate court agreed with the district court that, for purposes of California’s right to publicity statute, Samsung had not “knowingly use[d] another’s name, voice, signature, photography, or likeness.”³⁹ Relief under the statute is narrow: the term “likeness” is limited to a visual depiction of the plaintiff.⁴⁰ Because Samsung’s ad “used a robot with mechanical features, and not, for example, a manikin molded to White’s precise features,” it did not fall within the meaning of California Civil Code section 3344.⁴¹ “However,” the Ninth Circuit found, “the common law right of publicity is not so confined.”⁴²

In finding for White under the common law right to publicity, which also involves the appropriation of a plaintiff’s name, picture, or other likeness, the court offered an elaborate hypothetical:

*Consider a hypothetical advertisement which depicts a mechanical robot with male features, an African-American complexion, and a bald head. ... The ad depicts the robot dunking a basketball one-handed, stiff-armed, legs extended like open scissors, and tongue hanging out. Now envision that this ad is running on television during professional basketball games. Considered individually, the robot’s physical appearance, its dress, and its stance tell us little. Taken together, they lead to the only conclusion any sports viewer who has registered a discernable pulse in the past five years would reach: the ad is about Michael Jordan.*⁴³

³⁶ 971 F.2d 1395 (9th Cir. 1992), *cert. denied*, 508 U.S. 951 (1993).

³⁷ *Id.* at 1399.

³⁸ *Id.* at 1396.

³⁹ *Id.* at 1397.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.* at 1399.

Similarly, Samsung's depiction of a robot in a gown, jewelry, and blonde wig turning over letters on a game show set could only signify Vanna White. To limit liability on these facts would be, for the majority, to "permit the evisceration of the common law right of publicity."⁴⁴

Judge Alarcon, dissenting, would not have drawn a distinction between the common law and statutory notions of "likeness."⁴⁵ For Judge Alarcon, nearly every issue boiled down to the impossibility of anyone confusing the robot for the host. It was "clear that a metal robot and not the plaintiff, Vanna White, is depicted in the commercial advertisement" and indeed "no reasonable juror could confuse a metal robot with Vanna White."⁴⁶ The "crude features of the robot are very dissimilar to Vanna White's attractive human face."⁴⁷ Put simply: "One is Vanna White. The other is a robot. No one could reasonably confuse the two."⁴⁸

Samsung's robot generates a tension, evident in the sheer distance between the majority and dissent's respective starting points. For the majority, a robot in these circumstances could not but invoke an individual to anyone with "a discernable pulse."⁴⁹ For the dissent, the distinction between a robot and a person is "patently clear."⁵⁰ You see hints of the tension in the majority's conflicting interpretation of "likeness" for purposes of statutory and common law, as well as its analysis of likelihood of confusion under the Lanham Act. "On the one hand," noted the majority, "all of the aspects of the robot ad identify White; on the other, the figure is quite clearly a robot."⁵¹

The Ninth Circuit would confront the issue again just a few years later in *Wendt v. Host International, Inc.*⁵² This action was brought by the two actors who played famed barflies Cliff and Norm on the television show *Cheers*.⁵³ Plaintiffs alleged that the defendant company built two "animatronic robotic figures" or "robots" of them for use in airport bars modeled on the set of *Cheers*, violating their individual rights of publicity

⁴⁴ *Id.*

⁴⁵ *Id.* at 1402 (Alarcon, J., concurring in part, dissenting in part).

⁴⁶ *Id.* at 1404, 1405.

⁴⁷ *Id.* at 1406 (discussing plaintiff's claims under the Lanham Act).

⁴⁸ *Id.* Judge Alarcon—like Judge Kozinski in *Wendt*—drew a distinction between Vanna White's role as host and her identify as an individual. *Id.* at 1404. Moreover, he thought it was clear from the fact that Samsung was using a robot, rather than Vanna White herself, that she did not endorse their product. *Id.* at 1407.

⁴⁹ *Id.* at 1399.

⁵⁰ *Id.* at 1404.

⁵¹ *Id.* at 1400.

⁵² 125 F.3d 806 (9th Cir. 1997).

⁵³ *Id.* at 809.

by appropriating their likenesses for purposes of the same California state statute at issue in *White*.⁵⁴ The robots differed from the clearly metal robot in *White* in that they were embodied, human-looking, and had specific names (Hank and Bob) that differed from those of the plaintiffs.⁵⁵ The district court, observing both the robots and the plaintiffs “live” and in person, found them “totally different” and ordered summary judgment for the defendant.⁵⁶

Again the Ninth Circuit reversed. It began by noting that *White* left open the prospect that a “manikin molded to [plaintiff’s] precise features” could qualify as a likeness even under the California statute.⁵⁷ The appellate court then concluded from *its own* inspection of the robots that a reasonable jury could find them similar enough to violate California law.⁵⁸ The court also found likelihood of confusion, in part because people would come up to the plaintiffs and say things like, “Hey George, I just had a drink with you in Kansas City.”⁵⁹ There was no dissent in *Wendt* but, as alluded to above, Judge Kazinski vehemently dissented from the Ninth Circuit’s decision to deny rehearing en banc.⁶⁰

White or *Wendt* are well-known cases of robot impersonation, appearing in textbooks on torts and intellectual property. Less remembered is the earlier case of *Elnicky Enterprises v. Spotlight, Inc.*⁶¹ Rather than a robot copy of a person, *Elnicky* involved a robot copy of another robot. The key question in *Elnicky* was: did the defendant’s action of replicating the plaintiff’s robot, which he used at trade shows to entertain corporate guests, constitute a violation of the Lanham Act prohibitions on unfair competition?⁶²

Throughout its analysis, the *Elnicky* court referred to Rodney and Walter Ego as “he.”⁶³ As in *Wendt*, the judge observed Rodney, the original

⁵⁴ Unlike in *White*, the defendant in *Wendt* received explicit permission from the television show to build the surrounding environment. Thus, plaintiffs proceeded entirely in their personal capacity. *See id.*

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.* at 810.

⁵⁸ *Id.* (“[W]e conclude from our own inspection of the robots that material facts exist that might cause a reasonable jury to find them sufficiently ‘like’ the appellants.”).

⁵⁹ *Id.* at 813.

⁶⁰ *Wendt v. Host Int’l, Inc.*, 197 F.3d 1284 (9th Cir. 1999) (Kozinski, J., dissenting from denial of petition for rehearing). His basis was that actors should not retain intellectual property rights in the characters they play. *Id.*

⁶¹ *Elnicky Enterprises, Inc. v. Spotlight Presents, Inc.*, 1981 WL 48202 (S.D.N.Y. 1981).

⁶² *Id.* at *1.

⁶³ *See, e.g., id.* at *1-2.

robot, as well as the usurper Walter Ego.⁶⁴ According to the court, “Rodney was casually attired and presented a rakish appearance,” whereas “Walter Ego is clean shaven, and has a grin reminiscent of Mortimer Snerd.”⁶⁵ Rodney was of higher quality and operated with greater skill.⁶⁶ And the court went out of its way to note that Rodney’s design likely couldn’t be patented.⁶⁷ Nevertheless, the court found the two robots to be so similar as to confuse potential consumers.

The case made headlines in 1981. The reason had less to do with the difficult competition law question and more with the relief U.S. District Judge Charles Brieant went on to order. The judge wanted Walter Ego dismantled above the torso.⁶⁸ This was a strange Lanham Act remedy to say the least, and prompted news stories with headlines like “Robot beheaded” and “Walter Ego loses his head” across North America.⁶⁹ The case has since faded with history.

The entire line of robot appropriation cases is interesting for the light it sheds on judicial and public assumptions around robots.⁷⁰ In previous work, I have noted that robots contain a unique social valence among artifacts.⁷¹ In psychological studies, for instance, respondents struggle to characterize robots as animate or inanimate.⁷² In *White* and *Wendt*, courts are struggling instead with whether a robot version of a person can be said to *represent* that person in the way the law cares about. And in *Enlicky*, the public is reacting to a remedy that feels odd or even wrong given the anthropomorphic qualities of the disputed object, but which would fail even to raise an eyebrow were the artifact a toaster. The purpose of this section was to introduce the general ambiguity that surrounds robots as surrogates;

⁶⁴ *Id.*

⁶⁵ *Id.* at *1, *4. Mortimer Snerd was a puppet used by the legendary ventriloquist Edgar Bergen.

⁶⁶ *Id.* at *4.

⁶⁷ *Id.* at *10 (“In this Court’s view, any patent issued for Rodney or any parts of his articulation would be void for obviousness.”).

⁶⁸ *Id.* at *12 (finding that “the dismantling of Walter Ego’s head and torso will be required”).

⁶⁹ See Robot Beheaded, WILMINGTON MORNING START, Aug. 4, 1981. (“‘Off with his head!’ a judge has ordered in the case of a robot born of a stolen design.”); *Walter Ego loses his head*, THE MONTREAL GAZETTE, Jul. 21, 1981. For a contemporary example of the media’s fascination with beheaded robots, see Jack Nicas, *Mannequins Step In For Human Billboards, But Some Are Losing Their Heads*, WALL ST. J., Nov. 30, 2015.

⁷⁰ Cases in this line continue. In the recent *Brill v. Walt Disney Co.*, for example, a stock car driver sued a motion picture studio for allegedly appropriating his likeness with a driverless car. 246 P.3d 1099, 1103 (2010).

⁷¹ See Calo, *supra* note 8, at 545-49.

⁷² *Id.* at 532 (citing Peter H. Kahn, Jr., et al., *The New Ontological Category Hypothesis in Human-Robot Interaction*, 2011 PROC. 6TH INT’L CON. ON HUMAN-ROBOT INTERACTION 159 (collecting studies)).

the next few cases explore the issue in greater detail.

B. Robotic Performance

A robot can appropriate the likeness of a performer under certain conditions. But can a robot itself “perform”? The question came up in the context of a tax on entertainment. In *Comptroller of the Treasury v. Family Entertainment Centers*, a Maryland special appeals court had to decide whether life-sized, animatronic puppets that dance and sing at Chuckie Cheese restaurants trigger a state tax on food “where there is furnished a performance.”⁷³ In its analysis, the court looked to Webster’s dictionary, which defines performance as a “formal exhibition of skill or talent as a play, musical program, etc.; a show.”⁷⁴ For the court, it followed that a performance “has connotations of inherent human input that leaves room for spontaneous imperfections during the exhibition of skill or talent.”⁷⁵

The court found that, while they “are designed to give the impression that they are performing,” the Chuckie Cheese robots fell outside the scope of the statute.⁷⁶ In the court’s words:

*[A] pre-programmed robot can perform a menial task but, because a pre-programmed robot has no ‘skill’ and therefore leaves no room for spontaneous human flaw in an exhibition, it cannot ‘perform’ a piece of music ... Just as a wind-up toy does not perform for purposes of [the statute,] neither does a pre-programmed mechanical robot.*⁷⁷

The original tax court also found it noteworthy that the “cyberamic figures” the restaurant chain purchased had yet to be invented when Maryland passed its performance tax statute.⁷⁸ Had they existed, the lower court reasoned, surely the legislature would have added them to the list of exceptions, which include “mechanical music, radio, or television, alone.”⁷⁹ Both the tax and special appeals courts invoked a juke-box as the closest analogy to the robots in Chuckie Cheese.

⁷³ 519 A.2d 1337, 1338 (Md. 1987). The case was eventually overruled on other grounds involving the question of whether Chuckie Cheese tokens counted as “tickets” for purposes of municipal tax law. *See* 318 North Market Street, Inc. at al. v. Comptroller of the Treasury, 554 A.2d 453 (Md. 1989).

⁷⁴ *Id.* at 1339.

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ *Family Entertainment Centers of Essex, Inc. v. Comptroller of the Treasury*, 1985 WL 6106, *1 (Md. Tax 1985).

⁷⁹ *Id.*

Is a robot an “embellished juke-box”? And would a legislature today include robots in a similar ordinance? Consider the example of *The Robotic Church*, a 2014 art installation by noted sculptor Chico MacMurtrie.⁸⁰ MacMurtrie filled a deconsecrated church in the Red Hook neighborhood of Brooklyn with forty or so kinetic sculptures.⁸¹ The sculptures used a wide variety of mechanisms to generate noises and movement at random intervals. The effect is inhuman and surreal, and varies depending on where the audience stands, what robots happen to be working that day, and myriad other factors. It seems unlikely that any visitor could walk away doubting he or she had seen a performance, let alone that the installation was best analogized to a jukebox.

Following the court’s reasoning in *Family Entertainment Centers*, MacMurtrie’s installation is not a performance because the sculptures have no “skill” and can’t exhibit spontaneous flaws.⁸² Nor can we say that it is the artist MacMurtrie who is really performing; presumably someone also built the robots in Chuckie Cheese and programmed them to move about in a specific way as well. Consider, too, the ambiguity around the term “preprogrammed.” At the time of *Family Entertainment Centers*, robots largely carried out repetitive tasks. By the late eighties, many factories had mechanized every task they could, resulting in an explosion in the number of so-called industrial robots.⁸³ These machines could only do what they were programmed to do.

Even at the time of *Family Entertainment Centers*, however, roboticists at the Stanford Research Institute (SRI) had developed the famous robot Shakey, capable of basic autonomous actions such as mapping a room and planning a path around an obstacle.⁸⁴ Robotics has since moved toward ever greater adaptability. Today’s robots “learn” tasks just by watching human demonstrations or even through the robot’s own trial and error.⁸⁵ The robotic warehouses of online retail giant Amazon “organize themselves,” such that no human necessarily knows where an item is on the shelf.⁸⁶

⁸⁰ [cite]

⁸¹ *Id.*

⁸² Presumably the word “spontaneous” in this context excludes sudden glitches, for which real robots are famous. A Chuckie Cheese robot that, say, spontaneously combusted would not suddenly be engaged in a performance.

⁸³ [cite]

⁸⁴ For a nice account of Sharkey, see JOHN MARKOFF, *MACHINES OF LOVING GRACE: THE QUEST FOR COMMON GROUND BETWEEN HUMANS AND ROBOTS* (2015) 1-7. Robotic art also dates back to the 1960s. See Eduardo Kac, *Foundation and Development of Robotic Art*, *ART J.* 56:3, 60-67 (Autumn, 1997).

⁸⁵ Calo, *supra* note 8, at 538-39.

⁸⁶ The tagline of Kiva Systems, prior to its purchase by Amazon in 2012 for \$775 million, was: “Where products organize themselves.” Ryan Calo, *A Robot Really Committed a Crime: Now What?*, *FORBES*, Dec. 23, 2014,

Artists, including music artists, are aware of robots' new aptitude for spontaneity. They build robots that create art and play alongside robots in live concerts.⁸⁷ If ever there were a line between human and robot spontaneity or skill, it is rapidly disappearing.

C. Animate Objects

Closely related, perhaps, is the question of whether a robot represents something “animate” for purposes of tariff schedules. This question has come up repeatedly in American case law, as far back as the 1950s. For historic reasons, taxes on dolls have differed from those on other toys.⁸⁸ Tariff law understands dolls—which vary widely in terms of size, materials, and detailing—as distinct from other toys in that dolls represent “animate” life. Thus, the Tariff Act of 1930 drew a distinction between “Figures or images of animate objects, wholly or in chief value of metal” and toys “having a spring mechanism (except figures or images of animate objects).”⁸⁹

In *Louis Marx & Co. and Gehrige Hoban & Co., Inc. v. United States*, a customs court had to decide whether a “mechanical walking robot” being imported represented an animate object.⁹⁰ The importers argued that it did, and therefore that the robot should be taxed at 35 “per centum ad valorem” instead of the 50 percent assessed by customs officials.⁹¹ According to the trial transcription, the judge asked counsel for the plaintiff-importers whether the toy was “an imitation of an animate object.”⁹² Counsel replied: “Yes, a robot. It is as a synthetic man. It is something imitating men. That is the animate object that this particular toy represents. Also, the common meaning of robot supports our contention.”⁹³

The court disagreed. As in *Family Entertainment Centers*, the court turned immediately to the dictionary—in this case, two dictionaries.⁹⁴ In 1958, Webster’s defined a “robot” as “Any automatic apparatus or device that performs functions ordinarily ascribed to human beings, or operates

<http://www.forbes.com/sites/ryancaleo/2014/12/23/a-robot-really-committed-a-crime-now-what/#53862b9a1411>.

⁸⁷ [cite]

⁸⁸ [cite]

⁸⁹ 19 U.S.C. § 1513 (1930).

⁹⁰ 40 Cust. Ct. 610, 610 (1958).

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.* at 611. Another judge asked about the toy: “It is just a tiny robot?” To which counsel replied, “Yes.” *Id.*

⁹⁴ *Id.*

with what appears to be almost human intelligence.”⁹⁵ Funk & Wagnalls defined a robot as “An automaton that performs all hard work; hence, one who works mechanically and heartlessly.”⁹⁶ To these, the court compared each dictionary’s definition of the word “animate.”⁹⁷ These were, respectively: “Endowed with life; alive” and “Possessing animal life, living.”⁹⁸ For the court, there was “nothing in either of the quoted definitions from which to draw the conclusion that a robot is an animate object.”⁹⁹ A robot is “not a living thing; it is not endowed with life. A robot is a mechanical device or apparatus, a mere automaton, that operates through scientific or mechanical media.”¹⁰⁰ The court overruled plaintiffs’ exception to the higher tariff.

As much as anything, the court’s certainty about its decision in *Louis Marx & Co.* seems noteworthy. There was never any handwringing. And yet, at least one of the dictionaries the court consulted described robots as performing functions “ordinarily ascribed to human beings” and possessing “what appears to be almost human intelligence.”¹⁰¹ The other dictionary referred ambiguously to a robot as “one who works” in a particular way, almost as if to suggest that a robot is a specific type of person.¹⁰²

The court’s reasoning was curious in another way: it appeared to assume that the toy being imported—a mechanical walking robot—was not *itself* a robot, but only represented one. According to the court: “A robot is a mechanical device or apparatus, a mere automaton, that operates through scientific or mechanical media. It, therefore, follows that the toy under consideration, *which simulates a robot*, is not within the statutory language.”¹⁰³ In other words, although a robot is a machine that simulates a person, a toy robot is only a simulation of the simulacrum. We are left to wonder how robotic a toy must be to itself qualify as a robot.

The same issue arose again in 1971 in *Lewis Galoob Co. v. United States*.¹⁰⁴ Custom officials had assessed a 35 percent duty on a battery-operated Japanese toy called the Swivel-O-Matic Astronaut rather than the 21 percent duty then applicable to toys figures of animate objects.¹⁰⁵

⁹⁵ *Id.* (citing *Webster’s New International Dictionary*). The 2016 *Merriam-Webster Dictionary* defines robot differently. *See infra*.

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ *Id.* (citing *Webster’s New International Dictionary*).

¹⁰² *Id.* (citing *Funk & Wagnalls New Standard Dictionary*).

¹⁰³ *Id.* (emphasis added).

¹⁰⁴ 66 Cust. Ct. 484 (1971).

¹⁰⁵ *Id.* at 485.

According to the customs court, the Japanese toy consisted of a “representation” of a “mechanical robot” that, when activated, “slides forward on rubber wheels at the bottom of the feet.”¹⁰⁶ The toy’s chest lit up and opened to reveal two guns that pop out and appear to fire. A chief difference between this toy and that at issue in *Louis Marx & Co.* is the presence of a human face (like an astronaut).¹⁰⁷ Nevertheless, the court had no trouble characterizing the robot as representing something inanimate: “the presence of a human face in an article which is otherwise incapable of representing any living being cannot make ‘animate’ what is, in totality, incapable of animation or life.”¹⁰⁸ Again, the plaintiff’s exception was overruled.

By the 1990s, tariff law had changed to mention robots.¹⁰⁹ Interestingly, given the case law, the Harmonized Tariff Schedule characterized robots as “non-human creatures” and lumped them in with toys representing animals.¹¹⁰ The operative distinction became whether a given item for import constituted a “doll,” which in turn required that the toy specifically represent a human being.¹¹¹ This, too, proved contentious, as the 2003 case of *Toy Biz, Inc. v. United States* illustrates.¹¹²

In *Toy Biz, Inc.*, the U.S. Court of International Trade had to determine whether figurines of Marvel Comics superheroes and villains were dolls and hence subject to a tariff of 12 percent, rather than the 6.8 percent applicable otherwise.¹¹³ This in turn required the court to decide if the fictional characters, some of which had robotic features, were themselves human. Sometimes the choice was easy: the character Robot Wolverine is obviously a robot and hence a non-human creature.¹¹⁴ In other instances the call was harder. Is Spider Man not a human being? What about Kingpin, who is just a very bad person?¹¹⁵

To decide, the court made the familiar move of consulting a dictionary. The Oxford English Dictionary the court consulted defined a robot as “a machine (sometimes resembling a human being in appearance) designed to function in place of a living agent.”¹¹⁶ More relevant to the court, however,

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 486.

¹⁰⁹ See Harmonized Tariff Schedule of the United States, 9502.10.00 et seq. (1994).

¹¹⁰ *Id.* at 9503.49.00, HTSUS (1994).

¹¹¹ *Id.* at 9503.70.90, HTSUS (1994).

¹¹² 248 F. Supp. 2d 1234 (U.S. Ct. Int’l Trade 2003).

¹¹³ *Id.* at 1240.

¹¹⁴ *Id.* at 1241 n.10 (discussing imports that the parties stipulated to be non-human).

¹¹⁵ *Id.* at 1252 (“Nothing in the storyline indicates that Kingpin possesses superhuman powers.”).

¹¹⁶ *Id.* at 1251 (citing 9 OED 1036-37 (2d ed. 1989)). Today the OED has a long

was the OED's definition of a "mutant," which is how Marvel Comics characterized most of the figurines.¹¹⁷ The OED emphasized that a mutant *begins* as a human but winds up as something else by virtue of a mutant gene.¹¹⁸ Thus, by definition, mutants are no longer human beings and hence representations of them are not dolls, at least according to the court.

Toy Biz, Inc. helps illustrate how the evolution of human imagination—reflected, for instance, in the evolving definition of the term robot—winds up posing interesting challenges around legal categorization. Again we see evidence of confusion and equivocation. For instance: in a world of prosthetic hearts, ears, arms, and legs, what do we make of the court's contention that "robotic features, such as artificial eyes or limbs," militate against a finding of humanity?¹¹⁹ And why would one such robotic feature convert a person into a robot when a human face does not convert a robot into an astronaut?¹²⁰ I discuss these issues in greater detail in Part III.

D. Robot Possession

The case studies I've presented thus far interrogate the degree to which robots resemble people. The next two case studies involve a different question, namely, whether robots can be thought of as extending people into physical space in ways the law cares about. The contexts—maritime law of salvage in this section and state criminal law of burglary in the next—are quite disparate. But there are nevertheless some interesting similarities.

Salvage rights to a famous shipwreck were at issue in the next robot case, *Columbus-America Discovery Group, Inc. v. The Unidentified, Wrecked, and Abandoned Vessel, S.S. Central America*.¹²¹ The *S.S. Central America* was a steamship that sank in the Atlantic Ocean in 1857 carrying gold from the California Gold Rush.¹²² Many looked for the *Central America* following its accident; no one could find it. One hundred and thirty years later, a high tech operation discovered the wreckage and claimed first

definition of robot that encompasses everything from a "machine capable of automatically carrying out a complex series of movements, esp. one which is programmable" to a "central European system of serfdom, by which a tenant's rent was paid in forced labour or service" to a "traffic light." [cite]

¹¹⁷ 248 F. Supp. 2d, at 1251 (citing 10 OED at 145-46).

¹¹⁸ *Id.*

¹¹⁹ *Id.* at 1251.

¹²⁰ *See supra*, note 105 and accompanying text.

¹²¹ 1989 A.M.C. 1955 (1989).

¹²² *Columbus-America Discovery Group, Inc. v. The Unidentified, Wrecked, and Abandoned Vessel, S.S. Central America*, 742 F.Supp. 1327, 1328-29 (E.D. Va. 1990) (describing the facts around the shipwreck and salvage operation), *rev' on other grounds by Columbus-America Discovery Group, Inc. v. Atlantic Mut. Ins.*, 974 F.2d 450 (4th Cir. 1997).

salvage rights at maritime law.¹²³ Columbus-America Discovery Group made use of some very new technology for the late 1980s, including an unmanned (i.e., robotic) submersible equipped with cameras and actuators capable of grasping objects at the direction of its operators.¹²⁴

The trial court in *Columbus-America* had to decide whether, for purposes of salvage law, Columbus-American Discovery Group “achieved exclusive custody, control, and possession of the wreck.”¹²⁵ First salvor rights at maritime law entitle the operation to recover some substantial portion of the treasure aboard the vessel as well as exclude other potential salvors.¹²⁶ And indeed, several other teams were in the area searching for the *Central America*, leading the Columbus-America Discovery Group to ask the court to enjoin anyone else from entering the immediate salvage zone.¹²⁷

The usual way for custody, possession, and control to be achieved at this time was by human divers approaching the vessel and either recovering property over time or, if safe, lifting the wreck out of the water.¹²⁸ The salvage team in *Columbus-America*, however, was not able (or willing) to send anyone that far down—nearly one and one half miles below the surface. It sent down its robots instead.¹²⁹

The court decided that, in light of the conditions, sending the robots counted for purposes of effective control and possession. They were, after all, able to generate live images of the wreck and had the further “capability to manipulate the environment” at the direction of people.¹³⁰ The court fashioned a new test for effective possession through “telepossession,” consisting of four elements: (1) locating the wreckage, (2) real-time imaging, (3) placement of a robot near the wreckage with the ability to manipulate objects therein, and (4) intent to exercise control.¹³¹ As maritime law scholar Barlow Burke, puts it: “This is as close as the court can come to creating a new legal basis for establishing possession without actually doing so.”¹³² On the basis of the new test, which has been cited by other courts

¹²³ *Id.*

¹²⁴ *Id.* at 1329.

¹²⁵ *Id.* at 1330.

¹²⁶ *Columbus-America Discovery Group, Inc.*, 1989 A.M.C. at 1957-58.

¹²⁷ *Id.*

¹²⁸ See Barlow Burke, Jr., *A Reprise of the Case of Eads v. Brazelton*, 44 ARK. L. REV. 425, 456-58 (1991).

¹²⁹ *Columbus-America Discovery Group, Inc.*, 742 F. Supp. at 1331 (noting that “salvage operations will ultimately be effected by the use of a remotely operated vehicle capable of handling the remains of the vessel and retrieving its contents”).

¹³⁰ *Columbus-America Discovery Group, Inc.*, 1989 A.M.C. at 1958.

¹³¹ *Id.* at 1957-58.

¹³² See Burke, *supra* note 128, at 456.

since, the court granted salvage rights to Columbus-America Group and enjoined its competitors.¹³³

The 1990s saw a renaissance of deep sea treasure hunting, in large part due to advances in robotics.¹³⁴ Today the use of sea and undersea robotics is even more extensive. Both the public and private sector are making increasing use not only of teleoperated robots, i.e., machines under the constant direction of a remote pilot, but autonomous systems that explore the sea on their own.¹³⁵ Navy pilotless submarines monitor undersea activity.¹³⁶ And private or academic research vessels spend months on the open waves mapping out territory. The company Liquid Robotics lists over 625,000 autonomous miles at sea with its Wave Glider robots.¹³⁷

It is interesting to note that *Columbus-America* and its progeny leave open the question of whether the *autonomous* discovery of a shipwreck could ever support a first salvage claim. There is reason to believe it might not. First, autonomous exploration does not technically meet the *Columbus-America* elements, which emphasize the role of a human operator above water and require intent to exercise control.¹³⁸ A court might not credit an autonomous submarine with the “intent” to record or manipulate a wreck, even were it physically able to do so. Second, the court’s new standard grew from the recognition that high-seas salvage operations were dangerous, even if the crew did not go underwater.¹³⁹ This leaves open the prospect that an all-robot expeditions would not meet the spirit of so called telepossession because the human crew would be in safer waters or even on shore.¹⁴⁰

¹³³ R.M.S. Titanic, Inc. v. Wrecked & Abandoned Vessel, involving what is perhaps the most famous shipwreck in modern history, cites the Columbus-America test. 742 F. Supp. 2d 784, 794 (E.D. Virginia 2010). For another example of a case adopting the doctrine of telepossession, see *Ocean Mar, Inc. v. The Cargo of SS Islander*, 1998 WL 886109 (D. Alaska Aug. 28, 1998).

¹³⁴ [cite]

¹³⁵ R.M.S. Titanic, Inc., for instance, involved a mixture of teleoperated and autonomous submarines. 742 F. Supp. 2d at 799, n.20.

¹³⁶ See Craig H. Allen, *The Seabots are Coming Here: Should they be Treated as ‘Vessels’?*, 65 J. NAVIGATION 749 (2012).

¹³⁷ See <http://www.liquidr.com/> (last visited Feb. 17, 2016).

¹³⁸ Specifically, the fourth factor requires “present intent to control ... the location of the object.” *Columbus-America Discovery Group, Inc.*, 1989 A.M.C. at 1958.

¹³⁹ *Id.* (finding that “Columbus-America has maintained a reasonable presence at the cite,” given the “special circumstances which characterize deep ocean salvage, including rough seas, sailing distances to safe port, remoteness from repair facilities and assistance...”).

¹⁴⁰ Obviously the stakes are entirely different, but this question mirrors in a sense contemporary arguments around the propriety of using drones or other robots to kill at distance without imperiling American soldiers. For a discussion, see Singer, *supra* note 18, at 309-14 (discussing perceptions of the United States’ use of remote warfare).

E. The Robot Burglar

In 1887, an English court convicted Henry Hands of common law larceny for his appropriation of several cigarettes belonging to an Edward Shenton.¹⁴¹ Despite somewhat unusual facts for the time, neither the lower court nor the court on appeal had any trouble characterizing Hands' actions as theft. What Hand and his accomplices did was use a brass and lead disc instead of a penny to retrieve cigarettes from Shenton's new "automatic box."¹⁴² According to the court, Hands' substitution of a disc without value for a penny defrauded Shenton's machine—"the means ... were fraudulent"¹⁴³—and thereby deprived Shelton of his cigarettes without his consent.¹⁴³

Reg. v. Hand and Others involved theft from a machine. The case I want to examine here is the slightly more fanciful prospect of theft *with* a machine. Robots make another appearance in *People v. Davis*, a 1998 burglary case before the California Supreme Court.¹⁴⁴ The state accused Michael Wayne Davis of passing a bad check to a window teller through a chute. The teller grew suspicious and phoned the police, who picked up Davis while he was still waiting for the bank to cash the fraudulent check.

As in *Hand*, the trial and appellate courts in *Davis* had no problem finding larceny on these facts.¹⁴⁵ But one of the charges was burglary, i.e., entering a building or structure with the intent to steal. Relying on an earlier appellate decision in *People v. Ravenscroft*, the lower court found that Davis' actions were, in fact, a burglary as well.¹⁴⁶ *Ravenscroft* involved the burglary of an ATM through the use of a stolen card.¹⁴⁷ Other California courts had similarly held that any wrongful entry into a structure, however slight or partial, could support a burglary charge.¹⁴⁸ The dissent in *Davis*, like the lower court, would have found burglary in the act of approaching the security window and passing through it "an instrumentality to trick the teller into handing him money back."¹⁴⁹

¹⁴¹ *Reg. v. Hand and Others*, LVI. Cr. Cas. Res. 370 (May 14, 1857). At English common law, larceny had similar elements to statutory theft today; the defendant must intentionally deprive another of goods of value without permission. See Minturn T. Wright III, Note, *Statutory Burglary—The Magic of Four Walls and Roof*, 100 U. PENN. L. REV. 411 (1951). Thank you to James Grimmelmann for bringing *Reg. v. Hand and Others* to my attention.

¹⁴² *Reg.*, Cr. Cas. Res. at 370.

¹⁴³ *Id.* at 371.

¹⁴⁴ 958 P.2d 1083 (Cal. 1998).

¹⁴⁵ *Id.* at 1084.

¹⁴⁶ *Id.* at 1087.

¹⁴⁷ See *People v. Ravenscroft*, 198 Cal. App. 3d 639 (1988).

¹⁴⁸ 958 P.2d at 1086-87 (citing cases).

¹⁴⁹ *Id.* at 1091 (Baxter, J., dissenting).

The majority was of another view; it abrogated *Ravenscroft* and rejected the burglary charge.¹⁵⁰ The court first conceded that a defendant could commit burglary without himself entering the premises—for instance, through the use of a robot. “Instruments other than traditional burglary tools certainly can be used to commit the offense of burglary.”¹⁵¹ For example, “a robot could be used to enter the building.”¹⁵² But “it does not necessarily follow from these conclusions that insertion of a stolen card into an ATM constitutes a burglary.”¹⁵³ A robot represents a new means by which to accomplish the traditional ends of entry for the purposes of theft. The introduction of a card or check into a structure does not become entry merely because the defendant has a bad intent.

There is a certain intuitive appeal to the majority’s reasoning. Passing a bad check through a chute does not feel analogous to entering a facility with a robot without the permission of the owner. Yet the line between a check and a robot may not be as sharp as the majority in *Davis* assumes. The line is not, for instance, that a robot enters the building and a check doesn’t. Both enter the building, as the dissent pointed out.¹⁵⁴ And the owner of the building probably would no more consent to bad checks entering his or her bank than bad robots.

Nor is the line that a robot is always an invasion. The court envisions a robot entering a building that the robot’s operator is forbidden to enter—a bank after hours—and extracting property.¹⁵⁵ But imagine instead that an individual visited a bank during business hours with a telepresence robot like those commercially available today.¹⁵⁶ Presumably no one would accuse someone with an immune deficiency of burglary by seeing about a loan by robot instead of in person.

Nor is the line that a human intermediary has to assist with the check by cashing it but not with the robot. Again, if a were person to “enter” a bank during business hours by telepresence and trick or coerce the clerk into

¹⁵⁰ *Id.* at 1090.

¹⁵¹ *Id.* at 1087.

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.* at 1092, 1099. The dissent proposed that a burglary occurs whenever there is a burglar present at the scene. *Id.* at 1093 (“Simply put: no burglar at the crime scene, no burglary.”). The majority invoked robots once again in criticizing this standard: “Under the dissent’s proposed rule, a person who used a remote controlled robot, operated from across the street or across town, to enter the building for purposes of committing larceny or any felony would not commit burglary.” *Id.* at 1090, n.7.

¹⁵⁵ *Id.* at 1087, 1090, n.7.

¹⁵⁶ A telepresence robot allows a person to control and robot remotely and navigate a space via computer. Often there is a video of the operator displayed on the “face” of the robot. The operator can also see or hear the environment and move around in space. *See, e.g.*, <https://suitabletech.com/beam/>.

handing over money—for instance, by pretending to be another customer or hinting at the presence of a bomb—presumably the *Davis* court would uphold a burglary charge despite the cooperation of the staff.

An even more interesting question arises if the robot is already inside the premises. Personal and service robots represent a significant and growing segment of the exploding robotics market.¹⁵⁷ These new robots are smarter and more versatile in part because they are connected to the Internet—a model James Kuffner calls “cloud robotics” in reference to the idea that the robot’s intelligence is somewhere other than its body.¹⁵⁸

A few years ago, security researchers at the University of Washington showed how easy it is to take over an Internet-enabled robot remotely.¹⁵⁹ The researchers could not only record audio and video, but could also move the robot around the household.¹⁶⁰ Imagine a thief were to take control of a robot already in the home and use it to drop an expensive item—car keys or jewelry—out of the mailbox. This activity would violate federal laws against hacking.¹⁶¹ But is it a burglary? The robot had permission to enter the facility; the owner placed it there. But the thief did not have permission to enter the robot.¹⁶²

F. The Unreliable Robot

This Part’s final case study involves what we usually think of as the core interaction between robotics and law: legal liability for robot mishaps. This work can tend toward the fanciful and will often take the form of speculation. As David Vladeck, Patrick Hubbard, and others argue, however, some combination of tort law and safety regulations seems well-

¹⁵⁷ The International Federation of Robotics keeps statistics on world trends with respect to robotics, which it breaks down according to category. Historically industrial robotics has comprised the bulk of the sector. In recent years, however, personal and service robots have gained a greater share. [cite] *See also*, Calo, *supra* note 8, at 526-28 (citing additional statistics).

¹⁵⁸ *See* Erico Guizzo, *Cloud Robotics: Connected to the Cloud, Robots Get Smarter*, IEEE SPECTRUM (Jan. 24, 2011).

¹⁵⁹ Tamara Denning, et al., *A spotlight on security and privacy risks with future household robots: Attacks and lessons*, in: *Proceedings of the 11th International Conference on Ubiquitous*, COMPUTING, Sept. 30–Oct. 3, 2009.

¹⁶⁰ *Id.*

¹⁶¹ *E.g.*, Computer Fraud and Abuse Act of 1986, 18 U.S.C. § 1030 (1986) (prohibiting, inter alia, unauthorized access to a protected computer).

¹⁶² Holographic projects raise an interesting question as well. In July of 2015, a music performer appeared by hologram at a concert in Hammond, Indiana from a studio in Los Angeles. As he was wanted on an arrest warrant in Indiana, the local police shut down the venue, telling concertgoers that his virtual presence posed a safety risk. *See* Daniel Rivero, *This rapper’s hologram is changing the way we think about protest*, FUSION, Sep. 15, 2015.

positioned to address physical harm by robots, at least in the near-term.¹⁶³

I mostly agree with the Vladeck and Hubbard view with two exceptions. First, I believe the new collaborative ecosystem in robotics will shortly confront courts and lawmakers with a novel issue.¹⁶⁴ Someone will have to decide whether manufacturers of robots that are increasingly designed to run third-party code (colloquially, “apps”) will be liable when that code leads to physical harm.¹⁶⁵ Federal law immunizes Internet and mobile platforms for what users say and do on those platforms on the theory that it is the user, not the platform, who “publishes” the relevant content.¹⁶⁶ But courts and Congress might decide to strike a different balance when bones and not bits are on the line.¹⁶⁷ Second, I believe robots will present courts with yet another opportunity to rethink proximate causation. The prospect that robots will behave in ways that are not foreseeable to the designer or user is probably closer than many legal scholars admit.¹⁶⁸ Part III explores this issue in greater detail.

For now, the role of the robot in cases involving physical harm is largely incidental. Every year a robot in a U.S. factory kills one or two people, according to statistics kept by OSHA.¹⁶⁹ Some of these deaths result in lawsuits.¹⁷⁰ There are also medical malpractice or product liability lawsuits that involve robotic surgery.¹⁷¹ While some of the injuries people sustain would not occur with, for instance, comparable laparoscopic surgery, these cases do not seem to require a reexamination of tort doctrine.¹⁷² We might expect more such cases as drones and other robotic products saturate the market. But as the Introduction makes clear, these and other incidental robot cases are outside the scope of this particular

¹⁶³ See David C. Vladeck, *Machines Without Principles: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 118 (2014); F. Patrick Hubbard, ‘Sophisticated Robots’: *Balancing Liability, Regulation, and Innovation*, 66 FLA. L. REV. 1803 (2014).

¹⁶⁴ Calo, *supra*, note 8, at 532-37 (discussing embodiment).

¹⁶⁵ *Id.*

¹⁶⁶ See Communications Decency Act of 1996, 47 U.S.C. § 230(c)(1) (2006) (“No provider of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider.”).

¹⁶⁷ Calo, *supra*, note 8, at 532-37. See also Ryan Calo, *Open Robotics*, 70 MD. L. REV. 571 (2011).

¹⁶⁸ Calo, *supra*, note 8, at 538-45 (discussing emergence).

¹⁶⁹ John Markoff and Claire Cain Miller, *As Robotics Advances, Worries of Killer Robotics Rise*, N.Y. TIMES, Jun. 16, 2014.

¹⁷⁰ *E.g.*, Payne v. ABB Flexible Automation, Inc., 116 F.3d 480 (8th Cir. 1997).

¹⁷¹ *E.g.*, Reece v. Intuitive Surgical, Inc., 63 F. Supp. 1337 (N.D. Ala. 2014).

¹⁷² One possible exception is a case wherein an individual sued a hospital because it chose not to use a robot for surgery and to rely instead on a human-only surgery. Mracek v. Bryn Mawr Hosp., 2010 Lexis 2015 (3rd Cir. Jan. 28, 2010).

project.¹⁷³

Here I want to concentrate on a narrow category of harms that involve humans relying on robotic systems to their or another's detriment. A relatively straightforward example is the 1949 case of *Brose v. United States*.¹⁷⁴ In *Brose*, a federal district court had to decide whether the government could be held responsible for a plane crash between an army fighter and small private plane. "It was clearly established," according to the court, "that the army plane at the time of the collision was under robot control."¹⁷⁵ The court's rejection of the government's position in *Brouse*—that the collision could not have been avoided through reasonable diligence—was emphatic. The court characterized the pilot's obligation "to keep a proper and constant lookout" as "unavoidable" and found the plaintiff's right to recovery on the facts to be "without question."¹⁷⁶

Of course, robotic control today looks nothing like it did at time of the accident; in 1947, autopilot consisted of mechanical tension rods that merely kept the plane flying on the same path.¹⁷⁷ By 1994, navy fighter jets were landing on aircraft carriers without human input.¹⁷⁸ Nevertheless, as David Vladeck argues, "In cases involving other autonomous machines, liability has been difficult to establish where alternative theories of liability are present" that implicate a person's conduct.¹⁷⁹ Vladeck's main example is *Ferguson v. Bombardier Services Corp.*¹⁸⁰ *Bombardier Services Corp.* is a relatively recent case in which the court rejected liability for the manufacturer of an autopilot system. The system was engaged at the time of the crash and might have explained the crash.¹⁸¹ But the court decided against the airline instead on the theory that the plane had been improperly loaded.¹⁸²

The tendency of courts to locate liability for robots in people is subject to several caveats. First, as the Third Circuit observed in the context of a robotic practice pitcher that threw wild, "robots cannot be sued."¹⁸³ Thus,

¹⁷³ [cite]

¹⁷⁴ 83 F. Supp. 373 (N.D. Ohio 1949).

¹⁷⁵ *Id.* at 374.

¹⁷⁶ *Id.* at 374-75.

¹⁷⁷ [cite]

¹⁷⁸ Philip E. Ross, *When Will We Have Unmanned Commercial Airliners?*, IEEE SPECTRUM (Nov. 29, 2011) (interview with roboticist and former navy pilot Missy Cummings), <http://spectrum.ieee.org/aerospace/aviation/when-will-we-have-unmanned-commercial-airliners>.

¹⁷⁹ David C. Vladeck, *Machines Without Principals: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 117, 140 (2014).

¹⁸⁰ *Id.* at 140, n.78 (citing 244 F. App'x 944 (11th Cir. 2007)).

¹⁸¹ *Id.*

¹⁸² *Id.*

¹⁸³ *United States v. Althone Industries, Inc.*, 746 F.2d 977, 977 (3rd Cir. 1984).

the question is not whether the robot will be liable, but only *which* person will be liable. Will it be the manufacture of the autopilot system or surgical robot, or the pilot and the surgeon?

Second, we do not necessarily see the same tendency in the absence of physical harm. Take the example of *Royal Insurance Company of America v. Crowne Investments*.¹⁸⁴ In *Royal Insurance*, the Supreme Court of Alabama had to decide whether to uphold a default judgment in favor of Crowne Investments. Crowne had served process to Royal but, according to Royal staff, the relevant email was lost due to a glitch in Royal's "robotic mail system."¹⁸⁵ The court could have followed the reasoning of *Brouse* and subsequent cases that people have a responsibility to monitor automated systems and risk being held accountable if they do not. Instead, the court declined to find that the default judgment. For the court, the glitch was not "a result of the defendant's own culpable conduct,"¹⁸⁶ and Royal was "in no way culpable" for its robotic mail system.¹⁸⁷

II. ROBOTS AS LEGAL SUBJECTS

The first Part of this article offers a series of case studies as a corrective to the intuition that all interesting robot cases wait in the future. It hopes to illustrate that, while often the role of the robot is incidental to the underlying legal problem of a case, robots throughout the decades occasionally present courts with quite interesting or challenging issues. The way courts puzzle through them may shed some light on how the law may react to the rapid mainstreaming of robots we see today.

This second Part discusses another sort of case—a case in which no robot is at issue, except in the imagination of the judge. Reading through hundreds of cases, one is struck by the frequency and manner in which courts invoke robots to make observations about people or law. Humans are, or are not, like robots, a critical distinction that informs the legal issue before the court. What emerges is a fairly clear and consistent picture of a robot in the judicial mind: robots may appear to be agents or entities but in actuality are only tools. Robots are defined precisely by reference to their

¹⁸⁴ 903 So.2d 802 (Ala. 2004).

¹⁸⁵ *Id.* at 806.

¹⁸⁶ *Id.* at 808 (Ala. 2003) (citing *Kirtland v. Fort Morgan Auth. Sewer Serv. Inc.*, 524 So.2d 600, 605 (Ala. 1988)).

¹⁸⁷ *Id.* at 812. The court acknowledged that Royal was "at worse negligent." *Id.* In rare instances, courts may also hold parties accountable when a software problem results in injury to property or even economic loss. *E.g.*, *Pompeii Estates, Inc. v. Consol. Edison Co. of N.Y., Inc.*, 397 N.Y.S.2d 577 (N.Y. Civ. 1977) (service termination following a computer glitch). But pure information-based harms are generally not compensated. *See* Ryan Calo, *Open Robotics*, 70 MD. L. REV. 598-61 2010 (furnishing examples).

complete lack of discretion or capacity for spontaneity or judgment.

It is fair to ask what, if any, lessons we can draw from the way judges talk about a given technology, especially when that technology is not before the court. Several strains of research suggest the importance of mental models to legal outcomes. As an initial matter, rhetorical allusions appear capable of shaping policy recommendations. In 2011, Paul Thibodeau and Lera Boroditzky at Stanford University conducted an experiment (n = 1,482) in which they presented subjects with a description of an imaginary city experiencing a surge in criminal activity.¹⁸⁸ To one set of subjects, the researchers described crime in general as a “virus infecting the city” and “plaguing” neighborhoods.¹⁸⁹ To the other, they described it a “wild beast preying on the city” and “lurking in neighborhoods.”¹⁹⁰ When asked for policy recommendations, subjects in the first condition recommended more enforcement 56% of the time and social reforms 44%.¹⁹¹ Subjects in the second condition recommended enforcement and reform 75% and 25%, respectively.¹⁹²

Indeed, judges rely on metaphor and analogy when reasoning through the protection law should afford to new technologies. In the context of cryptography, for instance, Michael Froomkin explores the four metaphors that seem to have the most appeal to the courts: encryption is like a “car” that carries information, a kind of “language,” a “safe” that hides secrets, or a “house” in which conversation takes place.¹⁹³ According to Froomkin, a judge’s selection of metaphor in turn reveals the level of First and Fourth Amendment protection the judge is willing to apply. If encryption is merely a car in which messages travel, it gets lesser constitutional protection.¹⁹⁴ But if encryption is itself a language, it may be protected quite fully. Froomkin’s conclusion is that “ideas are weapons.”¹⁹⁵

Judges appear from remarks and arguments to possess a highly homogenous mental model of what a robot is. It turns out not to be a particularly accurate one: The puzzles and potential mistakes that arise in

¹⁸⁸ Paul H. Thibodeau and Lera Boroditsky, *Metaphors We Think With: The Role of Metaphor in Reasoning*, PLOS ONE 6(2): e16782 (2011).

¹⁸⁹ *Id.* at 3-4.

¹⁹⁰ *Id.* at 3.

¹⁹¹ *Id.*

¹⁹² *Id.* at 6.

¹⁹³ A. Michael Froomkin, *The Metaphor is the Key: Cryptography, the Clipper Chip, and the Constitution*, U. PA. L. REV. 709, 861-62 (1995).

¹⁹⁴ *Id.* at 879.

¹⁹⁵ *Id.* at 843 (title of Part IV). See also Orin S. Kerr, *The Problem of Perspective in Internet Law*, 91 GEO. L.J. 357 (2003) (arguing that courts come to different conclusions about the scope of a warrant or other Fourth Amendment issues depending on whether they take an “insider” or “outsider” view of the technology).

Part I arguably make more sense as we build out the typical judge's mental model of robots. And the way judges talk about robots, catalogued here for the first time in the literature, provides fodder for future investigations of robotics law and policy, which are the subject of Part III. But ultimately I acknowledge that a judge may invoke robots in one way but decide robot related cases in another.

A. *The Robot Judge*

Robots appear repeatedly in discussions of judicial bias. Confronted with a variety of allegations, many opinions remind us that judges are flesh and blood people. Litigants may *expect* judges to be robotic, but they are not. And nor should they be. We would not want to dispense with human judgment. As one court put it: "We have not, and hopefully never will reach the stage in Alabama at which a stone-cold computer is draped in a black robe, set up behind the bench, and plugged in to begin service as Circuit Judge."¹⁹⁶

This claim arises in at least two contexts. The first is the reaction of trial judges to the presentation of evidence or other behavior. Perhaps a judge laughs with a funny witness or betrays emotion at the plight of the victim, or displays impatience over delay or interruption.¹⁹⁷ Opposing counsel seizes on this moment in an effort to show the judge is prejudiced against their client. Courts almost universally reject these challenges, often citing to the holding of *Allen v. State* that "the trial judge is a human being, not an automaton or a robot."¹⁹⁸

Even in the absence of a reaction from the bench, litigants may question whether the very identity of a jurist suggests partiality. A fascinating and historically important case is that of *Commonwealth of Pennsylvania et al. v. Local Union 542 et al.* from 1974.¹⁹⁹ *Local Union 542* involved allegations of racial discrimination by twelve black workers against a predominantly white labor union.²⁰⁰ The union sought to disqualify the federal district court who was assigned to the case on the basis that he was himself black and had recently addressed a group of black historians, at

¹⁹⁶ *Allen v. State*, 290 Ala. 339, 342 (1973).

¹⁹⁷ *E.g.*, *Keppel v. BaRoss Builders, Inc.* 7 Conn. App. 435, 509 (1986) ("Above all, it showed that a judge is a human being, not the type of unfeeling robot some would expect the judge to be."); *Fletcher v. State*, 291 Ala. 67, 69 (1973) ("[T]he trial judge is not required to be a robot without emotional reaction to happenings in his court. Impatience with excessive delay by counsel is a natural and understandable reaction.").

¹⁹⁸ 290 Ala. at 342.

¹⁹⁹ *Commonw. of Penn. and Raymond Williams et al. v. Local Union 542, Int. Union of Op. Eng., et al.*, 388 F. Supp. 155 (1974).

²⁰⁰ *Id.* at 163, n.7.

which time the judge allegedly displayed “an intimate tie with and emotional attachment to the advancement of black civil rights.”²⁰¹

In rejecting the challenge to his impartiality, Judge Higginbotham noted that white judges were free to pursue their own interests and concerns outside the bench; no one expected white judges to renounce their heritage or history to maintain impartiality.²⁰² The union’s recusal motion implied that black judges, in contrast, must be “robots who are totally isolated from their racial heritage and unconcerned about it,” or at least refrain from discussing that heritage.²⁰³ “Should they be robots?” Judge Higginbotham asked of black judges; no more so than any other jurist.²⁰⁴

A second context in which we see the specter of the robot judge is in discussions of judicial discretion. A judge need not, for instance, “robotically recite” every statutory consideration in the course of meting out a sentence under the federal sentencing guidelines,²⁰⁵ or “recite robotic findings” to establish that conditions have changed in a given country for purposes of rejecting asylum.²⁰⁶ American law follows from a code, but not in the sense of software code that a judge executes like a computer.²⁰⁷ We assume a judge has considered relevant factors unless we have evidence to the contrary.

Also interesting for our purposes is the observation that appellate courts do not, by reversing and remanding a decision, turn the trial court into *their* robot. Obviously a decision by a higher court “severely limits the kinds of considerations open” to a lower court on remand.²⁰⁸ At the same time: “An appellate mandate does not turn a district judge into a robot, mechanically carrying out orders that become inappropriate in light of subsequent discoveries or changes in the law.”²⁰⁹ A lower court judge interested in

²⁰¹ *Id.* at 157.

²⁰² *Id.* at 165.

²⁰³ *Id.* at 178.

²⁰⁴ *Id.* at 180. In *Local Union 542*, the court believed that the petitioners expected black judges to be more robotic than white ones. Meanwhile, in *White v. Samsung*, the Ninth Circuit chose a hypothetical about a famous black athlete to illustrate just how close robots can come to the people they depict. For a further discussion, see *infra* Part III.A.

²⁰⁵ *United States v. Ruiz-Salazar*, 785 F.3d 1270, 1272-73 (8th Cir. 2015). Other cases dispense the requirement to make “robotic incantations that each factor has been considered.” See, e.g., *United States v. Blackmon*, 662 F.3d 981, 988 (8th Cir. 2011) (citing *United States v. Lamoreaux*, 422 F.3d 750, 756 (8th Cir. 2005)).

²⁰⁶ *Hoxhallari v. Gonzalez*, 468 F.3d 179, 187 (2d Cir. 2006).

²⁰⁷ Cf. John Greenman, *On Communication*, 106 MICH. L. REV. 1337, 1375 (2008) (advancing a free-will theory of the First Amendment that disputes computer code is speech).

²⁰⁸ *Anand v. Nat’l Republic Bank of Chicago*, 239 B.R. 511, 520 (N.D. Ill 1999).

²⁰⁹ *Id.* (quoting *Barrow v. Falck*, 11 F.3d 729, 731 (7th Cir. 1993)). See also *Jianli Chen v. Holder*, 703 F.3d 17 (1st Cir. 2012) (“This multifaceted role is not meant to be

some wiggle room might say that the mere fact she was overturned does not mean she has lost all humanity or judgment.

The intuition may go deeper still, beyond the individual judge. There is a general sense among many litigants and some courts that an overly robotic judicial *system* is not a fair one. In challenging health regulations, for instance, appellants in *Kirk v. Secretary of Health and Human Services* argued that the new guidelines “robotize the adjudicative process, in violation of due process guarantees.”²¹⁰ Although the court in *Kirk*, ultimately rejected appellants’ claim, a similar argument has gotten traction in other contexts such as disability rights.²¹¹ Though we are famously a government of laws, and not of men,²¹² those laws are to be interpreted and applied by real men and women.

B. The Robot Juror or Witness

The judge is not a robot and neither is the quintessential finder of fact, the juror. It is not necessarily evidence of bias for a juror to laugh or cry during trial and our Constitution requires courts to scrutinize the bases upon which litigants strike jurors from service.²¹³ Courts also assume jurors who do serve are people with lived experience, not programmable machines.²¹⁴ Thus the court invoked robots in *Burch v. Reading Co.*, a case in which a widow with two children broke her ankle on the job.²¹⁵ The judge’s instructions were adequate because jurors “are not robots who come to the court house with minds tabula rasa and who respond mechanically to every impression they receive in the courtroom.”²¹⁶

People are not robots. When they act like robots in court, this is

robotic. The [Board of Immigration Appeals] is not bound to parrot the precise language used by the [immigration judge] but, rather, may use its own vocabulary.”)

²¹⁰ *Kirk v. Sec’y of Health & Human Serv.*, 667 F.2d 524, 531 (6th Cir. 1981).

²¹¹ *E.g.*, *Stewart v. Harris*, 508 F. Supp. 345 (D.N.J. 1981). *See also* *Jianli Chen v. Holder*, 703 F.3d 17 (1st Cir. 2012) (noting that the role of the immigration appeals board “is not meant to be robotic” and that the board has the “prerogative—indeed the duty—of examining the basis for, and then synthesizing and analyzing, the [immigration judge’s] findings.”)

²¹² John Adams, *Letters of Novanglus*, BOSTON GAZETTE (1774).

²¹³ *See, e.g.*, *Batson v. Kentucky*, 476 U.S. 79 (1986) (holding that striking jurors solely based on their race violates the Equal Protection Clause of the Fourteenth Amendment). Courts also grant certain latitude to spectators at a trial in displaying emotion. *See generally* Meghan E. Lind, Comment, *Hearts on Their Sleeves: Symbolic Displays of Emotion by Spectators of Criminal Trials*, 98 J. CRIM. L. & CRIMINOLOGY 1147 (2008).

²¹⁴ *See Burch v. Reading, Co.* 240 F.2d 574, 577 (3d Cir. 1957).

²¹⁵ *Id.*

²¹⁶ *Id.*

considered to be a bad sign. Several cases hold robotic behavior in court against the litigant. It may be that cold, calculating people are not viewed as trustworthy; that truth cannot be rehearsed; or that justice is somehow an intrinsically humanistic process.²¹⁷ Regardless, we see this sentiment in cases, such as *Rong Lin v. Mukasey*, where a witness appeared to be “robotically repeating a script rather than testifying from actual experience.”²¹⁸ We also see it in cases, such as *Kung Lin Chen v. U.S. Department of Justice* in which the witness testified well enough but “appeared ‘robotic’ when pressed for details on cross examination.”²¹⁹ Such a finding—often, by an immigration authority—can support an adverse finding as to credibility.²²⁰ Apparently, testifying in court requires some measure of spontaneity, much like a “performance” for purposes of entertainment taxes on food.²²¹

C. The Defendant’s Robot

The previous two sections focus on behavior taking place within the judicial system. Courts also invoke robots in considering whether to hold parties accountable for conduct that landed them in the system in the first place. Stated simply, the defendant in this scenario describes him or herself as a robot under the control of some operator not before the court. Alternatively, the actions of an entity such as a corporation can be attributed to the defendant because the entity is simply an extension of the person—his or her robot. The idea of a robot becomes synonymous with the absence of autonomy or free will.²²²

²¹⁷ I would pause to note that the standard could be quite different for experts. No case we came across sought to detract from expert testimony on the basis that it felt coached or robotics. Rather, the issue came up in contexts, like asylum cases, where you might expect emotion intensity. Litigants can also try to leverage previous robotic behavior in court for advantage, as when a defendant attempts to withdraw a guilty plea that he delivered “like a robot.” *United States v. Osei*, 679 F.3d 742 (8th Cir. 2012).

²¹⁸ 299 F. App’x 10 (2d Cir. 2008).

²¹⁹ 195 F. App’x 10, 11 (2d Cir. 2008).

²²⁰ That the cases involving robotic witnesses tend to arise in the context of immigration could be a function of the fact that an immigration court originally came up with the formulation. Or it may reflect something else, such as a language or cultural barrier. *See infra* notes ___ to ___ and accompanying text (briefly discussing race and gender dimensions to robotics law).

²²¹ *See supra*, Part I.B.

²²² A note about scope: clearly the notion of free will in philosophy and law has a contentious and involved history. I will not attempt here to unpack whether such a concept exists or what its role should be in legal discourse. Rather, I only call attention to the ways litigants and jurists invoke the concept of robot—apparently, an entity human in appearance but lacking free will—in an effort to avoid or pass through culpability for wrongdoing.

In the 1950 case *Frye v. Baskin*, the plaintiff owned a Jeep that he taught his minor son to drive.²²³ His son John was on a date with the defendant, a minor girl, whom John asked to take the wheel. She did not know to drive how but, “under his tutelage,” she managed to drive the car around town for a time.²²⁴ At one point, John called out a direction to the girl and then reversed himself, telling her to go right instead of left. She tried to comply and wound up crashing the vehicle.

In the resulting suit by the father against his son’s friend, the court refused to find the defendant negligent as a matter of law. According to the court, plaintiff’s son John was really the driver.²²⁵ The defendant “controlled the car the same as if she had been a robot or an automaton. When John said ‘turn,’ she turned, mechanically.”²²⁶ She was merely “the instrumentality by which John drove the car.”²²⁷ Accordingly, “if it were negligence, it was John’s and not hers.”²²⁸ Or at least the jury was entitled to so hold.²²⁹

Molko and Leal v. Holy Spirit Association involved an allegation of false imprisonment against the Unification Church that came before the Supreme Court of California.²³⁰ Plaintiffs claimed inter alia that they were held captive through brain washing until each were captured and “deprogrammed” by professionals sent by their respective parents.²³¹ Robots do not come up in the majority opinion as such, which allowed the false imprisonment claim to go forward. But the dissent thought the distinction between people and robots to be crucial: “The evidence before us ... clearly indicates that the Church’s indoctrination did not render appellants mindless puppets or robot-like creatures.”²³²

Similar discussions occur in the context of corporate law. A series of cases involved the standing and knowledge of companies that were unwittingly part of a Ponzi scheme. These “captive corporations” were seen as but the “robotic tools” of the scheme’s architect.²³³ Neither the

²²³ 231 S.W. 2d 630 (Mo. App. 1950).

²²⁴ *Id.* at 633.

²²⁵ *Id.* at 635.

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ *Id.*

²²⁹ *Id.* at 635 (“Neither does the evidence show negligence on the part of the defendant as a matter of law (if it shows negligence at all, which we need not decide).”).

²³⁰ 762 46 Cal. 3d 1092 (1988).

²³¹ *Id.* at 1101.

²³² *Id.* at 1131 (Anderson, J., concurring in part and dissenting in part.) The dissent cited heavily a 1983 article on whether religious converts were the “robots” of their church, entitled *Of Robots, Persons, and the Protection of Religious Belief* by Robert Shapiro, 56 SO. CAL. 1277 (1983).

²³³ *Janvey v. Democratic Senatorial Campaign Committee, Inc.*, 712 F.3d 185, 190-92

corporations nor their investors could be imputed with the knowledge of the scheme. However, once released from the control of the Ponzi scheme, these companies regained their status as separate corporate entities with standing to sue the architect for fraud and other damages.²³⁴

Conversely, under the “alter ego” theory, a corporation that is merely a defendant’s robot is not entitled to treatment as a separate entity.²³⁵ The doctrine says litigants can reach beyond a corporation to the personal assets of a company principal to the extent he or she uses the company to further purely personal interests.²³⁶ But the standard is a high one. The plaintiff must establish that the controlled corporation acted “robot-like” and in “mechanical response” to the controller’s “pressure on its buttons.”²³⁷ Only then will the court pierce the corporate veil on the alter ego theory.

The idea is that a robot is what a person or entity becomes when completely controlled by another. Such a person or entity is not capable of fault or knowledge, leaving the person behind the machine—the programmer—at fault. The effect is, interestingly enough, temporary. Thus, presumably the defendant who later learns to drive will be responsible for any accident she causes;²³⁸ the victims of a religious cult may be deprogrammed and bring suit;²³⁹ and an entity freed from the robotic control of a Ponzi scheme regains the usual rights of a corporation.²⁴⁰ While a robot, however, no one sees, hears, or does evil.

III. THE MEANING OF ROBOT CASE LAW

To summarize the argument thus far: robots have played a role in American society for decades, occasionally resulting in interesting legal disputes. These include questions of how and when a robot can be said to represent a person, whether a robot extends people in ways the laws care about, and the conditions under which a person will be responsible for a robot’s actions. Not only have robots been at the center of disputes, they have served from their earliest contact with American society as a judicial trope. Judges invoke robots over the decades to describe the limitations and

(5th Cir. 2013).

²³⁴ *Id.* See also *Scholes v. Lehmann*, 56 F.3d 750 (7th Cir.1995), *cert. denied sub nom. African Enter., Inc. v. Scholes*, 516 U.S. 1028 (1995)/

²³⁵ See *Partners Coffee v. Oceana Services and Products*, 700 F. Supp. 2d 720, 737 (W.D. Pa. 2010). The alter ego theory should not be confused with the robot Walter Ego from Part I. But it is interesting to see the common verbiage.

²³⁶ *Id.*

²³⁷ *Culbreth v. Amosa (Pty) Ltd.*, 898 F.2d 13, 15 (3d Cir. 1990).

²³⁸ *Id.*

²³⁹ *Id.*

²⁴⁰ *Id.*

advantages of human beings and to extend and limit a defendant's responsibility for misconduct. The way judges use robots to reason or frame issues may bear on the metaphors and frames they employ to decide cases involving robots and related technology.

In the remainder of the article, I offer some preliminary conclusions regarding the role of robots in American law. The first set involves the direction of the burgeoning field of robotics law and policy. Do past decisions shed light on questions scholars have already explored, such as liability, legal metaphor, and the interplay with race or gender? And do past decisions generate new questions that the field had not considered, such as whether certain legal categories require much greater nuance?

The second set involves the direction of the law itself. Judges appear to hold a very specific mental model of robots as discretionless machines. The model is outdated, if it ever held. This has led to tensions in the case law to date that will only become more acute as sophisticated robot become mainstream. At the same time, a deepening of familiarity with robotics, as well as a diversification in the sources of robot law, may signal a shift toward wiser policy going forward.

A. Robotics Law: An Early Agenda

Legal scholars have been writing about robotics here and there for some time.²⁴¹ The recent community around robotics law is especially robust, with a steady drumbeat of new research.²⁴² Collectively the work spans many different areas. But it tends to take one of several forms. The first is a sustained examination of a particular technology or legal issue. This work might address one or more dimensions of a single technology such drones, driverless, cars, or surgical robots.²⁴³ Alternatively, it may address the intersection of robotics with one or more of the following issues: (i) civil

²⁴¹ See, e.g., Samuel N. Lehman-Wilzig, *Frankenstein Unbound: Towards A Legal Definition of Artificial Intelligence*, 13 FUTURES (1981). The same is true of other fields. For an early example in economics, see Herbert A. Simon, *The Shape of Automation for Men and Management* (1965).

²⁴² This is in part due to the annual robotics law and policy conference colloquially known as "We Robot." The conference is in its fifth year, having been held at Stanford Law School, University of Washington, and twice at the University of Miami. The next We Robot will take place at Yale Law School in the spring of 2017.

²⁴³ E.g., Gregory S. McNeal, *Targeted Killing and Accountability*, 102 GEO. L. REV. 681 (2014) (drones); Ryan Calo, *The Drone as Privacy Catalyst*, 64 STAN. L. REV. ONLINE 29 (2014); Bryant Walker Smith, *Automated Vehicles Are Probably Legal in the United States*, 1 TEX. A&M L. REV. 411 (2104) (driverless cars); Jack Boeglin, *The Costs of Self-Driving Cars: Reconciling Freedom and Privacy With Tort Liability in Autonomous Drone Regulation*, 17 YALE J. L. & TECH. 171 (2015) (same); Julie Goodrich, *Driving Miss Daisy: An Autonomous Chauffeur System*, 51 HOUS. L. REV. 265 (2013) (same).

or criminal liability,²⁴⁴ (ii) legal personhood or agency,²⁴⁵ (iii) enforcement,²⁴⁶ (iv) speech and intellectual property,²⁴⁷ (v) race and gender,²⁴⁸ and (iv) privacy.²⁴⁹ Technology or issue specific research is increasingly careful and rigorous and is already adding clarity and shape to the discipline. A limitation of the approach, however, is that it does not necessarily tell us much about the robot of robots *in general* across the law.

²⁴⁴ *E.g.*, See also PETER M. ASARO, A BODY TO KICK BUT NO SOUL TO DAMN: LEGAL PERSPECTIVES ON ROBOTICS, IN ROBOT ETHICS: THE ETHICAL AND SOCIAL IMPLICATIONS OF ROBOTICS (Patrick Lin et al., eds. 2012); Vladeck, *supra* note 163; Hubbard, *supra* note 163.

²⁴⁵ *E.g.*, Lawrence B. Solum, *Legal Personhood for Artificial Intelligence*, 70 N.C. L. REV. 1231 (1992); Christopher Stone, *Should Trees Have Standing? Revisited: How Far Will Law and Morals Reach? A Pluralist Perspective*, 59 S. CAL. L. REV. 1, 14 (1985) (discussing whether a robot could have standing); Steven Goldberg and Nancy Cruzan, *The Changing Face of Death: Computers, Consciousness*, 43 STAN. L. REV. 659 (1991); F. Patrick Hubbard, *'Do Androids Dream?': Personhood and Intelligence Artifacts*, 83 TEMP. L. REV. 405 (2011); SAMIR CHOPRA & LAURENCE F. WHITE, A LEGAL THEORY FOR AUTONOMOUS AGENTS (2011).

²⁴⁶ *E.g.*, Lisa A. Shay et al., *Confronting Automated Law Enforcement*, in ROBOT LAW (Ryan Calo, A. Michael Froomkin, and Ian Kerr, eds., 2016); Elizabeth E. Joh, *Discretionless Policing: Technology and the Fourth Amendment*, 95 CALIF. L. REV. 199 (2007).

²⁴⁷ For discussion of intellectual property, see, e.g., Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 2012 STAN. TECH. L. REV. 5, 21 (2012); Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?*, 71 TUL. L. REV. 1675, 1696-97 (1997) (arguing that patent law implicitly assumed a human inventor); Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 1185 U. PITT. L. REV. 47 (1985). For discussion of free speech, see, e.g., Tim Wu, *Machine Speech*, 161 U. PENN. L. REV. 1495, 1496 (2013) (“The question of ‘rights for robots,’ if once limited to science fiction, has now entered the public debate.”); Stuart Minor Benjamin, *Algorithms and Speech*, 161 U. PENN. L. REV. 1445 (2013).

²⁴⁸ *E.g.*, Sinziana M. Gutiu, *The roboticization of consent*, in ROBOT LAW (Ryan Calo, A. Michael Froomkin, and Ian Kerr, eds., 2016); Ann Bartow, *Robots as Labor Creating Devices: Robotic Technologies and the Expansion of the Second Shift*, Proc. We Robot 2014, Apr. 4, 2014; Peter A. Asaro, *Will Black Lives Matter to Robocop?*, Proc. We Robot 2016, Apr. 1, 2016.

²⁴⁹ *E.g.*, Margot E. Kaminski, *Robots in the Home: What Will We Have Agreed To?*, 51 IDAHO L. REV. 661 (2015); Ryan Calo, *Robots and Privacy*, in *Robot Ethics: The Ethical And Social Implications of Robotics*, 195 (Patrick Lin et al., eds. 2012).

In addition, scholars work in related areas such as the effect of automation on the legal profession and the prospect of accountability and impartiality in the design and implementation of algorithms. *E.g.*, Daniel Martin Katz, *Quantitative Legal Prediction—Or—How I Learned to Stop Worrying and Start Preparing for the Data Driven Future of the Legal Services Industry*, 62 EMORY L.J. 909 (2013); FRANK PASQUALE, THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION (2015); Solon Barocas and Andrew D. Selbst, *Big Data's Disparate Impact*, 104 CALIF. L. REV. (forthcoming 2016).

The work it does is more specific.

Other research takes a step back and looks at the larger context of robotics law and policy. The advantage, arguably, of treating robotics as a broader phenomenon is that one sees connections across robots and legal domains. For example, the degree of control people exert over a robot could come up as an issue as easily in tort law (vicarious liability, *res ipsa loquitur*) as in the international law of the sea.²⁵⁰ The issue with an approach that is less specific is that it also tends to be more speculative. The consensus among commentators is that robots will, someday, create legal and policy puzzles of a certain kind.²⁵¹ But we do not necessarily know in advance what they will be and, accordingly, we will be hard-pressed to identify models or solutions.

Consider again the conversation from the Introduction. Jack Balkin argues we cannot know how courts and others view robots.²⁵² Hence, we must wait and see to get a sense of what issues they will raise.²⁵³ There is truth to Professor Balkin's claim: robotics is certainly advancing at a rapid pace and more and more people are coming into contact with robots outside of the contexts of manufacturing or warfare. The results for law and society are difficult to anticipate. What this article shows, however, is that robots have already raised specific and interesting issues that current technological trends stand to enhance. Focusing on these issues not only helps us understand how the law will come to mediate the mainstreaming of robotics, but it also suggests or grounds questions for the burgeoning field.

One example is the role of metaphor in judicial reasoning, already raised in the lead in to Part II. We sense that the metaphor or analogy a court or policymaker chooses to adopt around a new technology can influence its fate.²⁵⁴ Thus, for example, thinking of email as analogous to a postcard could lead to less Fourth Amendment protection than thinking of email as analogous to a letter.²⁵⁵ Believing encryption to be a form of speech could lead to First Amendment pushback should government seek to regulate encryption.²⁵⁶

Students of robotics law have not missed the importance of metaphor. Law professor Neil Richards and roboticist William Smart, for example,

²⁵⁰ Calo, *supra* note 8, at 543-44 (discussing the concept of exclusive control in these contexts).

²⁵¹ See, e.g., Lehman-Wilzig, *supra* note 241. See also *supra*, note 245.

²⁵² Balkin, *supra* note 12, at 45.

²⁵³ *Id.*

²⁵⁴ See *supra*, notes __ to __ and accompanying text.

²⁵⁵ The Department of Justice has made this argument with mixed success. See SUSAN W. BRENNER, *CYBERCRIME AND THE LAW: CHALLENGES, ISSUES, AND OUTCOMES* 158 (2012).

²⁵⁶ Fromkin, *supra* note 193, at 879.

expressly call attention to the importance of metaphor and legal analogy in their work *How Should the Law Think About Robots?*²⁵⁷ These authors conclude that courts should be careful to characterize robots as tools, albeit programmable ones, because doing otherwise runs the risk of committing what the authors call the Android Fallacy.²⁵⁸ Two strengths of Richards and Smart's work are their recognition that metaphor matters and their sober-eyed examination of the present state of the technology. A weakness is that their failure to imagine the ways robots do and will depart from the mental model they urge.

The case studies in Parts I and III may help us predict the sorts of metaphors judges are likely to select. More specifically, the case studies suggest that judges already think of robots as no more than programmable (or teleoperated) tools.²⁵⁹ This is not necessarily ideal in all circumstances. For example, while it may be appropriate to hold the pilot accountable for failing to supervise the rudimentary robotic pilot of *Brouse v. United States*,²⁶⁰ perhaps judges should resist the inclination to attribute liability a person whenever he or she happens to be in the loop. We may not wish to incentivize the preservation of human control, even where less safe or efficient, merely to furnish a human "crumple zone" for liability.²⁶¹ I am aware that the liability still winds up landing on one or more humans—perhaps the manufacturer of the driverless car instead of whoever happens to be behind the skeuomorphic wheel. Even so, the metaphors and analogies we use influence *which* human pays the price for a robotic harm.

The case studies may inform other areas of scholarship as well. Consider the small but powerful literature surrounding the role of robotics in race and gender law.²⁶² Just as Jeannie Suk asks whether privacy is a woman,²⁶³ robotics law and policy scholars may ask whether *Frye v. Baskin*—the case of the robotically driven Ford—comes out the same way

²⁵⁷ Neil Richards and William Smart, *How Should the Law Think About Robots?*, in *ROBOT LAW 3* (Ryan Calo, A. Michael Froomkin, and Ian Kerr, eds., 2016). See also Meg Leta Jones and Jason Millar, *Hacking Analogies in the Regulation of Robotics*, in *OXFORD HANDBOOK OF THE LAW AND REGULATION OF TECHNOLOGY* (Karen Yeung, Roger Brownsword, and Eloise Scotford, ed. 2016).

²⁵⁸ Richards and Smart, *supra* note 257, at 4 ("Finally, we argue that one particularly seductive metaphor for robots should be rejected at all costs: the idea that robots are 'just like people' . . . We call this idea 'the Android Fallacy.'").

²⁵⁹ See *supra* Parts I and II.

²⁶⁰ 83 F. Supp. 373, 374.

²⁶¹ See Madeleine Elish, *Moral Crumple Zones: Cautionary Tales in Human Robot Interaction*, Proc. We Robot 2016, Apr. 1, 2016 (exploring the potential that people will be kept in otherwise fully autonomous systems for the sole purpose of absorbing liability).

²⁶² See *supra*, note 248 (listing examples).

²⁶³ Jeannie Suk, *Is Privacy A Woman?*, 97 GEO. L. REV. 486 (2009).

if the gender of the litigants were reversed.²⁶⁴ Would a court, particularly in 1950, find that a boy who could not drive was the robot of the girl who could? Scholars could also explore why the Ninth Circuit's example of a robot mostly clearly representing a person involves a robot Michael Jordan,²⁶⁵ or whether there is anything to Judge Higginbotham's contention that black judges are expected to be robots where white judges are not,²⁶⁶ and why it is that the concern over robotic testimony appears first and most often in the context of immigration.²⁶⁷

The preceding case studies not only illuminate existing debates, but hint at entirely novel questions scholars of robotics law and policy might explore. The literature speculates considerably as to who or what is to blame when a robot causes harm. It also grapples with whether the law should recognize legal, market, or intellectual behaviors initiated or executed by robots. Papers in the first category might ask whether the passenger or the manufacturer is responsible for a car accident in a driverless car.²⁶⁸ Papers in the latter might investigate whether an artificial intelligence can act as a trustee, make a binding contract, or "create" an original work.²⁶⁹

There is next to no scholarship, however, tackling several of the very questions with which the courts already struggle. These tend to involve deep questions around the differences between people and machines. One question that remains untheorized in the early literature, for instance, is whether and to what extent a robot can represent a person. When you take or draw a picture of a person, it represents her.²⁷⁰ But when you build a robot version of a person, does it represent the person in the same way? The Ninth Circuit at best equivocates, finding robots to represent people for purposes of common but not statutory law, though identically phrased.²⁷¹

There is a similar struggle in the cases attempting to characterize robots for purposes of trade law. The court in *Louis Marx & Co.*, examining the tariff schedule for a windup toy, itself winds up in a dubious position that would likely benefit from scholarly engagement within and beyond the legal academy.²⁷² The court acknowledges that robots are machines that

²⁶⁴ 231 S.W. 2d 630.

²⁶⁵ White, 971 F.2d 1395, 1399.

²⁶⁶ Local Union 542, Int. Union of Op. Eng., et al., 388 F. Supp. 155, 180.

²⁶⁷ See *supra*, notes 217-21 and accompanying text (listing cases).

²⁶⁸ See *supra*, note ____.

²⁶⁹ E.g., Solum, *supra*, note 245; Ian Kerr, *Ensuring the Success of Contract Formation in Agent-Mediated Electronic Commerce*, 1 ELECTRONIC COMM. R.J. 183-202 (2001); Bridy, *supra* note 247.

²⁷⁰ [cite]

²⁷¹ See *supra*, 39-42 and accompanying text (citing White, 971 F.2d at 1395).

²⁷² 40 Cust. Ct. 610.

represent men—it consults a dictionary that says so—but nevertheless concludes that robot toys only represent robots, which are just machines.²⁷³ There is even some tension between the appropriation cases and the cases involving tariffs. In the former, human features mean a robot can come to represent a person.²⁷⁴ But in the latter, human features like those of the astronaut in *Lewis Galoob Co.* do not necessarily detract from its characterization of a robot.²⁷⁵

Another puzzle involves whether and under what circumstances a person operating a robot can be said to exist in the places to which the robot travels. I have highlighted two case studies—one involving claims to a particular right at sea, the other involving responsibility for the crime of entering a dwelling with intent to steal.²⁷⁶ Thus, a court sitting in maritime generated a new category of possession to accommodate the changing nature of undersea exploration.²⁷⁷ And a criminal court found that while a person can burglarize a bank with a metal robot, he cannot do so with a paper check.²⁷⁸

But there are myriad areas of law where this question could arise. One such area is space law. Recently the United States, with the passage of the US Commercial Space Launch Competitiveness Act of 2016, adopted the position that American individuals or companies who extract resources from an asteroid or the moon are free to alienate those resources.²⁷⁹ Presumably two or more teams might compete for the right to mine the same extraterrestrial resource. Another area is remote or autonomous robotic surgery, which could raise questions of whether and where an operator or programmer must be board certified in order to perform a procedure in any given state.²⁸⁰

The issues presented are many and interesting. Do we allow persons to use a robot to extend themselves to new places only when a person cannot safely enter the environment? *Columbus America*, the case announcing the

²⁷³ *Id.*

²⁷⁴ See *Wendt*, 125 F.3d at 809 (permitting the lawsuit to go forward under California law because, unlike in *White*, the robots had molded skin like actual people).

²⁷⁵ See *Lewis Galoob Co.*, 66 Cust. Ct. at 486 (“[T]he presence of a human face in an article which is otherwise incapable of representing any living being cannot make ‘animate’ what is, in totality, incapable of animation or life.”).

²⁷⁶ See Parts I.D and I.E.

²⁷⁷ See *Columbus-America Discovery Group, Inc.*, 742 F.Supp. at 1328-29.

²⁷⁸ See *Davis*, 958 P.2d 1083.

²⁷⁹ H.R.2262, Public Law No: 114-90 (2015-2016).

²⁸⁰ The first issue is similar to the kinds of problems of jurisdiction that the Internet created. If a surgeon in Maryland is operating on a patient in Ohio, must she be certified in Maryland, Ohio, or both? The second issue—presented, for instance, by Google’s partnership with Johnson & Johnson to develop autonomous surgery robots—is whether the robot would need to be certified at all, let alone where.

doctrine of tele-possession, leaves this question open by limiting itself to the dangerous context of the high seas.²⁸¹ How much control must a robot afford over an environment for the person operating the robot to legally (or illegally) enter the space? What if there is a time delay between the command and its execution? What if the actions constitute a blend of human and machine control, or the work of many operators together as the case with military drones?²⁸²

Answering these and related questions in depth is outside the scope of this article. Nevertheless, the courts have already had to grapple with some of the difficult questions robots tend to spur, questions altogether outside of the existing legal literature. If these past cases are prologue, similar issues are on the horizon. And the robotics law and policy community is well-positioned to begin to lend analytic rigor to the debates.

B. Law and Contemporary Robotics

The bulk of this article is devoted to showing how courts have already come to grapple with robots in various ways. Robotics today is in the midst of a sea change, advancing at a breakneck pace. The field is headed toward a Cambrian explosion, referring to the great speed of the field's evolution and diversification.²⁸³ What can the way courts have talked about robots in the past tell us about their reaction to this old but newly transformative technology? And how are we to proceed if we are to fashion a wise robotics law and policy going forward?

A path toward understanding how contemporary robots will interact with the law involves grappling with the differences and similarities between robotics today and the robots the law has already met. Such an exercise is crucial, both because the introduction of vastly more robots into society will amplify the effect of judicial mistakes regarding the technology, and because the technology itself has evolved past what the doctrine contemplates.

Elsewhere I explore what I consider to be the three main qualities of robotics that pose particularly interesting legal and policy challenges.²⁸⁴ The preceding case studies support my older arguments to a degree. For instance, I argue that the unique social valence of robots, i.e., the ways we are hardwired to react to a robot as though it were a social being, will pose

²⁸¹ Columbus-America Discovery Group, Inc, 742 F.Supp. at 1328-29

²⁸² For a discussion of blended control, see Meg Leta Ambrose, *The Law and The Loop*, Proc. IEEE Ethics (2014).

²⁸³ Gill A. Pratt, *Is a Cambrian Explosion Coming for Robotics?*, 29 J. ECON. PERSP., 51 (2015).

²⁸⁴ Calo, *supra* note 8.

novel challenges for law and policy.²⁸⁵ And courts have indeed struggled with the ways robots might be surrogates for people beyond what one might expect with another technology. I also argue in past work that the physical embodiment of software code will play an important role in determining liability.²⁸⁶ This claim sees modest support in the greater willingness of courts to assign blame to a person when that person relies on a robot in a way that leads to physical harm.

What I found most striking in my review of the case law, however, is how uniformly courts reject the prospect of emergent robot behavior. Emergence refers to the ability or tendency of a system to behave in complex, unanticipated ways.²⁸⁷ Emergence has long been a gold standard in robotics.²⁸⁸ The idea is to create robots that do not need to be programmed to solve tasks, at least not in the same way as an entirely bounded system. They can learn from experience and solve problems in ways their creators never envisioned.

This capacity for surprise, of course, is double-edged. It can result in a more efficient warehouse,²⁸⁹ a new invention,²⁹⁰ or an unanticipated style of game play.²⁹¹ But it can also result in making people feel threatened or under assault. For example, police in Amsterdam investigated the designer of a Twitter bot—an autonomous software agent on the Internet—when it appeared to threaten harm to a local fashion show.²⁹² The bot threat had a real world impact through the show’s concern about potential violence and the costs of a police investigation. Where a system is embodied, i.e., has the capacity physically to affect the world in itself, emergent behavior can result in actual bodily harm. Even absent embodiment an emergent system can threaten critical aspects of society, as when high-speed trading

²⁸⁵ *Id.* at 545-49. *See also* Calo, *supra* note 249 (discussing social valence in the context of privacy).

²⁸⁶ Calo, *supra* note 8, at 532-37. *See also* Calo, *Open Robotics*, *supra* note 167.

²⁸⁷ Calo, *supra* note 8, at 539 (citing STEVEN JOHNSON, *EMERGENCE: THE CONNECTED LIVES OF ANTS, BRAINS, CITES, AND SOFTWARE* 18-19 (2001)).

²⁸⁸ *Id.* at 538-39.

²⁸⁹ *See supra* notes 5 and 86 (discussing Amazon’s use of robots).

²⁹⁰ ROBERT PLOTKIN, *THE GENIE IN THE MACHINE: HOW COMPUTER-AUTOMATED INVENTING IS REVOLUTIONIZING LAW AND BUSINESS* 51-52 (2009) (describing the “Creative Machine” that the company Gillette used to redesign its toothbrush). IBM’s Watson, an artificial intelligence engine that beat the top Jeopardy players in an exhibition match, also generates new food recipes. The Bengali Butternut BBQ Sauce is pretty good.

²⁹¹ Deep Mind, an artificial intelligence company owned by Google, has taught an algorithm to play multiple Atari games. Often the style of play differs from that of the best gamers, even as it breaks all high scores.

²⁹² *See* Kashmir Hill, *Who do we blame when a robot threatens to kill people?*, *FUSION*, Feb. 15, 2015, <http://fusion.net/story/48656/who-do-we-blame-when-robots-threaten-to-kill-people/>.

algorithms destabilize the stock market.²⁹³

From my study of how courts talk about robots, both in deciding cases about robots and in invoking the technology in the course of judicial reasoning, judges have a specific model of robots in mind. In American law to date, the robot is by definition a programmable machine.²⁹⁴ It does exactly what its programmer tells it to do. It follows that a robot cannot be spontaneous enough to perform in a restaurant or responsible for the collision between two airplanes.²⁹⁵ And it follows further that a person who acts like or is similar to robot is not responsible for his or her own actions.²⁹⁶

The idea that a robot can only follow its programming is, on one level, correct. Robots do not somehow “decide” how to act, and they are not capable of deviating from the code that constitutes them. But judicial understandings of robots are also fundamentally wrong in crucial respects. Even if a robot will always run its code, that does not mean that a programmer anticipates, let alone intends, every action the robot takes. People can and do program robots to interact dynamically with their environment and to generate and attempt new solutions.²⁹⁷ Part of the very appeal of these systems is that they come up with novel strategies and results by approaching problems in a way no human would.²⁹⁸

Courts have yet to come into significant contact with emergent systems. When they do, judges will have to shed their current conceptions of the technology or they will make analytic mistakes. Thus, while the research underpinning this article corroborates several of my earlier hypotheses, it amends others. I have assumed courts confronted with emergent behavior will recognize that its creators did not foresee or intend the behavior.²⁹⁹ The logical step would be the refusal to find the necessary mens rea in criminal law or foreseeability in tort, leading to would-be prosecutors with no defendants and victims without redress.³⁰⁰

My recent research convinces me that courts may assume this problem away for a time. The idea that robots do the specific bidding of people appears firmly ingrained in the judicial imagination. Confronted with an emergent mishap, courts may lay blame with the creator or operator no matter what they arguments these defendants deploy. There are, perhaps,

²⁹³ See Calo, *supra* note 8, at 541 (citing Tom C.W. Lin, *The New Investor*, 60 UCLA L. REV. 678 (2013)).

²⁹⁴ This definition is still popular in certain disciplines such as electrical engineering.

²⁹⁵ See *supra* Parts I.B and I.E.

²⁹⁶ See *supra* Part II.C.

²⁹⁷ See Calo, *supra* note 8, at 538.

²⁹⁸ *Id.*

²⁹⁹ *Id.* at 541-45, 554-55.

³⁰⁰ *Id.* at 554-55.

advantages to this approach. But the disadvantages are also significant. As the Supreme Court recently reaffirmed, the Constitution frowns on using even negligence as the intent standard for crimes.³⁰¹ And the approach in tort would go beyond even strict liability, where courts dispense with an inquiry into fault but nevertheless require foreseeability to satisfy proximate causation.³⁰²

The preceding raises an interesting institutional question: who should decide how law evolves with robotics? Another difference today, beyond advances in technology, is that officials other than the judiciary have become primary sources of robotics policy. Increasingly, legislatures and agencies are passing rules about robots. A full accounting for these laws is beyond the scope of this particular article. But just a few examples include dozens of state laws regulating driverless cars, the domestic use of drones, and insurance for telemedicine.³⁰³

These laws are not necessarily wise or perfectly informed. The state of Nevada had to repeal and rewrite its pioneering driverless car legislation within a year because of an unanticipated impact on automakers.³⁰⁴ But the new laws demonstrate that the courts are not the only place where robotics law and policy is made. A plausible scenario suggests that federal and state lawmakers wind up setting the new tone, tenor, and content of robotics law. Recently, the National Highway Transportation Safety Administration responded to Google's request to clarify whether driverless car software could qualify as a "driver." The NHTSA responded that, under certain circumstances, software could be a driver—an opinion likely to influence other judicial, regulatory, and legislative bodies down the line.

New legal institutions could play a role. Agencies famously serve as repositories of expertise.³⁰⁵ I and others argue in favor of a new technology commission, a kind of NASA-for-everything that can act as a repository of knowledge about robots to guide legal actors, including courts.³⁰⁶ This

³⁰¹ *Elonis v. United States*, 575 US. __, at *13-14 (2014) (rejecting a negligence standard in a criminal case).

³⁰² Calo, *supra* note 8, at 554-55.

³⁰³ *E.g.*, S.B. 1298, 2012 Leg., Reg. Sess. (Cal. 2012) (authorizing autonomous vehicles); A.B. 511, 2011 Leg., 76th Sess. (Nev. 2011) (same); S.B. 313, 2013 Leg., 77th Sess. (Nev. 2013) (regulating autonomous vehicles); S.B. 1134, 62nd Leg., 1st Reg. Sess. (Idaho 2013) (placing limits on domestic use of drones); S.B. 1587, 98th Gen. Assemb., Reg. Sess. (Ill. 2013) (same); Va. Code § 38.2-3418.16 (requiring insurance to cover telemedicine).

³⁰⁴ NRS § 482A.020 (repealed 2013); NRS § 482A.30 (2011).

³⁰⁵ *See Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.* 467 U.S. 837, 866 (1984).

³⁰⁶ *See* Ryan Calo, *The Case for a Federal Robotics Commission* (2014), <http://www.brookings.edu/research/reports2/2014/09/case-for-federal-robotics-commission>; Bruce Schneier, *The Internet of Things Will Be the World's Biggest Robot*,

article focuses on case law because state and federal courts have been the main points of contact between robots and the law in the past half-century. New configurations are always possible.

The mental models of judges may also change with time. Robotics experts may come before the court; technically minded organizations and individuals may file amicus briefs. In several of the cases in Part I, we see the court turning to the dictionary.³⁰⁷ This is interesting insofar as the definition of a robot changes with the time. Thus, imagine if the court in [insert case] were to apply the contemporary definition of a robot as a “machine that looks like a human being and performs various complex acts (as walking or talking) of a human being” to the toy under examination.³⁰⁸ But as we have also seen, courts are perfectly capable of ignoring definitional elements that go against their intuitions about the technology.³⁰⁹

The broadening of sources of robotics law may prove a good or bad thing.³¹⁰ Lawmakers and agency officials may be better positioned than courts to gain the expertise and appreciation of just how far robots has come, or else introduce new and unwelcome complexities. New policy frameworks, coupled with good experts and amicus briefs, could, on a charitable reading, help update the mental models of courts and lead to analytically sound outcomes. Here I agree with Professor Balkin: we will only understand the true impact of robots on American law and legal institutions in the fullness of time.

CONCLUSION

This article offered nine new case studies to illuminate the role of robots in American law. The first set considered robots as *objects* of American law, i.e., as artifacts in the world that have occasioned legal disputes. The second set considered robots as *subjects* of the judicial imagination, i.e., as metaphors or similes that support a particular verdict. Few of the decisions that make up these studies appear in the legal literature to date—even within the burgeoning field of robotics law.

Examining these cases together yields a series of valuable insights. One is that robots tend to blur the line between person and instrument. A robot is an artifact, but one holding special fascination and significance. Courts have

FORBES (Feb. 2, 2016), <http://www.forbes.com/sites/bruceschneier/2016/02/02/the-internet-of-things-will-be-the-worlds-biggest-robot/#27d41a853162>.

³⁰⁷ See *supra*.

³⁰⁸ “Robot.” *Merriam-Webster.com*. Merriam-Webster, n.d. Web. 10 Feb. 2016.

³⁰⁹ See *supra*.

³¹⁰ For a recent argument that courts are surprisingly well-positioned to cultivate expertise, see Elizabeth Fisher et al., *Rethinking Judicial Review of Expert Agencies*, 93 TEXAS L. REV. 1681 (2015).

struggled with the status of robots, asking how robots can be said to represent, imitate, extend, or absolve people. Judges also invoke robots in a variety of contexts when a person is acting, or being asked to act, outside of the typical bounds of a human being.

A second is that judges may have a problematically narrow conception of what a robot is. There are, unsurprisingly, conflicts and tensions in early robot law. Courts are ambivalent about each of the questions they confront and results vary with context. But there seems to be an odd consensus with respect to the judge's mental model of a robot: it is a programmable machine, by definition incapable of spontaneity.

If this definition of robots were ever true, it is not true today. Contemporary robots range in sophistication, with some systems solving and creating problems in ways never the programmer nor the public would have anticipated. The mismatch between what a robot is and how courts are likely to think of robots will only grow in salience and import over the coming decade.

The story of robots and the law is only beginning. Robots are rapidly entering the mainstream and are likely to alter the legal landscape in ways prosaic and profound. But we should not assume we write on a clean slate. Robots have been a part of American society for half a century. And as the preceding pages show, they have already generated a limited but significant body of law that awaits exploration.