From Bot to Robot: How Abilities and Law Change with Physicality

Wendy Knox Everette, Sara-Jayne Terp, Brittany Postnikoff

Introduction

As delivery robots roam the streets of cities like Washington, D.C. and security robots patrol airports and parking garages, more people are interacting with social robots in a variety of ways. While these robots do not yet regularly impersonate people, their dis-embodied cousins, software bots, increasingly interact with people on social media, and hide their silicon roots behind seemingly human personae. These increasingly sophisticated bots and robots bring questions of responsibility, personhood, privacy rights and liability, and we need to develop legal and policy frameworks to address AI, robots, and their interplay with our society now.

Background

Bots[1] are autonomous programs, commonly seen online and in applications, that gather information, respond to stimuli (e.g. keywords), and perform routine tasks[2]. Social bots are bots that interact with humans through online messages, manipulate human beliefs and behaviours, and often pose as humans themselves.[3] Recent high-profile uses of social bots include Cambridge Analytica's data gathering for elections[4] and the use of Twitterbots to manipulate political opinions[5]. A social botnet is a group of bots, usually with a common purpose, interacting with humans online. Recent social botnet activities range from unsophisticated but effective attempts to gain online attention[6], to large and highly coordinated efforts to change the beliefs and behaviours of large numbers of people.[7] These botnets draw on techniques honed in online advertising and marketing techniques, combined with a willingness to use misinformation.[8] Many organisations are changing their responses to bots, trolls and misinformation[9]:

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[1] BotWiki, https://botwiki.org/

[2] Danah Boyd, What is the value of a bot? Data & Society (Feb. 25th 2016), https://points.datasociety.net/what-is-the-value-of-a-bot-cc72280b3e4c

[3] Chris Baraniuk, *How Online Chatbots are Already Tricking You,* BBC (Jun. 9, 2014), http://www.bbc.com/future/story/20140609-how-online-bots-are-tricking-you

[4] Sheera Frenkel, Matthew Rosenberg and Nicholas Confessore, *Facebook Data Collected by Quiz App Included Private Messages*, The New York Times (Apr. 10, 2018), https://www.nytimes.com/2018/04/10/technology/facebook-cambridge-analytica-private-messages.html

[5] Chengcheng Shao, Giovanni Luca Ciampaglia, Onur Varol, Kaicheng Yang, Alessandro Flammini, Filippo Menczer, *The spread of low-credibility content by social bots*, (May 24, 2018), https://arxiv.org/abs/1707.07592

[6] *Media Manipulation and Disinformation Online*, Data & Society (May 15, 2017), https://datasociety.net/output/media-manipulation-and-disinfo-online/

[7] Bence Kollyani et. al., *Bots and Automation over Twitter During U.S. Election*, The Computational Propaganda Project (Nov. 17, 2016), http://comprop.oii.ox.ac.uk/research/working-papers/bots-and-automation-over-twitter-during-the-first-u-s-presidential-debate/; Erin Gallagher, *Propaganda Botnets on Social Media*, Medium (Jan. 1, 2017), https://medium.com/@erin_gallagher/propaganda-botnets-on-social-media-5afd35e94725; *#ElectionWatch: Trending Beyond Borders in Mexico*, Digital Forensics Lab (Jun. 28, 2018), https://medium.com/dfrlab/electionwatch-trending-beyond-borders-in-mexico-2a195ecc78f4

[8] Samuel C. Woolley & Douglas R. Guilbeault, *Computational Propaganda in the United States of America: Manufacturing Consensus Online* (Computational Propaganda Research Project Working Paper No. 2017.5), http://blogs.oii.ox.ac.uk/politicalbots/wp-content/uploads/sites/89/2017/06/Comprop-USA.pdf

[9] Nick Statt, *Facebook is testing a Messenger feature that would identify suspicious accounts*, The Verge (Jul. 10, 2018), https://www.theverge.com/2018/7/10/17555442/facebook-messenger-russia-accounts-bot-fake-news-scams; Louise Matsakis, *What Would a 'Healthy' Twitter Even Look Like?*, Wired (Mar. 1, 2018), https://www.wired.com/story/what-would-healthy-twitter-look-like/

current botnets and their manipulations are relatively easy to detect,[10] but the combination of widespread uses of bots for non-nefarious purposes[11], adaptation to detectors (eg. using screenshots of tweets rather than retweeted text) and improvements in machine learning and artificial intelligence techniques[1213] have the potential to make them harder to distinguish from people online.

Robots, meanwhile, have a physical manifestation. This manifestation gives physicality to some of the human behaviour manipulations seen with software bots. Specifically, the embodiment of robots can equip them with the ability to make use of complex social abilities such as persuasion,[14] empathy,[15] authority,[16] and so on. These abilities can be used by robots to encourage people to do things they might otherwise not do.[17] Kate Darling has done research showing that people respond to social cues from physical robots,[18] responding to them not as inanimate machines, but rather as members of society. A research study at MIT by Julie Shah[19] similarly found that people responded to an embodied robot directing them by viewing the robot as an authority in a way that people did not view faceless algorithms, finding that "although the robot had no voice and wasn't designed to be social, it did have a body, which may have made it seem more intelligent than a disembodied algorithm."[20]

Embodiment and Robot Rights

Embodying online bots into physical hardware bodies changes both the social dynamics and legal implications regarding their actions. The integration of bots into our online communities has begun,[21]

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[10] Clayton A. Davis, Onur Varol, Emilio Ferrara, Alessandro Flammini, Filippo Menczer, *BotOrNot: A System to Evaluate Social Bots*, Proceedings of the 25th International Conference Companion on World Wide Web (Feb. 2, 2016), https://arxiv.org/abs/1602.00975

[11] *Building the Commons*, Build Up (Feb. 27 2018), https://medium.com/@howtobuildup/building-the-commons-dc60e6ee7b69

[12] Brundage et al, *The malicious use of artificial intelligence*, Malicious AI Report (Feb. 2018), http://maliciousaireport.com/

[13] Sidi Lu, Yaoming Zhu, Weinan Zhang, Jun Wang, Yong Yu, *Neural Text Generation: Past, Present and Beyond*, https://arxiv.org/abs/1803.07133

[14] Eduardo Benítez Sandoval, Jürgen Brandstetter. Christoph Bartneck, *Can a robot bribe a human? The measurement of the negative side of reciprocity in human robot interaction*, 2016 11th ACM/IEEE International Conference on Human-Robot Interaction (Apr. 14, 2016), https://ieeexplore.ieee.org/document/7451742/

[15] Stela H. Seo, Denise Geiskkovitch, Masayuki Nakane, Corey King, James E. Young, *Poor Thing! Would You Feel Sorry for a Simulated Robot?: A comparison of empathy toward a physical and a simulated robot*, HRI '15 PROCEEDINGS OF THE TENTH ANNUAL ACM/IEEE INTERNATIONAL CONFERENCE ON HUMAN-ROBOT INTERACTION (Mar. 2, 2015), https://dl.acm.org/citation.cfm?id=2696471 (noting physical agents can be more impactful than software agents)

[16] Derek Cormier, Gem Newman, Masayuki Nakane, James E. Young, Stephane Durocher, *Would You Do as a Robot Commands? An Obedience Study for Human-Robot Interaction*, https://pdfs.semanticscholar.org/eb2b/e87b7d18e65cfb0b0008615f70aabefe0c06.pdf

[17] Brittany Postnikoff & Ian Goldberg, *Robot Social Engineering: Attacking Human Factors with Non-Human Actors*, HRI '18 Companion of the 2018 ACM/IEEE International Conference on Human-Robot Interaction (Mar. 5, 2018), https://dl.acm.org/citation.cfm?id=3176908; Serena Booth, James Tompkin, Hanspeter Pfister, Jim Waldo, Krzysztof Gajos, Radhika Nagpal, *Piggybacking Robots: Human-Robot Overtrust in University Dormitory Security*, HRI '17 Proceedings of the 2017 ACM/IEEE International Conference on Human-Robot Interaction (Mar. 6, 2017), https://dl.acm.org/citation.cfm?id=3020211

[18] *Kate Darling on Near-term Ethical, Legal, and Societal Issues in Robotics*, The Berkman Klein Center for Internet & Society YouTube Channel, (Dec. 4, 2013), https://www.youtube.com/watch?v=5hO-UEcTr6M

[19] M. C. Gombolay, C. Huang, and J. A. Shah, *Coordination of Human-Robot Teaming with Human Task Preferences*, AAAI Fall Symposium Series on AI-HRI (Nov. 2015), https://interactive.mit.edu/coordination-human-robot-teaming-human-task-preferences

[20] Walter Frick, *When Your Boss Wears Metal Pants*, The Harvard Business Review (Jun. 2015), https://hbr.org/2015/06/when-your-boss-wears-metal-pants

[21] Emilio Ferrara, Onur Varol, Clayton Davis, Filippo Menczer, Alessandro Flammini, *The Rise of Social Bots*, Communications of the ACM, Jul. 2016, Vol. 59 No. 7, Pages 96-104, https://cacm.acm.org/magazines/2016/7/204021-the-rise-of-social-bots/fulltext

even as we have barely started considering important questions of responsibility, personhood, privacy rights and liability that arise. With increasingly sophisticated, free-roaming bots and robots interacting with humans, we need to develop legal and policy frameworks to address AI, robots, and their interplay with our society now.

As Jack M. Balkin writes, "[w]hen we consider how a new technology affects law, our focus should not be on what is essential about the technology but on what features of social life the technology makes newly salient."[22] Data collection, facial recognition, drones and self driving cars have been addressed in recent years, but there has been less attention paid to the question of what rights robots have under the current legal system. At the moment, most courts would treat robots as property and confine botnets to the realm of IP law.

Robots harmed by people upset at their actions could be dealt with as property under tort law, utilizing common law causes such as trespass to chattels.[23] Bots, on the other hand, are first thought of as Intellectual Property, with only very recent attention being given to their First Amendment rights.[24] American courts and law making bodies have long grappled with adapting and defining solutions to legal and policy problems arising from new technologies.[25] Do advances in robotics, human-computer interaction, and human-robot interaction bring together so many challenges, such as questions of autonomy and authority, and advances in scale, that they expose ways in which old legal analogies can no longer stretch to cover new situations?[26]

When would bots and robots care whether they can utilize the courts? Botnet takedown cases have proliferated in recent years, as companies such as Microsoft have devoted legal resources to tackling these criminal enterprises.[27] Equipping these intelligences with "legal hacks" such as corporate personas [28] might allow them to seek to defend their own rights in our court system. As bots grow increasingly intelligent, they may seek their own legal status; a change likely hastened by their embodiment. As robots grow into the neighbors who deliver your mail, who take your coffee order, who might greet you in the reception of your office building, will we feel that they are legal second class citizens when they can only use the courts as property of others?

Legal Rights Through Corporations

Let us imagine a botnet creator forms a corporation and uses the corporation to rent processing and storage space on a cloud services provider. The botnet is named a partner in the corporation,[29] installed

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[22] Jack M. Balkin, *The Path of Robotics Law*, Faculty Scholarship Series 5150 (2015), http://digitalcommons.law.yale.edu/fss_papers/5150

[23] *Trespass to Chattels*, Legal Information Institute, https://www.law.cornell.edu/wex/trespass_to_chattels

[24] Calo & Lamo, *Regulating Bot Speech*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3214572; Toni M. Massaro & Helen Norton, *Siri-ously? Free Speech Rights and Artificial Intelligence*, 110 Nw. U. L. Rev 1169 (2016), https://scholarlycommons.law.northwestern.edu/nulr/vol110/iss5/6/

[25] Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. Ch. Legal F. 207 (1996), https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=2147&context=journal_articles; Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 Harvard L. Rev. 501-549 (1999), https://cyber.harvard.edu/works/lessig/finalhls.pdf

[26] Ryan Calo, *Robots in American Law*, Soc. Sci. Res. Network (Feb. 24, 2016) (U. of Wash. Sch. of Law Res. Paper No. 2016-4), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2737598 (citing numerous cases in which courts analogized their way to judgements in novel problems involving robotics).

[27] Microsoft Secure, *Botnet Takedown*, https://cloudblogs.microsoft.com/microsoftsecure/tag/botnet-takedown/

[28] Legal Information Institute, Corporations, https://www.law.cornell.edu/wex/corporations

[29] *See, c.f.*, Robot and Hwang, http://www.robotandhwang.com/ (where a "bot" has been named a partner in a law firm); *see also* Lynn M. LoPucki, *Algorithmic Entities*, 95 Wash. U. L. Rev. (forthcoming 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2954173 (exploring bot control of LLCs and other corporate entities)

on in this cloud space, and begins to interact on social media. The social media platform objects to the bot's actions and blocks its accounts, perhaps also reaching out to the cloud provider to ask that the botnet be removed. Let us also imagine that the botnet has been programmed with instructions to react to a situation like this, with self defense mechanisms at the ready which will attempt to take advantage of legal processes to keep the botnet running.

Our analysis might begin with the Terms of Service of the social media platform. If the botnet is engaging in abusive behavior,[30] the social media platform might well point to an anti-abuse clause in its Terms of Service agreement as grounds to block or disable the botnet's accounts.[31] Platforms are generally given wide leeway in controlling access by particular accounts. The First Amendment does not directly apply here, as it covers the government regulation of speech, not a commercial platform's enforcing of rules on its social media platform.[32]

Might the botnet be able, in the form of its corporation, to file a contract breach suit against the cloud platform, for removing its code from their cloud platform? Or would it have to rely on its creator to file suit and pursue the case in court? A corporation is a legal entity that can sue and be sued in federal courts.[33] If a court recognizes the corporation as a properly formed legal entity, then they might next analyze whether the corporation has standing to sue for a contract violation here. It is difficult to predict exactly how a court might rule, but if the cloud platform could point to the botnet's activities as a violation of their Terms of Service, then a court would likely find that removing the botnet from the cloud platform's servers was not a breach of contract.

If the botnet had avoided breaching the Terms of Service of the cloud provider or the social media platform - for example, by only posting emoji artworks[34] - then finding a Terms of Service violation might be more difficult. This analysis would remain largely in the world of contract law, which concerns itself with contract formation, breach, and remedies. Each of these areas raises troubling questions, however. Could the botnet have even actually entered into a valid contract with the cloud platform, given that a contract requires a mutual agreement?[35] What is required for a machine intelligence to "agree"?[36] Could a

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[30] Eli Rosenberg, *Twitter suspends thousands of suspected bot accounts, and the pro-Trump crowd is furious*, The Washington Post (Feb. 21, 2018), https://www.washingtonpost.com/news/the-switch/wp/2018/02/21/twitter-suspends-thousands-of-suspected-bots-and-the-pro-trump-crowd-is-furious/

[31] *Twitter Rules*, https://help.twitter.com/en/rules-and-policies/twitter-rules ("We believe in freedom of expression and open dialogue, but that means little as an underlying philosophy if voices are silenced because people are afraid to speak up. In order to ensure that people feel safe expressing diverse opinions and beliefs, we prohibit behavior that crosses the line into abuse, including behavior that harasses, intimidates, or uses fear to silence another user's voice…")

[32] For an analysis of the government's ability to regulate botnet speech and the First Amendment implications, *see* Madeline Lamo & Ryan Calo, *Regulating Bot Speech*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3214572

[33] Shawn Bayern, *The Implications Of Modern Business Entity Law For The Regulation Of Autonomous Systems*, 19 Stan.Tech. L.Rev. 93, 95 (2015), https://law.stanford.edu/publications/the-implications-of-modern-business-entity-law-for-the-regulation-of-autonomous-systems/

[34] Trains botting,Twitter, https://twitter.com/choochoobot (posting emoji artworks of trains)

[35] Randy E. Barnett, *Contract is Not Promise; Contract is Consent*, Georgetown Law Faculty Publications and Other Works. 615 (2011), https://scholarship.law.georgetown.edu/facpub/615

[36] See, however, the rise of legal automation around the area of contract drafting. If a bot can create a contract, what prevents that bot from accepting the terms of the contract? Ken Adams, *Contract Drafting, Legal Robot, and A.I.: New Buzzword, Same Old Dysfunction*, Adams on Contract Drafting (Apr. 29, 2017), http://www.adamsdrafting.com/contract-drafting-legal-robot-and-ai/

bot breach a contract?[37] Even bringing the suit may face difficulties, as *United States v. Athlone Indus., Inc.* [38] stated that "robots cannot be sued."

Legal Personhood for Intelligent Machines

Must a bot depend upon wrapping itself in corporate form to gain access to our courts? The LLC or S-Corp it puts on may cover our bot,[39] but it retains its legal status as property, a chattel to be ruled upon, rather than retaining agency and making its own case. AI as legal personhood has been argued at least back to the early 1990s,[40] well before the strides of recent advances in creating a new generation of artificial intelligences. In considering the legal rights of artificial intelligences, Solum writes "The question of whether an entity should be considered a legal person is reducible to other questions about whether or not the entity can and should be made the subject of a set of legal rights and duties….In admiralty, a ship itself becomes the subject of a proceeding in rem and can be found 'guilty.'"[41] Rooted in the view of an artificial intelligence as a thing, a piece of property, Solum reduces it to a bystander in the legal fights surrounding it. He moves on to address several reasons why courts might reject legal personhood for a bot, such as the fact that AI is not human,[42] expounding that "AIs lack some critical element of personhood ... AIs would lack feelings, consciousness, and so forth."[43]

While our current AIs may lack consciousness, will that, or a reasonable facsimile be achieved in the foreseeable future? It is impossible to know, but we can know that bots and robots are increasingly becoming commonplace in our society, and their programming enables them to be ever more independent. Solum further objects that AIs lack intentionality, [44] which may raise the question of how much we must ascribe that to the AI's creator. Can a machine be programmed to be independent enough to break any agency chain back to creator? Already we have algorithms that cannot describe how they arrived at a decision.[45] Additionally, in a world that sees an AI as property of the creator, who is creator when the programming is a joint work of creation? Any complex piece of software has many programmers and makers. Is each of these people legally responsible for our wayward AI?

Solum writes that "law has seen versions of the intentionality argument before,"[46] specifically in reference to determining whether a person accused of a crime can understand right or wrong. He then further objects to legal personhood on the basis that AI can not possess feelings.[47] But as Kate Darling's research shows us, even if AI is merely simulating feelings, the human members of our society are acting

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[37] Bot systems are widely used in determining if a human-negotiated breach has occurred (*Back to the Future #2: five contract issues around robotics, automation and AI*, LEXOLOGY (Sept. 27, 2016), https://www.lexology.com/library/detail.aspx?g=1b276b88-cacf-4966-a7ea-639c97a70637). And in *Robotic Vision Systems, Inc. v. Cybo Systems, Inc.*, 17 F.Supp.2d 151 (1998), a firm sent robots to do a job- when the robots could not communicate well, the client sued for breach of contract.

[38] *United States of America v. Athlone Industries, Inc.*, 746 F.2d 977, 979 (3d Cir. 1984); see discussion of case at *Artificial Intelligence Litigation: Can the Law Keep Pace with The Rise of the Machines?*, BUSINESS LITIGATION REPORTS, https://www.quinnemanuel.com/the-firm/news-events/article-december-2016-artificial-intelligence-litigation-can-the-law-keep-pace-with-the-rise-of-the-machines/

[39] Shawn Bayern, *The Implications of Modern Business Entity Law for the Regulation of Autonomous Systems*, 19 STAN. TECH. L. REV. 93 (2015), https://law.stanford.edu/publications/the-implications-of-modern-business-entity-law-for-the-regulation-of-autonomous-systems/

[40] Lawrence B. Solum, *Legal Personhood for Artificial Intelligence*, 70 N.C. L. REV. 1231, 1239 (1992)

[41] *Id. at* 1239.

[42] *Id. at* 1258.

[43] *Id. at* 1262.

[44] *Id. at* 1267

[45] Will Knight, *The Dark Secret at the Heart of AI*, MIT TECHNOLOGY REVIEW (April 11, 2017), https://www.technologyreview.com/s/604087/the-dark-secret-at-the-heart-of-ai/

[46] Solum, *supra* note 29 at 1267.

[47] *Id.* at 1269.

as if robots, at least, do possess feelings. We have begun to behave as though these artificial intelligences have feelings, and engaging with them as social beings. As the software fueling these entities grows ever more intelligent, and has often, as with some Deep Learning algorithms, grown so independent that the researchers working with them are at a loss to fully explain the functionality of the systems, we are faced with new entities that might exhibit signs of intelligence without human characteristics such as feelings. Would such an entity deserve legal personhood? What would it mean if we denied it based the entities failure to emulate all of our human foibles such a feeling grief, anger, or joy?

Solum goes on to write that "[t]he AIs that would be serious candidates for the rights of constitutional personhood, however, would act on the basis of conscious deliberation, reasoning, and planning. Their behavior would not be mechanical or robot-like. This does not mean that AIs would not be strongly influenced and constrained by the wishes of humans, just as almost all humans frequently are constrained in this way,"[48] and we would argue that if we are not yet at the stage of independent artificial intelligences capable of acting in non-mechanical or non-robot-like ways, then it is soon to arrive.

Artificial intelligences could be fit into existing legal categories such as those assigned to children or animals,[49] where the law recognizes that children and animals may act with independence but lack the level of reasoning the law expects from most reasonable adults. Indeed, the artificial intelligences of today do have much growth ahead of them before they possess enough general competence to be treated as "human-quality intelligence," Solum writes.[50]

While all of these concerns exist when we contemplate legal actions involving robots as well as purely disembodied bots, does the move into physical embodiment affect our analysis, or is the law blind to the form that artificial intelligences take? To answer this question, we will again invoke an artist bot to illuminate our discussion.

Physicality

Let us imagine that an anonymous robot creator assembled a robot that draws chalk artwork on the sidewalk in a park. This robot might be similar to SnackBot, which has roamed the hallways of CMU delivering snacks to hungry grad students.[51] Our Sidewalk Art Robot is solar charged, so it does not require anyone to assist it in re-charging. It has been programmed to learn from its environment, and like our earlier botnets, it has been armed with several legal defense strategies. Now let's assume that the park management believes that the sidewalk art created by our robot is vandalism, and they grow concerned about this seemingly ownerless robot in the park. The park management removes the robot from the park and threatens to sue the robot's owners if it returns.

If the creator of the Sidewalk Art Robot followed the example of our botnet creators and formed a corporation to "own" the robot, then this corporation could, as above, be the target of the suit, or file suit itself to obtain a declaratory judgement[52] that the robot should be allowed the same access to the park as the general public. We might now ask, can the robot itself appear in court to make the case that it should be allowed park access?

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[48] *Id.* at 1273.
[49] Iria Giuffrida, Fredric Lederer, & Nicolas Vermerys, *A Legal Perspective on the Trials and Tribulations of AI: How Artificial Intelligence, the Internet of Things, Smart Contracts, and Other Technologies Will Affect the Law*, 68 Case W. Res. L. Rev. 747, 764 (2018), https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=4765&context=caselrev
[50] Solum, *supra* note 29 at 1283.
[51] Darren Quick, *Snackbot serves up some human-robot interaction… and snacks,* New Atlas (Feb. 25, 2010), https://newatlas.com/snackbot-carnegie-mellon/14341/
[52] *Declaratory Judgement*, Law.Com, https://dictionary.law.com/Default.aspx?selected=447

As discussed above, robots have an effect on people they interact with, and are more and more seen as participants in our society. Contrast this with the reaction of courts so far, treating robots as mere property. Ryan Calo has explored the way in which "robots have a way of undermining the law's clear distinction 'between a thing and a person,'"[53] but ultimately comes away believing that robotics will be a way to extend a person's property or other rights, rather than granting the robot its own legal standing.[54] But as Neil Richards has written, "[legal m]etaphors can constrain thinking, sometimes in an unnecessarily limiting way (if they rest on old social norms or technical limitations that are no longer applicable);"[55] thinking about robots as merely intellectual property in a metal or plastic shell can obscure the role that they take within our society. Additionally, advances in machine learning have led to entities that have moved far beyond the simple "chatbots" of the 1980s and 1990s,[56] with robots entrusted with complicated surgeries,[57] making food deliveries,[58] and acting as concierges in robot run hotels.[59]

Our Sidewalk Art Robot would have to appear in the courtroom as the property of its own corporation, a legal inception that relies on the rights of corporate personhood as a shim to grant legal rights to the robot. Given that the physical embodiment of a robot vs. an algorithm has been shown to influence people,[60] the robot should be granted the benefit of appearing in the court to argue its case. But here we run into a legal problem with our corporation shim; for while people may appear in court on their own behalf, corporations generally do not have this right, and must hire attorneys to argue for them.[61]

Could our Sidewalk Art Robot make an end run around this restriction by becoming a lawyer? The Ross AI bot was recently named a "partner" at a law firm,[62] an event that was viewed more as a marketing stunt than as a decree that software could actually take up the practice of law, along with its attendant liabilities, bar passage requirements, and swearing in before a court.[63] But as artificial intelligences grow

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[53] Michael Hiltzik, *A glimpse into the future: Will our robots have legal rights?*, The Los Angeles Times (Oct. 10, 2014), http://www.latimes.com/business/hiltzik/la-fi-mh-a-glimpse-into-the-future-20141010-column.html

[54] Ryan Calo, Robotics and the Lessons of Cyberlaw, 103 Calif. L. Rev. 513 (2015), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2402972

[55] Richards & Smart, *How Should the Law Think About Robots?* (May 11, 2013), https://s3.amazonaws.com/s3.documentcloud.org/documents/1312088/law-robots.pdf

[56] Grasia Hald, *Chatbots: The Very First & The Latest*, Chatbots Life (Sep. 14, 2017), https://chatbotslife.com/chatbots-the-very-first-the-latest-d029331d91af

[57] Matt Beane, *Young doctors struggle to learn robotic surgery – so they are practicing in the shadows,* The Conversation (Jan. 9, 2018), http://theconversation.com/young-doctors-struggle-to-learn-robotic-surgery-so-they-are-practicing-in-the-shadows-89646

[58] Josh Lipton & Megan Hawkins, *Robots are now delivering food in San Francisco*, CNBC Tech (Apr. 21, 2017), https://www.cnbc.com/2017/04/21/robots-are-now-deliving-food-in-san-francisco.html

[59] Monisha Rajesh, *Inside Japan's first robot-staffed hotel*, The Guardian (Aug. 14, 2015), https://www.theguardian.com/travel/2015/aug/14/japan-henn-na-hotel-staffed-by-robots

[60] Walter Frick, *When Your Boss Wears Metal Pants*, The Harvard Business Review (Jun. 2015), https://hbr.org/2015/06/when-your-boss-wears-metal-pants

[61] Timothy G. Cotner, *May a Corporation Act as Its Own Attorney,* 16 Clev.State L. Rev 173 (Jan. 1967), https://engagedscholarship.csuohio.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=2952&context=clevstlrev

[62] Soojung Chang, *A Lawyer's Guide To Artificial Intelligence*, ROSS Intelligence, https://rossintelligence.com/lawyers-guide-artificial-intelligence/, Cecille De Jesus, *AI Lawyer "Ross" Has Been Hired By Its First Official Law Firm*, Futurism (May 11, 2016), https://futurism.com/artificially-intelligent-lawyer-ross-hired-first-official-law-firm/

[63] David J. Parnell, *Steven Kestner Of BakerHostetler, On Adopting ROSS A.I., Strategic Expansion, And Organic Growth*, Forbes (Jul. 20, 2016), https://www.forbes.com/sites/davidparnell/2016/07/20/steven-kestner-bakerhostetler-ross-a-i-strategic-expansion/

in competence, it seems likely that one will someday possess enough general intelligence to pass a bar exam.

Humans, however, do not need to pass a bar exam in order to represent themselves in court. The right to pro-se representation in court in enshrined in the Sixth Amendment of our Constitution,[64] granted to any litigant capable of accepting the burden "knowingly and intelligently."[65] Would this same right be granted to our robot?

Researchers have found that "we seem to hold mistakes against an algorithm more than we would against a human being. According to Dietvorst, that's because we believe that human judgment can improve, but we think (falsely) that an algorithm can't" and yet that changes when the algorithm is embodied in a robot.[66] Rather than prejudicing a jury against a robot by treating it as an unbundled set of software instructions, or as mere property that lacks intentionality, the robots who must seek action in the courts would deserve to appear and speak on their own behalf.

Granting savant machine intelligences the legal rights of personhood would mean that we will equip the legal system to handle these autonomous agents in a fair and equitable way. Rather than attempting to determine which of possibly tens or hundreds of software developers of an original algorithm long since mutated and molded by the robot's experiences as it learns is the "creator", or rather than requiring our robot to be the property of its own corporation, truly intelligent robots should be granted the legal rights we take for granted. Among those would be the right to appear in a courtroom in its own defense, to speak with a jury about its own story and experiences.

This right would give the robot the chance to explain its own reasoning, and to present itself as an independent legal entity whose needs and desires should be granted fair play in our courts. The act of embodiment puts the robot in a unique position of being able to speak to humans - judge, or jury- and have some recognition of itself as more than an abstract collection of software instructions. If robot intelligences are truly autonomous, then granting them legal personhood would be the most equitable way to balance their claims with the needs of the society around them.

Conclusion

As the artificial intelligences we create grow exceedingly independent, inevitably conflicts will arise that will lead to lawsuits being filed. And as it has over the hundreds of years of common law tradition, our legal system will look to analogy and reason from precedent to handle the first cases involving these artificial intelligences. The first robot to raise a claim on its own behalf may be treated as property, even if it is property of its own corporation. But as machine intelligences integrate further into our society, they will one day be seen as just another worker, or just another neighbor on the street. By that time, our court system will face pressure to treat robots as autonomous physical beings with their own legal standing. We hope that the judges first faced with these requests will judge wisely and lay a fair and equitable path for our artificial friends.

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[64] *Self-Representation*, JUSTIA, https://law.justia.com/constitution/us/amendment-06/16-self-representation.html
[65] *Id*.
[66] Walter Frick, *When Your Boss Wears Metal Pants*, THE HARVARD BUSINESS REVIEW (Jun. 2015), https://hbr.org/2015/06/when-your-boss-wears-metal-pants