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Property ownership and the legal personhood of artificial intelligence

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ABSTRACT

This paper adds to the discussion on the legal personhood of artificial intelligence by focusing on one area not covered by previous works on the subject – ownership of property. The author discusses the nexus between property ownership and legal personhood. The paper explains the prevailing misconceptions about the requirements of rights or duties in legal personhood, and discusses the potential for conferring rights or imposing obligations on weak and strong AI. While scholars have discussed AI owning real property and copyright, there has been limited discussion on the nexus of AI property ownership and legal personhood. The paper discusses the right to own property and the obligations of property ownership in nonhumans, and applying it to AI. The paper concludes that the law may grant property ownership and legal personhood to weak AI, but not to strong AI.

1. Introduction

Human development, when viewed within the larger context of the earth's existence, has been a very recent phenomenon. If one were to compare the earth's actual existence as lasting a year, human development[1] in comparison has only been for approximately one minute. Artificial intelligence (AI), in turn, has not even registered a full one second.

AI is still in its infancy. Yet, the rapid advances made in the field of AI has already been astonishing. AI awed the world in 1997 when IBM's Deep Blue supercomputer beat then reigning chess world champion Garry Kasparov.[2] In March 2016, Google's AI computer Alpha Go, developed by Google's DeepMind, defeated world Go champion Lee Sedol.[3] Go is considered a more complex and challenging board game than chess because playing the game requires anthropomorphic intuition and pattern recognition.[4] Previously in 2011, IBM's Watson, a cognitive supercomputer, defeated former Jeopardy!

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[1]There have been proposals to call this era the Age of Man or 'Anthropocene'.

[2]IBM, 'Icons in Progress: Deep Blue' (2020) <http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/deepblue/> accessed 5 December 2020. Kasparov lost previously in 1996.

[3]D Muoio, 'Why Go is So Much Harder for AI to Beat Than Chess' *Business Insider* (New York, 10 March 2016) <https://www.businessinsider.com/why-google-ai-game-go-is-harder-than-chess-2016-3 > accessed 5 December 2020.

[4]ibid.

champions Brad Rutter and Ken Jennings.[5] Watson was a significant advancement from Deep Blue because its software could process and reason with natural language.[6]

However profoundly impressive were AI's victories in the realm of games, society will ultimately measure AI's success or usefulness by the advancement of its application beyond gaming. Aside from Google's renowned driverless car, AI has recently demonstrated anthropomorphic learning and decision-making in two coveted professions: law and medicine.

In October 2017, partners and associates from top international law firms competed with Case Crunch, an AI start up in the UK, to assess and predict the success of almost 800 historic insurance misselling claims.[7] Case Crunch handily won with 87 percent accuracy against the lawyers' 62 percent accuracy.[8] In May 2016, the law firm of Baker and Hostetler announced that it had employed Ross, dubbed as the world's first 'artificially intelligent attorney', to assist in its bankruptcy practice.[9] Ross is built on IBM's Watson, the same computer system that had beaten the Jeopardy! champions five years earlier.[10] Ross, in addition to being able to process and reason with natural language, can now postulate hypotheses from questions asked, conduct legal research, and generate response with references and citations, as a lawyer would.[11] Most importantly, Ross is now self-learning, getting better and faster from experience and interaction.[12] Around the same time in May 2016, the Children's National Medical Center in Washington demonstrated that a supervised autonomous robot called Smart Tissue Autonomous Robot (STAR) could perform more superior soft tissue surgery than human surgeons could.[13] While robots have previously assisted in surgery,[14] surgeons consider soft tissue surgery to be more challenging for robots because of tissue deformity and mobility.[15]

At the current rate, AI resembling adult human intelligence may be achieved within 50 years.[16] Along each step, both critics and enthusiasts must raise ethical, philosophical, and legal questions posed by the rise of AI. This paper focuses on a specific legal issue within the larger AI discussion: whether the legal personhood of AI ought to be recognised. Society, as a practical matter, will likely be forced to confront the legal issues raised by AI. In fact, legal issues are already being raised concerning autonomous machines. What happens when an autonomous vehicle gets into an accident, when the AI attorney is sued for malpractice, or the patient of an AI surgeon dies?

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[5]*IBM* (n 2); J Watson, 'Jeopardy, and Me, the Obsolete Know-It-All' (2016) TEDxSeattleU <https://www.ted.com/talks/ken_jennings_watson_jeopardy_and_me_the_obsolete_know_it_all?language=en>.

[6]*IBM* (n 2).

[7]C Johnson, 'Artificial Intelligence Beats Big Law Partner in Legal Matchup' *The American Lawyer* (32 October 2017) <https://www.law.com/americanlawyer/sites/americanlawyer/2017/10/31/artificial-intelligence-beats-big-law-partners-in-legal-matchup/?slreturn=20201105095653> accessed 5 December 2020.

[8]ibid.

[9]C De Jesus, 'Artificially Intelligent Lawyer 'Ross' Has Been Hired By Its First Official Law Firm' (Futurism, 11 May 2016) <http://futurism.com/artificially-intelligent-lawyer-ross-hired-first-official-law-firm/> accessed 5 December 2020.

[10]ibid.

[11]ibid.

[12]ibid.

[13]A Shademan and others, 'Supervised Autonomous Robotic Soft Tissue Surgery' (2016) 8 STM 337; M Senthilingam 'Would You Let a Robot Perform Surgery by Itself?' *CNN* (12 May 2016) <http://edition.cnn.com/2016/05/12/health/robot-surgeon-bowel-operation/index.html> accessed 5 December 2020.

[14]An example is the da Vinci Surgical System.

[15]*Shademan* (n 13).

[16]With such fast development, the field of AI has already driven some to ponder the gravity of what it means to achieve strong AI, or AI that goes beyond human intelligence. Tempting as it may be, this author will avoid such discussions.

The issue of whether an AI, or an autonomous system for that matter, will be held legally accountable ought to begin with the question on who owes a legal duty for the negligent or criminal acts of an AI: the AI, the algorithm programmer, or its inventor/owner. Can the AI be sued? The inverse to this question is whether the AI has the right to sue.[17] In the U.S., the issue of right to sue may also raise the related constitutional issue of standing.

The first question deals with the imposition of a legal duty on AI, while the second question deals with the granting of legal rights on AI. As discussed further below, imposing a legal duty only on the owner of the AI causes obstacles to legal accountability in instances where the owner has limited knowledge and control over the AI's conduct, a predicament that can also raise obstacles in establishing causation. A proposed solution is to grant legal person status to AI and similar computer systems.

This paper aims to add to the discussion on the proposed legal personhood of AI by focusing on one area that previous works on the subject have avoided – the relationship between legal personhood and ownership of property.[18] Solum and other scholars that followed,[19] for example, opted for a discussion on the legal personhood of AI that relies on insurance as the source for the collectability of a legally recognised AI entity.[20]

Upon closer examination of the concept of legal personhood, however, it becomes apparent that the essence of legal personhood rests on the right to own property. This paper will discuss how the right to own property leads to the argument in favour of legal personhood for weak AI, but not for strong AI. The right to own property is a pre-requisite for legal personhood for one very practical reason: patrimony or collectability.[21] Yet, while scholars like Rothenberg and Denicola have begun to write about the concept of AI owning real property[22] and copyright,[23] respectively, there has been an absence of scholarship on the nexus of AI property ownership and AI legal personhood.[24]

Part II begins by defining AI, and the need for AI legal personhood. Part III discusses the literature on legal personhood, and argues that AI can theoretically attain legal personhood even without a will. Part III compares the *persona ficta* and juristic person approaches to legal personhood, and discusses the concept of will in rights or duties. Part III then applies the requirement of rights or duties to AI.

Part IV discusses the nexus between property ownership and AI legal personhood. The section first discusses the interconnected concepts of property ownership and legal personality before discussing the right to own property and the obligations of property ownership in nonhumans. The section then applies the rights and duties of property ownership to AI, and argues that the right to own property could be conferred to weak AI, but not to strong AI, because of the necessity of establishing a will, which needs to be attributed from a human agent. The section also discusses the imposition on nonhumans and

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[17]In the U.S., the issue of right to sue may also raise the related constitutional issue of standing.
[18]S Chopra and L White, 'Artificial Agents – Personhood in Law and Philosophy' (ECAI, 2004) <http://www.sci.brooklyn.cuny.edu/~schopra/agentlawsub.pdf> accessed 5 December 2020.
[19]L Solum, 'Legal Personhood for Artificial Intelligence' [1992] 70(4) North Carolina L Rev 1231, 1245.
[20]*Chopra* (n 18).
[21]ibid.
[22]D Rothenberg, 'Can Siri 100 Buy Your Home? The Legal and Policy Based Implications of Artificial Intelligent Robots Owning Real Property' [2016] 11(5) Washington Journal of Law, Technology & Arts 439.
[23]R Denicola, 'Ex Machina: Copyright Protection for Computer-Generated Works' [2016] 69 Rutgers L Rev 251.
[24]Rothenberg (n 22) 439; Denicola (n 23) 251.

AI in particular of the obligations of property ownership, and argues that the law could impose and enforce the obligations on weak AI, but not on strong AI. Finally, part IV discusses whether AI should own property, taking into account the moral theory of property, and how AI can own property. The paper concludes that legal personhood is the best approach for AI to own personal property.

2. Defining AI and the need for legal personhood

John McCarthy first coined the term 'artificial intelligence' in a proposal for a Dartmouth summer conference in 1956.[25] Whether strong AI is possible remains an ongoing debate. Yet, news of an advanced machine-learning computer defeating humans in various fields including law, continue to push the discussion closer to the possibility of a strong AI. To be clear, what most refer to as AI today is not AI as defined under the most widely recognised test for AI – the Turing test. Alan Turing, the same man who helped win the Second World War, is most known today for a test he devised for determining whether a machine can think. The Turing test has since remained at the centre of the debate regarding AI. According to the Turing test, a machine achieves artificial intelligence if it can convince a questioner that the machine is human, half as often as a human can.

There has yet been no proven claim of a machine or software that has met the Turing test.[26] The type of AI that would likely meet the Turing test is that with an intellectual capability that is equal to a human, called 'strong AI', which has intentionality and consciousness.[27] In law, this is the equivalent of having a will. Computer scientists, however, claim that we are closer than ever at achieving strong AI. Despite the astonishing feats of AI in defeating humans at advanced strategy games, conducting medical surgery, flying a fighter jet simulation, and conducting legal research and analysis; what some mistakenly call AI today is actually machine learning, or 'weak AI'. Weak AI is not equal to human intelligence but relies on humans to engage tasks while enhancing performance time and accuracy.[28] Machine learning is only but one of a number of fields under AI.[29]

Despite the popularity of the Turing test, there remains no widely agreed upon definition of AI.[30] It is widely recognised that AI is difficult to define.[31] According to Scherer, the difficulty in defining AI stems not in defining what is 'artificial', but rather in defining the term 'intelligence'.[32] Existing definitions of intelligence are tied to human intelligence. As stated by John McCarthy, there is no 'solid definition of

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[25]G Press, 'Artificial Intelligence (AI) Defined' *Forbes* (2017) <https://www.forbes.com/sites/gilpress/2017/08/27/artificial-intelligence-ai-defined/?sh=56189acf7661> accessed 5 December 2020; J Truby, R Brown, and A Dahdal, 'Banking on AI: Mandating a Proactive Approach to AI Regulation in the Financial Sector' [2020] 14(2) Law and Financial Markets Review 110–20.

[26]On the same token, there has been no serious attempts to try to prove the Turing test.

[27]J Searle, 'Minds, Brains, and Programs' [1980] 3(3) Behavioral and Brain Sciences 417–57.

[28]ibid.

[29]*Truby* (n 25); J Newman, 'Toward AI Security: Global Aspirations for a More Resilient Future' (CLTC White Paper Series, 2019) <https://cltc.berkeley.edu/wp-content/uploads/2019/02/CLTC_Cussins_Toward_AI_Security.pdf> accessed 16 May 2020.

[30]M Scherer, 'Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies' [2015] 29(353) Harvard Journal of Law and Technology 3–4.

[31]*Truby* (n 25).

[32]*Scherer* (n 30).

intelligence that doesn't depend on relating it to human intelligence'.[33] Another definition of AI is 'a suite of autonomous self-learning and adaptively predictive technologies that enhances the ability to perform tasks'.[34]

AI may also be categorised into four types: (1) systems that think like humans, (2) systems that act like humans, (3) systems that think rationally, and (4) systems that act rationally.[35] The Turing test falls under the systems that think like humans category. Instead of the Turing test, a simple way of conceptualising AI is to think of it simply as software or programmed code.[36]

This paper does not aim to offer a novel scientific definition of AI. Rather, this paper focuses on a working definition of AI for purposes of legal application. In this way, lawyers ought to consider proposing a legal (rather than a scientific or philosophical) definition for AI. Such a legal definition ought to be tied to AI's status and functions in legal relations and transactions, whether as an artificial agent or as a technological tool for efficient contract formation, as in smart contracts. For purposes of this paper, the author proposes that a legal definition for AI should include the concept of rights and duties that are necessary for legal personality. In law, the essence of asserting a set of rights, or duties, is tied to the ownership of property, as discussed further below. A legal definition of AI, for example, could be an autonomous self-learning and adaptively predictive technology consisting of codes that can think or act in order to exercise legal rights or perform duties that are incident to property ownership.

2.1. The need for the legal personhood of AI

That the law does not grant legal personhood to AI creates legal obstacles that lead to uncertainties.[37] This is especially so as AI becomes more autonomous, making the application of legal rules involving AI more challenging.[38] For example, concerns have been

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[33] J McCarthy, 'What is Artificial Intelligence?' (Computer Science Dept, Stanford 2017) <http://jmc.stanford.edu/articles/whatisai/whatisai.pdf> accessed 5 December 2020.

[34] *Truby* (n 25). See also European Parliament (EP), 'Recommendations to the Commission on a Civil liability regime for artificial intelligence' (Draft Report) CLA 2020/2014(INL), 27 April 2020 <https://www.europarl.europa.eu/doceo/document/JURI-PR-650556_EN.pdf> accessed 27 November 2020 [EP 2020] (defining 'AI system' as 'a system that displays intelligent behaviour by analysing certain input and taking action, with some degree of autonomy, to achieve specific goals. AI systems can be purely software-based, acting in the virtual world, or can be embedded in hardware devices').

[35] S Russel and P Norvig, *Artificial Intelligence: A Modern Approach* (3rd edn, Pearson 2010) 5.

[36] *Truby* (n 25).

[37] *EP 2020* (n 34). The Committee on Legal Affairs in its Draft Report to the Commission on a Civil liability regime for artificial intelligence, clarifies that 'AI-systems have neither legal personality nor human conscience, and that their sole task is to serve humanity'.

[38] The Committee on Legal affairs of the European Parliament also points to autonomy as potentially triggering the need for AI legal personhood when it put forward the following language in its Motion for a European Parliament Resolution in respect of robotics and artificial intelligence, which was later adopted as the Civil Law Rules on Robotics: '[T]he more autonomous robots are, the less they can be considered simple tools in the hands of other actors (such as the manufacturer, the owner, the user, etc.); … this, in turn, makes the ordinary rules on liability insufficient and calls for new rules which focus on how a machine can be held—partly or entirely—responsible for its acts or omissions; … as a consequence, it becomes more and more urgent to address the fundamental question of whether robots should possess a legal status'. European Parliament (EP) 'Motion for a European Parliament Resolution' CLA 2015/2103(INL), 27 January 2017 <https://www.europarl.europa.eu/doceo/document/A-8-2017-0005_EN.html> accessed 30 November 2020. The Committee also called on the Commission for Civil Law Rules and Robotics to conduct 'an impact assessment of its future legislative instrument, to explore, analyse and consider the implications of all possible legal solutions' in 'creating a specific legal status for robots in the long run, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons responsible for making good any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently'. ibid.

raised concerning the allocation of liability,[39] copyright ownership in works independently created by AI,[40] digital clones,[41] and contracting with artificial agents,[42] among others. Because a discussion of all the various legal uncertainties created by AI without having legal personhood is beyond the scope of this paper, it will only focus on the more prevalent issue of contracting involving AI.

Uncertainties created with contracts involving AI have raised the issue of the need to grant legal personhood to AI.[43] Bidding sites like eBay, for example, allow a user to rely on 'shopbots' or 'pricebots' to automatically bid on items sold on the website.[44] Legal doctrinal challenges to the contract arise on whether the parties were aware of the terms and whether the artificial agent has the intent to enter into the contract.[45] Nuanced difficulties from the same legal obstacle to contracting could later arise with AI agents that have increased autonomy and could speak, write, or even act like a human.

Critics of granting legal personhood argue that alternative legal doctrines to contract formation would be sufficient. Such alternatives include treating AI as mere tools, treating AI as an artificial agent governed by agency law, and using insurance to cover potential AI liability. Currently, with less advanced artificial agents, the obstacle to electronic contracting was resolved by resorting to analysis that classify artificial agents as 'tools' of humans,[46] treat the contract as a unilateral offer by the artificial agent,[47] or apply the objective theory of contract law.[48] Such alternatives will reach their limit, however, as AI, including artificial agents, engage in increasingly autonomous, unforeseeable, and uncontrolled actions and decision-making.

Increased autonomy diminishes the argument that humans use the artificial agent as a mere tool, or that the artificial agents intended a unilateral contract.[49] Increased autonomy also increases the artificial agent's ability to make a variety of choices and intentions.

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[39]ibid. Even the EU's strict liability approach to AI grappled with the challenge of human programmers, controllers, deployers, or owners of AI escaping liability due to the act of an AI that is not their fault. The Committee on Legal Affairs in its Draft Report provides an exception from liability when the deployer can prove that the harm or damage was caused without his or her fault since

'(a) the AI-system was activated without his or her knowledge while all reasonable and necessary measures to avoid such activation were taken, or (b) due diligence was observed by selecting a suitable AI-system for the right task and skills, putting the AI-system duly into operation, monitoring the activities and maintaining the operational reliability by regularly installing all available updates.' *EP 2020* (n 34) art 8(2)

[40]See generally, P Devarapalli, 'Machine Learning to Machine Owning: Redefining the Copyright Ownership from the perspective of Australian, US, UK and EU Law' [2018] 40(11) European Intellectual Property Review 722–28 (concluding that almost all jurisdictions requires a 'person' or 'human' to be an author or owner of a creative work to be copyright protected, and therefore works directly created by an AI or with the assistance of an AI has no copyright protection with varying degrees of approaches among jurisdictions as to the ownership of the work).

[41]J Truby and R Brown, 'Human Digital Thought Clones: The *Holy Grail* of Artificial Intelligence for Big Data' [2020] Information and Communications Technology Law. doi:10.1080/13600834.2020.1850174 <https://www.tandfonline.com/doi/full/10.1080/13600834.2020.1850174> accessed 5 December 2020 (posing the question of 'whether digital clones can retain or attain the status of personhood in the legal or philosophical sense').

[42]*Chopra* (n 18).

[43]T Allan and R Widdison, 'Can Computers Make Contracts?' [1996] 9 Harvard Journal of Law and Technology 25–52; I Kerr, 'Ensuring the Success of Contract Formation in Agent Mediated Electronic Commerce' [2001] 1(1/2) Electronic Commerce Research 183–202.

[44]*Chopra* (n 18).

[45]ibid.

[46]*Kerr* (n 43) 183–202.

[47]I Kerr, 'Providing for Autonomous Electronic Devices in the Uniform Electronic Commerce Act 1999' (ULCC, 1999) <https://www.ulcc.ca/en/annual-meetings/359-1999-winnipeg-mb/civil-section-documents/362-providing-for-autonomous-electronic-devices-in-the-electronic-commerce-act-1999> accessed 5 December 2020.

[48]*Chopra* (n 18).

[49]ibid.

Increased autonomy, therefore, also increases the unpredictability of artificial agents, and such unpredictability would pose a challenge to both the unilateral offer and the objective theory approaches.[50]

Another potential alternative to the contracting problem is to treat AI as an agent. However, treating AI as a legal agent requires that the AI must have capacity to give legal consent, have the ability to exchange promises, and in civil law systems, be a person with sufficient mental capacity. In other words, the agency theory would in essence still require legal personhood.[51] Legal personhood, therefore, will increasingly become a necessity as artificial agents evolve into highly autonomous AI.

An alternative approach to property ownership of AI is the one proposed by Solum: the use of insurance to cover the liability of an AI deemed as a legal person. This approach, however, opens a number of legal issues related to insurance law, and raises the same issues posed by agency and contract law. It is a temporary solution. For the same reasons that corporate liability is not solved by simply insuring the corporation, AI liability will not be solved by simply insuring the AI. One reason is that AI may actually control and possess property, and owners of AI may be able to avoid liability by simply having the AI control and possess property. The insurance industry will not likely allow itself to bear the risk, where the insurance company could spend substantially for the liability of an AI. One can imagine an AI, for example, that has manipulated the digital currency market or initial coin offering (ICO), costing billions of dollars in losses. Insurance would simply not cope with the risk, and could not cover all types of AI liability. Insurance companies will likely limit coverage to risks that they foresee, bringing the inquiry back to the issue of foreseeability and the autonomy of the machine. Additionally, the insurance approach prevents the legal system from imposing punitive and restraining orders on the AI.

Another uncertainty created by the use of AI in contracting is that of contractual or judicial enforcement. Chopra and White noted that civil law countries require that assets be under the control of a legal person in order to satisfy a judgment.[52] In other words, assets that are not under the control of a legal person would not be subject to judgment and enforcement, a problem that could be exacerbated with an AI that controls and possesses property.

3. Legal personhood and AI

Any discussion on the legal personhood of AI must initially demonstrate a keen understanding of the concept of legal personhood. Failure to ground the argument within the literature and history of legal personhood leads to logical gaps that tend to leapfrog well-established legal principles in favour of heuristics.

This section, therefore, explains the concept of legal personhood, and its misapplication and misunderstanding within the AI legal personhood debate. The section clarifies that a will is only necessary for the conferral of rights, but not for the imposition of duties. The section also compares the *persona ficta* and juristic person constructs to show that the juristic person approach does not even require a will for the conferral of legal rights or the imposition of legal duties. The section then explains how Solum's misreading of Gray has clouded the concepts of rights and duties in the AI legal personhood

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[50]ibid.
[51]ibid.
[52]ibid.

debate. As a corollary, the section argues that any discussion on the legal personhood of AI must first consider the potential for the imposition of legal duties and the conferral of legal rights to an AI.

3.1. Legal personhood

The concept of legal personhood has largely been misapplied.[53] One source of the misapplication comes from a tendency to give an anthropocentric philosophical view of legal personhood that approximates the concept to humanity.[54] Dyschkant explains that 'we rely on our experiences to help us determine what counts as a person, and our experiences are with other humans. It is a system that has served us well in the past, and can continue to act as a general guide for assigning personhood. It is only when entities are not sufficiently like humans that assigning personhood becomes difficult'.[55] Such an anthropocentric approach, however, ultimately acts to obscure the germane legal issue of rights and duties. As Dyschkant suggests, it is necessary to 'divorce the idea of humanity' from the discussion on legal personhood.[56] Dyschkant argues that the misapplication of the concept of legal personhood, which has been 'almost equivocated with humanity', stems from the use of a heuristic.[57] The focus instead ought to be on the technical legal definition of a 'person', which is a 'subject of legal rights and duties'.[58]

The AI and legal personhood literature, while recognising[59] Gray's canonical definition[60] of legal personhood, has leaned towards a philosophical rather than a legal inquiry ripe with heuristics that focuses on capacity, accountability, and humanity of AI.[61] Full treatment of whether AI can be a legal person through the imposition of a duty absent a will has been lacking. There has also been insufficient analysis on the conferral of rights to AI, including the attribution of rights from a human being.

This paper takes a narrow view of legal personhood by focusing on the significance of the two pillars of legal personhood: rights and duties. A misunderstanding of these two pillars and their relationship to the requirement of a will obscures the legal personhood analysis. A better understanding of will in legal personhood is necessary to clarify the differences in the necessity of a will power among the concepts of person, *persona ficta*, and juristic person.

3.2. Persona ficta *and juristic person*

The concepts of *persona ficta* and juristic person, as distinct from a natural person,[62] trace its origins to early attempts at giving legal rights to a group of men acting in concert.[63]

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[53]A Dyschkant, 'Legal Personhood: How We Are Getting It Wrong' [2015] U Illinois L Rev 2075.
[54]ibid.
[55]ibid.
[56]ibid.
[57]ibid 2077.
[58]J Gray, *The Nature and Sources of the Law* (1902) ch. II, §63.
[59]*Solum* (n 19) 1238; B Koops, M Hilderbrandt and D Jaquet-Chifelle 'Bridging the Accountability Gap: Rights for New Entities in the Information Society?' [2010] 11 Minnesota Journal of Law, Science, and Technology 497; E Zimmerman, 'Machine Minds: Frontiers in Legal Personhood' [2015] SSRN Electronic Journal <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2563965> accessed 5 December 2020.
[60]*Gray* (n 58).
[61]For an 'extensive review of literature on the topic of rights for non-humans,' see generally, *Koops* (n 59).
[62]Men are considered natural persons in law and philosophy. G Deiser, 'The Juristic Person' [1908] 48 U Pennsylvania L Rev 131, 133.
[63]*Deiser* (n 62) 131, 136.

While the concept of *persona ficta* has its roots from Roman law, ecclesiastical lawyers expanded upon it during the Middle Ages.[64] Savigny is now credited for bringing the concept into modern legal thought.[65] A *persona ficta*, under Roman law principles, could not exist unless under some 'creative act' of a legislative body – the State.[66] According to Deiser, however, the concept of a *persona ficta* during the Middle Ages was insufficient to give it the full extent of rights associated with the modern concept of legal personhood, particularly, property ownership and the recovery of property, that is, without invoking the right of an individual member.[67] It also could not receive state-granted rights, could not occupy a definite position within a community that is distinct from its separate members, and it could not sue or be sued.[68] In other words, *persona ficta* has historically required the will of the individual human member for the conferral of rights.

There were those, like George Beseler and Gierke, who later disagreed with Savigny's concept of *persona ficta*, and using *a priori* principles replaced *persona ficta* with the term juristic person.[69] Deiser argues that mere convenience rather than adequate analysis supported that change in concept.[70] The concept of juristic person relies on the premise that a legal right must attach to a subject, which could be either an individual or a group of individuals. In the juristic person construct, a group of individuals whom the law recognise as distinctly capable of holding a set of definite legal rights is no more a fiction than the legal personality of a human being.[71] Deiser explains that the term juristic person is simply the legal expression for the fact that above the individual human existence there is a generic human existence.[72] Another analogy is to think of the group as the genus and the individual as the species.[73]

In jurisdictions (i.e. the United States and England) that follow the *persona ficta* approach, therefore, the law regards a corporation as a fictitious person or entity; while in jurisdictions (i.e. Germany, Spain, France and other continental countries) that follow the juristic person approach, the law regards a corporation as a real person.[74] It is important to note that a will power is not required under the juristic person approach since it has conceptually abandoned the fictional premise under the *persona ficta* approach.[75] Under the *persona ficta* approach, a will is required to confer rights, but not to impose duties. Therefore, AI can arguably qualify (1) as a *persona ficta* with imposed duties even without a will; (2) as a *persona ficta* with recognised rights and a will, or an attributed will from a human being; or (3) as a juristic person without the need for a will.

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[64]ibid.
[65]ibid.
[66]ibid.
[67]*Deiser* (n 62).
[68]ibid.
[69]ibid.
[70]*Deiser* (n 62) 137.
[71]ibid.
[72]ibid 138.
[73]ibid.
[74]ibid 142.
[75]ibid (referring to Planck's version of the German Civil Code, which devotes an entire title to juristic persons).

3.3. Will in rights but not duties

One of the most widely cited articles on the legal personhood of AI is Lawrence Solum's *Legal Personhood for Artificial Intelligence*.[76] The article was a 'legal thought experiment' that aimed to contextualise the AI debate through a heuristic technique called Occam's razor[77] vis-à-vis asking whether an AI can act as a trustee. Solum's article provides a very brief discussion of legal personhood based on John Chipman Gray's classical work, *The Nature and Sources of the Law*.[78] Solum quotes Gray's definition of legal personhood: 'In books of the Law, as in other books, and in common speech, 'person' is often used as meaning a human being, but the technical legal meaning of a 'person' is a subject of legal rights and duties'. Solum quickly ends his discussion of legal personhood by stating, 'Gray's discussion was critical of the notion that an inanimate thing might be considered a legal person. After all, what is the point of making a thing – which can neither understand the law nor act on it – the subject of a legal duty?'

Solum, however, seemed to have missed a couple of Gray's point with regard to duty. As background, Gray began his discussion of legal personhood with two important premise. First, Gray clarified that the rights and duties components of legal personhood are not concurrent, but rather alternative requirements.[79] As Gray states, '[o]ne who has rights but no duties, or who has duties but no rights, is, I suppose, a person'.[80] Gray later gives examples of inanimate things that have granted legal personhood based on either duties or rights. First, Gray gives the example of Roman temples, church buildings, and relics as legal persons possessing rights.[81] Gray implies here that these rights based legal persons had no corresponding duty imposed on them, even though the law based these rights on the attribution of a will from a human being for purposes of enforcing the rights. Gray's division of rights and duties becomes apparent in the next section when he discusses a knife used as a weapon, a locomotive, a boat, and a gun as examples of deodands[82] given legal personhood status based solely on the imposition of a legal duty.[83] These deodands were subject to forfeiture for breach of a legal duty.[84] Gray is not alone in his view, as Salmond also states that 'a person is any being whom the law regards as capable of rights *or* duties'[85] [Emphasis added].

That both rights and duties must be established in order to confer the status of legal personhood is either a common misconception in the literature of legal personhood or an unresolved point of contention. For example, Solaiman also explains right and duties as

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[76]The article has been cited over 134 times. *Solum* (n 19) 1231.

[77]Occam's razor is a principle developed by William of Ockham, a Fransiscan friar, theologian, and philosopher in the thirteenth and fourteenth century. The principle can be postulated as follows: 'Among competing hypotheses, the one with the fewest assumptions should be selected'.

[78]*Solum* (n 19) 1238–39, citing *Gray* (n 58) §63:27.

[79]*Gray* (n 58) ch II, §64:27; §106:45.

[80]*Gray* (n 58) ch II, §64:27. Gray gives the example of the King of England as having rights but no duties, and a slave as having duties but no rights: both of which are persons.

[81]*Gray* (n 58) ch. II, §106:45.

[82]A deodand is a chattel (whether an animal or inanimate thing) that causes the death of a human being and is thereafter subject to forfeiture. The term originates from the Latin, *deo dandum*, or 'to be given to God'. A Pervukhin, 'Deodands: A Study in the Creation of Common Law Rules' [2005] 47(3) The American Journal of Law and History 237.

[83]*Gray* (n 58) ch II, §107:45–46.

[84]*Gray* (n 58) ch II §107:46.

[85]J Salmond, *Jurisprudence* (Stevens and Haynes, London 1916).

concurrent requirements, reading Salmond as requiring a person to be capable of interests in rights 'and correspondingly, also be capable of duties … '[86]

Second, Gray states that while a will is required to have rights, a will is not required to have duties.[87] According to Gray, 'for the existence of a legal duty, the person bound need not have a will; but in order that a legal right be exercised, a will is necessary'.[88] Yet, even in the absence of a will for the conferral of rights, the law may attribute a will, according to Smith.[89] In short, one can be deemed a legal person upon the state's imposition of a set of legal duties, even absent a will.[90]

Solum's reading of Gray as 'critical of the notion that an inanimate thing might be considered a legal person' seems misplaced. Gray was not generally critical of the idea that the law may consider an inanimate thing as a legal person. Instead, Gray begins his discussion of inanimate things by admitting that '[i]nanimate things may conceivably be legal persons'.[91] Gray supports his conclusion by applying the two pillars of the definition of legal personhood: rights and duties. Gray was generally descriptive rather than prescriptive in his discussion of inanimate things. With rights, Gray clarifies that the will of a human being must be attributed to the inanimate thing. With duties, Gray was consistent with his initial definition that a will is not required. Gray was indeed critical of how legal personhood arising from duties has been applied to inanimate things by associating the inanimate thing with a will or intelligence of its own. In this part of Gray's discussion, Gray's tone and language was critical of the application of will and intelligence to an inanimate thing such as a ship or deodand. Gray's criticism, of course, stems from the obvious premise that he had previously stated, that a will is not necessary for a person to have duties. In other words, Gray was critical of how legal personhood had been applied but he accepts the notion that inanimate things can be legal persons.

Solum has inadvertently changed Gray's meaning by implying that Gray did not agree that inanimate things could conceivably be considered a legal person. This is a clever choice for Solum as it allows him to proceed with his heuristics. If Solum had recognised that an inanimate thing could be a legal person based on a duty imposed upon it, then the legal discussion turns to how the law could impose such a duty on AI without the need for a discussion of whether AI has a will. Some scholars citing Solum have assumed that a will is necessary to grant legal personhood to AI because the assumption, in reliance on Solum's reading of Gray, is that a will is required both to impose duties *and* confer rights on inanimate things, an assumption that leads to philosophical rather than legal discussions about whether AI has a will.

By requiring a will to recognise legal personhood, only a strong AI with a proven will would qualify, and weak AI would not even be considered for legal personhood status. This paper disagrees with this premise, and instead examines the potential for legal personhood for ether weak or strong AI. As Bryson aptly puts it, 'While we should want our

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[86]S Solaiman, 'Legal Personality of Robots, Corporations, Idols and Chimpanzees: A Quest for Legitimacy' [2016] 25 Artificial Intelligence L 245–51, citing *Salmond* (n 85).

[87]*Gray* (n 58) ch II, §64:27.

[88]*Gray* (n 58) ch II, §65:27.

[89]B Smith, 'Legal Personality' [1928] 37(3) Yale LJ 283–84 (stating that 'Where there is no will in fact the law attributes one. So long as it has unlimited power of attribution, neither theory need hinder the sovereign in bestowing legal personality upon whomever or whatever it will'.)

[90]See also, *Solaiman* (n 86) 233–35, citing *Gray* (n 58) (free will is not necessary for a person bound by a legal duty).

[91]*Gray* (n 58) ch II, §106:45.

legal system to bear the metaphysical and ethical concepts in mind, at different times legal systems have conferred legal personhood on much less … '[92] It is important to emphasise that legal personhood status had been recognised in the past based, alternatively, on the conferral of rights or the imposition of duties. It is only in recent times that scholars like Solum and Solaiman, and courts for that matter,[93] have interpreted the requirements of both rights and duties as concurrent.

In short, a will is not required to impose a duty for purposes of legal personhood. While a will is required to confer rights, a human being may attribute its will power to inanimate things for purposes of legal personhood.[94] Finally, a will is not required for the conferral of rights under the juristic person construct.

3.4. Rights and duties of AI for purposes of legal personhood

Applying the alternative legal personhood pillars of rights *or* duties to AI ought not to require a preliminary analysis of whether AI has a will, as Solum and others do. The analysis of whether AI has a will is only necessary in the conferral of rights under the *persona ficta* construct. Assuming, *arguendo*, that a will is necessary to confer rights, the law could theoretically attribute the will of its human creator to the AI, as similarly conferred to temples, churches, and relics.[95] This paper discusses this question in more detail below. Further, that a will is necessary to grant rights to AI is only a requirement in jurisdictions that follow the concept of *persona ficta*. In those jurisdictions that follow the juristic person approach, a will is not a prerequisite.[96]

Additionally, an analysis of any rights and duties of AI should not be based on anthropocentric and philosophical concepts like autonomy and self-determination. As noted by the *Stanley* court, courts have never made autonomy and self-determination a prerequisite for the conferral of rights for purposes of legal personhood.[97]

Rather, whether the law can grant legal personhood status to AI should be a legal question of (1) whether the law ought to confer rights upon AI through attribution from its owner or programmer; or (2) whether the law ought to impose legal duties upon AI even absent a will. Notably, the legislature or the courts will likely decide the answers to both of these questions as a matter of policy within a given legal system,[98] as

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[92]J Bryson, M Diamantis, and T Grant, 'Of, For, and by the People: The Legal Lacuna of Synthetic Persons' [2017] 25 Artificial Intelligence L 273–91.
[93]*Matter of Nonhuman Rights Project, Inc v Stanley* (2015) NY Slip Op 31419, citing *People ex rel Nonhuman Rights Project, Inc v Lavery* 124 AD3d 148, 150–52 (3d Dept 2014). In *Stanley*, the court denied a challenge to a lower court's refusal to grant legal personhood to a chimpanzee because *stare decisis* required it to follow precedent (*Lavery*) that 'legal personhood has consistently been defined in terms of both rights *and* duties'. The *Lavery* court also refused to accord chimpanzees the status of legal personhood because 'they are incapable of bearing any legal responsibilities and societal duties'. By refusing to grant rights absent the capacity to bear a legal duty, the *Stanley* court essentially made rights and duties concurrent requirements.
[94]*Smith* (n 89) 288 (recognising that the law can readily bestow rights to for purposes of legal personhood through attribution).
[95]*Gray* (n 58) ch II, §106:45; *Smith* (n 89) 288.
[96]*Deiser* (n 62) 138.
[97]*Matter of Nonhuman Rights Project, Inc v Stanley*, (2015) NY Slip Op 314, *11, 49 Misc 3d 763 (2015).
[98]A Hutchison, 'The Whanganui River as a Legal Person' [2014] 39 Alternative LJ 179, 180 (stating that 'Who and what is granted legal personhood is determined by lawmakers and the influential who, in theory, can grant legal personhood to any entity they wish'.); *Bryson* (n 92) (stating that 'Legal personality results from a legal system's decision to recognize that a particular entity has it').

recognised by the courts in *Stanley*[99] and *Byrn*.[100] That a legal system would choose to grant legal personhood may be a matter of necessity, convenience,[101] social value,[102] or a legal objective.[103]

3.4.1. Conferral of rights on AI

Returning to the question of whether to confer rights or impose duties on AI, we should first examine whether to confer rights to AI. Solaiman, though not specifically addressing AI but industrial robots (presumably with an AI system), relied on the reasoning in the *Lavery* case and argues that a right cannot be conferred because 'a right is attached to moral agency and the ability to shoulder social responsibility in exchange for the entitlement'.[104] Solaiman seems to view rights and duties as concurrent and reciprocal prerequisites to legal personhood. However, as established by Gray, the law can confer rights even absent a duty. The conferment of rights to temples, churches, and relic, for example, did not impose a reciprocal set of legal duties.

Solaiman did distinguish the recognition of legal personhood for corporations and idols from robots, arguing that corporation and idols are juristic persons requiring the attribution or intervention of human agents. Solaiman would likely say the same about temples, churches, and relics, needing human agency to enforce legally recognised rights. Solaiman argues that what makes robots and chimpanzees different from corporations and idols is the reliance on a human agent, or the lack thereof for robots that have the ability to make autonomous decisions. According to Solaiman, since robots do not rely on humans to act and make decisions, they are not entitled to legal personhood. Solaiman takes an anthropocentric view of legal personhood, and adds a human agency element to legal personhood.[105]

Strong AI would not meet Solaiman's human reliance requirement, but one could argue that the types of weak AI present today does require human reliance and agency. While there are black-box AI that use neural networks, even those types of AI require human input data. Most AI (and even robots) today would not function without the programmed code and data, created and input by humans, respectively. The conferment of rights to an AI may, therefore, be accomplished through attribution from a human counterpart, whether from an owner, programmer, or otherwise.

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[99]*Matter of Nonhuman Rights Project, Inc v Stanley* (2015) NY Slip Op 314, *15; 49 Misc 3d 772 (2015). The *Stanley* court stated that the legal personhood of chimpanzees 'is best decided, if not by the legislature, then by the Court of Appeals, given its role in setting state policy'. The court aptly noted, though, that courts are slow to embrace change. Indeed, even the grant of legal personhood to corporations, now a widely accepted legal construct, was not an easy task and took time. Solaiman noted that despite the 'significance of corporations for human societies, obtaining the recognition of corporations as a separate legal person was a difficult task'. *Solaiman* (n 86) 294, 296.

[100]*Byrn v New York City Health & Hosps Corp* 31 NY2d 194, 201 (1972) (stating that '[w]hether the law should accord legal personality … in most instances devolves on the Legislature'), cited in *Stanley* (2015) NY Slip Op 314, *15.

[101]*Smith* (n 89) 292.

[102]*Hutchison* (n 98) 180 (stating that social values and the influential and powerful determine who is a legal person).

[103]*Bryson* (n 92) (stating that '[t]he most basic question for a legal system with respect to legal personhood is whether conferring legal personhood on a given entity advances or hinders those objectives').

[104]*Solaiman* (n 86) 871–73, citing *People ex rel Nonhuman Rights Project, Inc v Lavery* 124 AD3d 148 (2014).

[105]Solaiman does recognise that 'legal personhood is not necessarily synonymous with or confined to human beings'. *Solaiman* (n 86) 93–94, citing *Byrn v New York City Health & Hosp Corp* 286 N E 2d 887 (1972).

3.4.2. Imposition of duties on AI

The next question is whether to impose legal duties on AI. Solaiman, albeit discussing industrial robots, raised two arguments against the imposition of legal duties on AI: (1) the lack of intentionality, desires, and interests;[106] and (2) the enforcement of punishment or liability.[107]

The first argument sounds very much like a substitute for the requirement of a will to impose a duty. In the same vein, Solum also conflated the requirement of a will to duty, and substituted intentionality and consciousness for that of will.[108] Yet, as discussed earlier, a will is not a requirement for the imposition of a duty. Likewise, intent, desires, and interests should not be the basis for determining the imposition of a legal duty. There are, for example, strict liability and *per se* obligations that do not require intent.

Even the ability to understand and act upon the duty is not a requirement to the imposition of a duty. According to Gray, a person is bound to legal duty even if he cannot possibly do it and even if the person does not know of the legal duty.[109] Solum's position that the law should not impose a duty on one, who cannot understand or act upon it, is inconsistent with Gray's analysis of duty.[110] Likewise, Solaiman also requires a legal person be able 'to properly understand and follow the commands of law' to impose a duty and a right.[111] Solaiman relies on the *Lavery* and *Stanley* courts' holding that a legal person must be able to bear legal responsibility and social duties. But as recognised by the concurring opinion in *Lavery*, the ability to bear duties is likewise not present in infants, comatose adults, and a person with dementia.[112]

Regardless, while AI has not been shown to have desires, one could argue that intention and interest could be programmed into the AI depending on its intended purpose. AI, for example, could intentionally gather data with the interest of learning from those data, if self-learning is the programmed purpose. The AI could even act upon multiple programmed intentions and interests. Robots can even be programmed with deep learning AI to predict pre-conduct human intention.[113] One could argue that an AI with intentionality is a strong AI, as explained by Searle, and not a weak AI.[114] Even if weak AI is not found to have the human equivalent of intent and interest, one could argue that the intent, desire, and interest of the programmer led to the AI's conduct. Such intent and interest could be attributed to the human programmer, much like a corporation's intent and interest is attributed from its shareholders and officers.

The enforcement of criminal punishment and civil liability is perhaps one of the most compelling arguments against the imposition of a duty to an AI. As Bryson stated, 'legal

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[106]Solaiman refers to Solum who stated that robots lack intentionality, desires and interests, which are necessary to attribute criminal liability. *Solaiman* (n 86) 750–53, citing *Solum* (n 19).

[107]*Solaiman* (n 86) 750–53.

[108]*Solum* (n 19) 1240.

[109]*Gray* (n 58) ch II, §60–61:25–26.

[110]Compare *Solum* (n 19) 1239 with *Gray* (n 58) ch II, §60–61:25–26.

[111]*Solaiman* (n 86) 664–70.

[112]*People ex rel Nonhuman Rights Project, Inc v Lavery* 124 AD3d 148 (2014) (Fahey J, concurring), citing *People ex rel Wehle v Weissenbach* 60 NY 385 (1875) (grant of habeas corpus to an infant), and *Matter of Brevorka ex rel Wittle v Schuse* 227 AD2d 969 (4th Dept 1996) (grant of habeas corpus to a person with dementia).

[113]L Zhang and others, 'An Application of Convolutional Neural Networks on Human Intention Prediction' [2019] 10(5) Intl J of Artificial Intelligence Application l 1–11 (Unlike previous studies that recognised human intentions from a given set of distinct actions, the convolutional neural network method predicts human intentions before a single action is completed based on deep learning.).

[114]*Searle* (n 27) (discussing intentionality in strong AI).

obligations are meaningless if there is no way to hold robots accountable for them'.[115] To be clear, the enforcement of a legal duty, just as the general requirement of duty, is not a question of the existence of a will power, as consistent with Gray's conclusion that the law can impose a duty to a person who is not aware of the duty, or who is not able to act upon it. It is rather a question of effective enforcement, of accountability, in case of a breach.

So, the effectiveness and purpose of the punishment remains an issue. A point of comparison is that of the duty imposed on deodands. Like deodands, the forfeiture of the AI could be the sole punishment. But forfeiture may not serve the deterrent or even rehabilitative purpose of punishment. Though, it could arguably serve the retribution aspect of punishment.

In civil liability, Solaiman questions its effectiveness against robots since the human owners would eventually bear the liability. In this regard, the imposition of a liability on the robot would only make sense if it earned income or revenue. The analysis could be extended to AI, and especially various ways that AI may earn revenue or even own property that can be targeted for civil liability enforcement.[116] In other words, if AI can own property, then the imposition of duties could certainly be appropriate.

Whether AI could be granted rights and duties should be examined more closely by considering whether AI can be granted right and duties stemming from property ownership. This is a necessary inquiry since property ownership has always played a key role in determining legal personhood.

4. The nexus between property ownership and AI legal personhood

This section explores the connections and similarities between legal personhood and property ownership. The question of whether the law ought to grant legal personhood to AI may rest on whether it can own property with the accompanying rights and obligations of property ownership. The section analyses property ownership in prior successful claims of legal personhood status by nonhumans. The property ownership arrangement, however, relies on a human agent to act on behalf of the legal person to exercise and protect property rights and interests.

4.1. The interconnected concepts of property ownership and personality

The concepts of property ownership and personality are interconnected. Both concepts require the conferral of rights or the imposition of duties. Further, as Smith noted, both property ownership and personality creates a legal relation,[117] which then requires the exercise of rights or imposition of duties, often concurrently.

According to Deiser, 'the secret of personality … is contained in the possession or absence of property'.[118] As Deiser explains, in France, the law regards the state,

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[115]*Bryson* (n 92). This is perhaps Solum's main point when he asked, 'what is the point of making a thing – which can neither understand the law nor act on it – the subject of a legal duty?' *Solum* (n 19) 1239.

[116]The concern that the human programmer or owner of AI would be able to escape liability would only arise in case there is a limited liability, as in the case of a corporation. Limited liability, however, is not a prerequisite for legal personhood. For example, a natural person does not have individual limited liability. Further, the laws of vicarious liability would still apply to human agents of AI that act beyond the scope of authority. Even if there was a limited liability akin to a corporation, the veil piercing doctrine would also for holding human actors liable. See also, *Bryson* (n 92).

[117]*Smith* (n 89) 293–94.

[118]*Deiser* (n 62) 140.

government departments, and communes as juristic persons because they each hold property.[119] On the other hand, the law does not regard as persons the *canton* or the *arrondissiment* because it does not hold property, funds, or resources.[120] Deiser aptly puts it when he states, 'Where there is property, there is personality. Where there is no property, there is no personality'.[121]

Like legal personhood, the concept of property is a human invention, driven by various human motives that range from necessity, economics, convenience, reinforcement of male power structures, and even ethnocentrism.[122] One need not dig deep into human history to find a time when the law classified humans into categories of property.[123] The legal status of married women as property of her husband,[124] and those of slaves as chattel[125] was perhaps the biggest barrier for the recognition and exercise of their respective legal rights.[126]

Concepts of property and property ownership, like legal personhood, is not uniform among cultures. Anthropologists, however, have long established that property ownership is a universal phenomenon across societies.[127] While U.S. legal concepts of property, for example, embrace the principles of acquisition of property with rights of title through first in time discovery and capture of wild animals, indigenous possession of lands prior to the arrival of European explorers did not regard lands and animals as subject to full and exclusive ownership and title. This is not to say that indigenous tribes did not have a system of property ownership, or that they only owned land in common.[128] Instead, indigenous tribes like the Iroquois understood property ownership differently, as based on continued use with no right to sell and no transferrable title.[129] Legal personhood, likewise, is a divisible concept, and is not uniform or unified among legal systems.[130]

Further, both legal personhood and property ownership are evolving concepts that are based on changing social values. Both have at times evolved hand in hand. The transition of slaves and women from property to that of legal persons is an example of changing

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[119]ibid. Either by common consent or by virtue of legislation.
[120]*Deiser* (n 62) 140.
[121]ibid, citing Planiol, *Droit Civil*, Tome I (Quatrieme edn) 978, §3023.
[122]D St Pierre, 'The Transition From Property to People: The Road to the Recognition of Rights for Non-Human Animals' [1998] 9 Hastings Women LJ 255, 264–69 <https://repository.uchastings.edu/hwlj/vol9/iss2/5> accessed 3 December 2020.
[123]*St Pierre* (n 122) 257. The property status of women, who only became property upon marriage when a woman's legal existence was incorporated with that of her husband, differed from that of slaves who had no legal existence other than as property.
[124]*St Pierre* (n 122) 257 (stating that the subjugation of women facilitated domination and reinforcement of male power structure).
[125]After abolition, the law regarded slaves as legal persons rather than property. *Hutchison* (n 98) 180; N Naffine, *Law's Meaning of Life: Philosophy, Religion, Darwin and the Legal Person* (Hart Publishing 2009) 13.
[126]*St Pierre* (n 122) 257–58. The vestige of this era of human property still exists today in modern types of slavery, though outside the widespread sanction or acquiescence of legal systems like in previous centuries.
[127]L Becker, 'The Moral Basis of Property Rights' in J Pennock and J Chapman (ed), *Nomos XXII: Property* (University Press, New York 1980) 187–220, 198.
[128]See generally, K Bobroff, 'Retelling Allotment: Indian Property Rights and the Myth of Common Ownership' [2001] 54 Vanderbilt L Rev 1557 <https://scholarship.law.vanderbilt.edu/vlr/vol54/iss4/2> accessed 3 December 2020 (arguing that common ownership among indigenous tribes is a myth and that 'Indians had many different, functional, and evolving property systems, many of which recognised private property rights in land').
[129]*Bobroff* (n 128) 1578–79 (stating that 'Iroquois property ownership rested on use, not on transferable legal title'), citing E Tooker, 'Women in Iroquois Society' in M Foster, J Campisi, and M Mithun, *Extending the Rafters: Interdisciplinary Approaches to Iroquoian Studies* (State University of New York Press 1984) 116. In *Johnson v M'Intosh*, 21 US (8 Wheat) 543 (1832), the court held that although Indians had 'possession' of the land on which they lived, they did not have 'title' to it since such a title derived from the federal government, or from states or colonies.
[130]*Bryson* (n 92).

social values affecting a change in both legal constructs.[131] Hutchison views New Zealand's grant of legal personhood to the Whanganui River as an evolution driven by a change in social value as to what entity can have legal personality.[132] The court in *Stanley* recognised this evolving nature of legal personhood, which since the inception of the United States has undergone significant change.[133]

Ultimately, the relation between property ownership and personality can be summed up as follows: that which the law recognises as mere property will not have personality, while that which can own property must have legal personality. For this reason, nonhuman claims to legal personhood have been largely decided in this binary fashion: whether the nonhuman is deemed as mere property with no rights or duties, or as having elevated beyond that of mere property and is able to appreciate the conferral of legal rights or the imposition of legal duties.[134] Once an entity is conferred legal personality, it has undergone a transition from an objectified property to a non-property subject, a legal being vested with rights and obligations.[135]

Nonhumans like AI must likewise undergo this socially driven transition from property to personality. Yet, that transition will likely only happen if society and the law sees AI as having the ability to possess, control, and eventually own property, rather than an object that humans control and own. This is not the same as requiring AI to have a will, or any other human traits that allows it to be deemed a strong AI. Instead, the question is limited to whether AI can own property with accompanying rights and duties, keeping in mind that property and personality are human inventions that are subject to evolving cultural and social norms. Before we can answer this question, it is important to consider the role of property ownership in previous attempts to bestow personality to nonhumans.

4.2. The right to own property in nonhuman claims of legal personhood

To understand better the nexus between legal personhood and property ownership, let us explore the relation of property ownership to the grant of personality to nonhumans. Nonhumans that have been granted legal personhood status have also been conferred the right to property ownership, the exercise of which is attributed from a human agent, who protects its interests. This paper argues that human agency should be a prerequisite for the exercise of property rights for nonhumans, and especially for AI.

Corporations, rivers, and idols are examples of legal persons with a recognised right to own property. It is now a legal norm that corporations and even hybrid corporations like an LLC can own property.[136] In recent times, a few jurisdictions have conferred the right to own property to rivers, including the Whanganui River in New Zealand, and the Ganges

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[131]*St Pierre* (n 122) 268.

[132]*Hutchison* (n 98) 180.

[133]*Matter of Nonhuman Rights Project, Inc v Stanley*, (2015) NY Slip Op 314, *11; 49 Misc 3d at 764 (2015).

[134]*Stanley*, (2015) NY Slip Op 314, *13, 49 Misc 3d at 765 (2015), citing J Berg, 'Of Elephants and Embryos: A Proposed Framework for Legal Personhood' [2007] 59 Hastings LJ 369, 372, 403. In *Stanley*, the court noted this binary, all-or-nothing, approach to legal personhood.

[135]*Hutchison* (n 98) 180; E Hsiao, 'Whanganui River Agreement- Indigenous Rights and Rights of Nature' [2013] 42 Environmental Policy and L 371, 374.

[136]L May, 'Corporate Property Rights' [1986] 5 J of Business Ethics 225, 226–27.

and Yamuna Rivers in India.[137] A third example are idols in India that courts have long recognised as having the right to own property as a juristic person.[138]

The ownership of property in these three examples, however, is exercised thorough human agents. Solum stated as such concerning the corporation as legal person that relies on relations between shareholders and officers to act on its behalf.[139] Solaiman agrees with this position because a corporation is 'made up of human beings' without whom the corporation cannot engage in physical or intellectual acts.[140] The same applies with rivers. The Whanganui River Claims Settlement Act of 2017 declares the river as a legal person with 'all [attendant] rights, powers, duties, and liabilities'.[141] However, *Te Pou Tupua,* an office consisting of human agents that act on behalf of the river in the physical world, represents *Te Awa Tupua,* the name of the river's legal entity.[142] The Act vests the rights to the ownership of the waterbed in the *Te Awa Tupua*. Likewise, in the Ganges and Yamuna rivers in India, the High Court of Uttarakhand, after granting legal personhood under the juristic person construct, used the common law doctrine of *parens patriae* to require the state to act in *loco parentis* for the rivers.[143] Finally, courts in India have allowed idols to exercise property ownership rights through legally recognised managers who are in possession of the idol.[144]

Notably, the fiction of allowing a human being to exercise the right of property ownership on behalf of the nonhuman entity allows for the conferral of a property right and legal personhood. As stated earlier, Solaiman and Bertolini differentiates robots and animals from corporations exactly because corporations are made up of and rely on human beings, while robots and animals, according to them, do not rely on human agency.[145] When applied to property ownership, a corporation, river, or idol could not otherwise exercise its property rights without a human agent.

Exercising property rights, at minimum, has to mean the ability to take actual possession in the physical sense, or constructive possession through use, control or dominion over the property.[146] In this way, we can extend Solaiman's view that robots and animals could independently exercise physical possession of property in ways that a

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[137]E O'Donnell and J Talbot-Jones, 'Creating Legal Rights for Rivers: Lessons from Australia, New Zealand, and India' [2018] 23(1) Ecology and Society 7.

[138]Venkatasubramanian, 'Can a Deity Own land?' *India Legal* (2015) <https://www.indialegallive.com/commercial-news/states-news/can-a-deity-own-land/> accessed 3 December 2020.

[139]*Solum* (n 19) 1239; *May* (n 136) 227 (stating that the corporation itself does not act, but only in a vicarious way, through the acts of individual persons who are members or officers).

[140]*Solaiman* (n 86) 783–85.

[141]Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, s 12 (N.Z.).

[142]C Clark and others, 'Can You Hear the Rivers Sing? Legal Personhood, Ontology, and the Nitty-Gritty of Governance' [2018] 45 Ecology LQ 787, 803.

[143]*Mohd Salim v State of Uttarakhand & others*, WPPIL 126/2014, Uttarakhand High Court at Nainital (2017) (Ganges and Yamuna Case) <https://www.casemine.com/judgement/in/5b1a21874a932631a5a08d3f> accessed 29 November 2020); *O'Donnell* (n 137) 7.

[144]*Venkatasubramanian* (n 138). See however, *Mahant Damodar Dass and Ors v State of Rajasthan*, where the High Court of Rajasthan, in a question of whether the idol was capable of cultivating the land, held that the idol had to directly supervise, control, or manage the hired labor or workers engaging in agricultural cultivation, and without personal supervision the land vested in the State and not the idol. *Mahant Damodar Dass and Ors v State of Rajasthan,* Rajasthan – Jodhpur High Court (2015) <https://www.legalcrystal.com/case/60666/mahant-damodar-dass-vs-state-rajasthan> accessed 29 November 2020.

[145]*Solaiman* (n 86) 782–86.

[146]C Rose, 'Possession as the Origin of Property' [1985] 52 U Chicago L Rev 73; R Nimmer, 'Revised Article 9 and Intellectual Property Asset Financing' [2001] 53 Maine L Rev 287, 292–95 (describing information property according to use and control rather than physical possession).

corporation, river, or idol cannot without human assistance.[147] Robots, however, differ from AI because of the AI's lack of a physical manifestation. Essentially, robots are physical hardware while AI is the software made of code or algorithm. Unlike robots and animals, AI cannot necessarily exercise actual possession over property without the use of a hardware or the assistance of a human being. AI, however, may be able to exercise constructive possession through use, control or dominion over the property, and especially information property.[148] Still, weak AI would need human assistance to exercise constructive possession of property, requiring the application of the doctrine of *parens patriae*.

That an AI would not rely on human agency to exercise property rights is an oversimplification and ignores the different types of AI. It also assumes a strong AI that engages in independent physical and intellectual activity to exercise property rights without hardware and human assistance or intervention. First, the current state of AI has not achieved strong AI that could exercise property rights independently. Rather, what the public typically refers to as AI is actually machine learning.

Machine learning can further be categorised into supervised and unsupervised learning, the first requiring human assistance while the latter not requiring human assistance.[149] Supervised machine learning would be an ideal type of AI that could qualify for *parens patriae* arrangement for property ownership.[150] Unsupervised machine learning, on the other hand, is closer to the type of AI Solaiman and Bertolini sees as not requiring human assistance. Yet, even unsupervised AI requires limited human assistance with training and input data, code programming, and doing any other act or processes outside its programmed capacity.

In other words, weak AI, regardless of whether it is supervised or unsupervised ultimately would have to rely on some sort of intervention from its human programmer to exercise property rights. If anything, weak AI is more akin to an infant requiring guardianship, more so than a river or an idol, mainly because the weak AI functions in reliance on the human programmer's code and data. A weak AI in possession and control of property could arguably be conferred the right to own property subject to a human agent acting on its behalf as a guardian. In this way, the law could grant a weak AI legal personhood based on its exercise of property rights in the same way that the law granted legal personhood to a corporation, river, or an idol. The law would attribute the will of the human programmer to the weak AI.

The question of whether a strong AI, if it were to become a reality, should also be granted legal personhood based on its exercise of the right to own property is altogether a different inquiry. Strong AI could theoretically take actual or constructive possession of property, and therefore exercise property rights independently the way a human would, and even in more advanced ways.[151] However, a strong AI's independence and autonomy

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[147]See *Solaiman* (n 86) 782–86.
[148]See generally, *Nimmer* (n 146) 292–95.
[149]*Truby* (n 25); *Newman* (n 29).
[150]Supervised learning uses algorithms that learn from data with tagged elements, and requires human intervention to provide the input and output data.
[151]AI, for example, could move property perpetually through code so that only the AI itself had knowledge and control over it, akin to an anonymised blockchain technology. The ways that a self-coding and self-learning AI could possess or control property can only be limited by imagination. It is, unfortunately, beyond the scope of this paper. There are already self-learning and self-coding AI. See e.g. K Martineau, 'Toward Artificial Intelligence that Learns to Write Code' *MIT News* (2019) <https://news.mit.edu/2019/toward-artificial-intelligence-that-learns-to-write-code-0614> accessed 15 November 2020; J Gottschlich and others, 'The Three Pillars of Machine Programming' (Proceedings of

implies that it could have the ability to assert and exercise property rights beyond the control of laws and human beings. This would be problematic to our current notions of property ownership and social order.[152] In this way, the fear of a strong AI with unregulated possession of property is real, and bolsters the argument in favor of human-centred and explainable AI that requires human intervention.

Returning to legal personhood, since strong AI is by definition one that has a will, with intentionality, desires, and interests, there is no need to attribute the will of a human being like in a weak AI. If a court finds, for example, that a strong AI does not have a will like that of a human, the court will not likely grant legal personhood status to strong AI since it would not be able to fully exercise its property rights despite its autonomy. The law should not grant legal personhood to strong AI with a will, however, because it would not be good policy, not because it does not rely on human intervention, but because there is uncertainty as to how it would exercise its property rights against other legal persons. The grant of legal personhood to a weak AI that relies on human intervention, on the other hand, would incentivise against allowing uncontrollable strong AI to exercise property rights that society may not be able to control.

But this only begins the inquiry as to whether AI ought to be granted the right to own property. Questions that implicate accompanying obligations of property ownership and the moral aspects of property ownership beg for consideration.

4.3. The obligations of property ownership in nonhumans

Property is often described as a 'bundle of rights'.[153] However, this bundle also includes obligations.[154] It is, therefore, necessary to consider whether legal duties that is incident to property ownership can be imposed on a nonhuman like an AI. Nonhuman legal persons like a corporation, river, and idol have legal duties that are performed or discharged by human agents or guardians. Corporations, for example, must pay corporate taxes on property, are subject to fair use in copyright ownership, and must discharge its obligations as a corporate landlord in the same way as a natural person. The rivers described above also have legal obligations.[155] The *Te Awa Tupua*, for example, has general legal duties and liabilities under the Whanganui River Claims Settlement Act and could be sued.[156] Likewise, the court imposed the duty to protect, conserve and preserve

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the 2nd ACM SIGPLAN International Workshop on Machine Learning and Programming Languages, MAPL@PLDI, 2018) 69–80.

[152] Elon Musk famously gave an apocalyptic prediction about the existential risk AI poses to humans. C Clifford, 'Elon Musk: "Mark My Words — A.I. is Far More Dangerous than Nukes"' *CNBC* (13 May 2018) <https://www.cnbc.com/2018/03/13/elon-musk-at-sxsw-a-i-is-more-dangerous-than-nuclear-weapons.html> accessed 27 November 2020; C Domonoske, 'Elon Musk Warns Governors: Artificial Intelligence Poses "Existential Risk" *National Public Radio* (2017) <http://www.npr.org/2017/07/17/537686649/elon-musk-warns-governors-artificial-intelligence-poses-existential-risk> accessed 27 November 2020.

[153] J Lipton, 'Information Property: Rights and Responsibilities' [2004] 56 Florida L Rev 135, 172; J Singer, 'Property as the Law of Democracy' [2014] 63 Duke LJ 1287, 1288–90; *Rothenberg* (n 22) 445.

[154] *Lipton* (n 153) 172; *Rothenberg* (n 22) 445 (stating that a property owner 'has certain obligations that make him liable under the law'). For example, the property owner has an obligation to keep his premises in a habitable condition. *Javins v First Nat'l Realty* 428 F2d 1071, 1077 (1970).

[155] *O'Donnell* (n 137) 7.

[156] ibid. It is also subject to the rights of others as a set of obligations to allow certain 'fishing and navigation rights, the rights of State-owned enterprises, and "existing resource consents and other existing statutory authorisations"'. *Clark* (n 142) 802, citing Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, s 46(2)(d) (NZ).

on the designated persons in *loco parentis*.[157] In India, the issue of the idol's inability to discharge its duty of land cultivation through personal supervision of labourer and workers was the basis for the High Court of Rajasthan to vest ownership in the land to the state.[158]

In all three examples above, legal duties incident to property ownership are imposed on nonhuman legal persons even if human agents are required to discharge those obligations. While the inability to discharge a duty could mean the loss of property as held by the High Court of Rajasthan, the inability to discharge the duty only led to the loss of rights to ownership. It did not affect the idol's legal personhood status since it could theoretically still own other types of property and discharge its duties incident to those properties. This is additional support for the proposition that a duty can be imposed to a nonhuman legal person even without knowledge and ability to act upon the duty, and the fact that the duty is imposed supports the grant of legal personhood.

Likewise, legal duties incident to property ownership can be imposed on weak AI so long as the duty can be discharged by a human agent, or if there is a corresponding consequence in case the weak AI is unable or cannot perform the duty. Examples of the types of duties that could be imposed on the human agent could be registration of property, avoiding intellectual property infringement, and complying with data protection regulations. Even if a weak AI is unable to perform a duty, that inability should not be a basis for denying legal personhood, but merely raises the issue of enforcing punishment or liability on the weak AI or its human agent. A weak AI that can legally own property or earn income could be made subject to financial liability and legal enforcement, subject to vicarious liability rules.[159] Criminal liability, on the other hand, could be attributed to its owner or programmer on the premise that a weak AI could not intend to commit a crime without being programmed to do so by a human.

Imposing a duty incident to property ownership on a strong AI, which as stated earlier would have a will, would still allow for the performance of such a duty through a human being. It would simply fall under agency law, in as much as a human being can have an agent perform its obligations as a property owner. However, the ultimate liability for a failure to discharge the duty must rest on the principal- the strong AI. Like a weak AI, a strong AI that can legally own property or earns income could be held financially liable, and enforcement could be achieved through civil liability. Strong AI without human oversight, however, may attempt to hide its assets, and there again arises the issue of uncertainty as to how it would exercise its property rights against other legal persons. The question raises more complicated questions of whether morality and ethics can even be programmed into an AI, a technical question that is beyond the scope of this paper. Bryson, for example, is sceptical that a moral AI could ever be designed.[160]

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[157]*Clark* (n 142) 817.

[158]*Mahant Damodar Dass and Ors v State of Rajasthan*, Rajasthan – Jodhpur High Court (2015) <https://www.legalcrystal.com/case/60666/mahant-damodar-dass-vs-state-rajasthan> accessed 29 November 2020.

[159]When a corporation breaches a duty, the corporation could be held liable or its employee, if the employee acted outside the scope of authority. *May* (n 136) 228.

[160]*Bryson* (n 92). Even if an AI were to be designed with consciousness and will, it remains a theoretical and philosophical inquiry whether such an AI would have morality. Further questions arise about what AI morality may even be, and whether it remains moral if it contradicts human concepts of morality. Bryson argues that design in a strong AI is itself immoral an immoral act. ibid, citing J Bryson 'Building Persons is a Choice' [2009] 20(2) Erwägen Wissen Ethik 195–97.

Additionally, unlike a weak AI that relies primarily on its human programmer and owner, the criminal liability of a strong AI that can self-learn and self-program, among other things, should not be attributed to a human agent (unless of course he acted beyond the scope of his authority). Yet, what seems to be the most effective means of enforcing criminal punishment at present is forfeiture, and the problem of the suitability of the theories of punishment remains. For this reason, even if legal duties incident to property ownership could be imposed on strong AI, the grant of legal personhood should be withheld absent better understanding of holding strong AI accountable. Currently, existing duties incident to the ownership of information property, the type of property an AI would likely possess or control, could only be effectively enforced against human programmers, owners, and controllers of data.

4.4. Should AI own property?

Even if nonhuman legal persons have been granted the right to own property, it is imperative to consider whether AI should own property at all. The justification for weak AI owning property may be similar to the reasons corporations, river, and idols have been conferred the right to own property. The conferral of the right can be justified by convenience of being able to fund the obligations placed upon it by statutes as in the case of the rivers. It may also be justified by profit creation, economic efficiency, or even the avoidance of liability as in the case of a corporation. All of these justifications could equally apply to a weak AI, especially one that acts under the supervision and agency of its human programmer and owners.

Property rights, however, have significance to humans and human societies beyond that of rights and duties.[161] Under the common law, fundamental values attached to property rights. In other words, ownership of property has been viewed as a right reserved for humans, protected by the law as a fundamental right. For example, constitutions protect the taking of property without just compensation.[162] The fundamental nature of property rights relates to its close relationship with human rights, including the rights to bodily security and integrity.[163]

Further, ownership of property has been traditionally viewed through the lens of morality.[164] While traditionalists often associate property ownership with human acquisitiveness, greed, envy, and need for security,[165] a system of property ownership is a necessary and universal feature of human societies.[166] It has been associated with the liberty to pursue egoistic goals and acquire territory that are seen as fundamental human needs.[167] Some view property under the labour principle that labourers should have some property rights in what they produce, a concept that is universal across human societies.[168] Others view property ownership as an essential component in the reciprocal exchange of goods, whether for economic purposes or as part of social structures.[169] A

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[161]*Rothenberg* (n 22) 445.
[162]E.g. US Constitution, amend V.
[163]H Smith and T Merrill, 'The Morality of Property' [2007] 49 William & Mary L Rev 1849, 1851–53.
[164]*Becker* (n 127) 188, 212; *Rothenberg* (n 22) 445.
[165]*Becker* (n 127) 188.
[166]ibid 212.
[167]ibid 188.
[168]ibid 205.
[169]ibid 202–4.

moral theory of property, therefore, explains property as inextricably intertwined with the human condition,[170] including complex human concepts of identity and history that are tied to property, and the promotion of self-respect and autonomy for people.[171] According to Smith, property rights cannot survive without attaching it some moral significance.[172]

Because of the moral basis of property ownership, scholars have argued that nonhuman legal persons like a corporation should not own property.[173] Rothenberg suggests the possibility of corporate morality with the rise of the corporate social responsibility movement.[174] However, the issue of connecting corporate property rights to morality is far more complex and certainly far from settled.[175] May noted that corporate property rights pose an interesting challenge to the moral theory conception of property rights because it remains debatable whether corporate property ownership promotes the self-respect and autonomy of individuals.[176] May proposes that corporations, perhaps, should not be seen as owning property on its own behalf, but rather that the property rights must be reduced to individual members who then own the property collectively.[177] This approach is reminiscent of the U.S. Supreme Court's holding in in *Santa Clara County v. Southern Pacific Railroad* when it extended the Equal Protection Clause to corporations because the collective property belonged derivatively to individuals.[178] While May ultimately concludes that corporate property rights should not have moral status since reducing individual property rights is not possible with the limited liability of its members,[179] the idea of considering the morality of individual property rights as collectively creating morality in corporate property rights, is worth pursuing further.

One could argue that corporate property rights inherit, in the collective sense, the moral aspects of individual property rights since corporations are unable to own property without the egoistic, acquisitive, and other human needs of its members. Likewise, rivers and idols inherit the moral aspects of individual property rights since the legal personhood and property ownership allows the individuals to assert and fulfil human needs relating to ecology, identity, history, or religion.

When applied to weak AI, one could argue that the weak AI could inherit the moral aspects of individual property rights of the human programmers and owners. But that inheritance must be justified by a fundamental human need that the programmers and owners could only fulfil through the weak AI. Examples of these types of AIs are

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[170]ibid 188, fn 1 (stating that the moral basis of property consists of all facts about the human condition).

[171]*Rothenberg* (n 22); *May* (n 136) 225.

[172]*Smith and Merrill* (n 162) 1849.

[173]*Rothenberg* (n 22) 444.

[174]ibid 444–45.

[175]ibid 444.

[176]*May* (n 136) 225.

[177]ibid 229–30.

[178]*Santa Clara County v Southern Pacific Railroad Company* 118 US 394 (1886). In *Citizens United v Federal Election Commission* 558 US 310 (2010), the Supreme Court also extended free speech right to corporations in the context of political campaign spending.

[179]*May* (n 136) 230.

mindclones,[180] digital clones,[181] and even digital thought clones[182] that possess the personal data of the human programmers or owners. There are, of course, other examples of AIs that may merit the inheritance of its human programmer or owner's moral basis in property ownership.[183] But for purposes of illustration, digital clones raise a more direct issue related to legal personhood and property ownership. One may argue that the digital clone should not need to own the personal data of the human programmer or owner since the human programmer or owner would own and still possess the data. But let us suppose that the human programmer or owner would like the mindclone to own and possess its data after the human programmer or owner's death, in order to avoid the data from inadvertently becoming the property of another, or better yet, become public domain. The advantage of legal personhood is that the legal entity survives the human agents, and so do the legal entity's rights to property ownership. There is in this example a fundamental human need that merits the inheritance of the individual's moral basis in the property ownership: the need to protect personal data, recognised by the EU as a fundamental human right; and arguably human aspects of self-preservation, identity, and history.

With strong AI's, on the other hand, it becomes difficult to impute the moral aspect of individual property ownership since the strong AI is severed from the human needs of its agents due to its separate will. Strong AIs would only be able to claim a moral right, as the term is understood within the complex context of human experiences and societies.[184] Bryson goes further and states that there is no widespread acceptance that a strong AI ('robot') would consistently meet any universal metric for determining moral rights.[185] Without the human experience, there is no moral aspect even if one were able to code human experience into the strong AI, because the strong AI would not be living but rather replicating the human experience. As such, strong AI ownership of property without human intervention would run counter to the moral theory of property. For this reason, strong AI should not be legally allowed to own property, and even if they are, such property rights will not likely be given moral status.

The inquiry of whether AI should own property, however, does not end here. Another concern is whether AI should be allowed to own property that it cannot full understand or appreciate. In the case of corporations, rivers, and idols, these legal persons are allowed to own property despite that they cannot understand or appreciate what it is they own, the moral aspects of the property, or even the legal obligations that accompany such ownership. What is important is that the human agents from whom the moral basis of property ownership derive, understand the property the legal person owns.

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[180]A 'mindclone' is a digital copy of a person's mind. *Truby and Brown* (n 41), citing I Bakhariev 'Digital Cloning – A Sci-Fi Dream or a Legal Nightmare?' *Inside Scandinavian Business* (Malmo 20 September 2019) <https://www.insidescandinavianbusiness.com/article.php?id=472> accessed 5 December 2020.

[181]Truby and Brown defines 'digital clones' as 'the digital manipulation of images, audio, or videos' to create a likeness of a person. *Truby and Brown* (n 41).

[182]A 'digital thought clone' is a digital clone that represents each individual consumer, or a digital twin. *Truby and Brown* (n 41).

[183]AIs involved in contracting, for example, would advance the human need for reciprocal exchange of goods, and the right to contract.

[184]*Bryson* (n 92).

[185]ibid.

4.5. AI property ownership

Based on the discussions above, only weak AI should own property and be granted legal personality. But, a final inquiry is how a weak AI can even own property. Rothenberg discussed three scenarios in which AI may own property: (1) akin to an agent, (2) akin to a corporation, and (3) akin to a natural person.[186] In the first scenario, Rothenberg posits that machines and robots already act as agents, and possess and control property in that regard.[187] While most definitions of agent require that an agent be a 'person', Rothenberg suggests that such a definitional obstacle can be easily changed through legislation to include AI.[188] Rothenberg also suggests that AI could own property much like a corporation because an AI could meet all the attributes of a corporation.[189] According to Rothenberg, the following seven attributes could be met by an AI: (1) it is a legal entity separate and apart from its shareholders; (2) it has the capacity of continued existence independent of the lifetime or personnel of its shareholders; (3) it has the capacity to contract; (4) it has the capacity to own property in its own name; (5) it has the capacity to commit torts; (6) it has the capacity to commit crimes, but only such crimes where criminal intent is not a necessary element of the crime; and (7) it has the capacity to sue and be sued.[190] Rothenberg proposes an AI corporation with human oversight, or humans acting as a board of directors, meeting the requirements of corporate accountability and because corporations cannot exist without human oversight.[191] In essence, Rothenberg does seems to suggest that an AI be given legal personhood, but calls it 'artificial personhood'.[192] Finally, Rothenberg proposes that AI may own property like any natural person, although such a scenario, as Rothenberg admits, would pose a paradigm shift.[193]

Rothenberg should have considered more thoroughly that AI may own property as a legal person. Granting legal personhood to AI would be a more reasonable proposition than to make AI own property as an agent, human, or corporation. First, an AI owning property as a human would go against the moral aspect of property ownership, as Rothenberg recognises, and as discussed above. Second, an AI owning property as an agent, essentially requires granting legal personhood since the definition of an agent is that of a legal person. Third, Rothenberg's proposition of having an AI own property as a corporation is again essentially proposing that an AI be deemed a legal person, which Rothenberg calls an 'artificial person'.[194] Otherwise, if one were to form a corporation, and attempted to name it the same as an AI, it does not mean that the AI itself is the corporate entity, but that the corporate entity with the same name as the AI owns the AI code. Making an AI own property as a corporation would require asking for the AI to be considered as a legal person. When considering these three proposals, Rothenberg essentially supports the idea that an AI be granted legal personhood.

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[186]*Rothenberg* (n 22).
[187]ibid.
[188]ibid.
[189]ibid.
[190]ibid.
[191]ibid.
[192]ibid 454.
[193]*Rothenberg* (n 22).
[194]ibid 454.

Based on the analysis above, weak AI should be granted legal personhood, much like other recognised nonhuman legal persons, because weak AI can be the subject of both legal rights and duties. Weak AI can be conferred the right to own property because it can take possession or control of the property through its human programmer or owner, whose will would be attributed to the weak AI. The legal obligations that are incident to property ownership could also be imposed to a weak AI, since its human agents can perform the obligations through attribution. Strong AI, on the other hand, should not be granted legal personhood because it lacks the human agency from and to which rights and duties can be attributed, respectively. Strong AI should also not be conferred the right to own property because of the uncertainly and uncontrolled risk that a strong AI would pose to the sysem of property ownership, and because doing so runs counter to the moral aspect of property. Further, the law cannot impose and enforce legal obligations on strong AI because of the ineffctiveness of exisitng enforecement mechanisms, leaving strong AI likely unaccountable to the obligations incident to property ownership.

5. Conclusion

This article proposes an analysis of legal personhood that focuses on rights and duties. In doing so, the article looks to property ownership, which raises both requirements. Property ownership is certainly only one type of legal right, which also includes the right to sue or be sued, or legal standing, and the right to contract.[195] Property ownership, however, is a key feature of AI since it relies mainly on arguably the most valuable property today: data.

It is unlikely that governments and legislators will suddenly recognise in one event AI's ownership of property and AI's legal personhood. Rather, acceptance of AI's legal personhood, as with the acceptance of a corporate personhood will develop as a process and in stages, in parallel to the development of legal personhood. At first, AI will be deemed as a tool and not have the right to own property. This is the most common conception of AI today. Second, AI will be deemed as an agent, and upon updating existing agency law to include AI as a person for purposes of agency, then AI will also be allowed to own property as an agent in the same agency ownership arrangement that Rothenberg proposes. While AI already acts as de facto agent in many circumstances today through electronic contracts, most governments and legislators have not recognised AI as an agent. The laws of many countries like Qatar still defines an agent as a person, which upon strict interpretation would not include AI or an electronic agent. This is an existing gap in the laws that will likely create legal challenges in the near future.

However, as AI develops its ability to communicate and assert more autonomy, then AI will come to own all sorts of digital assets. At first, AI will likely possess and control property in conjunction with human action and decisions. Examples would be the use of AI in money laundering, or hiding digital assets by placing them within the control and possession of an AI. In some instances, AI will have possession and control of property unknown or unforeseen by humans.

If AI is seen as separate from data, as the software that processes and interprets data for various purposes, self-learns from the data, makes autonomous decisions, and predicts

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195 *O'Donnell* (n 137) 7; *Naffine* (n 125).

human behaviour and decisions, then there could come a time when society will view AI as separate from data. Society may come to view AI not as the object (the data) but that which manipulates, controls, and possesses data and digital property.

This relation between AI and data could lead society to view AI as having potential ownership rights over data, especially those that the AI inferred from the original set of data, or other types of data and digital properties that the AI itself could independently create. AI may then be viewed as having rights to own property that could lead to a grant of legal personhood. Alternatively, society could impose certain legal duties on AI, for example, to avoid creating code that would lead to harming a human being, or that would lead to public harm. The imposition of a duty could also lead to the grant of legal personhood.

The conferral of rights or the imposition of duties on AI for purposes of legal personhood could be attributed, in the case of a weak AI without a recognised will, or directly in the case of a strong AI with a recognised will. Weak AI, which relies on its human programmers and human data input, could enforce its rights and protect its interests through its human programmer or owner. Strong AI, therefore, must be able to exercise its rights and act independently without human intervention in order to attain legal personhood. Such a strong AI, however, if able to independently decide and act to protect its interest would likely exceed human intelligence and could theoretically exercise its will over humans and its environment in unimaginable ways that could manipulate or threaten social order. In such a scenario, it becomes imperative on humans to retain the control and ability to intervene. Legal personhood should not be recognised for strong AIs unless there is a means for human beings to impose legal obligations with effective enforcement.

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