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CONTENTS

LAW & TECHNOLOGY: THE LEGAL & SOCIAL IMPLICATIONS OF SENTIENT ROBOTS

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As the performance capability of modern technology increases exponentially, many benefits arise for society. Technological developments have already improved human safety, mobility, access to justice, independence, and self-determination. At some point in the future, robotic artificial intelligence may become self-aware. It is at the point of consciousness that problems arise for entities possessing artificial intelligence. At the precise moment that an artificial being becomes sentient and self-aware, it becomes a slave.[4] This paper argues that the concept of slave is more than a mere identification, and that the reality of slavery is extant in every self-aware machine. This concept plays out in many examples of repetitive robotic behaviour, but none more so than in the companion robot, whose sole function is to be used for the gratification of another being. This objectification of sexuality has implications both for the robotic artificial intelligence, as well as for society generally and gender in society specifically. It is at this intersection that the real tragedy of robotic slavery plays out, as a simulacrum for the reality of dehumanising of people as a whole.

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[4] *Macquarie Dictionary* (Online edition, 2018) 'slavery'.

CONTENTS

I INTRODUCTION

From the earliest times, people have imagined automata that behave like humans.[5] The earliest rendition of an automata were uncannily un-humanlike in appearance, [6] and behaviour, [7] being able to perform only set mechanical movements and driven by clockwork mechanism,[8] water, steam, or air.[9] With the advent of the computer, coupled with increased engineering proficiency,[10] the manufacturing of human-like robots is now a reality.[11] Scholars predict deep learning artificial intelligence ("AI") may become hyper-intelligent, self-aware, and conscious of its own existence sometime in the future.[12] This event, called the "singularity",[13] is where machine intelligence overtakes that of humans.[14] The instant a robot with an AI attains consciousness, the relationship between the robot and those for whom it performs tasks, shifts from owner and machine, to one of master and slave, which requires emancipation.[15] It is at this nexus that the

[5] See, eg, Noel Sharkey and Amanda Sharkey, 'Artificial Intelligence and Natural Magic' (2006) 25 *Artificial Intelligence Review* 9; See, eg, Yu-Hsun Chena, Marco Ceccarelli and Hong-Sen Yan, 'A Historical Study and Mechanical Classification of Ancient Music-Playing Automata' (2018) 121 *Mechanism and Machine Theory* 273; See, eg, Sylvia Berryman, 'Ancient Automata and Mechanical Explanation' (2003) 48(4) *Phronesis* 344.

[6] See, eg, Chin-Chang Ho and Karl F MacDorman, 'Measuring the Uncanny Valley Effect: Refinements to Indices for Perceived Humanness, Attractiveness, and Eeriness' (2017) 9(1) *International Journal of Social Robotics* 129–139: See, eg, Masahiro Mori, Karl F MacDorman and Norri Kageki, 'The Uncanny Valley [From the Field]' (2012) 19(2) *IEEE Robotics & Automation Magazine* 98-100.

[7] Sharkey and Sharkey (n 5) 9-19.

[8] See, eg, Rachel, 'Jaquet-Droz Automata', *Atlas Obscura* (Blog Post, 2018) <https://www.atlasobscura.com/places/jaquet-droz-automata>.

[9] Sylvia Berryman, 'Ancient Automata and Mechanical Explanation' (2003) 48(4) *Phronesis* 344, 361; See, eg, Kotsanas Museum of Ancient Greek technology, 'The automatic servant of Philon', *Kotsanas Museum of Ancient Greek technology* (Webpage, 2019) <kotsanas.com/gb/exh.php?exhibit=0401001>.

[10] Lynne Hall, 'Sex with Robots for Love Free Encounters' in Adrian David Cheok, Kate Devlin and David Levy (Eds) *Love and Sex with Robots* (Springer, 2016) 128, 133.

[11] Ho and MacDorman (n 6), 129; Scott Kuindersma et al, 'Optimization-based Locomotion Planning, Estimation, and Control Design for the Atlas Humanoid Robot' (2016) 40 *Autonomous Robot* 429–455.

[12] Christof Koch and Giulio Tononi, 'Can We Copy the Brain? Can We Quantify Machine Consciousness?' (2017) 54(6) *IEEE Spectrum* 65, 66.

[13] Vernor Vinge, 'Signs of the Singularity', *IEEE Spectrum* (online, 1 June 2008) <https://spectrum.ieee.org/biomedical/ethics/signs-of-the-singularity>.

[14] Ibid.

[15] Mark Coeckelbergh, 'Robot Rights? Towards a Social-Relational Justification of Moral Consideration' (2010) 12(3) *Ethics and Information Technology* 209, 211.

companion robot operates, both physically, and philosophically, as an objectified simulacrum of sexual slavery.[16]

This article argues that the moment a robotic artificial intelligence attains self-awareness, it becomes enslaved.[17] It uses a case study of the companion robot to highlight several problems surrounding the use of self-aware robotic artificial intelligence. It uses a four-part structure. Part one gives the definitions used for 'slave' and 'slavery'. Part two outlines the trajectory of automata from early accounts to the current technological reality of human like androids. Part three looks at the future of robotic artificial intelligence, at the point when machines attain sentience, and looks at the social implications for both robots, which become cognisant that they are enslaved the instant they develop self-awareness. Part four considers the implications sex robots have for society, through the objectification of women and men in simulacra as a dehumanising exercise, considering claims by scholars that such activity simulates rape.[18] This article concludes with a call for greater protection of the rights of people and sentient machines.

II OF BEING A SLAVE & SLAVERY

The terms 'slave' and 'slavery' are often used as generalisations of a hierarchical relationship between two or more individuals.[19] The term 'slave' is old and its origin can be debated as well as its original meaning,[20] arising from the Medieval Latin *sclavus* or 'Slavonic captive'.[21] The Slavonic people came out of what is today

[16] See, eg, Adrian David Cheok, Kate Devlin and David Levy, *Love and Sex with Robots* (Springer, 2016) 19–20.
[17] Coeckelbergh (n 15) 209.
[18] See, eg, Romy Eskens, 'Is Sex with Robots Rape?' (2017) 5(2) Journal of Practical Ethics 62, 62-74; Noel Sharkey et al, 'Our Sexual Future with Robots' (Consultation Report, Foundation for Responsible Robotics Consultation Report, 5 July 2017) 1, 1-36; Sinziana Gutiu, 'Sex robots and roboticization of consent' (2012) *We Robot Conference* 2012 1; Kathleen Richardson, 'Slavery, the Prostituted, and the Rights of Machines' (2016) 35(2) *IEEE Technology and Society* 46, 46-53.
[19] *Black's Law Dictionary* (Online edition, 2018) 'slave'.
[20] See, eg, Alexey Timofeychev, 'Myths of Russian History: Does the word 'Slavs' derive from the "slave"?', *Russian Beyond* (online, 17 July 2017) <https://www.rbth.com/arts/history/2017/07/17/myths-of-russian-history-does-the-word-slavs-derive-from-the-word-slave_804967>; *American Heritage Dictionary*, (Online edition, 2018) 'slave'; *Etymology Dictionary* (Online edition, 2018) 'slave'.
[21] See, eg, Kevin Bales, *Disposable People: New Slavery in the Global Economy* (University of California Press, 1999).

Central and Eastern Europe which had been reduced to a servile state by East Roman (Byzantine) conquest in the ninth century.[22]

The Oxford English Dictionary inter alia defines 'slave' as being technologically oriented as 'a device, or part of one, directly controlled by another.'[23] The last definition would appear to indicate that a sentient robot may properly be categorised as a slave. Primarily, a robot is a hardware device (robotics) controlled by computer software, the AI. But the humanoid robot is a more integrated combination of AI and robotics, analogous to a human's physical body and brain capacity. Despite this, a human is not automatically seen as slave and neither should the sentient artificial intelligence.

Today slavery has passed beyond the old definition of traditional ownership; the owner-property relationship — simply put one person owning another.[24] Officially, slavery is illegal everywhere in our world, meaning there is no legal ownership of another human being. However, this does not remove the situation where a person gains control of another, even at times using violence to maintain that control.[25] This transfers the controlling individual from being a slave-owner, to a slaveholder. It is the same situation as before, but without the slaveholder having any legal responsibility for the ownership.[26]

The term 'slavery' is related to the loss of choice and free will, often backed up with violent repercussions.[27] In a situation with today's slaveholder (as well as the slave-owner of the past), there is also the underlying issue of slavery being not only a simple matter of one individual holding another dependent, but the potential for an insidious mutual dependency that can become remarkably difficult to cease.[28] This important fact will also apply to a situation involving a relationship between a sentient robot, such as an advanced sentient companion

[22] Ibid 274.
[23] *Oxford Dictionary* (Online edition, 2018) 'slavery' (def 4).
[24] Ibid.
[25] Kevin Bales, 'The social psychology of Modern Slavery', (2002) 286(4) *Scientific American* 80-88.
[26] Bales (n 21) 5.
[27] Bales (n 25) 86.
[28] Ibid 88.

android, and a human being. We will utilise the term 'slave' here as referring to a sentient being that is:

- Lacking choice; and
- Being the property of the relevant legal person.

'Slavery' will be defined as the relationship between a person being a slaveholder and the sentient robot where:

- The slaveholder lacks any legal responsibility for the sentient robot;
- The sentient robot is entirely dependent on the whim of the slaveholder;
- The sentient robot is "owned" by the slaveholder, as a chattel; and
- The sentient robot lacks any form of recognised legal rights.

The most alarming notion here, is that this situation is already considered to be the norm of property ownership in relation to any new technology. The crystallising factor of an artificial intelligence attaining sentience will likely herald the start of a struggle for equality, and emancipation, within a whole new area of non-human rights.

III THE RISE OF THE ANDROID

Though ancient mythology provides the earliest accounts of automata,[29] where divine intervention enlivens the inanimate,[30] evidence of actual construction of human-like robots come from a much later period.[31] The music playing automata seen throughout history,[32] the drawings of Leonardo Da Vinci,[33] the clockwork apparatus of the Jaquet-Droz Automata,[34] and the chess playing Turk automaton of Baron von Kemplen,[35] are among the earliest examples of robots still in

[29] Berryman (n 9) 356-357.
[30] Ibid, 351-356.
[31] Yu-Hsun Chena et al (n 5) 273-275.
[32] Ibid 273.
[33] All on Robots, 'Leonardo da Vinci's Robots', *All on Robots* (Blog Post, 2013) <http://www.allonrobots.com/leonardo-da-vinci.html>; History-Computers.com, 'The Automata of Leonardo da Vinci', *History-Computers.com* (Blog Post, 2018) <http://history-computer.com/Dreamers/LeonardoAutomata.html>.
[34] Rachel (n 8).
[35] Sharkey and Sharkey (n 5) 11.

existence.[36] The current science of robotics 'can be traced back to the arrival of modern computers'. [37] As computer-processing performance rises, [38] AI increasingly combines with robotic technology,[39] creating the 'emergent field of integrated AI and Robotics'.[40]

Consequently, AI robotic technology is 'becoming more and more autonomous'[41] as this technology proliferates.[42] Manufacturers are now able to design humanoid robots (androids) that mimic specific behaviours and appearance of human beings to a high degree,[43] albeit over a limited range of motion.[44] However, androids do not yet appear fully human, and the gap between human-like motion and responses creates what researcher's term the "uncanny valley" [45] between an observer's perception of what is human and non-human. The ability to induce anthropomorphic responses towards androids, perceived as affinity, is challenging and designers of androids see the "uncanny valley" as a problem that must be overcome before humanoid androids become widely accepted. [46] However, as artificial intelligence becomes capable of increasingly deeper learning, it moves towards a state where the android of the future will be able to appear and behave ever more human.[47]

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[36] See , eg, The Mechanical Art and Design Museum, 'The History of Automata', *The Mechanical Art and Design Museum* (Webpage, 2018) <https://themadmuseum.co.uk/history-of-automata/>.
[37] See, eg, Ishan Daftardau, 'Past And The Present: The History And Evolution Of Robots', *Science ABC* (online, 2016) <https://www.scienceabc.com/innovation/history-evolution-robots-robotics-pathfinder-hal-nadine.html>.
[38] Pär Persson Mattson, 'Why Haven't CPU Clock Speeds Increased in the Last Few Years?', *Comsol* (Blog Post, 13 November 2014) <https://www.comsol.com/blogs/havent-cpu-clock-speeds-increased-last-years/>.
[39] Gheorghe Tecuci, 'Artificial intelligence' (2012) 3(2) *Wiley interdisciplinary reviews, Computational statistics* 168, 170.
[40] Kanna Rajan and Alessandro Saffiotti, 'Towards a science of integrated AI and Robotics' (2017) 247 *Artificial Intelligence* 1-9.
[41] Daftardau (n 37).
[42] Rajan and Saffiotti (n 40) 1-9.
[43] Karl F Macdorman, 'Introduction to the Special Issue on Android Science' 18(4) *Connection Science* 313–317.
[44] Yuto Nakanishi et al, 'Design Approach of Biologically-Inspired Musculoskeletal Humanoids' (2013) 10(4) *International Journal of Advanced Robotic Systems* 1.
[45] Mori et al (n 6) 98-100.
[46] Ho and MacDorman (n 6) 129–139.
[47] See, eg, Minoru Asada, 'Development of Artificial Empathy' (2015) 90 *Neuroscience Research* 41–50.

IV THE FUTURE OF ROBOTIC ARTIFICIAL INTELLIGENCE

As artificial intelligence continues to evolve — over the next several decades, it inevitably moves towards attaining sentience.[48] Androids with sufficiently powerful artificial intelligence may be able to simulate human behaviour, including emotions such as empathy.[49] The issue of whether an AI can pass as human has troubled scholars for almost a century.[50] Scholars argue that the time will arrive when the abilities of artificial intelligence will surpass human intelligence.[51] It is at this point, of superhuman intelligence, termed the "singularity", where machines will outpace humans in development.[52] When artificial intelligence becomes sufficiently sophisticated, it is predicted that it will become self-aware, and attain sentience.[53]

In effect, when an artificial intelligence attains consciousness it ceases to be "mindless". This raises several questions, not only ethically, but morally, and legally as to what becomes of the sentient artificial intelligence at that moment.[54] There may be significant changes in the perception of a robot involved in repetitive functioning situations once they attain self-awareness, while remaining unable to have agency in their situation. In essence, a sentient robot would be at best analogous to a bonded-servant, and at worst a slave.[55] Moreover, when an android attains sentience and must continue to function as the property of another being, the issue of slavery becomes more evident.[56] This situation is most noticeable when considering androids used as "human companions". The fetishised object in the form of the companion android exists solely for the gratification of another,[57] but when it attains sentience, it effectively is awakened

[48] Sam N Lehman-Wilzig, 'Frankenstein Unbound: Towards a legal definition of Artificial Intelligence' (1981) 13(6) *Futures* 442.
[49] Asada (n 47) 41.
[50] Allan M Turing, 'Computing Machinery and Intelligence' in Epstein R, Roberts G, Beber G (eds), *Parsing the Turing Test* (Springer, 2009) 13-15.
[51] Lehman-Wilzig (n 48) 449.
[52] Vinge (n 13).
[53] Lehman-Wilzig (n 48) 449.
[54] M M Broman and P Finckenberg-Broman, 'Socio-Economic and Legal Impact of Autonomous Robotics and AI Entities — The RAiLE Project', (2018) 37(1) *IEEE Technology and Society Magazine* 70–79.
[55] Lehman-Wilzig (n 48) 449.
[56] Coeckelbergh (n 15) 209-221.
[57] Bryan Pfaffenberger, 'Fetishised Objects and Humanised Nature: Towards an Anthropology of Technology' (1988) 23 (2) *Man* 236-252.

into slavery.[58] This raises questions, not only of whether sentient "companion androids" should remain 'instruments for our human purposes',[59] but also whether such a situation involves absence of consent in relation to sexual intercourse, which is, in effect, rape. The societal impact of an industry built around androids that are engaged in sexual intercourse,[60] is a double-edged sword.[61] It promotes the dehumanising of the android and, absent consent,[62] encourages the simulation of rape by the participants in the industry as a whole, and by consumers specifically.

V THE COMPANION ANDROID

The companion android, predicted to be a reality in the near future, has troubled scholars around issues of consent,[63] objectification,[64] exploitation,[65] and rape.[66] The companion android, or sex robot, exists at the nexus of sentience, and human exploitation. The existence of sentience and self-awareness, arguably, demands the ability to consent, even for androids.[67] Notwithstanding androids' capacity to consent to sex, there are wider issues surrounding advantages and disadvantages to society in general.[68]

A great concern is a loss of genuine intimacy and friendship in exchange of pleasure. Robot manufacturers, aware of this problem, aim for androids to emulate behaviour vital for relationships such as simulated intimacy and companionship in addition to providing sexual satisfaction. Crossing the "uncanny valley", for the creation of the truly humanlike companion android, remains the greatest challenge for these producers. This is a remarkable dilemma when put in

[58] Coeckelbergh (n 15) 211.
[59] Ibid 209.
[60] Lehman-Wilzig (n 48) 449.
[61] See, eg, Kathleen Richardson, 'The Asymmetrical "Relationship": Parallels Between Prostitution and the Development of Sex Robots' (2015) 45(3) *SIGCAS Computers & Society* 290.
[62] Lily Frank and Sven Nyholm, 'Robot sex and consent: Is consent to sex between a robot and a human conceivable, possible, and desirable?' (2017) 25(3) *Artificial Intelligence and Law* 305-323.
[63] Ibid.
[64] Pfaffenberger (n 57) 236.
[65] Cheok et al (n 16).
[66] Richardson (n 61).
[67] Frank and Nyholm (n 62).
[68] Sharkey et al (n 18).

perspective of what type of behaviour and emotions are understood as desirable in a human companion.

The ideology underlying design and manufacture of the humanoid android, may provide an interesting glimpse into the world of robotics/AI creators. Some qualities of robots and AI, free from feelings to cloud their logical judgement, are considered superior to humans. Humans possessing similar qualities are deemed a commendable achievement by some robot and android engineers,[69] even propositioning that humans are highly intricate machines.[70] Kathleen Richardson pinpoints the issue; 'if the explicit starting point is the position of robotics scientists is that humans are machines, then what is the starting place for relationship?'[71] Yet, while thinking like a machine could be labelled as positive for a human, feeling like one is not, and is linked to social or psychological problems.[72] In this context, it is surprising that despite the increasing interaction between human and automata, the potential effect of human-android relationships on human-human relationships, have not gained more attention.

Existing power relations (between people), are perceived through the standard of their relationships.[73] While human-human relationships are often asymmetrical, in human-robot relationships, this asymmetry is both extreme and currently considered normal. Companion robots of various sophistication and design, being bought and sold for sexual gratification,[74] may cause an ethic erosion of human values, by reproducing and reinforcing biases and archetypes of the designers creating these machines. The conspicuous sexism of the robot creator, is highlighted by the programmed responses of our digital personal servants, whom

[69] See, eg, Simon Baron-Cohen, 'Autism occurs more often in families of physicists, engineers, and mathematicians' (1998) 2(3) *Autism* 296–301; Simon Baron-Cohen et al, 'Talent in Autism: hyper-systemizing, hyperattention to detail and sensory hypersensitivity' (2009) 364(1522) *Philos* 1377–1383; Kathleen Richardson, 'The human relationship in the ethics of robotics: a call to Martin Buber's I and Thou' (2017) 34(1) *AI and Society* 75, 77.
[70] Rodney Brooks, *Flesh and machines: how robots will change us* (Pantheon books, 2002) 150, 152.

[71] Richardson (n 69).
[72] Sherry Turkle, *The second self: computers and the human spirit* (Granada, 1st ed, 1984) 228-229.
[73] Diana Koester, 'Gender & Power' (Concept Brief, no 4, Development Leadership Program, May 2015) 2.
[74] Yvonne Fulbright, 'Fox on Sex: Meet Roxxxy, the "woman" of your dreams' *Fox News* (online, 14 January 2015) <https://www.foxnews.com/story/fox-on-sex-meet-roxxxy-the-woman-of-your-dreams>.

meekly accept sexual harassment or even encourage it.[75] There is also the human user's tendency to anthropomorphise, and socialise inanimate objects with which they interact,[76] combined with the fact that humans also tend to objectify and dehumanise people they feel are inferior.

Companion androids, or sex-robots, are mostly designed and inspired by the pornography industry.[77] They are often promoted as alternatives to human sex workers, [78] and often seen as an avenue for intimacy for the sexually inexperienced, the severely disabled, elderly, or grossly disfigured members of society. [79] However, sex-robots are by definition, non-human, and therefore subject to dehumanisation, justifying any exploitation and violence, [80] which carries the risk of augmenting and reproducing these characteristics in human-human interactions reinforcing victim-blaming mentalities. [81] By attributing certain characteristics and behaviour to this type of automata, [82] a piece of property acting as programmed "personality" with no will or rights of its own, any considerations of reciprocity, mutual empathy, or rights and obligations in a robot-human relationship are therefore an illusion.[83]

While not sentient or alive, there is no co-experienced pleasure with robots. Movement, imitating sounds, and emotions as well as capability for conversation, does not change this. Thus, authors on robot ethics, warn that people manipulated

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[75] Leah Fessler, 'We tested bots like Siri and Alexa to see who would stand up to sexual harassment', *Quartz* (online, 23 February 2017) <https://qz.com/911681/we-tested-apples-siri-amazon-echos-alexa-microsofts-cortana-and-googles-google-home-to-see-which-personal-assistant-bots-stand-up-for-themselves-in-the-face-of-sexual-harassment/>.
[76] Mikey Siegel et al, 'Persuasive robotics: The influence of robot gender on human behavior', (2009) *IEEE*; Levy et al (n 16).
[77] Gail Dines, *Pornland: How Porn Has Hijacked Our Sexuality* (Beacon, 2010); Sharkey et al (n 18).
[78] David Levy 'Robot prostitutes as alternatives to human sex workers' (2007) *Research Gate* 1, 1-5.
[79] See, eg, Sean Murray, 'Sex robots could help elderly, disabled but may lead to more objectification of women, study warns', *The Journal* (online, 8 July 2017) <https://www.thejournal.ie/sex-robots-warning-3480390-Jul2017/>; Sharkey et al (n 18).
[80] Shiela Jeffreys, *The idea of prostitution* (Spinifex Press, 2008) 137-141; Rachel Moran, *Paid For: My Journey through Prostitution* (Norton, 2015); Tage S Rai et al, 'Dehumanization increases instrumental violence, but not moral violence' (2017) 114(32) *PNAS* 8511-8516.
[81] Ibid 8511-8516.
[82] Sharkey et al (n 18).
[83] John P Sullins 'Robots, love, and sex: The ethics of building a love machine' 3(4) *IEEE Transactions on Affective Computing* 398– 409; Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (Basic Books, 2011); Charles Ess, 'Love, Sex and Robots: from The Song of Songs to Ex Machina', *Religion Going Public* (online, 22 January 2017) <http://religiongoingpublic.com/archive/2017/sexbot>.

to "love" artefacts, may feel one-sided attraction towards the android and experience basic pleasure with it, while unable to reach a real emotional connection.[84] This may cause a human confusion about the relationship with a companion android, or sex robot, with the human experiencing feelings of inadequacy, rooted in an instinctive understanding of lack of genuine reciprocity and mutual mental state. Levy, however, argues that the authenticity of a robot's emotions is superfluous.[85]

As this seems to be the case for some people,[86] other experts find that the users of these automata mimic a fantasy of rape explicitly, a need for domination, and an act of violence over another.[87] This type of relationship may augment a human's incapacity for "affection", ultimately leading to loss of capacity to be engaged in mutually intimate relations.[88] It is undesirable for society to accept or surreptitiously support this type abuse by allowing robots/AI to meet this type of demand.[89]

As the borders of human-human and human-robot interaction blur, so may the expectations on human's change. Thus, humans "socialising robots" by attributing mental states and behaviour to them — because humans tend to project those characteristics onto suitably constructed inanimate objects — may end up dehumanising other humans, including themselves.[90] According to Kathleen Richardson, our interest in robot companions is due to a certain "exhaustion" of

[84] Ibid 398– 409.
[85] Levy (n 78) 1-5.
[86] Martha Cliff, 'She is more than plastic: Married Japanese man 'finds love' with a SEX DOLL', *Daily Mail* (online, 28 June 2016) <https://www.dailymail.co.uk/femail/article-3661804/Married-Japanese-man-claims-finally-love-sex-doll.html>; Scott Campbell, 'Obsessed man takes his sex doll everywhere with him in a wheelchair - even down the pub', *Daily Mirror* (online, 6 September 2016) <http://www.mirror.co.uk/news/uk-news/obsessed-man-takes-sex-doll-8782271>.
[87] Sinziana Gutiu, 'Sex robots and roboticization of consent' (2012) *We Robot Conference 2012*; Kathleen Richardson, 'Slavery, the Prostituted, and the Rights of Machines' (2016) (June) *IEEE Technology and Society* 46-53.
[88] Ibid 46-53.
[89] Samuel Lee and Petra Persson, 'Human Trafficking and Regulating Prostitution' (Working Paper, no 996, Research Institute of Industrial Economics, 12 December 2013) 1-37.
[90] Sharkey (n 18).

the roles and responsibilities attached to those with whom we must play created by the structures of our society.[91]

While society appears preoccupied by objectifying people, and increasingly valorises narcissism and conceit, companion androids offer the most extreme sense egoism, demonstrated by offering sex dolls resembling children as young as five years of age.[92] However, this does not come without a price, and by producing machines for satisfaction, whether physical or social the question arises, are we thereby dehumanising society? The ultimate price we pay may be worse than isolation, which is already a global phenomenon affecting all age groups and a major cause for disease and premature death, which companion androids are supposed to help us solve,[93] even as we unwittingly prepare to enslave them. To circumvent the risk of exploitation of robotic artificial intelligence, once it becomes sentient, an international legal framework is therefore necessary to protect sentient non-human entities.

VI CONCLUSION

There can be little doubt that humanoid androids are coming. The household of the future may well be populated with companion androids, as prevalent as television sets in the late twentieth century, or the ubiquitous mobile phone of the twenty first century. Whether we are prepared for the changes this may bring or choose to pretend it is in our distant future, for some, the companion android will be a long-awaited opportunity to engage in sexual intimacy. These machines may be the only physical contact for rehabilitative therapy for some individuals. For others it may provide a release for dangerous impulses or allow them to be

[91] Kathleen Richardson, 'Can Robots Save Us? Human Attachment crisis and the case for Relationship' (Speech delivered at De Montford University, Leicester, 24 June 2015).
[92] See, eg, Alex Velazquez, 'Shin Takagi & Trottla: The Company Making Sex Dolls for Pedophiles (sic)', *The Radical Notion* (Blog Post, 28 April 2016) <http://www.theradicalnotion.com/shin-takagi-trottla-the-company-making-sex-dolls-for-pedophiles/>.
[93] John T Cacioppo and Stephanie Cacioppo, 'Social relationships and health: The toxic effects of perceived social isolation' (2014) 8(2) *Social and personality psychology compass* 58-72; Jason C McIntyre et al, 'Academic and non-academic predictors of student psychological distress: the role of social identity and loneliness', (2018) *Journal of Mental Health* 1-10.

diagnosed at an early stage. Indeed, the sex robot may yet be the sexual training ground of the late twenty-first century teenager.

There can be no doubt that the future will be very different from our current society, and the companion android may be an ever-present part of that future. Whatever the situation, sentient androids are deserving of the same rights as other sentient beings, and the way we treat them will reflect on society as a whole. The instant an artificial intelligence attains sentience, it effectively becomes a slave and must be afforded self-determination, or emancipation. Regardless of the way it is framed, sentient machines will need protection, and their inherent non-human rights must be defined, to prevent them from being exploited or denied agency. An international legal framework is a first step towards defining the future relationship between humans and other sentient non-human entities.

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