
Exploring the Legal Rights & Obligations of Robots

A Legal Book Review of *I, Robot* by Isaac Asimov

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Introduction: Law & the Emerging Age of Robotics

In recent years, there has been unprecedented technological advancement in the area of robotics and artificial intelligence (AI). ‘Robots’ now engage in an increasingly wide range of complex activities traditionally conducted by humans: they are able to operate vehicles, diagnose cancer, detect fraudulent financial activities, produce news stories, and engage in problem solving.¹ It is expected that in the coming years robots will increasingly interact with humans in a variety of contexts, both in the workplace and in the home.² In view of these developments, some observers have argued that human history has entered into a new ‘age of robotics’, presenting myriad new and untold challenges and uncertainties³.

However, as robots become increasingly intelligent, sophisticated, and even ‘life-like’, these developments also raise numerous important challenges and questions for legal scholars across various fields of law. In this respect, this legal book review draws on the 1950 classic science fiction novel, *I, Robot*, written by American writer Isaac Asimov, to explore some of the basic legal questions raised in relation to this emerging ‘age of robotics’. The novel explores the ‘three laws of robotics’, which the author himself developed as a theoretical tool for exploring the future development and consequences of advanced artificial intelligence. The three laws are as follows: (1) a robot may not injure a human being or, through inaction, allow a human being to come to harm; (2) a robot must obey orders given it by human beings except where such orders would conflict with the First Law; and (3) a robot must protect its own existence as long as such protection does not conflict with the First or Second Law. The book is largely a collection of original short stories written by Asimov involving various situations of interaction between human beings and robots. These short stories are brought together through a framing narrative in which one of the characters, Susan Calvin, the World’s first ‘robopsychologist’ and a senior employee at US Robots and Mechanical Men, Inc., is being interviewed by a journalist about her experiences with robots. Each of the short stories are then presented within the framing narrative as memories that Calvin draws on to describe her experiences. The stories serve as an anthology that describes specific situations in which the various limitations, ambiguities, or contradictions of the three laws of robotics emerge. In many of the stories, the robots in question are behaving in unpredictable or erratic ways, often due to a conflict between the three laws, or because of confusion around their precise meaning.

Although the novel raises numerous legal and ethical questions, the present legal book review focuses specifically on themes and questions around what constitutes a legal subject. In particular, this

¹ B. Dellot & F. Wallace-Stephens, *The Age of Automation: Artificial Intellegen, Robotics and the Future of Low-Skilled Work* (2017), RSA Action & Resrouce Centre, available at https://www.thersa.org/globalassets/pdfs/reports/rsa_the-age-of-automation-report.pdf; C. Holder, V. Khurana, F. Harrison, & L. Jacobs, “Robotics and law: key legal and regulatory implications of the robotics age”, *Computer Law & Security Review*, Vol. 32 (2016), pp. 383-402.

² C. Holder, et al., 2016, p. 384

³ L. Guatrucci, “The age of robots could be a new renaissane. This is why”, *World Economic Forum* (18 October 2017), available at <https://www.weforum.org/agenda/2017/10/ai-renaissance/>

paper draws on three stories within the novel to explore the various challenges raised in relation to the legal rights and obligations of robots. In doing so, this review additionally draws on existing legal scholarship, legislation, and texts which inform our present understanding of law in relation to legal questions identified in the book. It focuses primarily on Dutch law as a concrete legal framework illustrating the challenges and complexities surrounding the legal obligations of robots in both civil law and criminal law contexts.

The Legal Rights of Robots

One of the main themes of *I, Robot* is the distinction between robots and their human creators. One of the most apparent distinctions between the two is that while humans have a legal personality, robots are nothing more than property, to be used and disposed of as their owners please. The ethical problems this causes become apparent in *Robbie*, the very first short story in the book. The story centers itself around a family of a father, mother and their young daughter, who employ a robot, Robbie, as a nursemaid. The girl and the robot are best of friends and play together all the time. After a few years, anti-robot sentiments increase in society. Because of this, the mother tries to persuade the father to dispose of Robbie and eventually succeeds. The daughter is terribly depressed by this, and through a ploy of the father, is finally reunited with her robot friend. Although mute, Robbie is capable of intelligent interaction with humans through gesturing. It also seems to have at least basic feelings, as it is seemingly hurt when the girl accuses it of cheating during a game of hide-and-seek. While the girl treats Robbie as a normal human being, her mother orders it around and disposes of it like it is a slave. This raises questions about how to treat a robot with the capacity to think and feel like a human being. Up to what point is it morally acceptable to treat such a robot as a mere object without rights?

This problem becomes even more apparent in 'Evidence', the eighth short story in the book. In this story, Byerley, a district attorney, is severely injured in a car crash and runs for mayor after he has recovered. His opponent, however, accuses him of being a humanoid robot who is impersonating Byerley. The story then focuses on the question how to ascertain that Byerley is indeed a human being, which turns out to be quite difficult. The researchers make him eat some food, but realize that a robot could also be designed with this ability. Eating is therefore not a definitive human characteristic. In the end, they conclude that the only way they would know for sure Byerley is human, is to make him violate one of the laws of robotics. During a speech, a protestor challenges Byerley to hit him in the face, which he does. At first, this seems definitive proof that Byerley is human, as a robot is unable to hurt a human being. However, in the epilogue of the story, the protagonists pose the theory that the protestor was in fact a robot himself, which means that the possibility of Byerley being a robot still has not been ruled out.

This story illustrates the challenges that arise when a highly advanced robot becomes nearly impossible to distinguish from an actual human being. Any possible solution for this problem must be sought in pre-programmed differences between humans and robots; in this case, Asimov's Three Laws of Robotics. However, if actual differences are almost non-existent, what justifies differential treatment between the two? Even though robots today are not yet this advanced, the idea that they will be someday is far from science fiction. In recent years the topic of rights for robots has been increasingly discussed. The majority of today's robots cannot act autonomically, but it is only a matter of time before robots equipped with intelligent AI's will be an actor in society and become your colleague, or maybe even your boss.⁴ Law will almost certainly have to adopt some form of legal personality for these entities for them to be able to participate in society. But legal personality does not necessarily entail entitlements to rights now reserved exclusively for humans, such as the right to bodily integrity. The arguments in support of granting robots moral consideration can be loosely categorized into direct and indirect arguments⁵.

The first group of arguments set out the reasons why an entity should or should not have certain inherent rights. Humans and animals are granted rights from a deontological viewpoint, among others. Most of these arguments involve the fact that humans are alive and have a certain level of rational sentience and exceptionality, which sets them apart from animals and machines.⁶ Decades ago however, scientists already created or proved that AI constructs are able to exhibit the six criteria that distinguish life from inanimate matter, which complicates the deontological argument.⁷ A comparison can be made with the animal rights movement, where there is often discussion about the level of sentience of different animal species, and where the lines should be drawn.⁸ The second group of arguments focus on virtue ethics and are based around the idea that human beings want to be virtuous and should therefore treat others well. Through this theory, robots should have rights because it 'is the right thing to do'. A problem with this line of thought is that virtues have a strong cultural, subjective component to them and will inevitably lead to different stances on what robot rights should entail.⁹

The above illustrates a major impasse in the discussion in Western societies on the rights of robots. However, this is not the case in some parts of Asia. For instance, Japan, the frontrunner in robotics, has already broadly implemented robots into their society. There, robots are a familiar sight in schools, in care facilities, and some of them have even received special residency permits that grant them citizenship.¹⁰ This is highly indicative of the status of the robot in Japanese society, as Japan is

⁴ R. van Hoven van Genderen, 'De slimme robot is geen apparaat, maar een rechtspersoon', *NRC* 18-11-2016.

⁵ M. Coeckelberg, "Robot Rights? Towards a social-relational justification of moral consideration", *Ethics and Information Technology* 12:3 (2010), p. 210-219.

⁶ *Id.*, p. 211.

⁷ P. McNally & S. Inayatullah, 'The Rights of Robots: Technology, culture and law in the 21st century', *FUTURES* (April 1988), p. 125.

⁸ Coeckelberg, "Robot Rights", p. 212.

⁹ *Id.*, p. 203-214.

¹⁰ J. Robertson, "Human Rights vs. Robot Rights: Forecasts from Japan" *Critical Asian Studies* 46:4 (2014), p. 590-592.

strongly ethno-nationalist, with a citizenship based on *jus sanguinus*. Foreigners and minority groups can only receive citizenship-status through a complicated procedure of naturalisation and are often treated as second-class citizens. Robots, on the other hand, have been made by Japanese companies, and are therefore fully accepted as ‘full-blood’ Japanese.¹¹ The country seems to have settled the question of robot rights, even though the rights of humans remain an issue. One explanation for the Japanese stance on robots might be found in the influence of the Shinto religion, a worldview that comprises a notion of ‘life’ that recognizes the energies of both organic and inorganic matter, as well as natural and manufactured entities.¹² From the Japanese point of view, then, a robot may actually be considered ‘alive’, which takes away one of the main deontological hurdles.¹³ It is therefore implausible that the Japanese solution is also applicable in Western society, where the idea of human exceptionalism is strongly rooted in society. The discussion on robot rights in the West will therefore most likely persist in the near future, and it is hard to see what its conclusion will be. What seems to be clear though, is that the rise of robotics will have an important impact on our understanding of rights in the future.

The Legal Obligations of Robots

On the flipside of the challenges pertaining to the legal rights of robots is the issue of legal obligations. In this respect, this paper now turns to Chapter 6 of the novel, entitled *Little Lost Robot*. In this particular short story, a number of scientists are working with dangerous radiation. Due to the First Law—requiring that no robot may, through inaction, allow a human being to come to harm—the robots repeatedly interrupt the scientists during their work in order to protect them from the radiation. To prevent this problem, a special *NS-2* robot is developed that does not have the First Law imprinted in its programming. However, as a consequence, the *NS-2* robot is now technically capable of bringing harm to a human. Throughout the remainder of the story, a dangerous situation unfolds in which the robot attempts to obey a direct order from a human (under the Second Law), but in so doing tries attack and bring harm to another human—namely, Dr. Calvin. This story raises the question of who can be held liable when a robot infringes the First Law of Robotics and does harm to a human being or causes damage. In particular, there are three areas of discussion relevant to the potential legal obligations raised; namely, (1) the obligations of the producer; (2) the obligations of the owner; and (3) the obligations of the robot itself.

Obligations of Producers & Owners

In terms of the first two areas of discussion, if the robots are considered merely to be products of a particular producer or owner, various laws may apply in relation to product liability for damages. For

¹¹ *Id.*, p. 593-596.

¹² *Id.*, p. 576.

¹³ *Id.*, p. 575-576.

instance, pursuant to Article 6:185 of the Dutch Civil Code, producers can be held liable when a product they have made causes damage. In relation to the owner, there exists two ways to hold the owner liable; namely, (1) by means of tort liability of Article 6:162 of the Dutch Civil Code, and (2) by means of strict liability of Article 6:173, paragraph 1 of the Dutch Civil Code. With tort liability of Article 6:162 the owner can be held liable for a breach of duty of care. With strict liability of Article 6:173, paragraph 1, the owner will be held liable for his movable property¹⁴. This latter form of strict liability similarly reflects what the European Parliament has recently been aiming for in its ‘Draft Report with recommendations of the Commission on Civil Law Rules of Robotics’. Here, the European Parliament considers that “the future legislative instrument should provide for the application of strict liability as a rule, thus requiring only proof that damage has occurred and the establishment of a causal link between the harmful behaviour of the robot and the damage suffered by the injured party”.¹⁵ When someone buys a robot, it can be argued that that person therefore accepts the risks owning a robot entails. Therefore, strict liability might be an reasonable option.

However, some present-day robots are already able to learn new behaviours, and it may in this case be possible that a producer places a robot on the market that is able to change its behaviour in unpredictable ways.¹⁶ This would mean that the producer cannot be held liable.¹⁷ On the other hand, pursuant to Article 6:173, paragraph 2, the owner cannot be held liable either.¹⁸ It may be argued that damages caused by robots should be regarded as ‘foreseeable risks’ under under Article 6:185, paragraph 1(e).¹⁹ Nevertheless, as robots become increasingly intelligent and autonomous, it may no longer be reasonable to hold either producers or owners liable. In view of these concerns, perhaps the most complicated legal challenges emerge when we consider the potential obligations of *the robot itself*.

Obligations of the Robot Itself

At present, there exists no law setting out the legal obligations of robots themselves. As such, the answer to the question of who should be held liable when a robot does harm to a human being or causes damage cannot be found in existing legislation. Perhaps new technological advancements in this area require the introduction of new and modernized forms of law. In this respect, the European Parliament has suggested the creation of a specific legal status for robots, “so that at least the most

¹⁴ E. Tjong Tjin Tai, ‘Aansprakelijkheid voor robots en algoritmes’, *NTHR* 2017-3, p. 5 and 13.

¹⁵ Mady Delvaux, Draft report with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), 31 May 2016, para. 27.

¹⁶ Mady Delvaux, Draft report with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), 31 May 2016, under Q. and Z.

¹⁷ S. de Schrijver & M. Mees, ‘Aansprakelijkheid in een ambient intelligent-omgeving: Wie heeft het gedaan?’, *Computerrecht* 2010/174, afl. 6, para. 3.1.

¹⁸ E. Tjong Tjin Tai, ‘Aansprakelijkheid voor robots en algoritmes’, *NTHR* 2017-3, p. 15.

¹⁹ E. Tjong Tjin Tai, ‘Aansprakelijkheid voor robots en algoritmes’, *NTHR* 2017-3, p. 15.

sophisticated autonomous robots could be established as having the status of electronic persons with specific rights and obligations, including that of making good any damage they may cause”.²⁰

Giving robots the status of electronic persons can mean that they will get the status of a legal entity. Therefore, the robot itself can be held civilly liable, similar to other non-human legal entities such as corporations.²¹ When it concerns a criminal act, a robot can be held criminally liable under Article 51, paragraph 2(1) of the Dutch Criminal Code. However, this raises a number of additional legal challenges in relation to the two main elements necessary to establish criminal liability; namely, (1) *actus reus*, referring to the criminal conduct itself (i.e., the external or factual element); and (2) *mens rea*, referring to the knowledge or intent of the conduct (i.e., the internal or mental element).²² Both elements are necessarily to establish criminal liability. However, in relation to robots, the most complicated legal challenges relate to establishing the *mens rea* element, which requires a degree of knowledge or intent on the part of the actor.²³ This dynamic might be similarly compared to the prospect of criminal liability in the case of animals. As Hallevy effectively describes, “a spider is capable of acting, but it is incapable of formulating the *mens rea* requirement; therefore, a spider bite bears no criminal liability”.²⁴ In this respect, criminal liability as it is traditionally understood within the legal system is predicated on the moral agency and responsibility of the person or entity in question, as well as the need to prosecute guilt and carry out justice²⁵. The legal issues that emerge with respect to criminal liability of robots therefore relate fundamentally to the robot’s lack of consciousness and ability to make moral judgements. As Asaro describes, “without moral agency, there can be harm but no guilt”.²⁶ Similarly, in the case of the story *Little Lost Robot*, as earlier described, the *NS-2* robot was certainly able to cause harm to a human being. However, it was strictly-speaking not able to formulate the *mens rea* necessary to establish criminal guilt.

However, Asaro draws a useful parallel between the prospect of criminal liability of robots and that of corporations.²⁷ Similar to robots, corporations are non-human entities that do not possess an individual ‘conscience’. Nevertheless, many legal systems in the world have recognized them as criminally liable entities. On the other hand, there are some important limitations to this analogy. For instance, corporations are not wholly abstract nonhuman entities, but rather are made up of and organized by conscious human beings, presumably capable of some degree of moral judgment.

²⁰ Mady Delvaux, Draft report with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), 31 May 2016, under f) and under S. See also R. van den Hoven van Genderen, ‘De slimme robot is geen apparaat, maar een rechtspersoon’, *NRC* 18-11-2016.

²¹ R.R. Murphy & D.D. Woods, “Beyond Asimov: The Three Laws of Responsible Robotics”, *IEEE Intelligent Systems*, Vol. 24(4)(2009), pp. 14-20

²² G. Hallevy, “The Criminal Liability of Artificial Intelligence Entities: From Science Fiction to Legal Social Control”, *Akron Intellectual Property Journal*, Vol. 4(2)(2010), pp. 171-201.

²³ G. Hallevy, 2010, p. 178.

²⁴ G. Hallevy, 2010, p. 178.

²⁵ P.M. Asaro, “Robots and Responsibility from a Legal Perspective”, *Proceedings of the IEEE*, 2007, available at <http://www.peterasaro.org/writing/asaro%20legal%20perspective.pdf>; p. 2.

²⁶ P.M. Asaro, 2010, p. 4

²⁷ P.M. Asaro, 2010, p. 4

However, these questions are largely based on the assumption that consciousness and the ability to make moral judgments is a uniquely human characteristic, and that robots—even those in the distant future—will be unable to share such abilities. For instance, if robots do become capable of making moral judgements, then they could presumably formulate the *mens rea* necessary to be held criminally liable in precisely the same way as humans. On the other hand, others have argued that, as human activity becomes increasingly mediated through various kinds of technologies and automation, it will become more and more difficult to assign ‘blame’ and prove ‘guilt’ in the way that the criminal justice system has traditionally been designed to do.²⁸ In this respect, modern notions of ‘blame’ within the criminal justice system may become altogether less relevant in the future, and it may instead be necessary to focus other normative aims, such as the reparation of harm.

Conclusion

This paper has intended to provide legal review and analysis of the classic science fiction novel *I, Robot*, written by Isaac Asimov, as an entry-point to examine the complex legal challenges presented by rapidly expanding technological advancements in the area of robotics and artificial intelligence. In particular, it has focused on examining these challenges in relation to both the legal rights and legal obligations of robots, drawing on three selected short stories presented in the novel.

In terms of the legal rights of robots, both the stories of *Robbie* and *Evidence* explore the challenges that emerge with the prospect of robots that are almost indistinguishable from human beings. They raise important questions concerning the fundamental features that are necessary for the recognition of rights, testing the assumption that rights should be afforded exclusively to humans—an assumption which has particularly dominated legal thought in the West. In this respect, countries, such as Japan, have already largely begun to recognize the possibility of granting rights and citizenship to robots and other forms of inorganic artificial intelligence.

On the other hand, the story *Little Lost Robot* provides a valuable exploration of the legal obligations of robots when they cause damage or harm. If it is assumed that robots are merely products of a particular producer or owner, then contemporary legal systems are already rather well-equipped through product liability laws. However, when faced with the prospect of more autonomous and independent robots, it may no longer be appropriate to hold producers and owners liable. It may therefore be necessary to examine the legal obligations of the robot itself. In this respect, the European Parliament has recently produced a ‘Draft Report’ on civil law rules governing robotics, setting out possibility of establishing the status of ‘electronic persons’ which would apply to robots in a civil context. However, additional legal challenges exist with respect to the criminal liability of

²⁸ M. Kukita, *When HAL Kills, Stop Asking Who's to Blame: Autonomous Machine and Responsibility*, Conference Paper (8 November 2017), available at https://www.researchgate.net/publication/320923158_When_HAL_Kills_Stop_Asking_Who's_to_Blame_Autonomous_Machines_and_Responsibility

robots, particularly in relation to establishing *mens rea*, or criminal intent, and guilt of the robot in question. Although useful parallels may be drawn in relation to criminal liability of corporations, complex legal and normative challenges remain.

Ultimately, in view of expanding technological advancements in the area of robotics, we have now indeed entered a stage of human history where advanced and sophisticated human-like robotics are no longer simply a matter of science fiction. The question of how legal systems should cope with these complex and fast-moving developments will become increasingly relevant for legal scholars across varied disciplines. In this respect, Asimov's classic science fiction novel, *I, Robot*, provides a interesting and valuable entry-point for legal scholars to begin thinking creatively about some the core legal questions and challenges these developments raise.