



CAN ROBOTS BE HELD LIABLE? A STUDY OF FUTURE LEGAL SYSTEMS

Akash Patil*

INTRODUCTION

The rapid development of Artificial Intelligence (AI), autonomous robots, and machine learning technologies has transformed various sectors, including healthcare, transportation, manufacturing, finance, and defence. Modern robots are no longer mere tools controlled directly by humans; many can learn from experience, make decisions, and perform tasks with minimal human intervention.¹ As autonomous systems become increasingly sophisticated, an important legal question emerges: can robots be held legally liable for their actions?

Traditional legal systems are built on the assumption that only natural persons and legally recognised entities such as corporations can possess rights and liabilities.² However, when autonomous robots cause harm, commit errors, or make decisions independently, assigning responsibility becomes challenging. This issue has generated extensive debate among legal scholars, policymakers, and technologists regarding whether future legal systems should recognise robots as separate legal entities capable of bearing liability.

This article examines the concept of robot liability, existing legal approaches, the doctrinal challenges associated with autonomous systems, and the possibility of granting legal personality to robots in future legal frameworks, with particular attention to comparative developments in the European Union and the emerging Indian position.

Currently, robots cannot be held legally liable for their actions. Because they lack legal personhood and intent, liability rests with the humans involved, the manufacturer, programmer, or user.³ However, future legal systems are exploring the concept of electronic personhood to

*BA LLB, FOURTH YEAR, SIR SIDDAPPA KAMBLI LAW COLLEGE, DHARWAD.

¹ Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (4th edn, Pearson 2021).

² Lawrence B Solum, 'Legal Personhood for Artificial Intelligences' (1992) 70 North Carolina Law Review 1231.

³ Ugo Pagallo, *The Laws of Robots: Crimes, Contracts and Torts* (Springer 2013).

close the responsibility gap for highly autonomous machines, an idea formally considered by the European Parliament in 2017.⁴

EVOLUTION OF AUTONOMOUS ROBOTS

Robots have evolved significantly from simple programmed machines to highly autonomous systems capable of decision-making through artificial intelligence.

Examples include:

- Self-driving vehicles.
- AI-powered medical diagnostic systems.
- Autonomous military drones.
- Industrial robots.
- Service and caregiving robots.

Unlike traditional machines, these systems may act unpredictably because their behaviour is shaped by machine-learning algorithms that continue to adapt after deployment, rather than by instructions fixed at the point of manufacture.⁵ This distinction matters legally, not merely technologically: fault-based liability presumes that a defendant could have foreseen and prevented the harmful outcome. Where a system's behaviour emerges from training data and post-deployment learning rather than from a designer's explicit instructions, the causal chain between human conduct and the eventual harm becomes attenuated. It is this attenuation, not autonomy as a technical feature in itself, that generates the legal uncertainty explored in this article, because it strains the foreseeability and control requirements on which negligence, product liability, and vicarious liability all depend.

EXISTING LEGAL FRAMEWORK

At present, robots are generally regarded as property or tools rather than legal persons. When a robot causes harm, liability is usually assigned to one of four categories of human or corporate actor, each governed by a distinct doctrinal basis.

⁴ European Parliament Resolution of 16 February 2017 with Recommendations to the Commission on Civil Law Rules on Robotics [2017] P8TA (2017)0051.

⁵ Harry Surden, 'Machine Learning and Law' (2014) 89 Washington Law Review 87.

Manufacturer Liability: Manufacturers may be liable under product liability laws if a defect in design, manufacturing, or software causes injury. Liability typically follows a strict-liability or negligence-based standard depending on the jurisdiction, requiring the claimant to establish a defect and a causal link to the harm rather than fault in the traditional sense.⁶

Programmer Liability: Software developers may be held responsible if negligence in coding or algorithm design contributes to harmful outcomes. This route depends on establishing a duty of care and a breach measured against the standard of a reasonably competent developer, which becomes difficult to define where the algorithm's outputs are not fully predictable even to its authors.

Owner or Operator Liability: Owners and users of robots may be liable when harm results from improper operation, lack of supervision, or failure to maintain the system, applying ordinary negligence principles to the human closest to the point of harm.

Employer Liability: Organisations deploying robots may bear responsibility under principles of vicarious liability when robots are used in the course of business operations, treating the robot analogously to an employee acting within the scope of employment.⁷

These traditional approaches function adequately for current technologies, where a defect, an instruction, or an omission can usually be traced to an identifiable human actor. They may, however, become insufficient as robots gain greater autonomy and the causal link to any single human decision weakens.

THE PROBLEM OF AUTONOMOUS DECISION-MAKING

A major challenge arises when an autonomous robot makes decisions that were neither intended nor foreseeable by its manufacturer or operator. For example:

- A self-driving car chooses a route resulting in a fatal accident.
- A healthcare AI recommends incorrect treatment causing injury.
- A financial trading algorithm causes substantial economic loss.

In such situations, determining responsibility becomes difficult because the harmful outcome may not be directly attributable to any individual human actor. This issue is often referred to

⁶ Ryan Calo, 'Robotics and the Lessons of Cyberlaw' (2015) 103 California Law Review 513.

⁷ Mark A Lemley and Bryan Casey, 'Remedies for Robots' (2019) 86 University of Chicago Law Review 1311.

as the responsibility gap: a gap between the harm caused and any human actor who possessed both the knowledge and the control necessary to be held culpable in the traditional legal sense.⁸

ARGUMENTS SUPPORTING ROBOT LIABILITY

Increasing Autonomy: As robots become capable of independent decision-making, assigning liability solely to humans may become unfair or impractical. Supporters argue that highly autonomous systems should bear responsibility for their actions, particularly where human control is limited.

Legal Efficiency: Granting robots a form of legal personality could simplify compensation mechanisms. Victims could seek compensation from insurance funds or assets linked to the robot rather than engaging in complex, multi-party litigation against manufacturers, programmers, and operators simultaneously.

Encouraging Accountability: Recognising robot liability may encourage developers and manufacturers to create safer AI systems and establish stronger oversight mechanisms, functioning as a regulatory incentive comparable to proposals for a dedicated algorithmic-approval body.⁹

Corporate Analogy: Corporations are legal fictions created by law. Since companies can possess legal rights and obligations despite lacking physical existence, some scholars argue that autonomous robots could similarly receive limited legal personality, holding assets or insurance sufficient to satisfy claims.¹⁰

ARGUMENTS AGAINST ROBOT LIABILITY

Lack of Consciousness: Robots lack emotions, moral understanding, intentions, and consciousness. Traditional legal liability, particularly criminal liability, is based upon concepts such as intent (*mens rea*) and free will, which robots currently do not possess.¹¹

⁸ Gabriel Hallevy, *When Robots Kill: Artificial Intelligence under Criminal Law* (Northeastern University Press 2013).

⁹ Andrew Tutt, 'An FDA for Algorithms' (2017) 69 *Administrative Law Review* 83.

¹⁰ Lawrence B Solum, 'Legal Personhood for Artificial Intelligences' (1992) 70 *North Carolina Law Review* 1231.

¹¹ Gabriel Hallevy, *When Robots Kill: Artificial Intelligence under Criminal Law* (Northeastern University Press 2013).

Absence of Punishment Objectives: The purposes of punishment include deterrence, rehabilitation, and retribution. Robots cannot experience punishment, remorse, or rehabilitation in the human sense, making criminal liability conceptually problematic.

Human Responsibility must Remain: Critics argue that humans design, manufacture, deploy, and profit from robots. Allowing robots to bear liability may enable corporations and developers to evade responsibility for harmful actions by interposing a legally distinct but functionally empty entity between themselves and the victim.¹²

Practical Difficulties –

Questions arise regarding:

1. How robots would own assets?
2. How fines would be imposed?
3. Whether robots could enter contracts.
4. Whether robots could be imprisoned or sanctioned.

Current legal systems are not equipped to address these issues.

ELECTRONIC PERSONHOOD: A FUTURE POSSIBILITY?

One proposed solution is the concept of electronic personhood. Under this approach, highly sophisticated autonomous systems would receive limited legal status similar to corporate personality.

Electronic persons could:

- Hold certain legal rights.
- Bear civil liability.
- Maintain mandatory insurance coverage.
- Compensate victims through dedicated funds.

¹² Joanna J Bryson, Mihailis E Diamantis and Thomas D Grant, 'Of, For, and By the People: The Legal Lacuna of Synthetic Persons' (2017) 25 Artificial Intelligence and Law 273.

The idea gained international attention when the European Parliament discussed potential frameworks for civil law rules on robotics.¹³ The European Commission's subsequent White Paper on Artificial Intelligence likewise considered risk-based regulatory tools short of full personality.¹⁴ However, the proposal for electronic personhood specifically remains controversial and has not been widely adopted, in part because divergent national approaches risk fragmenting the single market for AI products.¹⁵

CHALLENGES FOR FUTURE LEGAL SYSTEMS

Ethical Concerns: Granting legal personality to robots may blur distinctions between humans and machines.

Regulatory Complexity: Different jurisdictions may adopt conflicting approaches, creating uncertainty in international commerce and technology regulation. The European Union has moved furthest in codifying a risk-based approach: the EU AI Act classifies AI systems by risk tier and imposes graduated obligations of conformity assessment, transparency, and human oversight rather than assigning legal personality to the system itself.¹⁶ This model illustrates a broader comparative trend: regulators are, for now, favouring ex ante compliance obligations on human operators over ex post personality-based liability for the machine.¹⁷

Technological Uncertainty: AI systems continue to evolve rapidly. Legal rules adopted today may become obsolete tomorrow, a concern that has led some scholars to favour flexible, principle-based regulation over rigid statutory categories.¹⁸

Insurance and Compensation: Future systems may require compulsory insurance schemes similar to motor vehicle insurance to ensure compensation for victims harmed by autonomous systems, decoupling the victim's right to compensation from the often-protracted question of who, precisely, was at fault.

¹³ European Parliament Resolution of 16 February 2017 with Recommendations to the Commission on Civil Law Rules on Robotics [2017] P8 TA (2017)0051.

¹⁴ European Commission, White Paper on Artificial Intelligence: A European Approach to Excellence and Trust COM (2020) 65 final.

¹⁵ Nathalie A Smuha, 'From a "Race to AI" to a "Race to AI Regulation": Regulatory Competition for Artificial Intelligence' (2021) 13 Law, Innovation and Technology 57.

¹⁶ Regulation (EU) 2024/1689 of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) [2024] OJ L, 2024/1689.

¹⁷ Woodrow Barfield and Ugo Pagallo (eds), Research Handbook on the Law of Artificial Intelligence (Edward Elgar Publishing 2018).

¹⁸ Frank Pasquale, New Laws of Robotics: Defending Human Expertise in the Age of AI (Harvard University Press 2020).

Core Regulatory Approaches: Three regulatory approaches currently dominate comparative discussion. First, civil liability in tort, under which victims seek compensation from the manufacturer for software or design defects, or from the owner for negligent maintenance or user error.¹⁹ Second, criminal liability, which remains largely unavailable because robots lack mens rea and cannot be deterred or punished in any conventional sense.²⁰ Third, global governance frameworks such as the EU AI Act, which enforce risk-based classifications requiring algorithmic audits, transparency, and human oversight before deployment.

THE INDIAN PERSPECTIVE

India currently does not recognise robots as legal persons. Liability for harm caused by AI systems would generally arise under the following framework:

- The Bharatiya Nyaya Sanhita 2023.²¹
- Consumer protection law, principally the Consumer Protection Act 2019.²²
- Product liability principles, including the product liability provisions introduced by the Consumer Protection Act 2019.
- Contract law, insofar as an autonomous system operates as a party's agent or tool in performing a contract.
- Tort law and, where digital conduct is involved, the Information Technology Act 2000.²³

As India increasingly adopts AI technologies in governance, healthcare, transportation, and commerce, policy attention has begun to turn to AI-specific governance. NITI Aayog's National Strategy for Artificial Intelligence identified accountability and safety as core principles for India's AI ecosystem,²⁴ and its subsequent two-part Responsible AI paper proposed an operationalisable governance framework addressing bias, transparency, and accountability for AI systems deployed in India.²⁵ Neither document, however, amounts to

¹⁹ Ugo Pagallo, *The Laws of Robots: Crimes, Contracts and Torts* (Springer 2013).

²⁰ Gabriel Hallevy, *When Robots Kill: Artificial Intelligence under Criminal Law* (Northeastern University Press 2013).

²¹ Bharatiya Nyaya Sanhita 2023.

²² Consumer Protection Act 2019 (India).

²³ Information Technology Act 2000 (India).

²⁴ NITI Aayog, *National Strategy for Artificial Intelligence #AIforAll* (Government of India, 2018).

²⁵ NITI Aayog, *Responsible AI for All: Adopting the AI Governance Framework* (Government of India, 2021).

binding legislation, and commentators have accordingly called for specialised statutory intervention addressing autonomous systems and AI accountability directly.²⁶²⁷

CONCLUSION

The question of whether robots can be held liable represents one of the most significant legal challenges of the twenty-first century. Existing legal systems assign responsibility to manufacturers, programmers, owners, and operators because robots remain tools rather than legal persons. However, increasing autonomy and the emergence of sophisticated AI systems have created a responsibility gap that traditional legal doctrines may struggle to address.

While proposals such as electronic personhood offer innovative solutions, significant conceptual, ethical, and practical obstacles remain. Robots currently lack consciousness, moral agency, and the capacity to understand legal obligations. Consequently, fully independent robot liability may be premature.

Future legal systems are likely to adopt a hybrid approach that combines enhanced manufacturer responsibility, mandatory insurance mechanisms, AI-specific regulations such as the EU AI Act, and limited forms of legal recognition for highly autonomous systems. Until then, human actors must remain the primary bearers of legal responsibility for the actions of robots they create, deploy, and control a conclusion that, in its own way, still circles back to the question Alan Turing posed at the dawn of the field: not whether machines can think, but what follows, legally, if one day they behave as though they can.²⁸

²⁶ Pavan Duggal, *Artificial Intelligence Law and Regulation in India* (Universal Law Publishing 2022).

²⁷ Talwant Singh, *Cyber Law and Information Technology* (Allahabad Law Agency 2023).

²⁸ Alan Turing, 'Computing Machinery and Intelligence' (1950) 59 *Mind* 433.