

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

Touria MANSOURI *

Djillali LIABES University, Sidi Bel Abbes, Algeria

mansouritouria1@gmail.com

Date of submission:08/05/2025 - Date of acceptance: 15/06/2025 - Date of publication: 29/07/2025

Abstract: Despite the numerous benefits of artificial intelligence, especially intelligent robots, their use may sometimes result in harmful consequences-particularly when they operate autonomously. This raises a key legal question: to what extent can these systems be held liable, given their lack of legal personality and the absence of clear legislative frameworks for civil or criminal responsibility. This paper explores the possibility of assigning legal accountability to intelligent robots by critically examining both the theoretical foundations and the practical mechanisms through which liability for damages caused by such systems might be established.

Keywords: civil liability; criminal liability; harm; digital transformation; intelligent robotics; legal personhood.

*Corresponding author: Touria MANSOURI

Introduction:

In recent years, the world has been undergoing a rapid digital transformation, particularly in the realms of information exchange and the advancement of cutting-edge scientific technologies. This transformation has profoundly influenced various aspects of life—economic, social, and legal. Among the most prominent of these modern innovations is artificial intelligence (AI), which is increasingly taking over tasks that were once thought to be the exclusive domain of humans. This shift is largely due to AI's capabilities, which often match or even surpass human performance in terms of precision, efficiency, and the near elimination of errors.

The applications of artificial intelligence now span a wide range of practical fields, including the development of autonomous vehicles, unmanned aerial drones, self-executing contracts known as “smart contracts,” and the integration of blockchain technology into financial transactions. Moreover, intelligent robots are playing increasingly significant roles in everyday life.

Nevertheless, these technological advances represent a double-edged sword. While the benefits they bring are undeniable, their potential adverse implications cannot be ignored. Intelligent robots, in particular, may cause harm to others due to their autonomous behavior, thereby raising complex legal questions regarding civil or criminal liability. This issue is further complicated by the fact that such robots lack legal personality, and there is currently no explicit legislative framework governing their accountability for harmful actions.

Research problem:

From this perspective, the significance of this study emerges. It seeks to address the evolving legal dilemma resulting from rapid digital transformation—especially regarding the possibility of subjecting intelligent robots to conventional rules of legal liability.

Sub-questions:

Accordingly, the central question guiding this study is:

To what extent are traditional legal liability rules sufficient to provide compensation for the damages caused by intelligent robots?

To address this central issue, the study has been structured into two main chapters:

Chapter One: Civil Liability in Light of the Development of Autonomous Intelligent Systems

Chapter Two: Criminal Liability in Light of Advances in Artificial Intelligence and Intelligent Robots

This research adopts an analytical methodology, focusing on examining and evaluating the extent to which the general rules governing civil and criminal liability can be applied to ensure compensation for damages resulting from the actions of intelligent robots.

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

Chapter One: Civil Liability in Light of the Development of Autonomous Intelligent Systems.

Technological developments in the field of intelligent robotics have progressed to the point where such systems are capable of replicating human behavior in various domains of daily life. Despite this advancement, these systems have not yet achieved the dependability and adaptability associated with human intelligence—particularly in responding to the complex and unpredictable nature of real-world interactions. As a result, intelligent robots may still commit errors that cause harm to others, which has provoked significant legal discourse regarding the appropriate attribution of liability for such incidents. These discussions have, in some instances, led to calls for the recognition of a distinct legal personality for intelligent robots.

It is essential to clarify that the proposal to grant intelligent robots a form of legal personality does not imply endowing them with full legal rights equivalent to those of natural or juridical persons. Rather, the aim is to establish a transparent and structured legal framework that enables the determination of liability and the identification of the party responsible for compensating victims of harm caused by robotic actions.

Accordingly, this chapter aims to critically examine the extent to which traditional rules of civil liability can be applied to intelligent robots in view of the novel legal and ethical challenges posed by their increasing autonomy and integration into society.

First Subtitle: The first requirement: The Taxonomical Framework of Civil Liability Related to Harmful Acts of Intelligent Robots.

In 2015, the Legal Affairs Committee of the European Union established a specialized working group tasked with examining the legal challenges emerging from the increasing use of robotics and artificial intelligence technologies across Europe, in response to the accelerated pace of technological advancement in these fields.¹ Upon concluding its mandate, the working group submitted a series of recommendations to the Committee, which subsequently led to the issuance of a foundational document in February 2017 entitled “Civil Law Rules on Robotics.” This document outlined an initial vision for a comprehensive legal framework aimed at regulating the deployment and functioning of such technologies within the Union.

Building on these initial efforts, the European Commission,² in 2020, released a White Paper on Artificial Intelligence: A European Approach to Excellence and Trust, which proposed strategic orientations to ensure the development and adoption of AI systems that uphold European values and fundamental rights. Concurrently, the European Parliament mandated its policy departments to conduct an in-depth economic and legal analysis of potential liability regimes suitable for addressing harm caused by emerging technologies. This initiative reflects a growing recognition of the necessity to reassess and potentially reform existing civil liability frameworks in light of the transformative impact of intelligent robotics on modern societies.³

Building upon this legislative context, this section seeks to examine and analyze the various classifications of civil liability based on their respective legal functions, with the aim

¹**The European Parliament**, Civil Law Rules on Robotics, P8_TA (2017) 0051, 16 February 2017.

²**Eleonora Rajneri**, European Legislative Proposals on Liability for Damages Caused by Artificial Intelligence: Seeking a Balance Between the Interests of Consumers, Multinationals, and SMEs, *International Journal of Comparative Law*, 2022/3, 74th year, P 629.

³ **Eleonora Rajneri**, *op. cit* p 630.

of assessing the extent to which these frameworks can be applied to cases involving harm caused by intelligent robots.

Subsection One: Contractual and Non-Contractual Liability of Intelligent Robots – An Analytical Study in Light of Obligation Rules.

Under the legal provisions governing contractual liability, the conclusion of a valid contract between two parties—meeting all essential elements and legal requirements—establishes reciprocal obligations. Should one party fail to fulfill their contractual obligations, the other party is entitled to suspend the performance of their own obligations and to seek compensation for any resulting harm. In such instances, the non-performing party (debtor) bears liability for the damages that were foreseeable, or could reasonably have been foreseen, at the time the contract was formed, as a probable consequence of their failure to fulfill the contractual obligation.⁴

Accordingly, it may be argued that in certain cases, the damage caused by intelligent robots may stem from a breach in the performance of a contractual obligation, particularly obligations related to the robot's design, manufacturing, or construction. Failure to adhere to the specific terms and conditions explicitly stipulated in the contract gives rise to contractual liability on the part of the breaching party. In such cases, the injured party—such as the purchaser—acquires the right to seek compensation for the harm sustained as a direct consequence of that breach.⁵

Nevertheless, irrespective of the contractual provisions governing compensation for damages resulting from robotic activity, the question of fault remains particularly contentious—especially when evaluating whether the use of the robot constituted the most appropriate and reasonable means of fulfilling the intended objective under the contractual obligation. The inherent complexities involved in establishing fault in cases of harm caused by intelligent robots suggest that fault-based liability may be inadequate in such contexts. As a result, faultless liability regimes—such as those based on presumed or strict liability—appear more appropriate for addressing legal responsibility related to these artificial agents. While the traditional liability frameworks for objects or defective products were originally crafted to govern relationships involving inanimate tools or simpler technologies, they may nonetheless provide a provisional legal foundation for addressing harm caused by intelligent robots in the absence of a dedicated legislative framework.⁶

Firstly: The Directive Proposal on Non-Contractual Civil Liability in the Field of Artificial Intelligence.

The directive proposal issued by the European Union on September 22, 2022, seeks to regulate non-contractual civil liability for damages arising from the use of artificial intelligence systems. The proposal introduces a set of targeted evidentiary rules applicable to providers and professional users of AI technologies, with the aim of facilitating the attribution of liability in

⁴ محمد منصور، أحكام عقد البيع التقليدية والإلكترونية والدولية، دار الفكر العربي، القاهرة، 2006، ص 234 .

⁵ محمد البكري، موسوعة الفقه والقضاء والتشريع في القانوني المدني الجديد، المجلد الرابع، دار محمود للشر والتوزيع، القاهرة، 2019، ص 426.

⁶ محمد أحمد المعداوي، عبد ربه مجاهد، المسؤولية المدنية عن الروبوتات ذات الذكاء الاصطناعي - دراسة مقارنة - المجلة القانونية (مجلة متخصصة في الدراسات والبحوث القانونية)، المجلد 09، العدد 02، 2021، ص 219 .

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

cases where harm results from the operation or malfunction of such systems^{*}, Rather than establishing a comprehensive and autonomous legal framework, the directive is designed to complement existing national fault-based liability systems. Notably, the directive does not offer a precise definition of artificial intelligence systems; instead, it refers to the forthcoming European Union Artificial Intelligence Regulation, which remains under negotiation among EU institutions. For instance, certain AI applications such as medical robots may be classified as high-risk systems, thereby falling under a constellation of regulatory instruments—including the General Product Safety Regulation. Importantly, the implementation of this directive is contingent upon institutional consensus regarding the final content of the AI Regulation.

Collectively, these legislative instruments are expected to enhance the protection of affected individuals by introducing preventive obligations and easing the evidentiary burden on claimants when seeking to establish the liability of AI developers and professional users.⁷

Secondly: The Robot or Intelligent Machine – Towards an Independent Legal Framework

As intelligent machines acquire greater levels of autonomy, traditional legal frameworks become increasingly inadequate in addressing their unique characteristics. As previously noted, such machines—due to their capacity for self-modification and learning—can no longer be regarded merely as "objects" within the conventional legal understanding. They are neither guardians nor animals, given their lack of consciousness and sensory experience. Furthermore, the application of product liability principles proves insufficient in capturing their essence, and despite their ability to sometimes surpass human performance, they cannot be recognized as legal subjects based solely on the absence of originality in their outputs—an argument that is increasingly viewed as conceptually flawed.

Some legal scholars have even gone so far as to question the applicability of contract liability regimes to intelligent machines, despite observable behaviors that resemble consent and intention. This opens the door to a more foundational legal discussion: whether such entities should be granted a distinct legal personality.

Accordingly, the idea of assigning them a special legal status has gained traction, with proposals emerging to introduce the concept of a "robot person" as a novel category within legal doctrine.⁸

A. The Robot Person within the Legal Framework:

Under current legal systems, general legal personality is attributed to natural persons, while specific legal personality is assigned to legal entities such as corporations and associations. It has been proposed that a novel category of legal personality—termed the "robot person"—be introduced for intelligent robots. In 2017, the European Parliament issued

* **"Provider"**: A natural or legal person, or a public authority, who develops an artificial intelligence system for the purpose of placing it on the market or putting it into service, whether for remuneration or free of charge.

"User": Any person who uses an artificial intelligence system for professional purposes and under their own authority; this does not include personal or non-professional use.

⁷ **Juliette Sénéchal**, What Liability for the Use of AI in Robot Operation? Robotics and Health, Journal of Health and Health Insurance Law (JDSAM), 2023/3 No. 38, p 74.

⁸ **Alain Bensoussan and Léa Puigmal**, The Law of Robots? What Decision-Making Autonomy Does a Machine Have? What Protection Does It Deserve? Archives of Philosophy of Law, 2017/1, Volume 59, DALLOZ, 2017., p 170-172-173.

recommendations advocating for the creation of a civil legal framework that would grant advanced robots an “electronic personality,” recognizing them as entities capable of autonomous decision-making. This initiative marks a pioneering step toward establishing a comprehensive and structured legal regime for robotics within the European Union.

B. Key Aspects of the European Decision:

The European Parliament’s decision addresses several critical dimensions, including:

1. The adoption of a unified definition across the European Union for various forms of intelligent and autonomous robots;
2. The development of a centralized registration system for robots at the EU level, aimed at enhancing traceability and accountability within the internal market;
3. The establishment of a dedicated European agency focused on robotics and artificial intelligence, responsible for overseeing policy development and regulatory coordination in this rapidly evolving domain.
4. The adoption of a dedicated ethical charter for robots is proposed as a foundational behavioral framework to guide both developers and end-users.
5. This charter would establish clear principles for responsible design, deployment, and interaction with intelligent machines.
6. The establishment of specialized ethics committees and the formulation of comprehensive codes of conduct applicable to engineers, developers, and users alike, ensuring accountability and adherence to ethical standards throughout the lifecycle of robotic systems.⁹

Third: Elements of Contractual Liability

Liability in the context of intelligent machines is closely intertwined with the concept of "robot tracking." These entities have evolved beyond the classification of mere objects and, while not human, have become genuinely autonomous systems. As such, traditional notions of privacy and anonymity are not applicable to them. Instead, a robust system of identification and traceability is essential to ascertain liability in the event of harm or damage resulting from their actions.

➤ Contractual Fault :

Contractual fault refers to a party's failure to fulfill the obligations arising from a binding contractual relationship. In scenarios where a robot—particularly one utilizing self-learning or adaptive programming—causes harm to another party, the manufacturer may be held contractually liable, assuming a contractual relationship exists with the injured party. This form of liability is grounded in the breach of specific duties outlined in the contractual agreement. In support of this principle, the Algerian legislator has enshrined the notion of contractual liability in Article 124 of Ordinance No. 10/05, which forms part of the Civil Code, affirming responsibility in instances of non-compliance with contractual obligations.

⁹ Alain Bensoussan et Léa Puigmal, op, cit, p174.

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

Damage :

In legal terms, damage refers to the injury or harm suffered by an individual, either in their legally protected rights or legitimate interests. It constitutes a fundamental element of civil liability. A mere occurrence of fault is insufficient to establish liability; the presence of actual, demonstrable harm resulting directly from the fault is essential for any legal remedy to be considered valid.

➤ Causal Relationship :

The determination of causality in civil liability often relies on the "equivalence of conditions" theory. This principle holds that all contributing factors to the occurrence of damage are treated as having equal legal weight, given that the absence of any single factor would have prevented the harmful outcome. However, despite its logical rigor, this theory—originating from the natural sciences—is not entirely congruent with the methodological limitations of the legal field. The impossibility of reproducing legal scenarios or isolating variables with empirical precision makes its application within the human sciences problematic and subject to interpretative limitations.¹⁰

However, under the general principles established by the Civil Code, the existence of a causal relationship constitutes a fundamental prerequisite for the recognition of any form of liability. The mere presence of fault and resultant damage does not suffice on its own; it must also be demonstrated that the fault was the direct and effective cause of the damage incurred. In such cases, the burden of proof rests with the creditor, who must establish a clear and convincing link between the wrongful act and the harm suffered. Conversely, the debtor holds the right—and bears the responsibility—to refute this connection in order to be absolved of liability.¹¹

Subsection Two: Tort Liability for Damages Caused by Intelligent Robots.

Tort liability is invoked when a legally imposed obligation is breached in the absence of a pre-existing contractual relationship between the injuring party and the injured party. This form of liability represents the foundational framework for civil responsibility and applies to acts that cause harm—whether through affirmative misconduct or unlawful omission. In the context of intelligent robots, tort liability becomes particularly relevant when their autonomous actions result in damage to individuals or property. Once the essential elements of fault, damage, and causation are established, the responsible party is legally bound to provide full compensation for the harm inflicted.¹²

To secure compensation under the tort liability regime, the injured party must demonstrate the existence of fault, actual damage, and a causal connection between them. This principle extends to individuals responsible for harm resulting from the use of artificial intelligence. For example, if a physician relies on a robot-assisted clinical decision support

¹⁰ R.O. Dalq, Remarks on Civil Liability, *Interdisciplinary Journal of Legal Studies*, 1989/1, Volume 22. Human decisions are influenced by immeasurable factors such as intent, experience, and psychological conditions, which place the burden of assessment on the judge in a subjective and non-replicable manner. Therefore, some legal scholars advocate for establishing the concept of legal causation on statistical and behavioral rules derived from the social sciences, rather than on precise scientific measurement.

¹¹ محمد أحمد المعداوي عبد ربه مجاهد، المرجع السابق، ص 220.

¹² نبيل سعد، النظرية العامة للإلتزام - مصادر الإلتزام - دار الجامعة الجديدة، الإسكندرية، د س ن، ص 374 .

system to prescribe medication,¹³ and the system issues an incorrect recommendation—one that a competent physician could reasonably have identified and rejected under similar circumstances—the physician may be held liable for the resultant harm. In such a case, liability would not stem from the erroneous recommendation generated by the intelligent robot, but rather from the physician's failure to exercise due professional judgment.

The application of tort liability to intelligent robots, however, introduces profound legal complexities, given the evolving and intricate nature of such entities. In tort proceedings, courts are traditionally tasked with identifying a natural or legal person to whom responsibility for a harmful act may be attributed. As AI systems become increasingly autonomous, determining a liable actor becomes significantly more challenging—sometimes to the point of practical impossibility. This dilemma underscores the growing inadequacy of existing legal frameworks and highlights the pressing need to reassess and adapt traditional liability doctrines.

Article 1242 of the French Civil Code, as modified by Decree No. 131 of 2016, provides that a person may be held liable not only for damage caused by their own actions, but also for harm resulting from the acts of persons or objects under their care or supervision. Based on this provision, some legal theorists have proposed that liability for the custody of objects could offer a viable foundation for attributing responsibility in cases involving intelligent robots. However, this approach hinges on the existence of actual authority over the object in question, encompassing its use, oversight, and operational control. These criteria become increasingly difficult to satisfy as intelligent robots evolve greater levels of autonomy and independent decision-making, thereby undermining the applicability of custody-based liability within conventional legal paradigms.¹⁴

It is important to recognize that attributing liability to the custodian for damages caused by intelligent robots remains a contentious issue. Imposing such responsibility for significant errors that originate during the design, programming, and development phases of these systems is, in practical terms, highly implausible. This is primarily due to the fact that intelligent robots are largely composed of intangible software components, which are inherently difficult to monitor or subject to direct human oversight. The intangible and autonomous nature of these systems complicates efforts to determine the actual party responsible when harm arises.

Consequently, the traditional legal notion of the "custodian" becomes increasingly inadequate and ineffective in the context of artificial intelligence. This evolving reality necessitates a fundamental re-evaluation of classical liability doctrines to ensure their compatibility with emerging technological paradigms.¹⁵

Subsection Three: Fault and Strict Liability.

The doctrine of strict liability—holding individuals or entities accountable in the absence of proven fault—has long been established in legal systems and has evolved to encompass a broader range of applications. Its primary function is to ensure that victims receive compensation for harm, particularly in cases involving repeated damage or inherently

¹³ محمد عبد الرزاق ، وهبه سيد أحمد، المسؤولية المدنية عن أضرار الذكاء الاصطناعي - دراسة تحليلية - مجلة جيل الأبحاث القانونية المعمقة،

مركز جيل البحث العلمي، العدد 43 ، أكتوبر 2020، ص ص 22 - 23

¹⁴ محمد عبد الرزاق، وهبه سيد أحمد، المرجع السابق، ص 26.

¹⁵ محمد عبد الرزاق، وهبه سيد أحمد، المرجع نفسه، ص 26.

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

hazardous activities, without the necessity of demonstrating negligence or intentional misconduct. Legislators have employed this framework as a means of reinforcing protections for affected parties. Common domains where strict liability applies include industrial accidents, harm caused by objects or equipment, nuclear operations, and the handling of dangerous substances. While the legal structure removes the requirement to establish fault, moral and ethical considerations often persist, and in certain contexts, this liability may coexist with criminal responsibility.¹⁶

The European Directive 85/374/EEC introduces a product liability regime grounded in the concept of strict liability, particularly concerning damage resulting from defective products. Under this directive, joint liability is recognized in instances where multiple entities—such as manufacturers, suppliers, or importers—are implicated in the same harm. Consequently, the directive provides a comprehensive legal structure governing extra-contractual civil liability, enabling injured parties to seek compensation by merely establishing the presence of a defect and its causal relationship to the harm incurred. Notably, it does not require proof of negligence or misconduct by the producer. This legal orientation is mirrored in Egyptian legislation, specifically Article 28 of Law No. 181 of 2018 on Consumer Protection.

The Egyptian statute adopts a similar strict liability model aimed at safeguarding consumer rights. It emphasizes the link between the harm and the product defect, dispensing with the necessity to demonstrate a breach of duty or fault by the responsible party.¹⁷

The application of defective product liability offers a robust legal framework for addressing risks associated with intelligent robotics.¹⁸ This framework enables manufacturers to be held liable for damages arising from their products, particularly when defects in design, production, or warnings pose risks to individuals or property. For instance, if a self-driving vehicle contains a manufacturing or design defect that endangers public safety, or if the producer fails to adequately inform users of potential hazards, liability is attributed to the manufacturer under the principles of strict liability.

This legal model alleviates the burden on the injured party by eliminating the need to prove fault, requiring only the demonstration of a defect and a causal connection to the harm suffered. In doing so, it provides a critical mechanism for legal protection amid the evolving challenges presented by artificial intelligence technologies.¹⁹

Nonetheless, the application of product liability principles to intelligent robotic systems presents a range of complex challenges. These technologies are inherently associated with operational risks, often functioning as potential sources of public hazard due to their advanced and interactive nature. A key difficulty lies in the autonomous characteristics of artificial intelligence, particularly the self-learning capabilities that allow such systems to adapt and evolve over time based on accumulated experience. This dynamic and independent decision-making process complicates the straightforward application of conventional strict liability

¹⁶ R.O Dalcq, po, cit, p 51.

¹⁷ القانون رقم 181، المتعلق بقانون حماية المستهلك المصري، الصادر بتاريخ 13 سبتمبر 2018، الجريدة الرسمية، العدد رقم 48.

¹⁸ Y. Benhamou, et al, Artificial Intelligence & Damages: Assessing Liability and Calculating the Damages, submitted as a book chapter in: Leading Legal Disruption: Artificial Intelligence and a Toolkit for Lawyers and the Law, edited by P. D'Agostino, et al., 2020. p. 07.

¹⁹ محمد عبد الرزاق، وهبه سيد أحمد، المرجع السابق، ص 28.

models, which are traditionally predicated on static product behavior and predictable outcomes.²⁰

Second Subtitle: Legal Implications of Imposing Civil Liability for Damages Attributed to Intelligent Robotic Systems.

This research paper explores the relationship between the foundation of civil liability and the scope of compensation awarded for damages, arguing that there is no intrinsic or necessary correlation between them. It underscores that full compensation remains the prevailing legal standard, irrespective of whether fault is established. Nonetheless, the principle of contributory negligence may lead to shared liability when the injured party has played a role in causing the harm.

The study further examines the influence of insurance mechanisms on the rationale for punitive damages, noting significant divergence in legal treatment between jurisdictions, particularly in the cases of Belgium and France. The paper concludes by warning against premature legislative action, which may impede the organic evolution of jurisprudence through judicial precedent.*

Compensation for damages resulting from intelligent robotic systems represents the subsequent phase following the establishment of civil liability. As with any injured party, individuals harmed by artificial intelligence technologies are entitled to seek redress and to access judicial mechanisms for the protection of their rights and interests. Accordingly, this section will examine the legal implications arising from the application of civil liability in the context of damages caused by intelligent robots, through analysis of the following key points:

Subsection One: Judicial Compensation

Judicial compensation refers to the compensation awarded by the judiciary to a person who has suffered harm or is under threat of harm. This means that compensation is subject to the discretionary power of the judge, who assesses the amount of compensation based on the severity of the fault and the damage incurred by the injured party. This principle is evident in the text of Article 182 of Ordinance No. 05/10²¹.

The compensation or reparation of damage is carried out in accordance with the general rules stipulated in the Civil Code, either through specific restitution, which aims to eliminate

²⁰ محمد عبد الرزاق، وهبة سيد أحمد، المرجع نفسه، ص 28.

* the countries that offer the most generous compensation for damages. This tendency may be attributed to several factors: a legal culture that places significant emphasis on issues of harm and reparation; the presence of lawyers who operate independently of insurance companies and actively advocate on behalf of victims; and a judiciary that is responsive to the arguments presented by both parties. These three elements are particularly noteworthy given their relatively limited presence in the French context. In contrast, French legal thought has historically paid less attention to compensation-related concerns. Lawyers in France are generally less inclined to challenge conventional practices established by insurance companies. Moreover, French courts—partly due to the absence of a guiding role by the Cour de Cassation in this specific domain—are often not required to provide detailed reasoning for their rulings. It is frequently deemed sufficient for a judgment to state, for example, “the total damages are estimated at such an amount,” without elaboration.

²¹ المادة 182 من الأمر رقم 10/05، المؤرخ في 10 يوليو 2005، المعلق بالقانون المدني الجزائري، المعدل والمتمم .

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

the damage at its root by removing its source or cause, or through monetary compensation, which is awarded to the injured party in order to alleviate the impact of the damage suffered.**

Accordingly, the application of the principle of compensation for material damages caused by intelligent robots becomes possible whenever such damages result from defects in their operation, thereby justifying their attribution to the manufacturer.²² Damages may also arise from modifications in components or inadequate maintenance, which are situations whose effects can be assessed and financially compensated in accordance with the provisions of civil liability law.

Subsection tow: Automatic Compensation.

There is no doubt that automatic compensation may occur either through insurance or through compensation funds, which we shall briefly outline as follows:

Firstly: Compensation through Insurance Insurance companies are concerned with pooling a large number of risks in accordance with statistical laws and conducting scientific offsetting among them. This enables them to cover risks when they materialize, based on the premiums paid by the insured parties. The role of insurance is not limited to compensating for damage alone; rather, it serves as a precautionary mechanism to address potential future incidents, even if they do not result in direct harm. A robot insurance policy offers financial protection against material damage and bodily injuries arising from related accidents. The coverage includes medical expenses and compensation for affected parties, including moral damages.²³

This type of insurance is considered an effective tool for addressing the risks arising from the proliferation of intelligent robots. Insurance companies are actively working on designing specialized coverage, particularly in applied sectors such as automotive technologies. Consequently, insurance companies face highly complex challenges in assessing the risks associated with the production, use, and widespread deployment of robots in their various forms and types. The novelty and complexity of robots make it extremely difficult to determine the potential losses they may cause, due to the diversity of these risks and the difficulty in predicting them.

Secondly: Compensation through Compensation Funds According to the resolution issued by the European Parliament on February 16, 2017, compensation funds are considered a mechanism to ensure that victims receive compensation in cases where insurance coverage is

** Compensation is generally classified into two main categories: monetary compensation and non-monetary compensation. Monetary compensation involves awarding the injured party a specific sum of money to address the damage suffered. In contrast, non-monetary compensation refers to the obligation imposed on the liable party to perform a specific act or provide a form of reparation other than financial payment.

²²Directive, particularly with respect to the embedded software they contain. However, the classification of software within the Directive remains a subject of legal debate, largely due to the absence of definitive judicial rulings, despite earlier official support for such inclusion. In the field of medical robotics, software is typically considered an integral, physical component of the product, which facilitates its subjection to the defective product liability regime. An exception exists for standalone software applications, such as diagnostic support tools, which may fall outside the Directive's framework. Recent legislative proposals have addressed this ambiguity by explicitly including software, artificial intelligence systems, and associated digital services within the definition of a product, thereby clarifying their legal status for liability purposes. **to see, Delphine Cocteau-Senn**, Liability for Defective Products, *Journal of Health and Health Insurance Law (JDSAM)*, 2023/3 No. 38, The Institute for Law and Health, University of Paris Cité., p 76.

²³**H. Samani**, *Cognitive robotics*. Boca Raton: CRC Press, Taylor & Francis Group, 2016, p. 17.

not available. These funds serve as a last resort, particularly for individuals who own robots but do not possess an insurance policy.²⁴ This approach aligns with the principles of tort liability, which require the presence of a party responsible for bearing the cost of compensation. Accordingly, the primary purpose of establishing compensation funds is to provide an effective mechanism for compensating victims when other legal or insurance-based means fail to do so.

It is worth noting that in cases where compensation funds are established without the existence of a mandatory insurance system, these funds would be obligated to cover all damages caused by robots. This could result in the depletion of their resources and potential bankruptcy, due to the sheer scale of the compensations required.²⁵

Nevertheless, these funds can play a significant role in addressing the risks associated with artificial intelligence systems, particularly in cases where insurance coverage does not offer comprehensive protection. This makes them a supportive mechanism for promoting justice and ensuring compensation for affected individuals in the absence or inadequacy of other means.²⁶

Compensation Funds Have Several Advantages, Including:

1. They complement mandatory third-party insurance.
2. They shield society from the alarming consequences of robots.

They relieve injured parties from the burden of proof required to obtain compensation.

Chapter Two: Criminal Liability in Light of the Development of Artificial Intelligence.

Technologies and Intelligent Robots Criminal legislation aims to limit criminal behavior by establishing legal rules intended to achieve specific deterrence for the offender and general deterrence for the rest of society. This forms the essence of modern criminal policy. However, this traditional principle may undergo a shift in the face of the rapid advancement of artificial intelligence technologies, which are now being used in sensitive domains such as self-driving vehicles, medical robots that perform precise surgical procedures, and industrial and domestic robots.

As these applications expand, the risk emerges of intelligent robots committing acts that could be classified as crimes—such as homicide, bodily harm, vehicular assault, or even fraud. This raises new legal challenges that demand legislative intervention. Accordingly, this section seeks to examine the extent to which criminal liability can be attributed for criminal acts committed by intelligent robots, through the following discussion:

²⁴ محمد عبد الرزاق ، وهبه سيد أحمد، المرجع السابق ، ص 34 .

²⁵ سعيد قنديل، آليات التعويض الأضرار البيئية دراسة في ضوء الأنظمة القانونية والاتفاقيات الدولية، دار الجامعة الجديدة، الإسكندرية، 2004، ص 105 .

²⁶ محسن البيه، المسؤولية البيئية عن الأضرار البيئية، مكتبة الجلاء، المنصورة، 2002، ص ص 151 - 152 .

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

First Subtitle: Foundations for Criminalizing Behaviors Committed by Intelligent Robots.

Artificial intelligence crimes represent one of the most significant future challenges in criminal law, and some of these crimes have already begun to emerge due to the accelerating pace of technological development. Advanced programming has endowed intelligent machines with high-level capabilities, enabling them to make autonomous decisions in a manner resembling human behavior.

Subsection One: Challenges of Criminal Liability in Robotic Offenses.

This new reality presents complex dilemmas for the legal system, as traditional criminal statutes are no longer adequate to address such phenomena.

Crucial questions arise—particularly in cases where a robot commits a crime such as murder:

❖ How will the investigation be conducted? Can a robot be interrogated or searched? Can its “fingerprints” be taken and analyzed like those of a human? What about the two essential elements of a crime: the material and moral components? Can criminal intent be attributed to the robot, or should liability be assigned to its programmer or operator?

All of these questions point to a clear legislative void that necessitates a profound reexamination of the legal framework, which was originally designed to regulate human behavior, not that of machines.²⁷

Subsection Two: Legislative Reform and the Emergence of Electronic Legal Personality.

Legal practices and studies have shown that current regulations are insufficient, necessitating the enactment of new legislation that would allow for holding machines partially or fully accountable for their actions or omissions. According to the prevailing European approach, the existing rules apply only when the act or omission of a robot can be attributed to a specific human party. This party—such as the manufacturer or the user—is presumed to have the ability to foresee the harmful behavior and take steps to prevent it.²⁸

Among other important aspects, experts urge the European Commission—when conducting an impact assessment of its forthcoming legislative instrument—to explore the implications of all legal solutions concerning artificial intelligence entities (robots). Chief among these are:²⁹

²⁷ يحيى إبراهيم دهشان، المسؤولية الجنائية عن جرائم الذكاء الاصطناعي، مجلة الشريعة والقانون، كلية الحقوق، جامعة الإمارات، عدد 30، 2019/06، 2019، ص 15.

²⁸ بن عودة حسكر مراد، إشكالية تطبيق أحكام المسؤولية الجنائية على جرائم الذكاء الاصطناعي، مجلة الحقوق والعلوم الإنسانية، جامعة زيان عاشور، الجلفة، المجلد 05، العدد 01، لسنة 2022، ص 196.

²⁹ بن عودة حسكر مراد، المرجع السابق، ص 196.

- The establishment of a specific legal status for robots, particularly to recognize that the most advanced autonomous robots may possess, at minimum, a form of legal identity—namely, the status of "electronic persons" endowed with rights and responsibilities.

- The application of electronic personality to cases where robots make autonomous decisions or otherwise interact independently with third parties.

Second Subtitle: The Challenges of Attributing Criminal Responsibility to Intelligent Robots Responsibility.

Is defined as the obligation of a competent individual to bear the consequences of their unlawful actions, provided that they possess sufficient cognitive capacity for awareness and discernment, and are able to direct their will toward the choices they make.³⁰

It is undisputed in criminal jurisprudence that one of the firmly established principles is: "There is no crime and no punishment except by virtue of a legal provision." Since current legislation contains no explicit provision criminalizing or punishing the actions of artificial intelligence machines, the imposition of criminal penalties on such machines is, from a legal standpoint, not feasible.

Subsection One: Civil Liability and Legal Attribution in AI-Induced Harm.

Accordingly, and because artificial intelligence machines are not subject to criminal responsibility under the provisions of the Penal Code, liability for criminal acts they may commit is confined to the civil domain—specifically in the form of compensation for damages resulting from such acts. An illustrative example is the crime committed by a self-driving car owned by UBER in March 2018, when it struck a woman, leading to her death due to severe injuries. Given that artificial intelligence machines do not possess independent legal personality or financial liability, the question arises as to which party should bear responsibility for these actions: Is it the manufacturer? The owner of the machine? Or the individual who controls or operates it in practice?

To answer this question, we must refer back to our earlier discussion—that artificial intelligence machines have the capacity to act and make decisions, yet they may commit errors resulting in actions that are legally criminalized. If such actions cause harm to the victim or others, this harm necessitates compensation, even if the act occurred without any direct human intervention. This is in accordance with Article 138/2 of Ordinance No. 05/10 of the Algerian Civil Code, which holds a person liable for damage caused by objects under their custody.³¹

Subsection tow: Fault-Based Criminal Responsibility in AI-Related Offenses.

However, if the error stems from a defect in the programming of the artificial intelligence machine, responsibility lies with the programmer. If it is proven that the programmer intentionally designed the software in a way that enables the machine to commit a criminal act, then the programmer bears criminal liability as a principal offender. In such a case, liability is

³⁰ عبد الله محمد الحكيم ، المسؤولية الجنائية لآلات الذكاء الاصطناعية (الروبوت) ، مجلة قضايا التطرف والجماعات المسلحة، المجلد الثالث، العدد الثامن، أغسطس 2022، ص 150 .

³¹ تنص المادة 138 / 02 على أنه "يعفى من المسؤولية الحارس الشيء إذا ثبت أن ذلك الضرر حدث بسبب لم يكن يتوقعه، مثل غل الضحية، عمل الغير، أو الحالة الطارئة أو القوة القاهرة".

The Legal Accountability of Intelligent Robots: Between Criminal and Civil Liability

established on the basis of intent and deliberation, rather than mere negligence or technical error.³²

Similarly, if the criminal act committed by intelligent robots results from a virus that was deliberately implanted by an individual into the artificial intelligence system, that individual is deemed legally responsible for the criminal act carried out by the machine.³³

This is legally analogous to a person who sends electronic commands to an automated weapon to commit a murder against an innocent human being; in such a case, liability falls upon the individual who remotely activated the machine, even if they did not physically touch it. However, in situations where intelligent robots commit a criminal act based on the “autonomous will” of the system itself—without any direct or indirect human intervention, without programming errors, malicious viruses, or evident negligence—we lean toward the opinion that neither the manufacturer nor the owner should be held liable. This is because the resulting harm was not caused by any personal fault attributable to either party, and the elements of tortious liability are not established against them, in accordance with the general principles of civil law.

Conclusion:

In conclusion, it can be asserted that the issue of invoking both criminal and civil liability for the damages caused by intelligent robots represents a novel and thought-provoking area of legal inquiry. This matter is of significant importance in light of the rapid advancements in artificial intelligence technologies. It is no longer possible to overlook the legal challenges posed by such technologies—particularly regarding the identification of the party liable when criminal acts are committed or harm is caused to others. Therefore, shedding light on this issue and conducting an in-depth analysis is both a legislative and legal necessity, calling for a revision of the existing legal frameworks and the proposal of appropriate mechanisms to ensure a balance between the protection of rights and technological progress.

This study has culminated in a set of findings that can be summarized as follows:

- Civil liability arising from the damages caused by intelligent robots takes two primary forms: contractual liability and tortious liability, depending on the nature of the conduct committed by these intelligent systems.
- Contractual liability arises when one of the parties to a contractual relationship fails to fulfill the obligations stipulated in the contract, whether the breach is partial or total. On the other hand, tortious liability is based on the fulfillment of three essential elements: fault, damage, and a causal link.
- Establishing these elements in the context of intelligent robots poses substantial practical and legal challenges, due to the complexity of the systems' decision-making

³² عبد الله محمد الحكيم، المرجع السابق، ص 151 .

³³ بن طرية محمد، بن قادة شهيدة، أضرار الروبوتات وتقنيات الذكاء الاصطناعي تحدي جديد لمسؤولية المدنية الحالي لمحات في بعض مستحدثات القانون المقارن، بحث منشور في حوليات جامعة الجزائر عدد خاص، الملتقى الدولي للذكاء الاصطناعي المنعقد يومي 08/27 نوفمبر 2018، ص

processes and the degree of autonomy some of them exhibit from direct human intervention.

- Once civil liability is established, the victim must be compensated—whether in kind, by restoring the situation to its original state, or through financial compensation determined according to the severity of the harm suffered by the injured party, and not merely the nature of the act itself.
- The issue extends beyond harmful acts requiring civil compensation, as intelligent robots may also commit acts classified as crimes under the law. However, the problem lies in the fact that these systems do not possess independent legal personality or financial capacity, making it legally impossible to impose direct financial liability on them.

Based on these findings, a set of important recommendations can be proposed to keep pace with technological development and to achieve a balance between innovation and the protection of rights. These include:

- The necessity of enacting special legal provisions that recognize partial legal personality for intelligent robots, allowing certain types of liability to be attributed to them.
- Reformulating general provisions of civil liability to align with the challenges posed by artificial intelligence and automated systems.
- Mandating compulsory insurance against civil liability for damages caused by the use of intelligent robots.
- Establishing a legal framework to protect victims of criminal acts committed by robots and to guarantee their right to fair compensation.
- Creating national or international compensation funds dedicated to covering the losses of individuals harmed by acts committed by AI systems—especially in cases where identifying a direct liable party is not possible.