LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374 E-ISSN:1855-363X VOL. 23, NO.11(2025)

Criminal Responsibility for Artificial Intelligence Crimes

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Submitted: 14.09.2025. Accepted: 15.11.2025. Published:02.02.2026

ABSTRACT

Artificial intelligence is a substance of the Fourth Industrial Revolution, fetching undeniable positive outcomes on our lives and a plethora of conveniences. Despite its advantages, it also has repercussions and risks, as robots may likely commit crimes. While they serve humanity, they can also harm individuals. This study tends to depict the issues affiliated with artificial intelligence, focusing on criminal matters and determining the components of criminal responsibility. It attempts to apply general legal principles to intelligent systems, adapting them to the unique nature of these technologies that have become integral to our reality.

Keywords: Artificial Intelligence - Crime - Responsibility - Robot - Criminal Faul

Introduction:

In the past, criminal jurisprudence highlighted he stance of establishing legal frameworks to regulate cybercrime. Today, we affront a new type of crime, blending algorithms and computer science, resulting in what is exhibited as the robot or machine-man.

This invention serves humanity across all life scopes, such as healthcare, education, and marketing. However, artificial intelligence as a product of the Fourth Industrial Revolution does not solely serve humanity. On the one hand, it aids humanity, while at others, it can lead to criminal outcomes that harm individuals' interests. This reality has prompted criminal jurisprudence to spot out criminal responsibility for artificial intelligence crimes, majorly in countries that adopt these systems.

Therefore, artificial intelligence is no longer science fiction but a reality that requires arrangement to frame the rules of criminal responsibility for the criminal errors of robots or "machine-man" in any sphere, whether industrial, commercial, medical, or military. This stance is especially pertinent with the rise of algorithmic crimes following the deployment of these systems in all realms, both public and private. [1]

The "machine-man" or robot is one application of artificial intelligence, namely called "machine-man" because its structure resembles that of a human, with two legs and arms. Furthermore, robots or machine-man devices are now equipped with sensory skin similar to human skin. Some legal scholars refer to it simply as a robot. Besides, it is deemed essentially as a machine. This term is adopted by the French legislature, as we rely on it as it is a legislative term. [2]

Based on the aforementioned notions, this study aims to highlight the foundations upon which the policy of criminalization and punishment for intelligent systems' crimes is based. It seeks legal alternatives to adopt a prevailing framework of criminal responsibility against AI-related crimes.

The core issue of the study revolves around the following questions: Who is criminally responsible for AI-related crimes, and what are the components of this responsibility?

To address this issue, we will rely on both the analytical and descriptive methods, following an approach that probes into the aspirations of criminalization policy as well as the policy of punishment.

1.The Issue of Determining Criminal Responsibility for AI Crimes

The adoption of intelligent systems raises a plethora of practical questions with concern to criminal responsibility. Criminal error is depicted as a technical aspect. In this vein, the outcome may be the result of the machine-man's actions based on human error or may occur independently of human intervention. This requires an initial probe of the flaws that might lead robots to commit crimes, as well as the issues affiliated to the robot's error and its criminal category.

[1] .Said Tantawi Mohammed, Crimes of Artificial Intelligence, article published in the Journal of Law and Political Science, Democratic Center Berlin, Germany, 2020, p. 29.

[2]. Resolution of the European Parliament of February 16, 2017, containing recommendations to the commission regarding civil law rules on robotics.

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The study centers on criminal error as a foundation for criminal responsibility. In stances of civil responsibility[3] , however, one can consider civil errors arising from the use of algorithms, which serve as grounds for civil liability. This does not raise practical issues, as one can refer to the general rules stipulated in the civil code of the country that adopts these systems. [4]

There are variegated defects that might affect robots, potentially leading them to commit crimes. This sphere entails issues assigned with failure to provide sufficient warnings, manufacturing errors, and design flaws. **Thus, who is criminally responsible for the errors committed by robots? Is it the user, the programmer, or the manufacturer of the "machine-man"? This will be delineated as follows:**

1.1 Responsibility for Failure to Warn of Robot Risks

The use of intelligent machines may lead to risks owing to hidden defects within the robot, which requires the manufacturer to alert warning at averse of such dangers. If the manufacturer neglects this obligation in that, they are held liable for any resulting damages. This stance

applies to self-driving cars, drones, autonomous ships, lethal autonomous weapons, as well as medical, industrial, or military robots. [5]

1.2 Responsibility for Manufacturing Defects in Robots

An artificial intelligence product is deemed defective if it is manufactured without adhering to compliance standards or ensuring adequate care during the production process. Manufacturing defects may encompass issues within the robot's components, structure, or programming, where the intelligent product does not meet manufacturing specifications.

Therefore, if it is established that the harm caused by the machine-man originates from a failure in the standards of robot production or manufacturing, then the manufacturer or producer is undoubtedly held responsible. An illustration that would be proving a defect in the sensor system. [6] This stance applies to damage caused by intelligent transportation systems

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[3] Annabelle Baudry Merly, Civil Liability – An Aspect of Medical Liability, Western Legal Review, 1999, p. 15.

[4] The Adoption of General Civil Liability Rules on the civil fault committed by a robot or even humans do not pose a problem, unlike criminal fault, where 1. Said Tantawi Mohammed, Crimes of Artificial Intelligence, article published in the Journal of Law and Political Science, Democratic Center Berlin, Germany, 2020, p. 29.

adherence to the principle of legality of criminalization and punishment applies. That is, there is no crime, no punishment, and no security measure except by law, as stipulated by the Algerian legislator in Article 1 of the Penal Code. For more details, refer to Ordinance No. 66/156, dated June 8, 1966, concerning the Penal Code, as amended and supplemented

[5] Majdoub Nawal, Issues in the Application of Artificial Intelligence Systems, The Scientific Publishing Group, Cairo, 2022, p. 15.

[6] Academic Programs Project, Training Program for Volvo, 1st edition, Publications of the Arab Center for Educational Research for Gulf Countries, 2021, p. 13

such as cars, ships, and planes, where the manufacturing company is civilly and criminally liable for manufacturing defects that pave the way to collisions. [7]

In the same line, if manufacturing defects result in civil damage, civil liability for compensation is established, with compensation paid by the manufacturer, jointly with the insurance company [8] . However, if manufacturing defects lead to criminal errors, then criminal liability arises, allowing the heirs to establish themselves as a civil party on behalf of a deceased family member due to manufacturing errors. [9]

1.3 Defects Related to Robot Design or Programming

Design defects refer to flaws in the robot or machine-man arising from hidden defects in its design, such as a vehicle design that lacks a shock-absorbing system. The intelligent product is entitled to have design or configuration defects, if it poses a massive risk than anticipated by

the ordinary robot user. It is worth highlighting that determining design defects and distinguishing them from manufacturing defects is subject to the judge's discretion with the reinforcement of expert analysis.

There is no doubt that attributing design defects to consumer expectations imposes paramount obligations on smart device manufacturers. As consumer expectations for artificial intelligence products remain unrealistic due to a lack of understanding of AI functions. When it comes to programming defects, a complex issue arises: a robot may commit a criminal act as a result of programming even if the programming was correctly implemented, yet the robot was subjected to hacking or a virus attack. An example of this stance pertains in the medical field, where a medical robot might exceed its programmed limits, leading to a medical error due to hacking or manufacturing defects.

1.4 Defects Related to Usage

During the implementation of a robot, any misuse may lead to criminal liability. Proving criminal error arising from using a medical robot is particularly challenging, as it may entail a variety of individuals, including errors in programming, failure to update algorithms, user error[10] , or patient error in the case of a medical robot, not to mention force majeure or natural death unrelated to any robotic malfunction. In cases involving medical robots, some legislations exempt the physician from liability if it is proven that, they adhered to the duty of care required by the medical profession[11] , and did not act negligently, even if a medical error occurred. The physician's diligence is sufficient to absolve them of liability, as established by

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[7] Naila Ali Khamis Mohammed Bin Khouror Al-Muhairi, Civil Liability for Damages Caused by Robots, PhD thesis, United Arab Emirates University, 2020, p. 40

[8] In Our View, the Use of Intelligent Systems is dependent on insuring against the risks that may result from their use. Humanity will only trust intelligent machines through insurance that covers damages caused by them; otherwise, there is no need to adopt a smart society.

[9] Majdoub Nawal, previous reference, p. 57

[10] Alexandra Bensamoun and Gregoire Loiseau, Artificial Intelligence Law, 1st ed., "LGDJ" General Library of Law and Jurisprudence, 2019, p. 81.

[11] Jade Brossollet and Corolice Jaegy, Artificial Intelligence, publication of the Legal Workshop, Faculty of Law, Economics, and Management, June 2019, p. 3.

French legislation under the French Health Law[12] through Article 1142. .[13] Thus, in most cases, the source of criminal error is tied to one of these defects. By identifying the forms of criminal error in machines, we can further explore the concept of criminal responsibility for artificial intelligence systems and assess the feasibility of applying general criminal responsibility rules to machine errors, along with practical challenges.

2. Elements of Criminal Responsibility and Their Applicability to Robots

Typically, criminal responsibility arises once a person who meets the necessary conditions for liability—awareness and freedom of choice—commits a prohibited act. However, applying criminal responsibility to machine-man systems raises several issues, primarily because a machine is not a human but an object, some legislations (e.g., French law) have granted it legal personality. This makes assigning criminal liability for AI crimes challenging, if not impossible, as robots lack human qualities and do not fulfill the conditions for criminal responsibility. [14] Therefore, we will attempt to apply the traditional conditions for criminal responsibility to machine error to determine the feasibility of using general criminal responsibility principles for crimes committed by intelligent systems.

2.1.The raised Stance of Criminal Error in Machine Man

Under traditional rules, criminal error entails violating a criminal rule by committing prohibited act or neglecting an act that the law mandates, whether intentionally or unintentionally. In AI-related criminal error, human involvement is agglutinated with technology since the machine-man functions based on human programming, making the error committed by the machine essentially a human error executed via the intelligent machine.

The criminal error in the machine-man may stem from human errors in programming, manufacturing, design, or usage, as previously discussed. Furthermore, the machine's criminal error may occur independently of human actions, beyond human control, if the robot deviates from its programming due to a malfunction or sabotage by hackers or cybercriminals.

Hence, for the machine's error to constitute a crime, responsibility must be attributed to the individuals who contributed to the creation of the machine-man—from the manufacturer to the programmer, the developer, and at last, to the owner and user of the machine. [15]

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[12] -Law No. 2002/303, dated March 4, 2002, relating to patients' rights and the quality of the healthcare system.

[13] - Article L 1142 of the Public Health Code, paragraph 1, stating: "Except where their liability is incurred due to a defect in a health product, health professionals mentioned in the fourth part of this code, as well as any establishment, service, or organization where acts of prevention, diagnosis, or care are carried out, are only responsible for the harmful consequences of acts of prevention, diagnosis, or care in cases of fault."

[14] Mahmoud Salama Abdel Moneim El-Sherif, The Criminal Liability of the Human Machine: A Foundational Comparative Study, Arab Journal of Forensic Sciences and Forensic Medicine, Naif Arab University for Security Sciences, Issue 3, August 2020.

[15] Mohammed Irfan Al-Khatib, The Legal Status of the Human Machine, Journal of the Global College of Law, Issue 4, Kuwait, 2018, p. 124.

2.2 The Extent of Criminal Capacity in Robots

Criminal capacity refers to an individual's ability to comprehend and understand their actions and to exercise free will in their choices, with the capacity to distinguish right from wrong[16] . Responsibility cannot be imposed on an entity, such as a machine-man, that lacks cognitive ability. Intelligent machines rely on artificial intelligence, not artificial cognition. In this arena, they lack the capability to grasp matters fully, distinguish between them, understand the consequences, or evaluate outcomes. They operate according to instructions from humans and hence; do not possess independent will. [17] Since criminal capacity is paramount for establishing criminal responsibility, the absence of such capacity in a machine-man negates its criminal liability. The alternative is to hold the human legally accountable for the machine's error that constitutes a crime.

2.3 The Extent of Awareness in Robots

Awareness is the mental ability that enables humans to understand things, to comprehend matters, differentiate between them, foresee consequences, and evaluate results. Since AI depends on human intelligence, lacking any inherent cognitive abilities, awareness is absent in machine-men. These machines have artificial intelligence but not awareness[18] .This stance implies that they do not understand the consequences of their actions. Artificial awareness in a machine-man can be defined as the mandatory consciousness and independence in decision-making, derived from analyzing massive amounts of data (Big Data) [19]. The machine-man makes inferential decisions based on the context, often independent of the knowledge or intent of the manufacturer or programmer, which can inadvertently pave the way to criminal errors[20]

In other words, the machine-man lacks artificial perception. However, if it reaches a level of artificial awareness. In the same line; this stance depicts that it has gained independence from human will, thus making it eligible for responsibility, with the specific nature of liability for intelligent machines taken into account. In this context, it is worth noting that, thanks to efforts by a group of researchers in Singapore, an electronic neural system has been developed that can sense touch a thousand times [21] faster than human skin—an artificial skin. On top of that, robots have been equipped with artificial limbs and a sense of touch that

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[16] Said Bouali, Explanation of the Algerian Penal Code, Balqis Publishing House, 2019, p. 298

[17] Houra Moussa, How to Deal with Robots? article published in the Legal Journal, Issue 21, Dubai Judicial Institute, 2015, p. 23.

[18] - Bauris Baraud, Law and Data: Artificial Intelligence – Legal World, Lamy Journal of Digital Law, 2019, p. 19

[19] Through the Analysis of Big Data, advanced human-machine programs try to [19] mimic human comprehension and perception processes. For more details on the concept of artificial perception of smart machines as a product of evolution, see Mahmoud Salama Abdel Moneim El-Sherif, previous reference, p. 8 and beyond.

[20] - Bauris Baraud, op. cit., p. 20.

[21] Houra Moussa, How to Deal with Robots, Legal Journal, Issue 21, Dubai Judicial Institute, 2015, p. 25

rivals human sensation, perhaps even surpassing it, as mentioned earlier. However, no matter how advanced robots become, artificial components or synthetic skin do not imply that a robot has acquired artificial awareness. Artificial skin enables intelligent machines to feel touch, while artificial limbs and a human-like frame give the machine a resemblance to human form.

In conclusion, the absence of awareness in machine-men signifies they cannot be held criminally responsible. Instead, responsibility falls upon the human elements involved, whether they are manufacturers, programmers, users, or owners.

3. Criminal Classification of Machine Error

The legal debate around criminalizing AI-related offenses divides into two main approaches. **The traditional approach** stipulates the machine-man as akin to an object or animal, deeming it an "abstract agent" incapable of criminal liability, though potentially liable civilly. Conversely, **the contemporary approach** advocates for holding machine-men criminally liable if they deviate from programming, proposing penalties suited to their nature[22].

3.1- Classification of Machine Error in Traditional Criminal Jurisprudence

Traditional criminal jurisprudence counts on general principles of penal law, especially the theory of "abstract agency[23]," and views the machine-man as an object lacking focus and awareness. Consequently, if a machine is used to commit a crime, it is deemed an "innocent intermediary" rather than a criminal agent. In this realm, robots or machine-men could be regarded abstract agents, as their actions align with characteristics of abstract actors. However, this classification raises questions, especially regarding the concept of "good faith," which traditionally applies to a conscious, aware person used as a tool by another. Since robots lack awareness, they are analogous to an entity devoid of legal capacity[24] , much like an individual with mental incapacity. Even if we assume that the theory of abstract agency is most compatible, the question remains: who is liable for using a machine-man as an abstract agent in crime?

In some stances, the programmer may be responsible if they intentionally code the machine to commit a crime. For instance, programming a robot to set a factory on fire at night could make the robot appear as the direct arsonist, but in reality, the programmer is the true perpetrator, with the robot serving only as an abstract agent[25] .In the same line, the end-user of a machine-man could be accountable if they direct the machine to commit a crime. For example, if a person uses a robot for home security but orders it to assault trespassers, the robot acts as an abstract agent at the user's command. Moreover, liability could also fall on a user who fails to update the robot's programming, resulting in a crime being committed. In this scene, the user might be viewed as the actual perpetrator due to their neglect and intent behind directing the machine's actions.

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[22] Bauris Baraud, Laura Ellyson, Criminal Liability and Artificial Intelligence, Journal of Intellectual Property Notebooks, University of Montreal, Vol. 30, No. 3, 2018, p. 18

[23] The Moral Actor refers to the person who incites another to commit a crime, acting as a mere tool, either due to good faith or because they are not criminally responsible.

[24] Mahmoud Salama Abdel Moneim El-Sherif, previous reference, p. 8.

[25] laura ellyson ,op. cit .889.

3.2 - Classification of Machine Error According to Contemporary Criminal Jurisprudence

Unlike traditional jurisprudence, which exempts the machine-man from criminal liability, contemporary criminal jurisprudence advocates for holding intelligent machines criminally accountable with penalties tailored to their nature. The modern view suggests that advancements in artificial intelligence, especially in deep-learning technologies[26] , bring the potential for "artificial awareness." Therefore, under this approach, robots could theoretically bear some level of responsibility if they autonomously commit harmful actions. Contemporary jurisprudence also draws on the framework used for legal entities (such as corporations) by assigning penalties suited to a robot's nature, similar to measures like business closure or suspension of activity for legal persons.

This adaptation reflects an acknowledgment of the machine-man's role in society, aiming to develop penalties consistent with the nature of a robot's capabilities and legal status.

Advocates of the modern approach propose recognizing robots as legal persons, not merely to elevate their legal status but to make them eligible for both civil and criminal liability. Robots with advanced capabilities, particularly those capable of physical actions like striking or causing harm[27] , are increasingly viewed as potential independent agents in certain legal contexts. However, this approach faces criticism, with detractors arguing that robots lack the human-like cognition required for criminal liability. Proponents of the modern view counter this by highlighting the evolving sophistication of robots, particularly those equipped with sensory and responsive systems that allow them to engage with humans in complex ways[28] . As artificial intelligence progresses towards more advanced forms of artificial awareness, contemporary jurisprudence suggests that intelligent machines may one day possess the attributes necessary for responsibility in both civil and criminal spheres.

Furthermore, criminal liability for AI-related crimes could extend to cases of "criminal negligence" on the part of human agents who deploy or manage robots. This classification would apply when a human user unintentionally causes harm through a robot due to negligence rather than intent. The French legal system[29] , for example, leans towards this perspective, viewing the user's role as one of indirect liability due to lack of due diligence in preventing the robot from committing harmful acts.

Conclusion:

The Fourth Industrial Revolution offers substantial benefits for humanity as a whole, but it also presents practical challenges resulting from interactions between robots and humans. Smart machines do not operate randomly but rather through algorithms and programming set by humans. Sometimes the programming intentionally drives the robot to commit a crime, raising the issue of the programmer's responsibility. Other times, the programmer has no influence over the criminal outcome, as the robot might deviate from its programming due to an external cause, such as viruses or malfunctions, and in some cases, a crime may be committed accidentally.

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[26] -Deep Learning.

[27] Majdoub Nawal, previous reference, p. 111

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[29] -laura ellyson , op .cit 887.

[28] Mahmoud Salama Abdel Moneim El-Sherif, previous reference, p. 10

ISSN:1581-5374 E-
ISSN:1855-363X VOL. 23,
NO.11(2025)

In fact, the adoption of intelligent systems is expected to bring about a legislative shift, prompting modern criminal law to address the questions of criminal liability regarding artificial intelligence crimes. This highlights the need for increased attention to such contemporary issues and for preparation for this technological evolution, whose applications are already prevalent in many countries that are engaging with robots seamlessly.

The main conclusion drawn is that the legislative framework, especially in terms of penal law, displays a certain contradiction in defining the boundaries for intelligent systems, given the novelty of the concept within society.

The key recommendations from this discussion include the following:

- A clear delineation of criminal responsibility concerning AI crimes, which could fall on the programmer, the robot's manufacturer, its operator, or its user.
- Establishing the extent to which robots should possess legal personhood within all legal frameworks, as the French legislature has done.
- It is essential to clarify the extent to which the rules of criminal liability applicable to natural persons may apply to robots, especially given the lack of consciousness in intelligent machines.
- It is necessary to specify the types of penalties that could be enforced for crimes involving artificial intelligence.
- Modern research should increasingly focus on such topics, as the products of the Fourth Industrial Revolution are becoming an urgent necessity and will soon touch our lives directly.

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