RULES OF CRIMINAL LIABILITY IN CONFRONTING ARTIFICIAL INTELLIGENCE CRIMES

BAAZIZ AMEL
Lecturer "B," University of Algiers 3 Ibrahim Sultan Cheibout, Algeria.
Email: baaziz.amel@yahoo.fr

Received 05/06/2024 Accepted 16/11/2024 Published 19/11/2024

Abstract:
The use of robots and artificial intelligence programs in various fields has raised numerous challenges, particularly regarding liability for the actions of these programs and the adequacy of current legislation to accommodate the unique characteristics of this technology. This research paper aims to introduce artificial intelligence, its characteristics, and its types, while also highlighting examples of artificial intelligence-related crimes. Additionally, it seeks to legislate for these crimes to determine who is accountable and impose appropriate penalties. The topic holds significant importance as the growing use of artificial intelligence is expected to lead to an increase in associated crimes, necessitating a deeper exploration of criminal liability for these crimes. Furthermore, it is essential to identify who bears responsibility to ascertain the true perpetrator and the legal penalties applicable to them.

***Keywords**: Artificial intelligence, crime, criminal liability, punishment.*

INTRODUCTION

The world is currently witnessing a tremendous development in artificial intelligence (AI) and its various fields, with humans being at the forefront of its use. AI possesses unique characteristics that, despite offering luxury and advancement that facilitate human life, also pose a significant risk to the world and the potential loss of control over it. This technology can lead to various crimes in different areas, resulting in criminal liability. AI-related crimes are considered the crimes of the future, and their spread is accelerating in the present time.

Based on the above, the following question arises: What is the concept of artificial intelligence, and what are the provisions of criminal liability applicable to AI crimes?

I. The Nature of Artificial Intelligence and Criminal Liability

The significance of artificial intelligence lies in the diverse tasks it performs, which humans struggle to do[1], and its rapid development and continuous innovation, which make its potential harm outweigh its benefits. This is particularly true if AI commits crimes independent of what its programmer, manufacturer, or user intended[2].

1. Subsection One: The Concept of Artificial Intelligence

We will address the definition of artificial intelligence, its characteristics, and its types.

1.1 Definition of AI

Artificial intelligence has several different definitions, including:

- It is a branch of computer science that enables the creation and design of computer programs that mimic human intelligence, allowing computers to perform tasks that require thinking, understanding, hearing, and logical movement instead of humans[3].

[1] Mashael Musaad Al-Qaidi, Criminal Liability of Artificial Intelligence, Research presented as part of graduation requirements (Law 498), Bachelor's Program in Law, Taibah University, Saudi Arabia, 1441-1442 H, at 4.

[2] Id. at 4.

[3] Sara Amjad Abdelhadi, Artificial Intelligence in Criminal Law, Master's Thesis, Al-Khalil University, Jerusalem, Palestine, 2022, at 4.

- Another definition is "a set of behaviors exhibited by computer programs aimed at enhancing productivity while also attempting to simulate human mental capabilities."[4]

1.2 Characteristics of Artificial Intelligence

AI has several characteristics, some of which include:

a. Knowledge Representation: AI has methods for representing information through specialized structures that combine facts and knowledge rules.

b. Incomplete Data: AI can solve problems even when necessary data is unavailable at the time of need.

c. Contradictory Data: AI has the ability to handle data that is erroneous or contradictory.

d. Learning Capability: AI can learn from past experiences[5], improving performance and applying it to new situations[6].

e. Reasoning: AI employs methods to discover specific ideas or concepts through available data and guiding documents .

1.3 Types of Artificial Intelligence

AI can be classified based on its capabilities and functions.

A. Based on the capabilities it possesses

AI can be categorized into limited, general, and superintelligent.

1. Narrow AI: Refers to AI that performs specific, defined tasks, such as self-driving cars, speech recognition programs, or chess-playing software found on smart devices. This type is the most widely used.

2. General AI: This type mimics human thought processes, allowing machines to think, plan, and act on their own. One example is the artificial neural network.

3. Super intelligent AI: AI that surpasses human abilities, performing tasks better than specialized humans. This type requires capabilities like understanding, planning, communication, and decision-making, but remains a theoretical concept with no real-world existence[8].

B. Based on the functions it performs

AI is divided into:

1. Reactive Machines: The simplest form of AI, lacking the ability to perceive or learn from past experiences, and only reacting to current situations to optimize responses.

2. Limited Memory: AI that can store past experiences for a limited period, such as systems used in self-driving cars to maintain speed and distance from other vehicles.

3. Theory of Mind: AI designed to simulate human emotions and interact with individuals, though no real-world applications currently exist for this type.

4. Self-aware AI: AI that can predict the future and possess greater awareness and understanding than humans. This remains a theoretical research project with no practical applications as of now[9].

2. Examples of Artificial Intelligence Crimes

We will discuss two examples of AI-related crimes: the first example involves crimes caused by self-driving cars, and the second involves crimes committed by smart robots.

2.1 Self-Driving Cars

2.1.1 Definition:

[4] Ali Ahmed Ibrahim, Applications of Artificial Intelligence in Combating Cybercrimes, Legal Journal, Issue 8, Faculty of Law, Cairo University, 2022, at 281.

[5] Alan Bonnet, Artificial Intelligence: Incident and Future, Political Press, No Edition, Kuwait, 1993, at 19.

[6] Sara Amjad Abdelhadi, supra note 3, at 6.

[8] Abdul Razzaq Mukhtar Mahmoud, Applications of Artificial Intelligence, International Journal of Research in Educational Sciences, Volume 3, Issue 4, 2020, at 184-85.

[9] Artificial Intelligence and Its Application Fields, Article published on the website, accessed on 14/03/2024 at 14:20, http://www.annajah.net/site/contact.

A self-driving car is defined as "digitally programmed vehicles capable of sensing their environment and moving autonomously through traffic and avoiding obstacles with minimal or no human intervention."[10]

Self-driving cars have several levels, including:

- **Level 0:** No automation[11]. This category includes cars that do not include any self-driving technology, where the driver is responsible for all aspects of driving.
- **Level 1**: Driver assistance. A system takes over certain aspects of the driving process.
- **Level 2**: Partial automation. The vehicle at this level has the ability to perceive its environment and control its path partially.
- **Level 2+:** Advanced partial automation. This level allows the car to drive itself but still requires a driver to be present.
- **Level 3**: High automation. At this level, the car is controlled by automated systems, but human oversight is still required in certain situations.
- **Level 4**: Full automation. At this level, the car is completely autonomous and does not require a human driver[12].

2.1.2 Examples of Crimes Involving Self-Driving Cars:

- Joshua Brown Case: Joshua Brown was the first person to be killed in a self-driving car accident. On May 7, 2016, he was driving a Tesla Model S in Williston, Florida, when his car failed to detect an 18-wheel trailer due to bright sunlight. The car collided with the side of the trailer, resulting in his death. This incident raised concerns about the safety of self-driving cars.
- Elaine Herzberg Case: On March 18, 2018, a self-driving Uber car hit and killed a woman named Elaine Herzberg in Arizona while she was riding her bicycle. The car was in self-driving mode under human supervision, but it failed to recognize her body movements, leading to her death from the resulting injuries.
- Other Incidents: There have been additional accidents involving self-driving cars due to violations of traffic laws.

From these cases, we conclude that crimes committed by self-driving cars could be classified as manslaughter, unintentional harm, or traffic violations[13].

2.2 Crimes Committed by Smart Robots

2.2.1 Definition and Types:

A smart robot is a mechanical device capable of performing pre-programmed activities under direct human control or by software. It is used to accomplish specific tasks and objectives in place of humans. There are several types of smart robots, including:

- **Surgical Robots**: These robots are equipped with 3D cameras and are used for remote surgeries[14].
- **Military Robots**: Used in the military and in emergency situations where the task is dangerous, such as bomb disposal, border surveillance, and unmanned aerial vehicles (drones).
- **Service Robots**: Used by research teams in universities and labs to introduce new features and present them to the public.
- **Domestic Robots**: Used to perform household chores[15].

---

[10] Manikandan Thyagarajan, Self-Driving Car, International Journal of Psychosocial Rehabilitation, 2020, Issue 05, at 230.

[11] Automation: Also called "self-operation" and also known as "mechanization," it is a modern term that covers a broad range of technologies requiring minimal human intervention.

[12] Maryam Abdel Wahab, Labeed Hind, Criminal Liability for Artificial Intelligence Crimes, Journal of Law and Environmental Sciences, Volume 2, Issue 2, Business and Globalization Lab, Medea University, 2023, at 687.

[13] Maryam Abdel Wahab, supra note 11, at 688.

[14] Mamdouh Hassan Mani'a Al-Addwan, Criminal Liability for Unlawful Artificial Intelligence Competencies, Studies in Sharia and Law Sciences, Issue 4, University of Jordan, Hashemite Kingdom of Jordan, at 153.

[15] Mamdouh Hassan Mani'a Al-Addwan, supra note 13, at 153.

2.2.2 Examples of Crimes Involving Smart Robots:

- Kenji Orada Case: In 1981, Kenji Orada, a Japanese employee, was killed by a robot at the Kawasaki Heavy Industries factory in Japan. This made him the first Japanese man to be killed by a robot. He was trying to repair the robot when it placed him into another machine, leading to his death. Attempts to free him from the robot's grip were unsuccessful, and he died[16].

- Robert Williams Case: On January 25, 1979, Robert Williams was killed by a robotic arm at the Ford Motor Company plant in Michigan. He was attempting to retrieve molds from a shelf, a task that the robot was supposed to handle. However, the robot kept providing incorrect information regarding the number of molds, forcing Williams to climb up, where he was struck by the robotic arm and fatally injured[17].

3. The Nature of Criminal Responsibility

In this section, we will define criminal responsibility from a doctrinal and legal perspective in (First Branch), and then we will identify its characteristics and elements in (Second Branch).

3.1 Definition of Criminal Responsibility

The doctrinal definition of criminal responsibility is "the individual's accountability for the consequences of their criminal acts, which they commit while being aware of their meaning and the potential outcomes. The offender is accountable because they chose an unlawful and prohibited path, even though they could have chosen a lawful alternative. They are free in their actions."[18]

The legal definition, as adopted by Algerian legislation, follows the doctrinal and judicial definitions of criminal responsibility. It is defined as "the accountability of an individual for their criminal act by being subject to the penalty prescribed for their action in the Penal Code. Legally, responsibility is the individual's eligibility to bear the punishment resulting from their actions."[19]

3.2 The Elements of Criminal Responsibility in the Context of Artificial Intelligence

The elements of criminal responsibility consist of two main components: the material element and the mental element. We will explain each in the following sections.

3.2.1 The Material Element

The material element in a crime generally refers to the external behavior of an individual that is punishable by law. The law does not punish bad intentions unless they are manifested in criminal conduct. We will try to apply the rules of the material element to actions involving artificial intelligence. The actions of AI are considered criminal if it engages in an unlawful positive act, such as a medical robot failing to assist patients, resulting in harm.

The material element consists of three components:

a. Criminal Conduct:

The criminal law requires the presence of criminal conduct because "there is no crime without material conduct."[20] This is a common element in all crimes, whether intentional or not. There are two types of criminal conduct:

- Positive conduct, where the individual performs an act that the law deems criminal.
- Negative conduct, where the individual fails to perform a legally required act.

b. Criminal Result:

This is the outcome of the criminal conduct that causes a change in the external world. There are two types of intent:

---

[16] Mustafa Al-Sadawi, People Killed by Smart Robots, Article published on the website, accessed on 15/3/2024: http://www.sayidaty.net/node/701311.

[17] Mohamed Al-Khatab, Notable Cases of People Killed by Robots, Article published on the website: http://www.mp.me/p7UGLA/_2fbd.

[18] Nesreen Awadallah Mohamed Imam, The Nature and Elements of Criminal Liability, Ph.D. Dissertation in Law, Mansoura University, Egypt, 2020, at 4.

[19] Bramadan Al-Tayeb, Criminal Liability between Sharia and Algerian Criminal Law, Al-Mi'yar Journal, Issue 1, 2022, at 89.

[20] Abdullah Ahmed Matar Al-Falasi, Criminal Liability Arising from Artificial Intelligence Errors, Legal Journal, Issue 8, Egypt, 2021, at 2863

- The first intent is the material result, such as causing death.
- The second intent is the legal result, which refers to the creation of a risk that threatens a legal interest protected by law.

c. Causal Link:

This is the relationship between the criminal act performed by the offender (AI) and the harmful criminal result. This link must exist for the material element to be fulfilled, as the offender's actions (the criminal conduct) must lead to harm or a crime (the criminal result)[21].

3.2.2 The Mental Element

A crime cannot exist based solely on the material element; it must also be coupled with the mental element, which is the internal connection between the apparent criminal act and the subjective mental state. The mental element can take two forms:

a. Criminal Intent:

This refers to the offender's intention to commit the criminal act and achieve the criminal result, with prior knowledge of the legal conditions and restrictions. When applying this concept to artificial intelligence, if the crime is committed by the manufacturer, programmer, or user, it is possible to establish the mental element because the offender is human and intends to achieve the behavior and result through AI, such as a robot or a self-driving car[22].

b. Intentional Error:

Intentional error differs from criminal intent in that the offender performs the criminal act knowingly and intentionally, but without intending the result. In the context of artificial intelligence, if an error is made by the offender (the human), such as the manufacturer failing to adjust the algorithms in a robot's programming, or if a person drives a self-driving car and the automated system alerts the driver to take over due to a malfunction, leading to a traffic accident, the mental element is fulfilled because the error is unintentional.

II. Procedural Rules for Criminal Responsibility in AI Crimes

In order for criminal responsibility to arise, a criminal act must be committed by an individual to trigger the corresponding penalties as prescribed in criminal law. However, when this criminal act is the result of actions taken by artificial intelligence, how will the rules of criminal responsibility be applied to such entities? This question leads us to explore, in this chapter, the foundations of criminal responsibility for AI crimes (in Section One), and the penalties imposed for these crimes (in Section Two).

1. Foundations of Criminal Responsibility for AI Crimes

Artificial intelligence programs and robots are now used in various fields, including medicine, military, industry, and even service sectors. To establish criminal responsibility, legal scholars have begun to consider the possibility of applying criminal penalties to these entities and determining the applicable rules. Therefore, we will examine the applicability of the doctrine of moral agency in AI crimes (in Subsection One) and whether personal responsibility can be assigned to AI actions based on criminal capacity elements (in Subsection Two).

1.1 The Applicability of the Doctrine of Moral Agency to AI Crimes

The criminal responsibility of the manufacturer of artificial intelligence arises when an AI entity commits an act that constitutes a crime according to the law. Therefore, it is necessary to investigate whether the manufacturer can be held criminally responsible for the AI's actions, given that the manufacturer can protect themselves through terms in the user agreement signed by the owner. In this case, the owner may bear full responsibility for any criminal acts committed by the AI, absolving the manufacturer of any criminal liability. However, a crime may also result from a programming error made by the developer, which causes the AI to commit unlawful acts. In such cases, the

[21] Maryam Abdel Wahab, Labeed Hind, supra note 11, at 685.

[22] Id. at 686.

programmer should bear criminal responsibility, and it is crucial to differentiate between intentional or accidental crimes[23].

Moreover, the owner or user of the AI might misuse it, leading to a crime. In this context, we need to differentiate between the following possibilities:

- The crime results solely from the owner's or user's actions: In this case, the criminal responsibility lies entirely with the owner or user.
- The crime results from the owner's actions in conjunction with other parties (such as the manufacturer or the AI itself or a third party): For example, if a car owner alters the commands of a self-driving car, with the assistance of a specialist, to commit a crime, the responsibility would shift to the manufacturer and the car itself, making the responsibility joint. In this case, the owner or user would be the moral agent in the crime, while the AI (robot) would be the material agent. Thus, the doctrine of moral agency and full criminal responsibility for the owner or user would apply.

Most scholars agree that a moral agent is someone who uses another (in this case, AI) to commit a crime, exploiting the device or person's capabilities to achieve their goal. The moral agent takes advantage of the material actor's lack of full understanding or intention, as in cases of minor age or mental incapacity, and instigates the commission of the criminal act. Therefore, in such cases, the moral agent can be held responsible for the crime[24].

The prevailing opinion is that this responsibility should be assumed in cases of crimes committed by the owner or user through artificial intelligence, and the burden of proof should be on them to demonstrate otherwise. Hence, the focus shifts from liability based on error to liability based on risk.

1.2 Assigning Personal Responsibility for AI Actions Based on Criminal Capacity Elements

Most Arab legal systems have not explicitly defined criminal responsibility and have left this to legal theory. They generally mention those who cannot be held criminally responsible, such as individuals lacking awareness or will, like the insane, minors who are not able to discern, and those under coercion. These individuals do not have the criminal capacity, a necessary element for criminal responsibility, meaning that a person can only be criminally liable if they have full awareness and will.

In this context, the question arises: Can the elements of will and knowledge be applied to crimes committed by artificial intelligence? The answer is that criminal law applies only to humans. Therefore, under current laws, criminal penalties cannot be imposed on artificial intelligence entities. In practice, however, a criminal court judge might order the confiscation of the AI machine that was used to commit the crime.

One form of liability is the responsibility for the natural outcome of the AI's actions, which assumes the involvement of programmers and users in the daily activities of AI, even without the intention to commit a crime through the AI entity.

2. Penalties for AI Crimes

Penalties for AI crimes are varied, depending on whether they are imposed on the manufacturer, the owner or user, a third party involved, or even the AI itself.

2.1 Penalties for the Manufacturer

The manufacturer of AI technology plays a key role in its creation and controls its programming and operational systems. These systems must meet specific safety standards to ensure the safety and security of the AI. In cases where the manufacturer loses control over the technology, the rapid development of AI could lead to a high degree of autonomy in decision-making. Therefore, the manufacturer must bear criminal responsibility for any harm caused by failure to meet the required safety standards. Legal texts should be established to mandate compliance from manufacturers

[23] Ben Aouda Hasker Murad, The Problematic Application of Criminal Liability Rules to Artificial Intelligence Crimes, Journal of Law and Humanities, Volume 15, Issue 1, 2022, at 198.

[24] Ben Aouda Hasker Murad, supra note 22, at 199-200.

during the development of these technologies, and penalties should be proportionate to the severity of the crime committed by the AI due to negligence in adhering to the established regulations[25].

2.2 Penalties for the Owner or User or Third Party Involved

The owner or user has a direct relationship with the AI, as they benefit from its capabilities. If the owner or user misuses the AI for personal gain, leading to a criminal act, they will be criminally responsible. The owner's or user's actions can fall under two scenarios:

1. The crime is solely the result of the owner's or user's actions: In this case, the owner or user bears full criminal responsibility and will face the corresponding penalty.
2. The crime is a result of collaboration between the owner or user and a third party: In this case, liability is shared, and the penalty is also shared between the parties[26].

2.3 Penalties for the AI Entity Itself

The principle of personal criminal responsibility is a fundamental pillar in criminal law, requiring that the person responsible for a crime must have the capacity to perceive and freely choose their actions. Therefore, if an AI entity commits a crime, can the entity itself bear criminal responsibility? The answer is no. AI entities do not possess the elements of awareness and will necessary for criminal responsibility. They do not have the ability to understand their actions or freely choose them. Their actions are directed by their operators, programmers, or users. Consequently, criminal responsibility for the crime committed by AI rests on the agents controlling or programming the AI[27].

Conclusion:

The widespread use of artificial intelligence technologies in various fields of life, and its competition with humans in performing tasks traditionally done by human intelligence—such as natural language understanding, automatic recognition of words and faces, speech production, smart image editing, and autonomous driving—indicates that we are surrounded by intelligent machines that behave in ways that mimic human actions. This makes it imperative to regulate their behavior with legal texts, especially when their actions exceed the boundaries of the law, resulting in criminal responsibility for their crimes.

Algeria, like other countries, is striving to adopt these technologies to support scientific research and technological advancement, and is thus obliged to develop its legal system accordingly. A good example is the smart applications adopted by the police, particularly in the area of traffic safety programs through video surveillance systems and automated image analysis. This reflects the country's direction towards adopting a smart city system. From this, we can draw several conclusions and recommendations:

➢ CONCLUSIONS

- Artificial intelligence has become a tangible reality, and with its increasing use and future development, it will gain independence, which could pose a risk to individuals' lives.
- Artificial intelligence has unique characteristics that allow it to do things that human beings cannot.
- Criminal responsibility is based on the principle of personal liability, and it applies only to humans.
- Awareness and knowledge are among the most important conditions for criminal responsibility.
- Criminal responsibility is based on two essential elements: the material element and the moral element.
- Criminal responsibility applies to humans, and penalties cannot be applied to AI entities.
- Current laws are not aligned with the developments in the use of artificial intelligence technologies.

➢ RECOMMENDATIONS

- Legislators should adopt the idea of preparing a law that regulates artificial intelligence technologies and how they are used, so that the state and citizens can benefit from them.

[25] Abdel Wahab Maryam, Labeed Hind, supra note 11, at 690.

[26] Ben Aouda Hasker Murad, supra note 22, at 199.

[27] Abdel Wahab Maryam, Labeed Hind, supra note 11, at 691

- Efforts should be made to create a framework that allows the application of criminal responsibility to artificial intelligence technologies that are similar in intelligence and awareness to humans.
- The responsibilities of manufacturers, owners, and users in AI-related crimes should be clearly defined, and these situations should be legally regulated to hold each party accountable according to the principle of personal responsibility and the personal nature of the crime.
- Criminal laws should be revisited to establish rules that align with the crimes committed by AI entities.
- There is a need to encourage the use of AI technologies by the state in areas such as security and justice to achieve transparency, fairness, and equality.

BIBLIOGRAPHY:

1. Abdel Razzaq Mokhtar Mahmoud, *Applications of Artificial Intelligence*, *International Journal of Educational Science Research*, vol. 3, no. 4 (2020).
2. Abdel Wahab Mariam & Labied Hind, *Criminal Liability for Artificial Intelligence Crimes*, *Journal of Law and Environmental Sciences*, vol. 2, no. 2 (2023).
3. Abdullah Ahmed Matar Al-Falasi, *Criminal Liability Arising from Artificial Intelligence Errors*, *Legal Journal*, no. 8 (2021).
4. Ali Ahmed Ibrahim, *Applications of Artificial Intelligence in Combating Cyber Crimes*, *Legal Journal*, no. 8 (2021).
5. Alain Bonnet, *Artificial Intelligence: A Reality and Its Future* (Al-Siyasa Printing, 1993).
6. Barmadan Al-Tayeb, *Criminal Responsibility Between Sharia and Algerian Law*, *Al-Mi'yar Journal*, no. 1 (2022).
7. Ben Aouda Hasker Mourad, *The Problem of Applying Criminal Liability Rules to Artificial Intelligence Crimes*, *Journal of Law and Human Sciences*, vol. 15, 2022.
8. Manikandan Thyagarajan, *Self-Driving Cars*, *International Journal of Psychosocial Rehabilitation*, vol. 23, no. 5 (2020).
9. Mamdouh Hassan Maan Al-'Adwan, *Criminal Liability for Illegal Actions by Artificial Intelligence Competencies*, *Studies in Islamic Law and Law*, no. 4 (University of Jordan).
10. Mashaal Mes'ad Al-Qaydi, *Criminal Responsibility of Artificial Intelligence* (Research for graduation requirements, Taibah University, 1441-1442 AH).
11. Mohamed Al-Khatab, *Notable Cases of People Killed by Robots*, *MP.me*, available at http://www.mp.me/p7UGLA/_2fbd.
12. Mustafa Al-Sadawi, People Killed by Intelligent Robots, Sayidaty, available at http://www.sayidaty.net/node/701311.
13. Nasreen Awad Allah Mohamed Imam, The Nature and Elements of Criminal Responsibility (Ph.D. Dissertation, University of Mansoura, 2020).
14. Sarah Amjad Abdelhadi, Artificial Intelligence in Criminal Law (Master's Thesis, Al-Khalil University, 2022).
15. Artificial Intelligence and Its Application Areas, available at http://www.annajah.net/site/contact.