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Artificial Intelligence and Criminal Law

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ABSTRACT

The world is on the cusp of entering a new era of artificial intelligence, and it has become necessary to develop laws. Artificial intelligence is one of the most critical topics for criminal law jurists, given that there is a need to establish legal rules commensurate with the nature of this technology that is expected to prevail worldwide. The problem of the study is the lack of a legal framework that regulates the uses of artificial intelligence and shows the criminal rules that should be applied. The chapter aims to introduce the applications of artificial intelligence, its fields, advantages, and its expected impact during the next stage, highlighting the proposed rules of criminal law to regulate the use of artificial intelligence and discussing the appropriate penalties proposed to be applied. The study recommended the international community develop a global framework governing the use of artificial intelligence technologies, calling national legislators to set rules that regulate the use of artificial intelligence and determine appropriate penalties in case of misuse.

INTRODUCTION

There is no doubt that the whole world, due to successive technological developments, is on the cusp of entering a new era, which is the era of the fourth industrial revolution and digital transformation, which will change the details of human life by relying on applications of artificial intelligence, the Internet of things, and the blockchain (Ghaitas, 2017).

The name “Fourth Industrial Revolution” was launched during the World Economic Forum in Davos, Switzerland, in 2016, on the last episode of the current Industrial Revolution series. Prof. Dr. Klaus Schwab, Professor of Comparative Economics and President of the Davos Economic Forum, points out, “There are three reasons that support the belief in the emergence of a fourth industrial revolution, which is the development of the current revolution at an extremely rapid rate, and its reliance on a digital

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Artificial Intelligence and Criminal Law

revolution that combines multiple technologies that lead to unprecedented transformations at the level of economy and business, as well as the transformation it entails in various systems. Across all countries, institutions, fields, and societies (Schwab, 2017).

In light of these developments, it becomes necessary to develop most of the laws and legislations to keep pace with this new reality, as the fourth industrial revolution today opens the doors to unlimited possibilities through the significant breakthroughs of emerging technologies in the field of artificial intelligence (El-Behairy, 2019), robots and massive databases, the Internet of Things, self-driving vehicles, 3D printing, nanotechnology, biotechnology, materials science, government computing, Blockchain and others, which will lead to humanity entering a new phase (Mayer-Schönberger & Cukier, 2013).

This requires the need to develop a governing legal framework for these new uses, and there is no doubt that the existence of this legal framework requires a realistic perception of the uses of artificial intelligence and their effects on human and social behavior and the various legal interests that deserve legal protection.

Significance of the Study

Artificial intelligence techniques are one of the most critical topics for criminal law jurists, given that it is a science that focuses on designing machines that engage humans in behaviors that are described as intelligent. Then, the need arises to establish legal rules commensurate with the nature of this technology that is expected to prevail worldwide. For example, some called for the need to work on amending the European Convention on Cybercrime to establish legal rules that regulate developments in the field of information technology (Khalifa, 2018).

The Study Objectives

The study aims to address the issue of the rules of liability and punishment for artificial intelligence applications, as several sub-goals emerge from this primary objective, which can be summarized as follows:

- A- Introducing artificial intelligence applications, their fields, advantages, and expected impact during the next stage.
- B- Highlighting the proposed rules of criminal law to regulate the use of artificial intelligence.
- C- Examining the appropriate penalties proposed to be applied against artificial intelligence entities.

Problem Formulations or Methodology

The difficulty of the study is that it deals with very modern topics, and some of these topics do not have legal regulations that deal with them. Instead, some subjects are still subject to jurisprudence, which seeks to establish new legal rules commensurate with the nature of these new tools (LEEMANS & JACQUEMIN, 2017), in addition to the lack of references that deal with this subject.

Hence, the research problems arise in the lack of legal regulation of artificial intelligence applications. This prompted the researcher to address this issue and shed light on the criminal rules suitable for dealing with it. The chapter will use the comparative analytical approach that seeks to describe, analyze, and diagnose the research topic from its various aspects and dimensions to reach a clear view

Artificial Intelligence and Criminal Law

of criminal responsibility for crimes resulting from the use of artificial intelligence and monitoring and to analyze it from all aspects, taking the comparative approach in dealing with the subject of the study.

Chapter Plan

The chapter will address the study by defining artificial intelligence, its characteristics, advantages, images, its relationship to criminal law, and the ideas advocated by jurisprudence to establish rules for criminal liability for crimes of artificial intelligence by addressing the responsibility of the artificial intelligence program itself, and the responsibility of each of the operator, manufacturer, programmer, and third parties. Interfering in the artificial intelligence program and punishment for crimes of artificial intelligence in two parts as follows:

PART 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Multiple Definitions of Artificial Intelligence

The term artificial intelligence was used for the first time during a conference in Dartmouth by John McCarthy in 1956, and artificial intelligence is a branch of computer science and new technology that makes it simulate human mental capabilities and modes of work". Some define it as the ability of digital machines and computers to perform tasks that mimic and resemble those performed by intelligent beings, such as thinking or learning from previous experiences or other operations requiring mental operations (Mohamed, 2020).

Some define it as a software system capable of imitating human ways of thinking with the help of a computer or other device (Russell & Norving, 2009) or as a simulation of human behavior and cognitive processes on a computer (Ibrahim, 2020). Hence, it becomes clear that artificial intelligence is intended to provide the computer with programs and capabilities similar to human intelligence, enabling it to perform intelligent operations (Pham et al., 2020). With many definitions of artificial intelligence, the researcher sees the importance of concerted international efforts to develop a unified definition.

Characteristics and Fields of Artificial Intelligence

Artificial intelligence applications are characterized by many characteristics, the most prominent of which are the ability to learn, infer, and react to situations that were not programmed into the machine. The areas of using artificial intelligence have multiplied in the commercial, economic, and industrial fields. Such as the use of industrial robots in many industrial projects and the health field, such as the use of medical robots in performing delicate surgeries, where the applications of artificial intelligence indicate the expansion of its use in performing surgeries, as the available evidence of artificial intelligence tools was not found, due to its speed in surgical operations, but the matter is not without a cause on the part of the robot in one of the surgeries (Poirot-Mazeresdu, 2013).

In the fields of education, transportation, communications, and traffic, the environment, the security and military fields, and in all aspects of social life, even on social networking sites, in a way that is expected to predominate in applications of artificial intelligence in human life (Weng et al., 2015).

Artificial Intelligence and Criminal Law

One of the most prominent fields of artificial intelligence in Egypt is in the societal field of searching for missing persons by comparing images of missing children with pictures of homeless children through face recognition technology, and in the field of tourism and antiquities in the Grand Egyptian Museum, through face recognition technology as well and displaying antiquities according to the characteristics of the interested public, and in the field of security to determine the personality of the suspects, through the use of crime data, their timing and geographical location in addition to the database of accused, wanted and convicted persons, which facilitates the speedy detection of crimes, and in the field of agriculture, through the use of satellites to determine the quality of crops and estimate the amount of water needed by those crops (IDSC, 2020).

Advantages of Artificial Intelligence

Some enumerate the advantages of a robot or robot as being able to produce more, use equipment efficiently, have lower labor costs, improved flexibility, shorter work completion, flexibility and ease of programming, ability to work in hazardous conditions, and improved quality of workplace and production, and achieve good investment returns, in addition to having the freedom to move in the third dimensions of space (Khalifa, 2018).

Types of Artificial Intelligence

Three types of artificial intelligence can be distinguished: Specialized Artificial Intelligence, General Artificial Intelligence, and Super Artificial Intelligence.

- *Specialized artificial intelligence* means artificial intelligence systems that can perform specific tasks, such as self-driving cars, speech or image recognition programs, or the game of chess on smart devices, and this type of artificial intelligence is considered the most common and available type today.
- *General artificial intelligence* is the type that can operate with a capacity similar to human ability. In terms of thinking, it focuses on making the machine think and plan on its own, like human thinking, but there are no practical examples of this type. Everything that exists so far is just research studies that need much effort to develop and turn them into reality.
- *Super artificial intelligence*, which may exceed the level of human intelligence, can perform tasks better than a specialized and knowledgeable person does, and this type has many characteristics that it must contain, such as the ability to learn, plan, communicate automatically, and issue judgments. Superior artificial intelligence is a hypothetical concept that does not exist in our current era (Mohamed, 2020).

The importance of dealing with these types of artificial intelligence highlights the possibilities that artificial intelligence applications may reach in the future and the extent to which the rules of criminal law are perceived to apply. The reference is highlighted to the tendency of many countries to take steps to enhance the uses of artificial intelligence, among which we mention, for example, Egypt, which established a national council for artificial intelligence, and several fake intelligence colleges. There are even some countries, such as the United Arab Emirates.

Artificial Intelligence and Criminal Law

The United Nations has worked to establish a Ministry of Artificial Intelligence to achieve the UAE's strategy for artificial intelligence and its inclusion in all fields in the country (Dahshan, 2020). At the same time, the report of the Science and Technology Committee of the English Parliament in 2016 recommended the establishment of a permanent committee for artificial intelligence. Its mission is to study its effects, establish principles governing its development, and establish a legal framework (UK Parliament, 2016). The United Nations Interregional Institute for Crime and Justice Research established a center on artificial intelligence and robotics in The Hague to be an international reference point in matters related to artificial intelligence (UNCCPCJ, 2020).

The Dangers of Artificial Intelligence

Some estimates indicate that in contrast to the bright aspects of artificial intelligence, a dark side makes it a fertile field for new types of crimes. Artificial intelligence will make malware and viruses aware of the context in which they move, which prompted the Executive Director of the European Police to say that: "It is necessary to be able to predict the impact of any emerging technologies that criminals will resort to so that the safety of European Union citizens can be preserved."

The European police also warned that artificial intelligence could help provide criminals, hackers, and attackers with new attack vectors to carry out malicious activities that were unfamiliar before, such as improving the success of phishing attacks by designing deceptive emails and negative responses. Artificial intelligence may make crime. Cyber security is more straightforward for criminal actors with limited experience and enables them to launch sophisticated and dangerous attacks.

One of the most prominent potential areas in this field is profound falsification, whether of video or audio, to carry out large-scale disinformation campaigns, and some criminals have already started using video and audio files to impersonate CEOs to defraud institutions and organizations.

Darktrace experts believe that artificial intelligence will make malicious programs aware of the context in which they are operating, such as whether it knows whether this is a Windows operating environment, a Linux application, a mobile application, or a network, and then make its decisions independently according to that understanding. Then, it can self-propagate and use every security vulnerability exposed to exploit networks on a network. It can also decide to postpone the attack for more learning and understanding, or it can activate the attack, which is done quietly and slowly and makes it unnoticed as if copying several straightforward files and data and transferring it to those who operate it.

According to the warnings issued by the European Police and the "Dark Trace" company, law enforcement needs more innovation, creativity, dynamism, and modernization at an accelerated pace, and for those in charge of it to work from now on to keep pace with criminal threats shortly, which are expected to benefit significantly from emerging technologies to become More dangerous than ever (Europol, 2019).

The Nexus Between Artificial Intelligence and Criminal Law

There is no doubt that the widespread use of artificial intelligence applications will raise many questions about the legal rules that these applications will be subject to, the extent to which the rules of criminal law will apply to them, and the extent to which these applications may be subject to the rules of criminal liability.

Moreover, is it possible to talk about criminal liability for the machine that is operated through artificial intelligence applications in light of recent scientific developments and the use of many robots in

Artificial Intelligence and Criminal Law

the implementation of many different tasks, as advanced programming has given some machines that operate with artificial intelligence capabilities that reach them to build Self-experiences that enable them to make individual decisions in any situations they face, like a human, so is it possible to say that it is acceptable to grant these machines a legal person?, and then to determine their criminal responsibility (Dahshan, 2020).

There is talk among legal circles about the expansion of the use of artificial intelligence applications in many aspects of life, which leads to questions about criminal responsibility for the activities of these applications and who bears criminal responsibility. If these activities result in an act that constitutes a crime, many questions have been raised about the validity of the prevailing ideas in criminal law.

Its applicability to artificial intelligence applications, and the extent to which a machine driven by artificial intelligence systems can be held accountable, Such as self-driving or self-driving cars in the event of traffic accidents that lead to injuries and victims, and the extent of the responsibility of each of the manufacturer of artificial intelligence systems and the operator and user of these systems, and whether he is criminally liable for crimes resulting from the use of these systems of artificial intelligence (Hallevy, 2013).

The truth is that these issues are still the subject of great controversy among jurists. This controversy is due to the recent use of these systems in practice, but instead, these uses are still subject to continuous development and modernization. Therefore, the discussion of these issues is still in the stage of speculation and assumptions unless there are some applications. The first and most important of these issues is the issue of criminal responsibility arising from crimes of artificial intelligence, so the issue of researching criminal rules that deal with applications of artificial intelligence has become an urgent matter in light of the results of reality related to some accidents, which researchers, specialists, and experts worked on analyzing and dealing with research and study.

Among the most prominent incidents that the researchers dealt with related to the uses of artificial intelligence was the incident in which an Uber self-driving car collided with a woman on the road in March 2018, resulting in her death from her injuries, and another incident represented by a robot in a Japanese bicycle factory killing a worker, by He pushed him using his hydraulic arm towards one of the machines, which led to his death, in addition to the incident of a medical robot during an operation displaying error messages. The medical team was not allowed to manually adjust his arm, which affected the patient after that with complications and severe bleeding because of what happened during the surgical operation.

PART 2: RULES OF CRIMINAL LIABILITY AND PUNISHMENT ON ARTIFICIAL INTELLIGENCE CRIMES

Criminal Liability and Its Forms

There are many jurisprudential definitions of criminal responsibility, and it can be approved as: “the obligation to bear the responsibility for criminal acts and to submit to the penalties prescribed by law” (Ali, 1980). There are only two forms of criminal liability: the first is the criminal liability of a natural person, and the second form is the new form, which is the liability of the legal person.

Then, the question arises about the possibility of criminal law defining a third form of criminal responsibility: the responsibility of the machine controlled by artificial intelligence systems. Talking

Artificial Intelligence and Criminal Law

about this form of criminal liability is premature as long as legalists and legislators do not decide to create this form of criminal liability.

Credit goes to the researcher called Gabriel Halevy for establishing criminal liability rules for artificial intelligence crimes, who worked on establishing criminal liability rules for artificial intelligence entities using three possible models of responsibility: models (responsibility by committing through the other - responsibility for potential corollary results - direct liability).

When we talk about the responsibility of artificial intelligence, we should speak of AI programs and the human being user, the programmer, the owner, and the manufacturing company, as follows:

Liability of the AI Program Itself

The question arises about the extent to which artificial intelligence systems can be held legally liable for their actions, and to take the matter in some detail, it should be noted the importance of distinguishing between forms of artificial intelligence, such as specialized artificial intelligence, which means artificial intelligence systems that can perform specific and clear tasks; Such as self-driving cars, and general artificial intelligence, which can work with a capacity similar to human ability in terms of thinking, as it focuses on making the machine able to think and plan on its own and like human thinking.

Super artificial intelligence, which may exceed the level of human intelligence and can perform tasks better than a specialized and knowledgeable person, is considered a hypothetical concept that does not exist in our current era.

As for specialized artificial intelligence, jurisprudence agrees that it is not currently possible to determine criminal liability for a robot or an artificial intelligence program if it commits a crime. The criminal responsibility defined by the criminal law is the responsibility of the natural person and the responsibility of the moral person in some cases if the crime is committed for his benefit and account. At the same time, for artificial intelligence, it is not possible to say it is criminal responsibility as long as it cannot perceive and distinguish, which is considered the basis for the responsibility of the natural person (Ibrahim, 2020).

A part of German criminal jurisprudence considers adherence to traditional rules related to artificial intelligence crimes, which limit criminal responsibility to humans exclusively, as most experts do not prefer to introduce fundamental changes to criminal law to deal with these new technical developments, so Dr. Susan Beck, “Professor of Law Criminal Law and Philosophy of Law at the German University of Hannover” that: “The criminal law that was developed to deal with individuals faces difficulties in keeping pace with the development of machines that are independent of humans at work, as well as dealing with the developments of artificial intelligence,” and it was expressly decided that: “The criminal law naturally provides for tolerance The operator of the machine is responsible, for example, if Google gives you with false information and you make a decision based on it, you will be the one who bears the responsibility (Beck, 2019).

The Program of Artificial Intelligence as an Innocent Mediator

Some tended to examine the hypothesis of using the artificial intelligence program as a mediator to commit the crime, by analogy with the moral actor theory, when the crime is committed by a mentally minor person or an animal. Then, the artificial intelligence program can be considered an innocent mediator. The criminal liability report for everyone who programmed the artificial intelligence program

Artificial Intelligence and Criminal Law

Or whoever operates or uses it, apart from discussing the issue of criminal liability for this program or application, and some cite the example regarding the responsibility of artificial intelligence as the responsibility of a person who has a mental illness or a natural mental disability that deprives him of the ability to understand what he is doing or his ability to control his actions, or the ability To know whether he is doing or refraining from doing so (Kingston, 2016).

In this case, the assumption is that the artificial intelligence entity does not attribute any mental ability to it. Therefore, there is no legal difference between it and the machine used in the crime, while about general or superior artificial intelligence, it is expected in the future to develop the rules of legal responsibility for its actions in light of its characteristics that bring it closer to the characteristics of human beings, the most prominent of which are: the availability of the two properties of perception and discrimination, and then the availability of freedom of perception, which is the basis for achieving criminal responsibility for a person's act, and then it can also be said that criminal punishment can be imposed on him (GLESS et al., 2016).

Hence, the assumption in this case is that the artificial intelligence entity is not dependent on a specific programmer or user. Therefore, three conditions are required for the responsibility of the artificial intelligence entity for the crime:

- 1- It must be proven that the crime occurred as a result of the behavior of the AI entity itself.
- 2- It proves that the AI entity committed the crime without relying on a programmer or user.
- 3- It proves that the entity committed the crime with knowledge or intent.

Suppose the artificial intelligence program or system controls a mechanical or other machine to move its moving parts. In that case, any positive or negative action performed by this machine can be considered implemented by the artificial intelligence entity (Ibrahim, 2020) in light of the characteristics of artificial intelligence techniques. Self-learning, as well as its use of advanced algorithms that enable it to make and implement decisions without human intervention, in addition to the feature of learning from the situations it is exposed to and the presence of giant and advanced databases inside it that enable it to do the right thing in most situations (Dahshan, 2020).

Determining the intent is the most challenging matter; some give an example of a speeding violation by self-driving cars. Speeding is a strict liability crime. Suppose a self-driving car is found to have exceeded the speed limits on the road it is running on. In that case, the law may refer criminal responsibility to the intelligence program, who was driving the car at the time," without questioning the car's owner.

Some believe that for AI entities to have criminal liability, they should be treated as legal persons, such as commercial companies, and the previous opinion adds to this the possibility of granting AI entities some legal rights in line with those given to commercial companies as moral persons (Ibrahim, 2020).

In sum, we conclude that the criminal liability for crimes of artificial intelligence is to talk about the criminal responsibility of each of the designers or manufacturers of artificial intelligence systems and its users without addressing the issue of criminal responsibility of the self-driving machine that lacks the elements of the availability of criminal liability towards it as previously mentioned. Suppose the matter may witness a development in the rules of criminal responsibility commensurate with the developments in this field. In that case, we discuss some hypotheses that regulate how to hold accountable those who cause crimes due to the misuse of artificial intelligence systems according to the established rules in the criminal law, as the person is not responsible for the crime. Its punishment is not imposed on him except as a perpetrator or accomplice.

Artificial Intelligence and Criminal Law

Liability of the Natural Person for Crimes of Artificial Intelligence

Criminal responsibility is only achieved by the person responsible for this crime, which depends on attributing the material and moral pillars to him. According to the honest attribution of the act, responsibility does not occur unless the will of the perpetrator to whom the act is attributed is materially directed towards its commission.

Hence, the rules of traditional criminal liability do not apply to artificial intelligence systems or self-driving machines, which lack awareness and discrimination, which is the basis for realizing the will constituting the criminal intent carried out by criminal responsibility. A person cannot be considered criminally responsible except for his act or abstention.

The first condition is the existence of a material relationship between the crime and the behavior of the person responsible for it, which assumes the person's contribution to the crime by his act, the availability of a causal relationship between the act of contribution and the criminal result that the legislator relies on in criminalization and punishment.

On the other hand, reference is made to the importance of the role of natural persons in artificial intelligence crimes, as they play an essential role as the people behind these devices. Then, they ask about the circumstances in which the artificial intelligence entities acted, the programs they designed and implemented in the artificial intelligence program, and the machine or device running this software (Nedbálek, 2018).

Significance of Establishing a Causal Nexus in the Availability of Personal Liability

The idea of criminal activity is inseparable from the illegal result, as both are two intimate ideas that are indispensable for any of them to carry out the criminal act that constitutes the material element of the crime causal (Bilal, 2010).

The physical link between the act and the result is something that is required by the idea of material attribution, just as the moral link between the two also requires the conscious free will that must be available in the right of the criminal as a condition for his responsibility (Sorour, 2003), the most prominent of which is: the theory of sufficient causation, and then the criminal responsibility of the manufactured person may be achieved or the user of artificial intelligence systems for crimes committed by self-driving machines, as long as the error on the part of artificial intelligence systems, in which the crime was realized, should have been expected by the average person at the time of the activity that caused the crime.

In the scope of artificial intelligence, a distinction can be made between the responsibility of each programmer, manufacturer, and operator on the one hand, the responsibility of the user or owner on the other hand, and the responsibility of third parties, as follows:

Liability of the Programmer, Manufacturer, and Operator

In the framework of manufacturing and innovating artificial intelligence systems, a distinction can be made between the programmer, who means the person who sets the codes that run the work of the artificial intelligence system, which is prepared using machine language. He asks about the crimes committed by the artificial intelligence system if the crime was committed due to his fault, Feeding the

Artificial Intelligence and Criminal Law

system with the steps to be taken to deal with possible situations during its operation, according to the theory of probabilistic intent.

The factory means the person responsible for manufacturing the physical devices managed by the artificial intelligence system, and the programmer and the manufacturer may be one person (Dahshan, 2020). There may be more than one person, and the robot maker is asked about the machine's defects resulting from poor manufacturing, which may lead to the robot's failure and actions out of its ordinary course (Nevejans, 2016). For example, a defect in the medical care robot leads to the wrong movement of the patient, which worsens his health condition (Goeldner et al., 2016), and as another example, harming the patient due to the medical robot's miscommunication with the analysis lab or neglecting the robot's maintenance from the manufacturer (Cristiano Almonte vs. Averno Vision & Robotics, 2015).

In any case, the owner of the factory cannot refer to the worker who does not understand anything about robots and has forced him to enter the manufacturing process (Joshua Drexler vs. Tel Nexx, 2015), while the operator means the professional person who is based on exploiting the robot; Such as: managing the virtual commercial bank, which operates an intelligent application that relies on a robot in managing some banking operations, as an error may occur in managing customer accounts (Al-Qusi, 2018).

Owner and User Liability

The owner means the person who operates the robot personally to serve him or his clients, such as the doctor who owns a hospital that owns and operates a medical robot to carry out surgical operations if the robot poses a threat to the safety of patients, with the knowledge of the doctor who owns the hospital about that, and his willingness to harness the robot as he works without pay for its implementation (Al-Qusi, 2018).

The user means the affiliated person who is based on the use of the robot other than the owner or operator and who is responsible for the behavior of the robot that has caused harm to people, and the user may be a beneficiary of the robot; the self-driving robot bus may use a group of people traveling through an electronic board and one of them sends a wrong command to the bus, which causes a traffic accident, or the professional operator may take a human user to use the robot so that he is an assistant to him; The user, who is affiliated with the company operating the robot, may be sued for negligence in its maintenance (Cristiano Almonte vs. Averno Vision & Robotics, 2015).

LIABILITY OF THE OWNER OR THE USER AS THE ORIGINAL PERPETRATOR OF THE CRIME

We address the following hypotheses.

The First Hypothesis Is the Use of Artificial Intelligence as a Means of Committing a Crime

The assumption, in this case, is that the offender harnesses a machine driven by artificial intelligence systems to use it in committing crimes, which requires that a causal link be established between the behavior of the offender and the criminal outcome achieved using artificial intelligence systems so that it can be said that he has criminal responsibility for crimes committed with the knowledge of the driven

Artificial Intelligence and Criminal Law

machine. Artificial intelligence systems and the basis for this is that the criminal legislator has the same means of committing the crime, as the perpetrator may use a stick or a firearm to assault the victim. He may use an animal that cannot think and perceive and direct a machine driven by artificial intelligence to achieve the same result.

Jurisprudence requires that evidence be established that the robot or the artificial intelligence system is subject to the offender's will, its use of the robot with prior knowledge, and the direction of its intention to achieve the crime through this robot (GLESS et al., 2016).

In this context, researchers address the hypothesis that programmers or users program or use the artificial system entity knowingly and intentionally to commit a particular crime, but the artificial intelligence entity deviates from the plan and commits some other crime in addition to or instead of the planned crime (Ibrahim, 2020). In this case, it can be said that the intentional criminal liability of the programmer or user is available based on the general rules established in this regard regarding deviation from the goal or mistake in personality (Wazir, 2008) and the criminal liability for them does not negate.

The Second Hypothesis Is the Idea of Probabilistic Intent

Some address the hypothesis that the artificial intelligence system commits a crime if the standard procedures of the artificial intelligence system are misused to perform a criminal act, as analysts refer to the case of an artificial intelligence robot in a Japanese bicycle factory killing a human worker, the robot wrongly identified the employee and considered him a threat to its mission, and he thought that the most effective way to eliminate this threat was to push it into the neighboring operating machine, so the working robot moved the worker using the hydraulic arm towards the machine, killing him (Kingston, 2016).

Then, the previous opinion calls for holding the machine programmer accountable if he knew about the possibility of this criminal result before its occurrence. Here, the perpetrator has committed a behavior and expected that this behavior might result in a particular result. Still, despite this expectation, it occurred before the result was achieved as a possibility of his behavior or as a possible natural consequence, which is what performs his responsibility for the crime due to his probabilistic intent (Wazir, 2008).

The Third Hypothesis Is Negligence in the Manufacture, Programming, or Use of Artificial Intelligence

In this case, the assumption is that the perpetrator, as a user, manufacturer, or programmer of artificial intelligence, did not want to use it in committing the crime. Still, the crime occurred due to his negligence or negligence, or his failure to observe the rules of caution and precaution. In this case, this user, manufacturer, or programmer will be criminally responsible for the illegal intentional crime, which requires that the relationship between the occurrence of the crime be proven through the artificial intelligence system and the unintentional mistake against the perpetrator (Al-Qusi, 2018).

In this case, the assumption is pure negligence by the programmers or users, who may have acted negligently or failed to act. Therefore, nothing can prevent them from determining their criminal responsibility for unintentional crimes based on negligence and failure to perform their duties, which led to the commission of the intelligence system for a specific crime or crimes.

Some distinguish artificial intelligence crimes between two forms of crimes. The first is the crimes that occur due to a software error or a loophole in the artificial intelligence system, resulting from the fact that the machine code was insufficient to anticipate all possibilities or that the crime that was committed

Artificial Intelligence and Criminal Law

occurred. Through the misbehavior of the owner or the intervention of an outside party to penetrate the machine and use it as a tool in the commission of his crime, in these cases, the responsibility is achieved towards the natural persons causing the occurrence of the crime (Dahshan, 2020).

This system can learn and develop itself and make individual self-decisions outside the software system set for it. In this case, criminal behavior stems from free will without software intervention from the factory, and it is unfair to hold the programmer accountable for a mistake made by the artificial intelligence system.

A question about the nature of the criminal responsibility of the user of artificial intelligence systems: Is it direct or assumed responsibility? Can the responsibility of the person using the artificial intelligence systems be attached to the responsibility of the autonomous machine for the act? The perception of this is not valid given that the assumed responsibility assumes the realization of the criminal responsibility of another person, which is an assumption that is not available given the lack of determination of the criminal responsibility of such machines. Therefore, it cannot be said that the human criminal responsibility for the crimes of artificial intelligence is an assumed responsibility, or Responsibility is transferred automatically from the machine to the human being to realize his responsibility for the crime committed from these systems or applications.

Contrary to this opinion, some believe criminal responsibility based on error should be transformed into responsibility based on taking risks. The previous opinion believes that establishing the responsibility of the owner or user on the idea of assumed responsibility for crimes committed through artificial intelligence that falls into his possession. Consequently, the onus falls on him to prove his lack of responsibility. Some proponents of the previous opinion establish this assumed responsibility according to the responsibility model of the natural possibility, which was dealt with by Gabriel Halevy, which went to the possibility of holding the programmer or user accountable if the crime committed was a wild and probable result of the behavior of the artificial intelligence entity, and this is assumed Opinion is the ability of programmers or users to anticipate potential wrongdoing by an AI entity (Hallevy, 2010).

Hence, the possibility of any person being held accountable for the crime of artificial intelligence if it is a natural and possible consequence of this behavior, and this model for establishing responsibility based on realistic possibility requires that the programmer or user be in a neglected mental state and nothing more. Then, the programmers or users are not required to know any commission Coming to a crime due to their activity. Still, they must understand that this crime is a possible result of their actions, as they are responsible for the possible future crime even though they were unaware of it.

Liability of Third Parties for Crimes of Artificial Intelligence

As previously mentioned, a third party means anyone other than those associated with the artificial intelligence system. This third party may be a partner of one of the persons related to the artificial intelligence systems, such as the programmer or the user, and may be an independent actor from them, which we will address as follows:

Third-Party Liability as an Accomplice to the Crime

Criminal jurisprudence defines the theory of the moral perpetrator of the crime, which is meant by the person who uses others to carry out the crime, so he is like a tool or a tool that this person uses to investigate the elements of which the crime entity is based. His body, but he used the help of someone

Artificial Intelligence and Criminal Law

else who was more like a machine directed by the moral actor (Hosni, 1992). Examples of moral actors are those who incite crime, a person who is not qualified for criminal responsibility, such as the insane, or a person who is not discerning, such as a child, or a person with good intentions.

The basis for determining this theory is that the legislator has equated the means that the offender imagines using to commit the crime. The law does not distinguish between the tools used by the offender in committing his crime. Criminal or good faith does not have its independence of character (Hosni, 1992).

Liability of Others as Principal Perpetrators of the Crime

The researchers address the hypothesis that someone obtains in some way the codes for the operation of the artificial intelligence entity or exploits a vulnerability in the artificial intelligence system, whether by negligence on the part of the owner, user, or manufacturer or without that and through the use of these codes he enters his program or Its system and directing it to commit a crime, beyond the control of the owner or user, in which case this third party is responsible as a principal actor for the crime committed by the AI entity (Dahshan, 2020).

Liability for the Actions of Others

The Egyptian legislator has known some cases that raise the problem of responsibility for the actions of others, such as the successive liability in publishing crimes in the French legislation, which is one of the forms of responsibility for the actions of others. It should be noted that the criminal judiciary and legislation abandoned the idea of responsibility for the acts of others and the person's criminal responsibility for the actions of his subordinates, as the general rules of criminal law decide that it is not sufficient for the availability of criminal responsibility for a specific person to establish the attribution of a particular act or omission to him unless this act is the result of a free will sent This verb into existence.

This free will emanates from criminal intent or unintentional error associated with the act. The will is not free unless it results from a criminal capacity recognized by the law, awareness, or discrimination. This capacity expresses its owner's ability to legally direct his will to what violates the Penal Code. This matter is not available to the self-driving machine; therefore, the criminal responsibility prescribed for the natural person is not fulfilled. The self-driving machine using artificial intelligence lacks the criminal capacity that depends on the availability of awareness and discrimination (Hosni, 1992).

The Responsibility of the Manufacturer of the Artificial Intelligence System for Its Crimes

In light of the criminal law's recognition of the responsibility of the legal person in some cases, it can be said that it is permissible to hold the manufacturer of the artificial intelligence system accountable for its crimes, and two conditions are required for the responsibility of the legal person to be established:

1. That the crime was committed by a member of the legal person or one of its representatives.
2. The commission of the crime must be for the benefit and account of the legal person.

Among the forms of criminal penalties that may be imposed on legal persons, we mention, for example, a financial fine, suspension of the legal person's license to practice the activity for a specified

Artificial Intelligence and Criminal Law

period, revocation of the permit, or dissolution of the legal person, and publication of the judgment at the expense of the legal person.

Hence, it can be said that the manufacturer can be held criminally liable for AI crimes provided that it is proved that the crime occurred due to the manufacturer's fault.

The Right of Defense in Artificial Intelligence Crimes

Some raised some questions about how to exercise the right of defense in the event of an artificial intelligence system committing a crime and whether the defense can plead excluding criminal liability for these crimes, so can a program that works in error claim a defense similar to the human defense under the pretext of insanity? Could an artificial intelligence affected by a cyber-virus claim defenses similar to coercion or involuntary intoxication? These types of defenses are not theoretical at all, and the previous opinion is based on a case in the United Kingdom in which defendants who committed information crimes pleaded not responsible because their devices were infected with malicious software (viruses) that were responsible for the crime (Hallevy, 2010).

In one of the other cases, a denial-of-service defendant pleaded that the Trojan program was responsible and that the program had erased itself before being forensically analyzed, and the defense persuaded the jury to verify this possibility beyond a reasonable doubt. (Hallevy, 2010), Moreover, some support the previous view, suggesting that a robot be given the right to be exempted from punishment if interference from an external source affects its behavior, such as undergoing a hacking process in its system, which may cause it to lose the ability to control his actions and actions that resulted in the behavior (Dahshan, 2020).

Some have questioned the extent to which it is possible to rely on the availability of a state of legitimate defense for a robot or an artificial intelligence entity in the event of an attack by an individual (El-Kady, 2021) and then claim the absence of its responsibility as a reason for permissibility, as the current legal texts do not allow that, due to the limitation of the right of defense The legal right of a person to defend himself and his money and the life and money of others without others, this right is limited to humans. It does not extend to machines and animals. Therefore, it is not permissible for the artificial intelligence entity to rely on the state of legitimate defense of itself or others in the event of its assault on any human being.

Also, it is not permissible for any person to program a robot or any entity that works with artificial intelligence to defend it when it is subjected to an attack, given that this entity does not have the right to protect the life and money of others legally, as this right is limited to humans only, to the exclusion of other entities, and contrary to this opinion, Some see the possibility of this; Provided that the programming of this robot is advanced, and can balance between the act of attacking its owner and its behavior represented in the legitimate defense of its owner, but if the programming of the robot does not reach this development. The person has no right to program a robot to defend it, and its capabilities can be recognized. Robots and the extent of development of their programming systems through the producing companies and their manufacturing profile (Dahshan, 2020).

Punishment for AI Systems

If the artificial intelligence system commits a crime, who will be punished for the crime, and what form will this punishment take? Punishing individuals, even if it does not raise any problems, punishing arti-

Artificial Intelligence and Criminal Law

ficial intelligence systems and robots raises a problem in the application, as it is a machine even if She had artificial intelligence (El-Kady, 2022).

It is noteworthy that this issue is still a matter of disagreement among jurisprudence, as some have argued that the future may witness a revolution in criminal law with the emergence of robots and artificial intelligence systems, as the previous opinion believes that technological development in this field may result in the manufacture of super-intelligent robots that can take decisions without relying on human beings, and then the previous opinion expects a growth in the rules of criminal responsibility to allow for the determination of penalties for such systems; Among the most prominent penalties proposed to be applied to artificial intelligence entities:

1. Confiscation of the AI machine.
2. Destroying it in whole or in part.
3. Stop operating it entirely or partially.
4. Cessation of the program or system that operates with artificial intelligence, in whole or in part.
5. reprogram it (Ibrahim, 2020).

Hence, we are expected to see penalties for artificial intelligence entities similar to those imposed on legal persons.

While some rightly argue that there are no answers to these questions, criminal liability may not apply, so the matter should be settled by civil law.

In summary, regarding the issue of punishment for crimes of artificial intelligence, determining penalties for these crimes requires the issuance of criminal legislation that criminalizes these acts and discriminates specific penalties for them in the application of the principle of illegal legality (there is no crime or punishment except by text), and therefore the separation between the two previous opinions is in the hands of criminal legislators, We can only wait for the legislators to have the final say on this particular issue.

CONCLUSION

1. The evolution of lifestyle and human behavior towards digital transformation and the use of modern technologies in all aspects of life prompts us to say that humanity has entered the era of the Fourth Industrial Revolution, which is based on applications of artificial intelligence.
2. The spread of the uses of artificial intelligence in all areas of life and the occurrence of some incidents that raise issues related to the rules of criminal liability resulting from the uses of artificial intelligence.
3. The inadequacy of the rules of criminal liability to establish a legal framework governing abuses related to the uses of artificial intelligence.

Recommendations

1. Inviting national research centers to adopt a study of the uses of artificial intelligence, establish a legal and economic framework for its use, and organize many scientific and research events to delve deeper into its studies.

Artificial Intelligence and Criminal Law

2. Directing the attention of the international community towards the necessity of developing a global framework governing the use of artificial intelligence technologies similar to the Budapest Convention on Combating Information Crimes, or at the very least amending the agreement above, to ensure the existence of such rules that regulate the use of artificial intelligence applications, provided that they include a unified international definition of intelligence artificial.
3. Calling on the Egyptian legislator to set rules that regulate the use of artificial intelligence applications and determine appropriate penalties in case of misuse, or at least amend the provisions of the Information Technology Crime Law to allow for the development of an integrated framework to confront the abuse of the data of the Fourth Industrial Revolution, including artificial intelligence technologies.
4. Looking towards creating a department specialized in the use of artificial intelligence systems and digital transformation, primarily criminal justice agencies (judicial and security), to achieve an effective confrontation in dealing with all forms of misuse of these new technologies by criminal and terrorist groups, as well as a department to combat cryptocurrency crimes via the Internet in coordination with the concerned national and international authorities, within the framework of strengthening international judicial and security cooperation.
5. Considering the creation of a unit for studies of digital transformation and artificial intelligence in scientific and research entities and national research centers to research activating the policy of digital transformation and developing technological infrastructure, preparing studies related to applications of artificial intelligence in security work and discussing ways to apply them in practice in coordination with the concerned authorities, and conducting in-depth studies on various issues and topics related to information technology crimes, topics of cyber security and insurance against cyber-attacks, the development of massive databases and the expansion of their applications in the areas of security work, and conducting research in the areas of technological development related to police work to keep pace with scientific progress using modern technical and scientific devices and means.
6. Consider teaching courses for university students that deal with applications of artificial intelligence to familiarize students with the successive developments in this field.
7. Creating a department for technological training in state institutions concerned with developing individuals' technical behavior by organizing several specialized training courses based on technological developments and introducing artificial intelligence applications.
8. Expanding the establishment of specialized departments in the field of securing information networks and government websites and providing them with technical cadres to counter information penetration operations, securing these networks from the risks and repercussions of penetration, and keeping abreast of successive developments in this field, similar to developed countries.

REFERENCES

Al-Qusi, H. (2018). The Problem of the Person Responsible for Operating the Robot - A Prospective Analytical Study in the European Civil Law Rules for Robots. *Generation Journal of In-Depth Legal Research*, 89-93.

Ali, Y. A. (1980). *Explanation of the General Principles of the Penal Code, Part 1*. Dar Al-Nahda Al-Arabiya.

Artificial Intelligence and Criminal Law

Ashley. (2017). *Artificial Intelligence and Legal Analytics, new tools for law practice in the digital age*, University of Pittsburgh School of Law. Cambridge University Press.

Beck, S. (2019). *Autonomous Systems and Criminal Law – new impulses for the concept of responsibility?* <https://www.inf.uni-hamburg.de/en/inst/ab/eit/about/newsfeed/2019/20190703-beck.html>

Bilal, A. A. (2010). *Principles of the Egyptian Penal Code - General Section*. Dar Al-Nahda Al-Arabiya.

Calo, R., Froomkin, A. M., & Kerr, I. (2016). *Robot Law*. Edward Elgar Publishing Limited. doi:10.4337/9781783476732

Corrales, M., Fenwick, M., & Forgó, N. (2018). *Robotics, AI and the Future of Law, Perspectives in Law, Business, and Innovation*. Kyushu University, Springer International Publishing AG.

Cristiano Almonte vs. Avera Vision & Robotics, Inc.; United States District Court, W.D. New York. No. 11-CV-1088 EAW, 128 F.Supp.3d 729 (2015), Signed August 31, 2015.

Cristiano Almonte vs. Avera Vision & Robotics, Inc.; United States District Court, W.D. New York. No. 11-CV-1088 EAW, 128 F.Supp.3d 729 (2015), Signed August 31, 2015.

Dahshan, Y. I. (2020). *Criminal Responsibility for Artificial Intelligence Crimes. Sharia and Law Journal*, (82).

El-Behairy, A. S. G. (2019). *The Impact of Artificial Intelligence Applications on Raising the Efficiency of Security Performance by Application to Road Securing* [Doctoral dissertation]. Police Academy.

El-Kady, R. (2021). Towards approving rules for criminal liability and punishment for misuse of artificial intelligence applications. *Journal of Legal and Economic Research (Mansoura)*, 11(1), 875–924. doi:10.21608/mjle.2022.217213

El-Kady, R. (2022). Criminal confrontation of encrypted digital currencies and artificial intelligence crimes Analytical study in Egyptian and comparative legislation. *Journal Sharia and Law*, (89). Available at: https://scholarworks.uaeu.ac.ae/sharia_and_law/vol2022/iss89/6

European Police & Darktrace. (2019). *How Technology Will Shape the Future of Cybercrime?* <https://www.emaratalyoud.com/>

Ghaitas, G. M. (2017). Internet and Digital Transformation Department. *International Policy Journal*, (180).

Gless, Silverman, & Weigend. (2016). If Robots Cause Harm, who is to Blame? Self-Driving Cars and Criminal Liability. *New Criminal Law Review*, 1-12.

Goeldner. (2015, March). The emergence of care robotics – A patent and publication analysis. *Technological Forecasting and Social Change*, 92.

Hallevy, G. (2010). The Criminal Liability of Artificial Intelligence Entities – from Science Fictions to Legal Social Control. *Akron Law Journal*, 4(2), 132.

Hallevy, G. (2013). *When robots kill: Artificial intelligence under criminal law*. Northeastern University Press.

Artificial Intelligence and Criminal Law

Hosni, M. N. (1992). *Criminal Contribution to Arab Legislation*. Dar Al-Nahda Al-Arabi.

Ibrahim, A. I. M. (2020). *Criminal Liability Resulting from Artificial Intelligence Errors in UAE Legislation - A Comparative Study* [Doctoral dissertation]. Ain Shams University.

Information and Decision Support Center of the Egyptian Cabinet (IDSC). (2020). Artificial intelligence is the most essential element of the Fourth Industrial Revolution. *Bulletin of Future Directions*, 1(1).

Joshua Drexler vs. Tel Nexx, Inc., etc.; United States District Court, D. Massachusetts, Civil Action No. 13-cv-13009-DPW, 125 F.Supp.3d 361 (2015), Signed August 28, 2015.

Khalifa, M. M. T. (2018). Artificial Intelligence in the Balance of Legislation. *Dubai Legal Journal*, (28).

Khalifa, M. M. T. (2018). *Artificial Intelligence in the Balance of Legislation*. Academic Press.

Kingston, J. (2016). Artificial Intelligence and Legal Liability. *International Conference on Innovative Techniques and Applications of Artificial Intelligence*.

Kurki, V. A. J., & Pietrzykowski, T. (2017). *Legal Personhood: Animals, Artificial Intelligence and the Unborn*. Springer International Publishing AG. doi:10.1007/978-3-319-53462-6

Leemans, T. & Jacquemin, H. (2017). *La Responsabilité Extracontractuelle de l'Intelligence Artificielle*. Master en droit, Faculté de droit et de criminologie (DRT), Université Catholique de Louvain.

Mayer-Schönberger, V., & Cukier, K. (2013). *Big Data: A Revolution that Will Transform How We Live, Work and Think*. John Murray.

Mohamed, S. T. (2020). *Legal Aspects of Artificial Intelligence and Robotics*. <https://democraticac.de/?p=64965>

Naguib Hosni, H. (1992). *Criminal Contribution to Arab Legislation*. Dar Al-Nahda Al-Arabiya.

Nedbálek, K. (2018). *The Future Inclusion of Criminal Liability of the Robots and Artificial Intelligence in the Czech Republic*. Paradigm of Law and Public Administration, Interregional Academy for Personnel Management. Available at <https://maup.com.ua/assets/files/expert/1/the-future-inclusion-of-criminal.pdf>

Nevejans, N. (2016). Directorate-General for Internal Policies, Policy Department C: Citizens' Rights and Constitutional Affairs, Legal Affairs. *European Civil Law Rules in Robotics*, No. EA n° 2471.

Parliament, UK. (2016). *Robotics and artificial intelligence*. Report of the Committee on Science and Technology.

Pham, Q. V., Nguyen, D. C., Hwang, W. J., & Pathirana, P. N. (2020). *Artificial Intelligence (AI) and Big Data for Coronavirus (COVID-19) Pandemic: A Survey on the State-of-the-Arts*. Academic Press.

Poirot-Mazeredu. (2015). Robotique et médecine: Quelle(s) responsabilité(s)? *Journal International de Bioéthique*, 24(4).

Russell, S., & Norving, P. (2009). *Artificial Intelligence - A Modern Approach* (3rd ed.). Prentice-Hall.

Schwab, K. (2017). *The Fourth Industrial Revolution - A Book in Minutes*. In Summaries of international books. Mohammed bin Zayed Knowledge Foundation.

Artificial Intelligence and Criminal Law

Sorour, A. F. (2003). *Constitutional Criminal Law*. Dar Al Shorouk.

United Nations Congress on Crime Prevention and Criminal Justice. (2020). *Current Crime Trends, Recent Developments, and Emerging Solutions, especially New Technologies as Means of Committing Crime and Tools for Combating Crime*. Workshop at the Fourteenth Congress held in Kyoto, Japan.

Wazir, A. M. (2008). *Explanation of the Penal Code - General Section, The General Theory of Crime*. Dar Al-Nahda Al-Arabiya.

Weng. (2015, February). Intersection of “Tokku” Special Zone, Robots, and the Law: A Case Study on Legal Impacts to Humanoid Robots. *International Journal of Social Robotics*.