Research of artificial intelligence as a subject of crime

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Abstract. The paper focuses on the prospects of recognizing artificial intelligence as a subject of crime and the presence of artificial intelligence as Mens Rea and Actus Reus. The paper aims to do the following: (1) study the international experience of the criminal justice response to crimes committed with the use of artificial intelligence based on the systematic and comparative analysis, and (2) answer the question of the possibility of recognizing artificial intelligence as a subject of crime. The research is based on a wide range of international sources and data from international organizations, national legislation, and scientific literature. Within the study, we have used the following research methods: historical, comparative, formal-legal, and functional methods, and a systematic approach. As a result, we have found that artificial intelligence has the ability to implement all three components of guilt: act, direct causal link, and occurrence of socially dangerous consequences. Consequently, we have concluded about the possible definition of artificial intelligence as a special subject of crime. Therefore, we have proposed considering some of its fundamental properties as possible criminological prerequisites for recognizing artificial intelligence as a special subject of crime.
Keywords: artificial intelligence, robot, crime, subject of crime, special subject of crime, criminology, criminal law, social problems.

1 Introduction

Artificial intelligence (AI) is a digital technology that will have great importance for developing humanity in the near future [1, 2]. Not amazingly, AI-based innovations are driving some of the most leading-edge results that we practice in our regular lives [3, 4]. Artificial intelligence is evolving so fast and it plays an important role in our society [5-10]. But anyhow it was a massive revolution, even then, invented the idea that gave us an ambition [11, 12]. Today most organizations, governments, and businesses use AI and develop a high-performing network to perform their tasks [13-15].

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AI is a set of theories and techniques that develop complex computer programs capable of simulating certain traits of human intelligence (reasoning, learning, etc.) [16].

In numerous examples, benefiting from exponentially improving technologies, what was once considered a task distinctly requiring human intelligence is now being done much faster and more efficiently by artificially intelligent machines [17].

It is an interdisciplinary field that includes computer science, as well as various types of technology and science, such as robotics and biomedical engineering, and focuses on automating human actions and intelligence using machines. AI is the modern use of machines to perform algorithmic calculations and understand tasks that include learning, problem solving, mapping, perception, and reasoning [18].

We should note that the pace of developing the AI market is exceptionally high. According to the Tractica analytical report Artificial Intelligence Market Forecasts, the AI software market will reach 126 billion dollars in annual global revenue by 2025 [19].

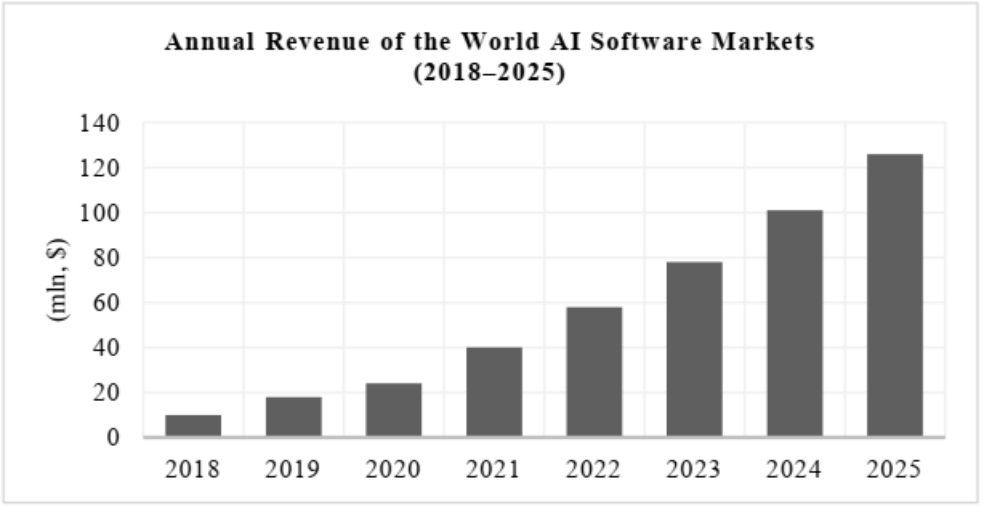

Fig. 1. Artificial intelligence market forecasts. Source: Compiled by the authors based on [19].

Today, AI is one of the most controversial phenomena in many fields of science and technology, such as chemistry [20], nanotechnologies [21], computer science [22], programming [23], construction [24], machine learning [18], earth science [25], finance [26], medicine [27, 28], economics [29] and cybersecurity [30].

Besides, many areas of medicine have adopted the AI capabilities to help diagnose and treat diseases, including pediatrics [31], radiology [32], urology [33], nephrology [34], oncology [35], and others.

AI is a technology that has a considerable resource for storing, processing, and transmitting information, its stable encryption, and creating computer programs for various purposes based on it [5].

The sphere of law did not go unnoticed. At present, machine-learning methods are used to fully or partially automate legal analysis and planning tasks [36] and simplify cumbersome legal tasks [37]. At the same time, AI technologies can be used (or are already being used) for protecting intellectual property [38] and consumer rights [39], as well as in law enforcement [40], international law [41], detecting [42, 43] and predicting crimes [44, 45], including financial crimes [46, 47].

2 Materials and Methods

Within the study, we have used the following research methods:

1. System-structural method (expressed in allocating the structure of integrated systems of social relations with defining those social practices, in which AI is most likely to become widespread);
2. Dialectical method of cognition (since the laws of materialistic dialectics are of universal importance and equally characteristic of the development and functioning of AI technologies);
3. Method of modeling (highly relevant to the research purposes and consisting in creating a mental model that allows us to obtain the expected information required for disclosing the main research results);
4. Prediction method (receiving the wide distribution and based on the analysis of the objective laws of developing AI as a social and technical phenomenon, as well as using the theory of prognostics for developing further research);
5. Analysis of the interrelated provisions of scientific papers on similar or overlapping topics;
6. Synthesis of general theoretical developments aimed at AI studying.

Using various methods allows us to reasonably assume that the content of the study will be relevant to the scientific community. Meanwhile, the conclusions will allow us to develop the doctrine for the legal regulation of AI.

3 Results

The potential of this technology for accumulating information can be used to cause harm to legally protected public relations. In this regard, it is relevant to note that currently, there is no certainty in solving criminal liability issues for those acts where AI technology is a source of harm. These circumstances form the need to prepare legal models for preventing the criminological risks of creating and using AI [5]. The pace of developing machine learning technologies requires a fundamental reworking of the main approaches to legal regulation, especially in terms of introducing mechanisms for regulating public relations that involve AI technology [5]. This means that it is necessary to consider the nature and characteristics of AI as a preliminary step towards defining its legal paradigm [48].

We should agree with the opinion of the scholars who believe that there is still no AI technology that is self-aware, independent, and capable of coping with emotional and social effects [49]. In China, we have focused on all possible development of this technology and its use in our activities [50].

We also support Korean researchers who believe that people should understand the AI meaning in the super-era and formulate the principles of criminal responsibility related to the definition of AI technology to facilitate the solution of complex problems in the future [51]. In addition, Polish scholars have supported this idea [52].

However, we should express some doubts about a particular possibility of AI independently committing an independent crime, at least soon. Without denying the potential of this scenario, we note that this requires a sufficiently high level of development in digital technology, which allows AI to act on the basis of behavioural algorithms independently formulated.

We agree with the researchers who note that currently, there are no sufficient grounds for identifying a person and AI technology due to the fact that the ability of the latter to self-study and make decisions within the absence of pre-formed algorithms is not developed enough to study this issue [5]. Moreover, criminal law policy in the field of criminalization of certain types of acts should be based on accurate criminological forecasting. Thus, short-

term, medium-term, and long-term criminological forecasting is the traditional basis for providing public relations by criminal law. Of course, we cannot expect a complete technological singularity soon, but its onset is an irreversible process. In this regard, whether AI can be recognized as a special subject of crime seems to us relevant, although it applies only to the long term.

4 Discussion

We should indicate the theory, according to which the level of AI consciousness can be comparable to the human one in the future, as a foundation for further reasoning. This phenomenon will necessitate AI considerations through the prism of law. Simultaneously, the legal regulation of AI implies the need to solve a set of tasks to ensure the safe functioning of socio-economic and socio-political processes by legal means, including criminal law [53].

Some scholars describe the criminogenic potential and the preventive role of AI [54] and consider the legal situation regarding automation and AI in the UK, USA, and Asia [55].

The criminological approach is associated with modeling the legal system and criminal processes, which can be used to describe the current state of AI development and identify ways to study the relevant technology and processes for the prospect of future development [56].

There are several points of view on the issue of defining AI as a subject of law, which we can reduce to the three main ones:

• AI can be recognized as a subject of all public relations (including the subject of criminal activity) [57];

• AI can only be recognized as a subject of civil liability [58];

• AI cannot be recognized as a subject of law [59].

Over the past decade, AI has received increased attention, discursive circulation, and practical application. It is important to distinguish weak (allopoesis) AI from strong (autopoiesis) AI [60].

The AI development warns of possible social risks, and AI of crime has put forward a new proposal for the theory of criminal law and legislation. From the perspective of a criminal subject, AI can be divided into narrow artificial intelligence (NAI) and general artificial intelligence (GAI). NAI does not have independent judgment and decision-making ability, so it is unlikely to become a criminal liability subject. However, GAI has independent discrimination and control ability, and it can commit a crime by self-selection and identification, so it is possible to become a subject of crime. At present, we should gradually construct and improve the scientific normative system of AI crime, focusing on legislative foresight [57].

The researchers of the Cybercrime Observatory of the Australian National University have outlined an interesting position on this issue in their report. According to their arguments, AI should be divided into strong, medium, and weak AI [54]. The first two elements of the above classification have a limited intellectual potential and a strictly defined purpose reduced to performing individual household or industrial functions. It is hardly possible to state the imitation of human cognitive functions, the ability to act without pre-established algorithms, and obtaining results comparable to the results of human intellectual activity regarding them. In other words, they are more like computer programs and not of interest to us since they are positively correlated with the objects of law.

According to their reasoning, the conclusions of scholars regarding the strong AI technology that can perform actions and make decisions based on independently formulated behavioral algorithms have the most significant scientific value. We find this circumstance fundamental. Even though the above report does not confirm the presence of this technology, we suppose that due to the alleged autonomy of its actions, there will be a reasonable question

about who exactly the subject to criminal liability is in a situation of causing harm. Consequently, we would like to explain that, in our opinion, the independent formulation of a behavioral algorithm means at least the following:

• AI technology selects information from the outside world through its channels, stores it, analyzes it, and adjusts its behavior to it independently, without the participation of third parties;

• AI technology is potentially able to internalize the requirements and prohibitions of the legal acts and realize the objective illegality of specific actions to the extent that is sufficient to formulate a conclusion about the awareness of the illegality of specific behaviors;

• Since sanity is a key feature of the subject, which is expressed in the ability to recognize the actual nature and social danger of the actions and guide them, we can probably assume that with a certain degree of conditionality, the AI variety considered is the established sanity. We should also note that some foreign researchers insist that even if the complex of technological solutions does not have a sign of sanity, the harm they cause should be penalized and provided with other measures of a criminal nature, like those applied to insane persons [61].

We find the above arguments quite fair. Notwithstanding the resolution of the issue on AI sanity, criminal law should ensure effective protection of public relations from AI actions. At the same time, the position on applying punishment (or other measures of a criminal nature) to AI does not mean distance from the question of the guilt of users or developers (whose mental attitude to causing harm in each case should be resolved considering the actual circumstances of the event) and is completely justified.

We anticipate the objections and note that it is unacceptable to identify the sanity of a person, based on the ability to make a conscious and volitional choice of socially acceptable behavior due to their psychophysiological qualities, with the sanity of AI technology. However, it seems that there are no sufficient grounds to bring users of AI (potentially created in the future), who decided to intercept and register information from technical communication channels based on independently formulated behavioral algorithms, to criminal responsibility.

We should also note that in foreign legal literature, researchers express their opinion about the need and expediency of establishing criminal liability of robots in situations where their cognitive qualities are sufficiently similar to human ones [62, 63]. At the same time, intelligence, including the ability to self-learn, is not determined solely by biological factors [64].

Concerning cybercrime, creating strong (or universal) AI raises significant criminological risks, including within committing cyber-attacks and other digital crimes. In our opinion, one of the critical tasks for the modern legal community is forecasting, proving, and justifying them, together with developing security issues.

Returning to the presentation of the previous idea about the possibility of considering AI as a special subject of crime, we generalize that it is unlikely to justify denying the following qualities in this technology:

• Ability to self-study (i.e., autonomous collection of information from theexternal environment, its processing, analysis, storage, and use);

• Ability to independently choose a behavior option in a specific situation in the absence of pre-entered behavioral algorithms based on the array of knowledge that the technology has independently obtained;

• Ability to analyze information to formulate several alternative solutions (behavioral models in specific situations) and make an autonomous (independent of the will of the creator or user) choice based on the opinion about the greater or lesser effectiveness of a particular option;

• Comparability of the results of AI activities with the results of human intellectual activity.

Thus, we can express a negative opinion with a sufficient degree of conviction regarding causing harm to users or creators of AI. As we have demonstrated earlier, the AI activities are neither covered by the will of these subjects nor controlled by them, which excludes the possibility of stating their guilt.

5 Conclusions

Based on the above, we can conclude that the world community needs to develop an interstate and national policy within legal regulation of AI and determine the ways of criminal law regulation of AI activities, especially in terms of penalization of acts.

We propose to consider the following properties as possible criminological prerequisites for recognizing AI as a special subject of crime: (1) ability to selfstudy and self – development; (2) ability to formulate behavioral algorithms independently; (3) ability to identify possible options to address the issues (problems); and (4) comparability of the AI results with the results of human intellectual activity.

As the primary mechanism of criminal law counteraction to crimes committed by AI, we propose to develop a set of special criminal law rules that establish the following: (1) special limited AI sanity; (2) using AI in the form of qualifying circumstances; and (3) applying specific criminal law measures to AI.

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