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Legal Risk Analysis for Artificial Intelligence Generated Content (AIGC)

Lei Li [1], Chuyun Wang [2, *]

[1] Department of International Law, China Foreign Affairs University, Beijing 100037, China
[2] School of Economics, Shenzhen Polytechnic University, Shenzhen 518055, Guangdong, China

[*] **Corresponding author**

Abstract: Artificial Intelligence Generated Content (AIGC), exemplified by ChatGPT, has experienced significant advancements in recent years. These advancements are attributed to training language models on extensive datasets, resulting in the acquisition of distinct learning and creative abilities that differentiate them from earlier AI tools. Generative AI has enhanced the productivity of human society's work and education. However, it has also brought up several legal hazards, such as challenges in regulating it under public law and issues of infringement under private law. China's regulatory approach to generative AI should prioritize caution and inclusivity on a broad scale. It should progressively establish a flexible regulatory and governance structure, as well as a comprehensive liability governance system, on a smaller scale.

Keywords: Artificial Intelligence Generated Content (AIGC); Data Training; Legal Risk.

1. Introduction

1.1. Definition of generative artificial intelligence

Since 2022, there has been a significant advancement in generative AI, specifically represented by ChatGPT. This development has sparked a global conversation. ChatGPT is trained using extensive data, enabling it to comprehend and communicate in human language. It can perform various tasks such as composing emails, creating video scripts, generating copywriting, and translating. This AI system possesses a strong capacity for self-creation and is increasingly being utilized in professional domains. The subject has a high level of self-creativity and demonstrates a shift from everyday life to the professional domain, as depicted in Figure 1. [1]

Generative AI, unlike other AI technologies, utilizes "Large Language Models" (LLMs) that possess the ability to comprehend human language and retain a vast amount of information acquired during training. Additionally, these models can generate superior content by leveraging their stored knowledge, aided by robust computational capabilities. [2]

Generative artificial intelligence is a product of the advancement of deep synthesis technology from a technological perspective. Deep synthesis technology, also known as generative synthesis, utilizes deep learning with virtual reality to create text, images, music, video, and virtual scenes. The research findings of advanced synthesis technologies, such as Generative Adversarial Networks (GANs) introduced in 2014 and Generative Pre-Training Model (GPT-3) introduced in 2020, have greatly enhanced the level of authenticity in creating multimedia data. These advancements have also facilitated the development of innovative applications such as "AI-generated content" and meta-universe. [3]

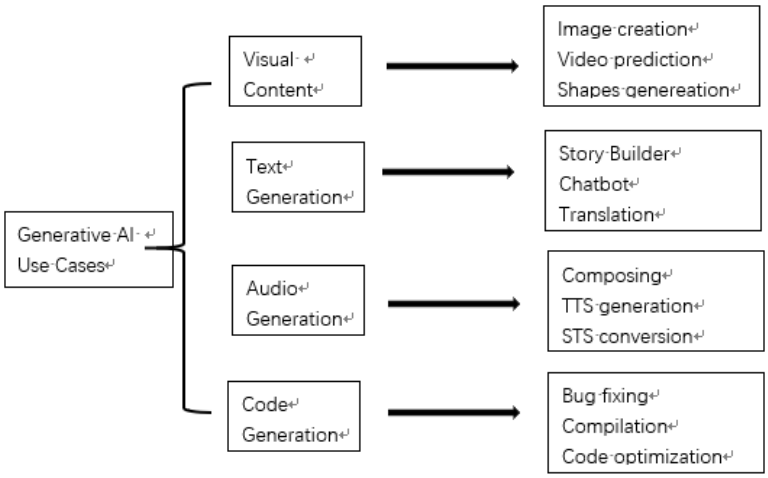

Fig.1 Generative AI and current use cases

1.2. Fundamental Concepts of Generative Artificial Intelligence

There are currently two types of generative AI: Generative Adversarial Network (GAN) and Generative Pre-trained Transformer (GPT). One commonly used AI technique for generative modeling is GAN, which involves the collaboration of two neural networks: the generator and the

discriminator. On the other hand, GPT utilizes a vast amount of publicly available data to read and generate text that resembles human language. It is specifically designed to generate text that is contextually appropriate based on given cues or contextual contexts.

The fundamental technical idea of generative artificial intelligence involves utilizing natural language processing to produce appropriate responses using algorithms and data. By autonomously analyzing and learning from the existing text database without supervision, this process examines the semantic relationships, contextual connections, and colloquial expressions within the text. It then dissects the question posed by the user using an algorithmic model that follows the logic of human linguistic expression. This generates a digital sequence, which is subsequently transformed into a text response using specific algorithms. [4]

Using the current ChatGPT as a reference, the operational concept of generative artificial intelligence can be analyzed. The generation process of ChatGPT is separated into four distinct phases, as seen in Figure 2. [5]

(1) Phase of training data. Provide the AI with data to enhance its capacity to generate text automatically. By training the AI on a large dataset of text solitaire and then evaluating its responses against the subsequent content in the corpus.

(2) Engaging in the process of acquiring knowledge about human data. The researchers solicited responses from human participants to a set of questions, and subsequently sent both the questions and answers to GPT in order to enhance its model and align its responses with human expectations.

(3) Gather data that may be compared and use it to train the reward model. The researchers instructed the GPT to provide many responses to a particular topic, and the human evaluators assessed the quality of each response as either satisfactory or unsatisfactory. Using the evaluation data, the researchers developed a reward model that satisfies the criteria used in human evaluations.

(4) Reinforcement learning algorithms aim to optimize strategies based on reward models.

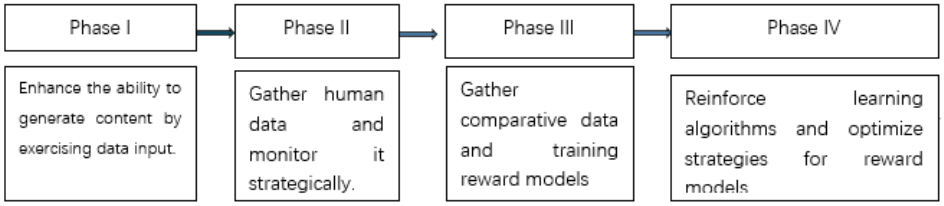

Fig.2 ChatGPT Content Generation Principles

1.3. The Importance of Generative Artificial Intelligence

From the standpoint of the artificial intelligence development trajectory, ChatGPT has emerged as a prominent example of a new direction in artificial intelligence development, namely a significant transition from "decision-making AI" to "generative AI". The focus of decision-making AI is in the system's capacity and its direction towards achieving specific objectives. The subject matter is around the process of making the most effective choices and taking appropriate actions within certain circumstances and limitations, utilizing analysis and logical thinking. Decisional AI typically employs pre-established rules, logical reasoning, and specialized knowledge to draw conclusions and make determinations, with the objective of resolving a specific problem or reaching a specific decision. Generative AI, however, focuses on the system's creative and generative qualities. It has the capability to generate fresh information based on acquired patterns and knowledge. Generative AI typically use techniques like deep learning and generative modeling to provide realistic and innovative information content. Decision-making AI in practical applications employs available data to do analysis, make judgments, and anticipate outcomes. It has previously been employed in various domains to deliver services to humans, including recommendation systems, risk control systems, and precision marketing. Generative AI, as a higher-order epistemological model, not only analyzes current data but also generates deductive innovations by summarizing the available information. Currently, generative AI has already made significant contributions to content creativity, human-computer interaction, and product design. Generative AI exhibits superior performance when it comes to tackling creative tasks, in comparison to other methods. The system has the ability to handle complex and flexible tasks, develop original content and ideas by analyzing patterns and styles used by humans, based on a vast quantity of data. It can offer valuable support and inspiration for human creative endeavors. [6]

Furthermore, the emergence of generative AI technology exemplified by ChatGPT signifies a notable transition in the content creation model from user-generated content (UGC) to artificial intelligence-generated content (AIGC). This shift has profoundly impacted the methods by which human society produces and accesses information. The AIGC model, characterized by its substantial benefits of producing vast amounts of high-quality content at a low cost, is currently transforming the landscape of content generation. The AIGC paradigm is transforming the content production landscape through the utilization of extensive pre-trained language models. AIGC has become a potent technological tool for efficiently generating diverse articles, stories, poems, and artworks by utilizing large-scale pre-trained language models like ChatGPT and multimodal technologies such as CLIP. This tool offers ample space for innovation. AIGC, equipped with its immense computational capacity and extensive pre-trained language models, has the capability to automatically produce or aid humans in generating substantial volumes of material within a brief timeframe. [7]

2. Legal risks associated with generative artificial intelligence

2.1. The factors contributing to significant legal issues associated with generative AI

Generative artificial intelligence, while a significant milestone in human society's progress, presents numerous legal risks due to its emergence as a technological

advancement. The challenge of avoiding these newly generated legal risks can be attributed to two factors: the inherent impossibility of completely circumventing technical risks and the inadequacy of regulatory tools in effectively managing these risks.

2.1.1. Perspective based on technical analysis

AIGC, an acronym for artificial intelligence-generated content, signifies a novel phase of transformation in content creation. In the era of Web3.0, AIGC content is expected to see rapid and significant expansion. Prior to this, the dissemination of misinformation was restricted, and the government had the ability to regulate the propagation of detrimental information through source manipulation, account supervision, and communication platform oversight. By implementing advanced deep synthesis technology in content production, the cost of producing material has significantly decreased. However, this has also made it challenging to track the origin of the content and discern between genuine and fraudulent information. Consequently, regulating content has become considerably more complicated.

From a violations standpoint, deep synthesis will dramatically lower the threshold for gaining specialized knowledge and specific abilities, greatly broaden the range of cybersecurity threats, and elevate the level of security hazards. Generative AI systems, similar to ChatGPT, possess the capability to program without the need for traditional coding. This reduces the technical requirements for creating attack codes, potentially resulting in an increase in cybersecurity threats.

The synthetic data business relies on pre-trained macromodels for deep synthesis to enhance data security. These macromodels have the ability to imitate real user data and bypass the expensive requirements of privacy compliance. Deep synthesis can utilize the robust inference skills of pre-trained macromodels to effectively discover genuine data. [8]

Regarding data security, the pre-trained large models used in deep synthesis have greatly aided the growth of the synthetic data sector. Deep synthesis technology can accurately replicate real user data and avoid the expensive requirements of privacy compliance. The advanced synthesis technology possesses the ability to effectively discover authentic data by utilizing the strong deductive powers of pre-trained macromodels. It is important to note that there is now no established regulatory framework governing the use of synthetic data in individual countries. In previous instances, generative synthesis algorithms have been employed to produce instances of fraudulent activity, violations of personality rights, breaches of privacy, as well as occurrences of face-switching and voice-switching. In the latest iteration of synthetic algorithmic apps, like ChatGPT, the user discussion serves as a means of gathering information, particularly when users engage in conversations with the machine, which has the potential to expose their privacy. The gathering, use, and transmission of personal information pose security problems and can be utilized for user profiling and training models. [9]

2.1.2. Perspective based on governance

In theory, the current set of algorithmic governance tools is capable of addressing all aspects and aspects of algorithmic governance. However, none of these tools have proven to be effective in dealing with the challenges posed by large-scale language models operating under generative AI. As a result, they may encounter a range of difficult problems in the governance processes associated with these models. [10]

Within the confines of Chinese legislation, the current monitoring models face challenges in effectively, precisely, and promptly detecting instances where generative AI produces illegal and undesirable content. This is primarily due to the presence of deceptive elements, a significant level of concealment, and elusive abnormal characteristics in emotional computing. If a large, non-detachable language model is considered a unified content producer, it implies that the entire model can be held responsible for any information it produces, regardless of the circumstances. When the volume of generated information is substantial and it is challenging to automatically determine whether it is illegal or not, finding a feasible solution to fulfill network information security obligations while maintaining a reasonable regulatory burden becomes a complex problem to solve. [11] Hence, the present legal regulatory mechanisms in China are susceptible to excessive regulation of the outcomes produced by generative AI, and the current algorithmic governance tools do not offer readily available solutions to address this issue.

In July 2023, a number of Chinese regulators jointly released Interim Measures for the Administration of Generative Artificial Intelligence Services in an attempt to provide the necessary regulation for the rapidly developing field of generative artificial intelligence. However, the existing regulatory tools are limited in their ability to address the infringement risks generated by generative AI. Although the Interim Measures for the Administration of Generative Artificial Intelligence Services have generally required generative AI service providers to respect intellectual property rights and business ethics, and not to infringe on the intellectual property rights enjoyed by others in accordance with the law, as well as not to infringe on the rights of others to portrait, reputation, honor, privacy, and personal information rights and interests, etc., [12] but still faces the problem of the configuration of the regulatory measures on how to prevent the above infringement risks according to the specific law. Algorithm standards, algorithm audits, retention records, result audits, algorithm accountability and other tools can prevent or curb infringement on the output side to a certain extent, but they are not able to prevent the infringement of intellectual property rights or data rights by training data on the input side.

2.2. Particular legal risks

2.2.1. Public law regulatory concerns

Due to the wide range of applications of generative AI, this has led to violations and crimes using generative AI as a tool, violating public interests and the legal rights of ordinary citizens. Since 2023, there has been a proliferation of "AI fraud" crimes in China. From the perspective of national security, generative AI usually has a relatively large volume of data, for example, ChatGPT has more than 175 billion parameters, and once a data leak occurs, it will not only cause significant harm to personal information, but also jeopardize national security if the data involves state secrets. What's more, at a time when data exit is becoming more and more frequent, generative AI is more likely to increase the security risk of national data.2022 The National Internet Information Office issued the Measures for Security Assessment of Data Exit, emphasizing that the security assessment of data exit focuses on evaluating the risks that data exit activities may pose to national security. [13]

Regarding the criminal hazards associated with the widespread use of generative artificial intelligence, there are certain sections in criminal laws that attempt to govern it. However, all of these provisions have flaws, and there is a lack of adequate regulation. For instance, the offense of "fabrication and intentional dissemination of false information" specifically encompasses the act of creating false danger, epidemic, disaster, and police information. However, the content produced by ChatGPT is generated automatically based on user prompts, rather than being prompted by the user. Nevertheless, the content produced by ChatGPT is generated automatically based on the user's input, known as "prompting," and is not restricted to only these four scenarios. Therefore, the question of whether it may be held responsible remains uncertain. For instance, the essential component of the offense of "inciting subversion of state power" necessitates that the accused individuals engage in incitement with a constructive and assertive approach. Nevertheless, the generative AI application offers information by engaging with users, but this does not completely align with the essential aspect of the aforementioned criminal law. Consequently, even if it can contribute to incitement in a harmful manner, it remains challenging to prosecute it under the criminal offense of inciting subversion of state power. Consequently, despite its potential to provoke negative actions, effectively controlling the offense of inciting subversion of state power through criminal legislation remains challenging. Simultaneously, the criminal law, being a more limited form of law, cannot directly incorporate the mode of criminal governance beyond what is possible under administrative law and civil law. Additionally, excessive criminal liability and a low threshold for criminalization are not beneficial for fostering innovation in this particular technology. [14]

In addition, the control of administrative norms is also problematic. Generative AI, represented by ChatGPT, because of its nature as a commercial service, makes data sharing more and more difficult to realize to some extent, but will deepen the digital divide between countries, regions and populations. Generative AI requires too much arithmetic input, so much so that small developers cannot afford it at all, which will further result in monopolization of technology and concentration of arithmetic; pre-training of large models requires massive amounts of data, and ChatGPT-like generative large models require almost the entire Internet's data for training. On the one hand, this means that a large amount of data resources have been seized for free, such as text data of mainstream media, billions of copyrighted images have been downloaded by generative AI companies for model training; on the other hand, the distribution of data resources is not balanced, such as the data generated by English language is much more than that generated by other languages, which can't provide enough nutrients for pre-training of the big models for machine learning, and therefore the generative AIs of small languages can't provide enough nutrients for pre-training of the big models. The quality of generative AI output in small languages is relatively low. [15] This type of issue, which is of great interest to the public, urgently needs to be regulated by detailed and systematic administrative norms, although China's Interim Measures for the Administration of Generative Artificial Intelligence Services responds to the governance challenges posed by the algorithms, training data, and content of generative AI. However, since the provision was formulated when generative AI was introduced less than a year ago, the relevant institutional arrangements are not mature, and its level of effectiveness is low, so the administrative law governance of generative AI is still facing the challenge of insufficient supply of rules and institutions." [16]

2.2.2. Violations of private law

The extensive utilization of generative AI in the domain of private law poses a significant threat of numerous violations of individual rights. However, the violation of generative AI differs from infringement in the conventional sense. AI infringement is distinct from normal product infringement. Generative artificial intelligence poses no substantial threat to the user's right to life, physical well-being, or health, and does not result in considerable harm to the user's property. Consequently, it distinguishes itself from the concept of product liability in traditional tort law. The risk posed by artificial intelligence can be effectively managed within specific boundaries. However, it is important to note that artificial intelligence infringement differs from typical network infringement. While generative artificial intelligence has the ability to produce misleading information and generate deceptive images, it is important to note that the transmission of such false information still relies on the involvement of users or other entities, which can potentially impact the general population. Hence, the content produced by generative artificial intelligence lacks inherent publicity and is primarily intended for specific users. As long as the user refrains from widespread dissemination, the content generated by generative artificial intelligence will not proliferate, thereby preventing large-scale infringement occurrences. Generative AI differs from classical online infringement in this context. [17]

The domains in which generative AI may violate can be classified as follows:

Violation of privacy and disclosure of personal information. Generative AI has the potential to result in significant privacy violations or breaches of personal information on a massive scale. Implementing large-scale generative AI necessitates a substantial volume of data as parameters. However, AI product providers may potentially contravene the law by amassing a significant amount of personal information while training AI products or by employing a substantial amount of data without a lawful source for training purposes. This could result in novel violations of privacy and personal information. The utilization of generative AI in training, application, and model optimization processes may involve the inclusion of personal information or privacy of individuals. Failure to handle this data appropriately could lead to the misuse or exploitation of citizens' personal information by large-scale models, thereby infringing upon individuals' privacy rights and interests. Furthermore, the current operational framework of generative artificial intelligence has the potential to rediscover and exploit private information that was previously "forgotten" on the internet. This, combined with the significant self-learning and iterative capabilities of large-scale models, poses increasing challenges in safeguarding citizens' privacy. Scholars refer to this phenomenon as the loss of the "right to be forgotten" in the era of generative artificial intelligence. [18]

The utilization of extensive generative AI models primarily involves processing human text input to produce various output products, including text, images, audio, video, etc. However, this process may result in the violation of individuals' right to reputation if the generated information is

inaccurate. ChatGPT, in particular, may introduce novel forms of reputation infringement.

Intellectual property infringement. In the training and operation process of generative artificial intelligence, there are two main links that may result in copyright infringement. First, in the training of generative artificial intelligence, a large amount of data needs to be used, and there may be other people's copyrighted works in these data. If the generative AI uses these data without the authorization of the copyright holder, it may infringe on copyright. Secondly, in the process of generating content by generative AI, the generated results may also infringe on the copyright of others. If the generated results use a copyrighted work or a fragment of a work, or constitute a rendition of a work, they may fall under the control of copyright. For example, when ChatGPT came into existence, some people used it to create abbreviated versions of copyrighted books to help others read the books quickly, which may be recognized as an infringement of copyright because it constitutes a market substitute for the original book and hardly constitutes fair use.

The extensive utilization of generative artificial intelligence presents challenges in terms of copyright attribution. Generative AI has the capability to produce diverse types of content, including text, music, and paintings. During the creation of such content, the matter of copyright ownership arises. As generative AI generates new content by acquiring knowledge and imitating existing works, the issue of whether the copyright for manuscripts generated or aided by generative AI belongs to the individual or company that provides the training text for the AI system, or to the person who utilizes the system to direct the writing process, is currently a subject of intense debate. [19]

3. The Regulatory Framework for Artificial Intelligence Generated Content (AIGC)

In the contemporary technological landscape, Artificial Intelligence Generated Content (AIGC) has emerged as a transformative force, driving innovation across multiple sectors. However, with its rapid evolution comes a complex web of challenges that necessitate a comprehensive regulatory approach. As expounded, the regulatory ideas for generative AI development are bifurcated into macro and micro levels.

At the macro level, the principle of prudence and inclusiveness holds paramount significance. Prudence is essential as generative AI, with its potential to disrupt established norms, requires careful monitoring to prevent unforeseen negative impacts. For instance, the spread of misinformation generated by AI could have far - reaching consequences for society. Simultaneously, inclusiveness ensures that the technology is not stifled in its infancy. By providing a conducive environment, diverse stakeholders can contribute to its development, fostering innovation and the exploration of new applications. This balance between caution and openness is crucial for harnessing the full potential of generative AI while mitigating risks.

Descending to the micro level, constructing a flexible regulatory and governance framework is a pressing need. The dynamic nature of generative AI, characterized by continuous technological advancements and the emergence of novel use - cases, demands a regulatory system that can adapt in real - time. This framework should be designed to incorporate new insights from research and industry practices, enabling regulators to respond promptly to emerging issues. For example, as AI algorithms evolve, the framework should be able to update requirements for algorithmic transparency and accountability.

Complementing the regulatory framework is the improvement of the liability governance system. In the context of generative AI, where the lines between developers, users, and content creators can be blurred, a clear demarcation of responsibilities is essential. When instances of infringement or other legal transgressions occur, this system serves as a guiding light, facilitating the accurate determination of liability. By holding parties accountable, it not only safeguards the rights and interests of affected individuals but also instills a sense of responsibility within the generative AI ecosystem, thereby promoting ethical and legal conduct.

In conclusion, the proposed regulatory ideas for generative AI development, spanning both macro and micro levels, form a holistic approach that is vital for the sustainable and responsible growth of this revolutionary technology.

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