

Analysis on Tort Liability of Generative Artificial Intelligence

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Abstract: This paper deeply discusses the application of generative artificial intelligence technology in modern society and its possible infringement and liability attribution issues. First, it analyzes the core characteristics of generative artificial intelligence, especially its ability in automatically generating content, and points out that while creating novel content, this technology may have the risk of infringing others' intellectual property rights. Then it discusses the definition of tort liability and the determination of liability subject according to different tort scenarios, and puts forward the liability distribution scheme in different situations, including the division of subjective fault liability and no-fault liability. In order to effectively manage these risks and protect the rights and interests of individuals and enterprises, it is necessary to establish a comprehensive management system and judicial standards, including perfect management norms, clear subjects of responsibility, and fair and efficient compensation and judicial mechanisms. Through these measures, we can maintain legal order and social justice while ensuring technological innovation, and promote the healthy and sustainable development of generative AI technology.

1. Introduction

With the rapid development of generative artificial intelligence technology, it is widely used in the automatic generation of text, image, audio and video content. This brings convenience to people's creation, work and life, but also causes some new problems. The generated content may contain elements that infringe the intellectual property rights of others and bring losses to the right holder. Therefore, it is necessary to explore the possible infringement and liability attribution caused by generative AI in order to promote technological progress and social development.

2. Introduction to generative artificial intelligence technology

2.1 Technical definition and classification

Generative artificial intelligence refers to the use of artificial intelligence techniques, especially machine learning and deep learning methods, to automatically generate content such as text, images, music and so on. The core of this technology is to simulate the creative process of the human brain, by training algorithms to understand and mimic the way humans create. Generative AI can be divided into several types, mainly including rule-based systems, statistics-based systems, and deep

learning-based systems. Rule-based systems rely on preset rules and templates to generate content, which is simple but less flexible. Statistics-based systems analyze large amounts of data to find patterns in content generation, which is more dynamic and adaptable. Generative AI based on deep learning is the most advanced form, which uses neural network models to simulate the way the human brain works and is capable of generating more complex and diverse content.

2.2 Main functions and features

The main functions of generative AI include text generation, image and video generation, music creation, etc. In terms of text generation, it can write news articles, create poems, stories, and even write code. In terms of image and video generation, generative AI can create new works of art, perform image editing and enhancement, and generate video content of real or fictional scenes. In terms of music creation, it can create new melodies, music arrangement and production. These functions make generative artificial intelligence have a wide application prospect in many fields. The main characteristics of generative AI include a high degree of automation, the ability to generate content without human intervention. Strong creativity, can create new content unimaginable by human beings. In addition, it is highly adaptable and can learn and adapt its own models to different generation tasks. Finally, generative AI also has a certain universality, that is, the same set of technologies can be applied to multiple types of content generation.

3. Infringement risks and types of generative artificial intelligence

3.1 Risk of infringement of generated content

Generative AI technologies may inadvertently create infringements when creating new content, especially in the area of intellectual property. This technology can sometimes copy or mimic existing works, raising copyright infringement issues. For example, in text generation, content may be produced that is similar to an existing literary work, article, or report. In terms of image generation, elements of another person's artwork or photography may be inadvertently reproduced. Music generation can also face similar risks, such as producing musical works that are similar to the melody or rhythm of existing songs. In addition to direct content reproduction, generative AI may also inadvertently violate non-material rights such as reputation rights and privacy rights during the simulation creation process. For example, when news or social media content is generated, misinformation may be generated that damages the reputation of an individual or company, or sensitive personal information may be disclosed. The emergence of these risks is not only related to the characteristics of the technology itself, but also closely related to the data set used in the training process. If the dataset contains copyrighted content or sensitive information, the resulting results may contain infringing elements.

3.2 Different types of infringement

Generative artificial intelligence may involve various types of infringement, the most important of which include copyright infringement, trademark infringement, reputation infringement and privacy infringement. Copyright infringement occurs when generative AI copies or excessively mimics existing literary, artistic, or musical works. For example, an auto-generated article may be too similar to an existing publication, or the generated artwork may mimic the unique style of an existing artist. Trademark infringement can occur when a registered trademark is improperly used in content created by generative AI, such as the use of a specific brand's logo or slogan in advertising or marketing materials. Reputational infringement usually occurs when the generated content

contains a false statement about a person or business, which can lead to legal issues of defamation or damage to goodwill. For example, an automated news story may contain false allegations against a public figure. Privacy violations involve the unauthorized disclosure or use of a person's private information, especially when it comes to the automated generation of social media content or news stories. In addition, there are other types of potential infringements, such as patent infringement, design rights infringement, etc. The occurrence of these infringements not only causes damage to the victims, but also brings legal liability and reputational risk to the individuals, companies or institutions using generative AI ^[1]. Therefore, it is critical for entities using generative AI technologies to understand and prevent these infringement risks. This will not only require technology developers to take prudent measures when designing and training AI, but will also require relevant stakeholders to work together to establish appropriate legal, ethical and technical standards to ensure the healthy development and application of the technology.

4. Liability identification of generative artificial intelligence infringement

4.1 Liability for subjective fault

In the tort cases caused by generative artificial intelligence, the determination of subjective fault liability is a complicated and critical issue. Subjective fault liability usually refers to infringement caused by the intentional or negligent actions of developers, users, or managers. Intentional infringement involves the use of AI technology to knowingly violate the legitimate rights and interests of others. For example, if a company knowingly uses generative AI to copy a competitor's copyrighted material, this constitutes willful infringement. Liability for negligence relates to negligence or misconduct in the use or management of AI systems. For example, if a developer does not properly review and filter the data set used by its AI system, resulting in the system generating infringing content, this could be considered negligent liability. In practice, the judgment of subjective fault liability often involves a specific analysis of the behavior of developers, users or managers. It is necessary to examine whether they have taken reasonable precautions to avoid infringement, such as whether they have conducted copyright checks on the data used, and whether they have established effective content monitoring and filtering mechanisms. In addition, it is also necessary to consider whether they are aware or should be aware that their actions may lead to infringement ^[2]. In these cases, the determination of liability often requires a combination of technical complexity, industry standards, legal requirements, and specific use scenarios.

4.2 Liability without fault

No-fault liability is equally important in generative AI infringement cases. This form of liability is not based on the intentional or negligent actions of users, developers or managers, but on the nature of the technology they use or control. The rationale for no-fault liability is that certain technologies or activities, due to their inherent risk, may cause unforeseen harm even if all reasonable precautions have been taken. For example, even if an AI system has been rigorously trained and tested, infringing content may still be generated due to the unpredictability of the algorithm or the complexity of the data set. In such cases, the determination of liability may be based on the principle of strict liability or liability at risk. Strict liability means that users, developers, or managers can be held liable if their technology causes infringement, regardless of whether their actions are negligent. Risk liability emphasizes that due to the inherent risk of certain technologies or activities, the relevant parties need to bear the consequences, even if they have exercised reasonable care and management duties. The determination of no-fault liability is crucial to balance technological innovation and the protection of individual rights. It encourages technology

developers and users to be more cautious about the development and application of AI technology and encourages them to invest resources to improve the security and reliability of the technology^[3]. At the same time, the principle of no-fault liability also provides an easier way for individuals or entities harmed by infringement to obtain compensation, thereby protecting them from unnecessary losses. In practice, balancing the need for technological innovation and preventing the excessive legal burden caused by no-fault liability is an issue that needs careful consideration when formulating relevant regulations and policies.

5. Improve the tort liability system of generative AI

5.1 Improve the management and standardization system

In order to deal with the possible infringement problems caused by generative artificial intelligence, it is necessary to establish a sound management and specification system. This system needs to cover all aspects of technology development, application and regulation to ensure that the healthy development of AI does not infringe on the rights of others. On the one hand, the technology development phase should introduce compliance reviews to ensure that the development process complies with relevant laws and regulations and industry standards. This includes conducting copyright and privacy audits of the data sets used to ensure that data sources are legitimate and compliant. On the other hand, for the release and application of artificial intelligence products, strict quality control and risk assessment mechanisms should be established, including regular security testing and performance evaluation, to ensure that they will not be infringed due to technical defects or unforeseen algorithm behavior. Strengthening industry self-discipline is also an important aspect of improving the management system. The industry should establish uniform ethical and technical standards to clarify the responsibilities and obligations of developers and users. At the same time, it is necessary to strengthen public awareness education on artificial intelligence technology and improve social awareness of the legal and moral issues that may be brought about by artificial intelligence^[4]. Finally, the perfect management and standardization system also needs effective legal supervision support. Government departments should formulate corresponding laws and regulations, monitor market behaviors, investigate and punish illegal behaviors, so as to protect the public interest and promote the healthy development of technology.

5.2 Clarify the main body of responsibility and compensation mechanism

Clarifying the subject of responsibility and establishing an effective compensation mechanism is also a key link to improve the tort liability system of generative artificial intelligence. The definition of the subject of liability is very important to investigate the tort liability and compensate the victim. Typically, the responsible parties include AI developers, providers, users, and other parties that may be involved. The liability of each subject shall be determined according to its degree of control over the infringement, its degree of participation and its degree of fault. For example, if the infringement is primarily due to the negligence of the developer, then the developer shall be primarily liable; If the infringement is caused by the user's improper use, the user shall be responsible. In terms of compensation mechanism, establishing a fair and efficient compensation system is the key. This includes the establishment of rapid response compensation procedures to ensure that victims receive compensation in a timely manner. In some complex cases, professional arbitration and mediation agencies may be required to handle disputes. In addition, considering the particularity of generative AI, traditional compensation mechanisms may need to be adjusted and optimized^[5]. For example, special compensation funds or insurance systems could be considered to deal with possible collective infringement cases and large-scale damages. Strengthening damage

compensation and punitive compensation is an important means to ensure the effectiveness of the liability system. For the tort caused by intentional or serious negligence, punitive damages should be considered in addition to basic compensation, so as to play a deterrent and preventive role. Through these measures, the relationship between technological innovation and rights protection can be balanced to promote the healthy development of generative AI technology, while protecting the public interest and individual rights.

6. Establish generative AI judicial trial standards

6.1 Claim and proof standard

In generative AI-related judicial trials, establishing clear claims and proof standards is the key to achieving a fair verdict. The claim standard involves the right owner defining and asserting his rights affected by the infringement. This includes identifying the specific rights infringed (such as Copyrights, trademarks, reputation rights, etc.) and specific allegations of infringement. In this process, the right holder needs to clearly state the scope of his rights and the specific circumstances of the infringement, how he violated the legal provisions or the terms of the contract. The standard of proof is a key link in the trial process, requiring the right holder to provide sufficient evidence to prove that his rights have been violated. This may include showing similarities between the original work and the alleged infringing content, proving ownership of a trademark or patent, and the existence of an infringement. In the case of generative AI, this may require complex technical analysis and expert evidence, such as how the algorithm works, the legitimacy of the data source, the originality of the generated content, etc. ^[6]. The identification of damage is also an important part of proof, and the right owner needs to show the specific losses he has suffered due to the infringement, including economic losses and non-material losses.

6.2 Defence and burden of proof

In generative AI infringement cases, the defendant (such as the developer or user of AI) usually has the right to present a defense to refute the rights owner's allegations. The defense reasons may include denying the infringement, claiming that their behavior is a legitimate use, or making a claim beyond the reasonable scope. For example, defendants claim that the AI-generated content they use is based on material in the public domain, or is within the scope of fair use (such as commentary, news reporting, teaching, etc.). In these cases, the defendant is required to bear the corresponding burden of proof, that is, to provide sufficient evidence to support his defence. In judicial trials, the distribution of the burden of proof is crucial, which determines the degree of evidence that parties need to provide. Typically, rights holders need to first provide sufficient evidence to prove that their rights have been violated. Then, if the defense does enter a plea, it also needs to provide relevant evidence to support its defense. This process can involve complex legal and technical issues, such as the interpretation of copyright law, understanding of AI technology and data processing.

In conclusion, the establishment of generative AI judicial trial standards needs to take into account the clarity of claims, the rationality of proof standards, and the validity of defense grounds. At the same time, the court needs to have the corresponding technical knowledge and professional judgment ability when dealing with these cases to ensure the fairness and accuracy of the trial. Through such trial standards, legal disputes caused by generative artificial intelligence can be handled more effectively, protecting the legitimate rights and interests of rights holders, and promoting the healthy development of AI technology.

7. Conclusion

Generative artificial intelligence technology provides new impetus for the development of human society, but also brings certain risks. Improving the generative artificial intelligence tort liability system, clarifying the subject of responsibility, and formulating trial standards can effectively balance the rights and interests of all parties, promote technological progress and innovation, and promote social development. This requires the joint efforts of multiple disciplines such as law, technology and ethics, and the cooperation between industry and regulatory authorities. It is believed that with the deepening of theory and practice, a scientific, reasonable and fair generative artificial intelligence tort liability system will be formed.

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