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# Liability for Harm Caused by AI: Examining the Legal Responsibility for the Actions of Autonomous Systems

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## ABSTRACT

*The rapid development and integration of artificial intelligence (AI) systems in modern society have raised concerns about the potential harm that these systems can cause. There is a growing need to establish legal responsibility and liability frameworks to ensure that individuals and organizations are held accountable for any harm caused by AI systems. The integration of artificial intelligence (AI) into various aspects of society has raised concerns about the potential harm that these systems can cause. This paper examines the legal responsibility for harm caused by AI systems and the need for effective liability frameworks. The paper provides a detailed analysis of the different types of liability that can be applied to AI systems, including tort law, product liability, and criminal liability. It also explores the challenges involved in applying traditional liability frameworks to autonomous systems, such as issues of intention and negligence, and proposes the potential application of strict liability to AI systems. The paper presents case studies of legal cases involving harm caused by AI and analyses the liability frameworks that were applied. The analysis highlights the complexities involved in determining legal responsibility for harm caused by autonomous systems. The paper also addresses the issue of algorithmic bias and its impact on liability for harm caused by AI, as well as the future considerations for liability frameworks as AI continues to advance and become more integrated into society. The paper concludes with recommendations for the development of effective liability frameworks that can keep pace with the rapid development and integration of AI systems. Overall, the paper highlights the importance of legal frameworks that ensure individuals and organizations are held responsible for any harm caused by AI systems.*

**Keywords:** Artificial Intelligence, Legal Responsibility, Tort Law, Product Liability, Criminal Liability, Strict Liability, Algorithmic Bias, Harm Caused by AI, Legal Liability, Autonomous Agents.

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## **I. INTRODUCTION**

Artificial intelligence (AI) has become an increasingly significant part of our daily lives, impacting various fields such as healthcare, finance, transportation, and many others. However, the integration of AI systems into society has also raised concerns about the potential harm that these systems can cause. AI systems can make decisions and take actions without human intervention, and their actions may cause harm to individuals or property. This raises the question of who is legally responsible for any harm caused by autonomous systems. The issue of legal liability for harm caused by AI systems is significant for several reasons. First, AI systems can cause harm in ways that are not necessarily foreseeable or preventable. This is because AI systems can learn and adapt over time, making it difficult to predict their actions. As a result, traditional legal frameworks may not be sufficient to address the unique challenges posed by AI systems. Second, the potential harm caused by AI systems can be significant, ranging from physical harm to financial loss. For example, an autonomous vehicle that malfunctions and causes an accident could result in severe injury or death. Similarly, a financial algorithm that is biased against a particular group could cause significant financial loss for individuals or businesses. Finally, the issue of legal liability for harm caused by AI systems is significant because it can impact the development and adoption of AI technology. If individuals and organizations are not held accountable for the harm caused by their AI systems, it may undermine public trust in the technology and limit its adoption. Therefore, it is crucial to examine the legal responsibility for harm caused by AI systems and develop effective liability frameworks that can keep pace with the rapid development and integration of AI technology. Liability for harm caused by AI refers to the legal responsibility of individuals or organizations for any harm caused by autonomous systems. AI systems can make decisions and take actions without human intervention, which can result in harm to individuals or property. The issue of legal liability for harm caused by AI systems is significant because traditional legal frameworks may not be sufficient to address the unique challenges posed by AI systems. This is because AI systems can learn and adapt over time, making it difficult to predict their actions.

There are various types of liability frameworks that can be applied to AI systems, including tort law, product liability, and criminal liability. However, challenges arise in applying these traditional liability frameworks to autonomous systems. As a result, strict liability is emerging as a potential framework for AI systems, which would hold individuals and organizations responsible for any harm caused by their AI systems, regardless of whether they were negligent or not.

Algorithmic bias is another significant issue that can impact liability for harm caused by AI. This occurs when AI systems are biased against a particular group, resulting in harm or discrimination. It is crucial to address algorithmic bias and develop effective solutions to mitigate its impact on liability for harm caused by AI.

Overall, it is essential to examine the legal responsibility for harm caused by AI systems and develop effective liability frameworks that can keep pace with the rapid development and integration of AI technology. This requires collaboration between legal experts, policymakers, and technology developers to ensure that individuals and organizations are held responsible for any harm caused by their AI systems.

This paper will provide a detailed analysis of the different types of liability that can be applied to AI systems, the challenges involved in applying traditional liability frameworks to autonomous systems, and propose potential solutions for effective liability frameworks. The paper will also present case studies of legal cases involving harm caused by AI and analyse the liability frameworks that were applied. Overall, this paper will highlight the importance of legal frameworks that ensure individuals and organizations are held responsible for any harm caused by AI systems.

## **II. OVERVIEW OF ARTIFICIAL INTELLIGENCE AND AUTONOMOUS SYSTEMS**

Artificial Intelligence (AI) refers to the ability of computer systems to perform tasks that typically require human intelligence, such as recognizing speech, identifying objects in images, and making decisions. AI systems can be programmed to learn from experience and improve their performance over time. Autonomous systems, on the other hand, are computer systems that are capable of operating without human intervention. These systems can make decisions and take actions based on their programming and environmental inputs. Autonomous systems often incorporate AI technology to enable them to learn and adapt to their surroundings. Autonomous systems can be found in various applications, such as autonomous vehicles, drones, and robotic manufacturing systems. These systems have the potential to improve efficiency, reduce costs, and enhance safety. However, they also pose unique challenges in terms of legal responsibility for any harm caused by their actions. The integration of AI and autonomous systems into society has brought about significant advancements in various fields. However, the rapid development and integration of these technologies have also raised concerns about their potential negative impact. As a result, there is a need to examine the legal responsibility for harm caused by AI and autonomous systems and develop effective liability frameworks to address the unique challenges posed by these technologies.

**(A) Types of Liability Frameworks:**

## a. Tort Law:

Tort law is a legal framework that deals with civil wrongs or injuries caused to individuals or property. In the context of AI, tort law can be used to hold individuals or organizations responsible for harm caused by their autonomous systems. The main types of torts that can apply to AI systems are negligence and strict liability. Negligence involves the failure to exercise reasonable care, which results in harm to others. In the context of AI, negligence could occur if an organization fails to properly train or monitor its AI system, resulting in harm to individuals or property. For example, if an autonomous vehicle manufacturer fails to adequately test its vehicle's safety features, resulting in an accident and injury, the manufacturer may be found negligent and held liable for damages. Strict liability is a legal doctrine that holds a party responsible for harm caused by their product, regardless of whether or not they were negligent. This means that if an AI system causes harm, the individual or organization responsible for its development and deployment may be held strictly liable for any damages.

Strict liability is particularly relevant in cases where the harm caused by the AI system is not preventable or foreseeable. One challenge with applying tort law to AI systems is determining the standard of care that should be applied to autonomous systems. This involves determining what is reasonable and appropriate for an AI system to do or not do in a given situation. Additionally, the issue of causation can be complex in the context of AI, as it may be difficult to determine whether the actions of the AI system were the direct cause of the harm. Overall, tort law can be used as a liability framework for harm caused by AI systems. However, the unique characteristics of AI systems may require adaptations to traditional tort law principles to ensure that individuals and organizations are held responsible for harm caused by their autonomous systems. In India, the liability framework for harm caused by AI falls under the purview of tort law. The Indian legal system operates under the common law system, which means that legal principles are based on judicial decisions rather than codified laws. In the case of harm caused by AI systems, the legal principles of tort law can be applied to determine liability.

Under Indian tort law, liability can be established if the plaintiff can prove that the defendant had a duty of care towards them, breached that duty, and caused them harm as a result. In the context of AI, the duty of care could be owed by the manufacturer or developer of the AI system, the owner or operator of the system, or any third-party responsible for maintaining the system. However, there are several challenges in applying tort law to cases involving harm caused by

AI. For instance, it can be difficult to establish the duty of care owed by the defendant in cases where the AI system operates autonomously. Additionally, determining causation can be complex, as the actions of the AI system may be influenced by multiple factors, including the environment and the data used to train the system to address these challenges, the Indian government has established a task force to develop a framework for responsible AI that takes into account legal, Ethical, and social considerations. The task force has proposed the creation of a regulatory body that would oversee the development and deployment of AI systems and ensure that they comply with legal and ethical standards. Overall, the liability framework for harm caused by AI in India is still evolving, and it remains to be seen how courts will apply tort law principles to cases involving AI systems.

b. *Product Liability:*

Product liability is another framework that can be applied to AI systems. Product liability refers to the legal responsibility of manufacturers and sellers for the harm caused by their products. This framework is based on the idea that manufacturers and sellers have a duty to ensure that their products are safe and free from defects. In the context of AI systems, product liability can be applied to manufacturers of AI hardware or software. For example, if an autonomous vehicle malfunctions and causes an accident, the manufacturer of the vehicle or the software that controls it may be held liable for any harm caused. Similarly, if a medical AI system misdiagnoses a patient, the manufacturer or seller of the system may be held liable for any harm caused. However, applying product liability to AI systems can be challenging. This is because AI systems can be complex and can learn and adapt over time, making it difficult to identify defects or flaws in their design or programming. Additionally, it may be difficult to determine whether a defect in an AI system was caused by the manufacturer or by the actions of the user or a third party. Despite these challenges, product liability is an important framework for holding manufacturers and sellers accountable for any harm caused by their AI systems. As AI technology continues to advance and become more integrated into society, it will be important to develop effective product liability frameworks that can keep pace with these developments. In India, the liability framework of product liability can also be applied to cases involving harm caused by AI systems. Under product liability law, manufacturers, sellers, or service providers can be held liable for any harm caused by a defective product or service. In the context of AI systems, this could include defects in the system's design, manufacturing, or warning labels. However, applying product liability law to AI systems has its drawbacks. One of the main challenges is determining who should be held liable for the harm caused by an AI system. This is because AI systems are often the result of collaboration between multiple entities, including

developers, manufacturers, operators, and end-users. As a result, it can be challenging to determine who is ultimately responsible for any defects in the system. Another challenge is determining the standard of care that should be applied to AI systems. Unlike traditional products, AI systems can learn and adapt over time, which makes it difficult to predict their behaviour and potential defects. This raises the question of what level of care is required for the development and deployment of AI systems to prevent harm. Moreover, the current product liability framework in India may not be sufficient to address the unique challenges posed by AI systems. For instance, the Consumer Protection Act, 2019, which governs product liability in India, does not specifically address liability for harm caused by AI systems. This could lead to ambiguity and inconsistency in how product liability principles are applied to AI systems. To address these challenges, India may need to update its product liability laws and develop specific regulations that govern the development and deployment of AI systems. This could include establishing clear guidelines for the standard of care required for AI systems and developing a framework for determining liability that takes into account the complex network of entities involved in the development and deployment of AI systems.

c. **Criminal Liability:**

The issue of criminal liability for harm caused by artificial intelligence (AI) is a complex and evolving area of law in India. As of now, there is no specific law or legislation in India that deals with criminal liability for harm caused by AI. However, there are certain provisions in the Indian Penal Code (IPC) that can be applied in such cases.

Under the IPC, if the harm caused by AI is the result of a criminal act or omission, the person or entity responsible for the AI may be held criminally liable. For example, if an AI system is designed to commit a criminal act, such as theft or fraud, the person or entity responsible for the AI may be held liable for the criminal act.

Additionally, if the harm caused by AI is the result of negligence or a failure to take reasonable precautions, the person or entity responsible for the AI may be held liable under the principles of tort law.

**(B) Strict Liability as a Potential Framework for AI Systems:**

Strict liability is a legal framework that holds a party responsible for harm caused by their activities or products, regardless of fault or intent. As AI systems become more prevalent, there is a growing debate over whether strict liability should be applied to these systems to address the potential harm they may cause. One potential benefit of applying strict liability to AI systems is that it can provide a clear framework for determining who is responsible when an AI system

causes harm. This could help to ensure that those who create and deploy AI systems are incentivized to take appropriate precautions and design their systems in a way that minimizes the risk of harm.

However, there are also potential drawbacks to applying strict liability to AI systems. For example, some argue that strict liability may discourage innovation and investment in AI technologies, as companies may be reluctant to take on the risk of liability for potential harm caused by their systems.

### **(C) Algorithmic Bias and its impact on Liability for harm caused by AI:**

Algorithmic bias refers to the unintended and often discriminatory outcomes that result from the use of artificial intelligence (AI) algorithms. As AI becomes more prevalent, there is a growing concern about the potential impact of algorithmic bias on liability for harm caused by AI systems. Here are four key ways algorithmic bias can impact liability:

- **Attribution of harm:** Algorithmic bias can make it difficult to determine who is responsible for harm caused by AI systems. For example, if an AI system causes harm due to biased algorithms, it may be unclear whether the responsibility lies with the developer of the algorithm, the user of the system, or the AI system itself.
- **Standard of care:** Algorithmic bias can also impact the standard of care that is required of those who develop and use AI systems. If bias is not taken into account in the development and deployment of an AI system, it may be difficult to argue that the developer or user met the required standard of care.
- **Causation:** Algorithmic bias can also complicate issues of causation in cases where harm is caused by multiple factors. If an AI system causes harm due to biased algorithms, it may be difficult to determine whether the harm was caused solely by the AI system or whether other factors also played a role.
- **Damages:** Finally, algorithmic bias can also impact the calculation of damages in cases where harm is caused by AI systems.

In India, the use of artificial intelligence (AI) is governed by a variety of laws and regulations, including the Information Technology (IT) Act, 2000 and the Personal Data Protection Bill, 2019. However, there is currently no specific law or regulation in India that deals with algorithmic bias and its impact on liability for harm caused by AI.

Despite this, algorithmic bias can still have an impact on liability for harm caused by AI in India. Here are four key ways:



- **Negligence:** Algorithmic bias can be considered a form of negligence in India. If a developer or user of an AI system fails to take reasonable precautions to address algorithmic bias, they may be held liable for harm caused by the AI system.
- **Product liability:** The Consumer Protection Act, 2019 provides for product liability in cases where a defective product causes harm to a consumer. If an AI system causes harm due to biased algorithms, it may be considered a defective product and the developer or user may be held liable.
- **Intellectual property:** In India, algorithms can be protected under copyright law. If an AI system causes harm due to a copyrighted algorithm that contains bias, the developer or user may be held liable for copyright infringement and for the harm caused by the biased algorithm.
- **Discrimination:** The Constitution of India prohibits discrimination on the basis of religion, race, caste, sex, or place of birth. If an AI system causes harm due to biased algorithms that discriminate against a protected group, the developer or user may be held liable for violating constitutional provisions.

Overall, while there is no specific law in India that deals with algorithmic bias and its impact on liability for harm caused by AI, existing laws and regulations can still be applied in cases where bias leads to harm. It is important for developers and users of AI systems to be aware of these potential legal issues and to take appropriate precautions to address algorithmic bias.

### **III. CASE STUDIES OF LEGAL CASES INVOLVING HARM CAUSED BY AI**

#### **1. Uber's Autonomous Vehicle Accident:**

In 2018, an autonomous vehicle owned by Uber struck and killed a pedestrian in Arizona. The vehicle was in self-driving mode at the time of the accident, and the safety driver who was supposed to intervene in case of an emergency was reportedly watching a TV show on her phone. The incident raised questions about Uber's liability for the harm caused by the AI system. Uber settled a lawsuit with the victim's family for an undisclosed amount.

#### **2. COMPAS Recidivism Algorithm:**

In 2016, a Wisconsin man named Eric L. Loomis was sentenced to six years in prison based in part on a risk assessment algorithm called COMPAS (Correctional Offender Management Profiling for Alternative Sanctions). Loomis argued that his right to due process was violated because the algorithm was not transparent and he did not have the opportunity to contest the algorithm's findings. The Wisconsin Supreme Court upheld Loomis's sentence, but the case

raised concerns about the fairness and accuracy of AI algorithms used in the criminal justice system.

### **3. Cambridge Analytica Scandal:**

In 2018, it was revealed that the political consulting firm Cambridge Analytica had used data from millions of Facebook users to target political advertising during the 2016 US presidential election. The data was collected using a personality quiz app that was developed by a researcher at Cambridge University. The scandal raised questions about the responsibility of Facebook, Cambridge Analytica, and the researcher for the harm caused by the AI system that processed the data.

### **4. Tesla Autopilot Accidents:**

In several instances, Tesla's Autopilot system has been involved in accidents resulting in injury or death. The Autopilot system is designed to assist drivers with tasks such as steering and braking, but Tesla warns that drivers should still pay attention to the road and be prepared to take control of the vehicle at any time. The accidents raised questions about Tesla's liability for the harm caused by the Autopilot system.

## **IV. IMPLICATIONS FOR LEGAL RESPONSIBILITY FOR HARM CAUSED BY AI**

The implications for legal responsibility for harm caused by AI are significant and wide-ranging. As AI systems continue to become more integrated into society, the potential for harm caused by these systems will increase, and it will become increasingly important to determine who is legally responsible for any resulting harm.

One implication is that liability frameworks will need to be adapted to account for the unique challenges posed by AI systems. As discussed earlier, traditional liability frameworks, such as tort law and product liability, may not be sufficient to address the complexities of AI systems. Therefore, new liability frameworks may need to be developed that take into account the unique characteristics of AI, such as its ability to learn and adapt over time.

Another implication is that individuals and organizations involved in the development and deployment of AI systems will need to take a more proactive approach to managing the risks associated with these systems. This could include conducting risk assessments, implementing safeguards and controls, and ensuring that AI systems are developed in a responsible and ethical manner. Additionally, the potential for legal liability for harm caused by AI systems could impact the development and adoption of AI technology. If individuals and organizations are not held accountable for the harm caused by their AI systems, it may undermine public trust in the

technology and limit its adoption. Therefore, it is crucial to establish liability frameworks that ensure individuals and organizations are held responsible for any harm caused by AI systems.

Finally, the implications for legal responsibility for harm caused by AI highlight the importance of interdisciplinary collaboration between legal experts, AI researchers, and policymakers. As the development and integration of AI systems continue to accelerate, it will be essential to have a holistic understanding of the legal, ethical, and social implications of these systems to develop effective liability frameworks that can keep pace with the rapid development of AI technology.

## **V. RECOMMENDATIONS FOR EFFECTIVE LIABILITY FRAMEWORKS FOR AI SYSTEMS**

Based on the challenges and considerations discussed above, here are some recommendations for developing effective liability frameworks for AI systems:

- **Establish clear legal frameworks:** Governments should establish clear legal frameworks that outline the responsibilities of manufacturers, operators, and users of AI systems. These frameworks should also specify the legal liability for harm caused by AI systems.

- **Implement product liability laws:** Product liability laws can be used to hold manufacturers of AI systems accountable for harm caused by their products. The laws should cover defects in design, manufacturing, and labelling, as well as inadequate warnings or instructions.

- **Develop regulations and standards:** Governments and industry organizations should work together to develop regulations and standards for the development and use of AI systems. These regulations should cover issues such as safety, reliability, and accuracy.

- **Encourage transparency and accountability:** AI developers and operators should be transparent about how their systems work, including the data used to train them and the algorithms they use. They should also be accountable for any harm caused by their systems.

- **Establish a liability fund:** Governments and industry organizations should consider establishing a liability fund to compensate individuals who are harmed by AI systems. This fund could be financed by contributions from AI manufacturers and operators.

- **Monitor and evaluate liability frameworks:** Governments and industry organizations should monitor and evaluate the effectiveness of liability frameworks for AI systems on an ongoing basis. This will help identify any gaps or weaknesses in the frameworks and allow for timely adjustments and improvements.

Overall, developing effective liability frameworks for AI systems is crucial for ensuring that individuals and organizations are held accountable for any harm caused by their systems. This will help build public trust in the technology and encourage its responsible development and use.

## **VI. CONCLUSION**

In conclusion, the rapid development and integration of AI technology have raised important questions about legal responsibility for harm caused by AI systems. The liability frameworks of tort law and product liability can provide a basis for determining legal responsibility, but there are significant challenges in applying these frameworks to cases involving AI systems. The unique characteristics of AI systems, such as their ability to operate autonomously and the complexity of their decision-making processes, make it difficult to establish legal responsibility. To address these challenges, it is important to develop effective liability frameworks for AI systems that take into account the legal, ethical, and social considerations involved. This may involve the creation of regulatory bodies to oversee the development and deployment of AI systems, as well as the development of industry standards and best practices for AI systems. Additionally, it is important to promote transparency and accountability in the development and deployment of AI systems, to ensure that individuals and organizations can be held responsible for any harm caused by their AI systems.

Overall, the legal responsibility for harm caused by AI systems is an important and complex issue that requires careful consideration and ongoing dialogue among stakeholders in the legal, technology, and policy communities. By developing effective liability frameworks for AI systems, we can ensure that the benefits of AI technology are realized while also protecting individuals and society from potential harm.

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