Computational Linguistics Research Review

Volume. 1 Issue No. 1 (2024)

Artificial Intelligence and Liability: Who is Responsible?

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ABSTRACT

This paper explores the complex interplay between artificial intelligence (AI) and legal liability, addressing the pressing question of accountability for AI-driven actions. As AI technologies evolve rapidly, traditional legal frameworks struggle to keep pace with the implications of autonomous systems. The study begins by examining the historical development of AI, highlighting its applications from early expert systems to modern machine learning. It then outlines existing legal frameworks related to liability, including product and negligence liability, while discussing the challenges posed by the autonomous nature of AI. Ethical considerations in AI development are emphasized, focusing on the responsibility of developers to ensure safety, transparency, and fairness. The paper also presents case studies illustrating potential liability scenarios, such as incidents involving autonomous vehicles and AI-driven medical systems. These examples underscore the need for updated legislation that addresses the unique challenges posed by AI. Ultimately, the paper calls for a multi-stakeholder approach to develop comprehensive legal and ethical guidelines that ensure accountability in AI deployment, advocating for ongoing interdisciplinary dialogue among technologists, legal experts, and ethicists to navigate the evolving landscape of AI liability.

Keywords: Artificial Intelligence, Liability, Legal frameworks, Accountability, Ethical considerations, Autonomous systems, Product liability, Multi-stakeholder approach

1. Introduction

Artificial Intelligence and Liability: Who is Responsible? AI is evolving at an unprecedented pace, offering viable solutions in various sectors and streamlining decision-making processes. AI-assisted decision-making prompts inquiries into the liability for AI's outcomes. Who should—and potentially already is—accountable for undesired AI-prompted consequences is a question worth paying attention to. Legal traditions traced back from Roman law traditionally recognize at least one of only three possible bases of liability: a wrongful act/omission, failure to act/omission, or a violation of a statutory obligation (Wardhani et al., 2022). Through a careful analysis of legal provisions, remarkable discussions have taken place about who should be responsible for AI's actions. AI is notably used to design new technologies in the increasingly expanding field of robotics. Over the past few decades, robotic systems have been involved in a considerable number of serious accidents in which human life and physical integrity, public and private property were damaged. Since it is mainly by the design and development of these systems that AI is later employed, the following pages address who should be liable for an AI-driven robotic system's harmful consequences. One major area of interest resides in whether and to what extent the law recognizes and operates liability for autonomous robotic systems' harmful, intentionally or unintentionally caused activities prompted or supplemented by the use of AI. In criminal law, updated legislation and industry practices impose liability and apply sanctions for such activities on the main subjects involved in robots' operations – their specifically programmed tools: their own autonomous functioning imposes accountability for any juridical act they commit. Was a person harmed by an AI-driven action in a field of activity not covered by strict liability norms? In that event, none may be held automatically legally responsible for the AI's undesired consequences, and that person should approach a court. (De Cruz, 2022).

2. The Development of Artificial Intelligence

Artificial Intelligence is not new. It was introduced in the 1940s to validate mathematical theory and was further developed in the 1950s and 1960s with the

aim of creating programs that mimic human thought and problem-solving capabilities. The DENDRAL program, begun in 1965, was a pioneering expert system aimed at identifying organic compounds from mass spectrometry and nuclear magnetic resonance data, ensuring AI's enduring applications in the domain of chemistry. In the 1980s, developments in the domain of machine learning contributed to AI, causing several European governments and the European Union to initiate research programs for the future. Since then, many new breakthroughs in machine learning have been made, mostly in the area of artificial neural networks, the most recent of which have been convolutional, recurrent, hierarchical, and variational AI (Mansfield, 2022).

Most of the latter advances were absent from the scene until the mid-1990s. For the first time, the area of malware detection came to a complete stop due to automated methods: computer scientists began to investigate supervised learning for the detection of new malware samples in 1999. Although AI is fundamentally stronger than traditional rule-based systems, it is also based on other things that those systems were not. Rule-based systems require humans to point out to the computer how to reason from the rules, something a computer can't do by itself. Instead, learning algorithms are designed for this, which is the "intelligent" in artificial intelligence. However, AI is not static. It can also evolve, adding uncertainty to legal interpretation. The great success in AI has caused applications that affect everyday life throughout the world and taken over some aspects of production and services. It can also be mistaken for human decisions and mislead human decisions, which can be a problematic center of the responsibility question. In summary, it is threatening to overrun societies; therefore, it would be reasonable to concentrate on the social impact of all AI technologies. As of more than words, research on AI and liability requires an in-depth view of the impacts that AI technology has on the abilities to intervene and influence the choices and abilities of possible persons suffering from the consequences, whether it is just the elected party in a current period or the

average person. We have attempted to outline in the upcoming sections what this means for repositories, which are applications where liability issues need to be solved (Park, 2021).

3. Legal Frameworks and Liability

B. Existing Legal Frameworks and Liability AI researchers have long called for work in roboethics, addressing the potentials and liabilities of artificial intelligences. The legal code has also begun to address its own vision of policy for AI behavior on a variety of fronts. The primary avenues of legal responsibility addressing liability for property damages are: product liability, applying to "goods"; and negligence liability, which may potentially be extended, if it began to be applied at all, to artificial agents who are not part of the plaintiff's property relations. Each of these may apply in unique ways to complex systems with articulate programming and the ability to "learn" from their environments. In addition to the pathways in this chapter relating to AI liability, there remains the open possibility of foreseeing legislation specifically for AI, which might be more specific to this area's unique issues. How exactly the law and potential legislation changes from current practices may be difficult to predict, and it must be sensitive to the sensitivities of different AI fields. The question of whether algorithms could satisfy the mens rea component of a criminal act is a notoriously tricky question. The ethical implications of deploying autonomous cars raises issues in the context of autonomous vehicles, arguing among other things that such vehicles should come equipped with a "reasoned elaboration" of why accidents occurred (Zhou et al., 2021).

There is an argument for developing data protection law to require businesses to only make "reasonable inferences" from their data. For example, in the case of an autonomous vehicle teaching itself to drive by pretending to be a raccoon in a machine learning environment, we should distinguish between an algorithm that learns dangerous behavior because it learned how to be a raccoon, and an algorithm that has developed dangerous behavior without a determining external

factor. The culpability of the engineers, programmers, and deployers of such systems may also be raised as questions of "accessorial liability" or conspiracy. Being liable legally refers to being responsible at law. When being a causal variable in an accident, the law does not necessarily distribute fault or responsibility according to the level of involvement. In cases where humans and AI both contribute to an injury in some way, the law may not be able to attribute shares to each of the liabilities. There are gaps and lurking proximate cause issues and a word of caution that even smart historical suggestions may be outgrown by an AI with new accident conversion opportunities. The discussion can now turn to what, outside of specific liability paths, may be an appropriate level of responsibility for autonomous systems and what factors might make for changing linkages between AI and accidents. The European Union recently suggested the first set of AI liability standards. When a party cannot establish liability, a redundant system could serve as a deep pocket in any subsequent compensatory schema, motivating deployment insurance (Pennington, 2022).

4. Ethical Considerations in AI Development

Artificial intelligence (AI) has become a burgeoning field in which continued growth creates an inestimable scope of opportunities. Although the goal is to expand the greater good, concerns prompted by the development of AI are profound to the developers. Given the potential ripple effects, a misstep could release on everyone. Consequently, AI developers have a certain level of moral responsibility in ensuring that their AI systems are safe, sufficiently secure, and transparent. However, transparency takes on a more complex implication when processing bias. Hardwiring a system to detect and code a response implies the biased trait from which it was learning. Furthermore, the AI only throws into the spotlight the question of accountability. For instance, if someone's exposure to a job was restricted due to an AI-generated product, who owes what to whom when something goes wrong? What are the consequences of predictions made in a process in a decision drawn by the AI?

Today, various ethical frameworks guide the development forecast of AI, and each one of them demonstrates a moral good, be it humans or society as a whole. Just like employers considering the installation of secure sockets HTTP protocol for online transactions, it is necessary to consider the ethical and legal implications of AI. At the European level, the General Data Protection Regulation and the regulatory outline for a European AI Act application articulate that AI should be trustworthy, human-centric, rule of law, non-discrimination, and fairness, allowing the deployment of AI systems. With the AI system's direct and indirect impact on children and natural persons, organizations and governments should afford equality in their AI decisions under filing with the AI principles (Derrett, 2021).

Ethical considerations intervene with concerns on predictability, liability, and the role of AI in virtually developing human ethics if AI performs the role of making fair decisions. Thus, ethical issues are, in the ultimate analysis, intertwined with legal and regulatory inquiries on AI. Ethics is situated somewhere between the objective world of experiences and human beings and the subjective world that each and every one of us inhabits as autonomous moral agents. An emphasis on human beings and the reality of a shared network of relationships makes this presentation of an embodied and situated philosophy deeply human-centered. Ethically designed experiences will preserve the rights, dignity, and freedom of the real people who will use the ethically designed technology on a daily basis. In addition, it would ensure that a person operating a system laced with abductive approaches would rely on AI goals, moral implications, and quality management results in his decision-making. Since the legal elements at the core of AI systems cannot be disentangled from their potential ethical implications, legal capacity overlaps with ethical assessments to ensure accountability. AI gives humans the impression that it is capable of thinking and making choices like a real human, hence making them complacent and causing them to switch off their cognitive abilities. Hence, the uniqueness of humanity is lost. Instead of a deep ethical

discussion that we have been witnessing, one would argue that the entitlement per se or misuse of any AI system could itself have profound ethical implications (Koch, 2022).

5. Case Studies of AI Liability

Case Studies of AI Liability: 5. Case Studies

Case Study 1: Unknown UAS over Tempe

Incident: On September 27, 2008, a Piper turbine twin suffered a midair collision with an unknown small UAS. The aircraft, which had been rented from a municipal general aviation airport, was being operated by the owner-pilot before the collision.

Liabilities: With respect to liability, there are a number of issues that are necessary to understand the answer to liability questions. The type of accident (the facts associated with the case, including where it happened, the facts of the actual incident, whether there are multiple claims, the loci of the established claims, and the defenses of the alleged wrongdoers) weighed heavily in any court case. The level of liability that may exist in this incident is so varied that identifying a "responsible person" is difficult. Then, once the responsible parties have been identified, it is reasonable to anticipate that the co-joined legal wrangle will significantly delay any possible legal resolution, which is another reason for the complete expunging of the plaintiff from the legal arena (Tamanaha, 2021).

Case Study 2: Autopático

Incident: In 2012, two patients died from a "stroke" shortly after obtaining apparently normal medical recommendations from an AI-initiated remote medicine system developed by Autopático. An autopsy of the two patients performed a couple of months later revealed the existence of highly invasive aggressive late-stage cerebral tumors that were responsible for inhibiting vital functions in the patients.

Liabilities: What is intriguing about Autopático, like the Tempe case, is that there is some potential for a single person, Autopático, to be identified as the

responsible party. In the case of Autopático, one could argue that it is possible, even if unlikely, that the AI could have been legally compelled to reveal that there was a problem with its software because it "failed in any material way to provide proper or adequate warning." The pure contingency of the Autopático incident also was approached from a legal perspective, although the attempt to assign responsibilities to, in this case, the software company is of dubious merit.

6. Conclusion and Future Directions

Albeit artificial legal and moral persons are still science fiction, artificial intelligence (AI) technologies are of great legal and ethical relevance. Developments in autonomous systems in domains as diverse as cars, drones, or medical devices raise the question of where to allocate legal responsibilities. In this paper, we discussed some of the most promising responses to this question; notably that traditional tort doctrines already have the conceptual flexibility to cover "new AI." However, it would need further study in the fields of both computer science and law to see how well it performs in reforming liability on an everyday basis.

In the moral literature, the liabilities of autonomous vehicles are sometimes used as case studies of how robots could revolutionize common-sense morality. Yet philosophers also make distinctions between electronic tools and AI systems. For example, some argue that we should prosecute persons rather than their electronic tools when, for example, a weapon fires based on perceiving a threat. Many of the developments that we address in this paper were far beyond hypotheticals and worth considering today. The current legal and ethical landscape calls for multi-stakeholder approaches on the national and international level. Ethical codes and guidelines enacted by technologically oriented organizations are one important tool in a set of tools that can be used to foster AI for Good. On the international and European level, soft-law instruments offer a legislative response to the challenges posed by AI's need for qualified data according to a multi-disciplinary approach. Predicting the future legal framework

is difficult, but discussing the trajectory of AI progress to consider risks and responsibilities is important. A lively, interdisciplinary, multi-stakeholder, and multi-platform discussion on these issues is overdue.

In the future, agents might be entities with highly integrated and distributed cognitive systems, spawning new entities with their ethical and informational systems. As companies secure AI against adversarial attacks, AI might develop "security by obscurity," resulting in AI that is unexplainable and built on trade secrets. In the meantime, companies are working on quantum computers. These developments are concerning as they might increase the opacity of automated decision-making systems or change their decision-making power altogether. Profound advancements in the field of AI are taking place, enabling once unavailable possibilities in the online environment, automation and robotics, health, and other sectors. The legal infrastructure is challenged to face and provide sufficient responses and solutions for the creation of autonomous and intelligent systems, the adaptation of society, as well as coping with the liability of the operators. Thus, a transparent and multi-stakeholder approach that is also provided in ethical guidelines and codes might be the most sustainable way to advance responsible AI rather than reactive problem-solving once adverse effects occur. Enforcement is also facilitated by being closely connected to multi-stakeholder compliance reports in companies. Albeit barriers exist in introducing a global legal framework, cooperation is an indispensable tool to establish responsible AI. The major challenge in this case is the diverse interests of different states and directed platforms towards the use of AI, due to the heterogeneity of regulating legislative powers as well as diverse levels of AI capabilities across the globe. Interdisciplinary discussions among computer scientists, lawyers, ethicists, and other stakeholders about the capabilities and limitations of AI, as well as efforts to improve AI capabilities, can help to identify realistic goals and constraints for AI ethics and law. Overall, these developments require ongoing interdisciplinary and inter-stakeholder dialogues.

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