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# *ARTIFICIAL INTELLIGENCE IN THE JUDICIAL SYSTEM EXPLORING BENEFITS, CHALLENGES AND THE EMERGENCE OF AI HALLUCINATIONS*

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# ABSTRACT

The purpose of the thesis is to discuss the integration of Artificial Intelligence (AI) into the judiciary, focusing on its transformative potential alongside the challenges it poses. AI technologies have the potential to change the judicial practices by enhancing efficiency, lessening workloads, and supporting legal professionals in decision-making. These advancements raise significant concerns about bias, transparency, accountability, and dehumanization of justice. Of particular importance is the role of AI-generated hallucinations, which imperil the reliability of and public trust in legal outcomes.

This study will research the dual impact of AI, one of reinforcing judicial efficiency and the other of fundamental limitation in emulating human judgment and ethics, by analyzing various case studies and comparative legal frameworks in Europe, the USA, and China. The findings underscore the risks of over-reliance on AI in decision-making processes and highlight the critical need for human oversight to uphold fairness, transparency, and the principles of justice.

By examining both the opportunities and dangers of AI adoption in the judiciary, the thesis contributes to the ongoing discourse on harmonizing technological innovation with the foundational values of legal integrity and human rights. It advocates for a well-balanced approach so that AI strengths can be utilized to reinforce the indispensable element of human judgment in the pursuit of equitable justice.

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# ABBREVIATIONS

| | |
|---|---|
| AAA | Algorithmic Accountability Act |
| ADM | Automated Decision-Making |
| ADR | Alternative Dispute Resolution |
| AGI | Artificial General Intelligence |
| AI | Artificial Intelligence |
| ANI | Artificial Narrow Intelligence |
| ANN | Artificial Neural Networks |
| APA | Administrative Procedure Act |
| ASI | Artificial Super Intelligence |
| CAT | Condominium Authority Tribunal |
| CBR | Case-Based Reasoning |
| CDCJ | European Committee on Legal Co-operation |
| CDCP | European Committee on Crime Problems |
| COB | Commission des Opérations de Bourse |
| CoE | Council of Europe |
| COMPAS | Correctional Offender Management Profiling for Alternative Sanctions |
| DGFiP | Direction Générale des Finances Publiques |
| DNN | Deep Neural Networks |
| DSS | Decision Support Systems |
| ECHR | European Convention of Human Rights |
| ECJ | European Court of Justice |
| ECtHR | European Court of Human Rights |
| EO | Executive Order |
| EPS II | Heuristic Rule-Based Expert System II |
| EU | European Union |
| GA | Genetic Algorithms |
| GDPR | General Data Protection Regulation |

| | |
|---|---|
| GEN AI | Generative Artificial Intelligence |
| GSA | General Services Administration |
| H.R. | House of Representatives |
| HUD | Department of Housing and Urban Development |
| ICAIL | International Conference of AI and Law |
| ISCE DB | International Database on Child Sexual Exploitation |
| KR | Knowledge Representation |
| LDSS | Legal Decision Support Systems |
| LLM | Large Language Model |
| LSI-R | Level of Service Inventory-Revised |
| MAS | Multi-Agent Systems |
| ML | Machine-learning |
| MRV | Mission requêtes et valorisation |
| NDAs | Non-Disclosure Agreements |
| NLP | Natural Language Processing |
| NPL | Natural Language Processing |
| OECD | Organization for Economic Cooperation and Development |
| PIPL | Personal Information Protection Law |
| PSA | Public Safety Assessment |
| PSI | Pre-investigation Sentencing Report |
| RbS | Rule-Based Systems |
| RTA | Road Traffic Accidents |
| S. | Senate |
| SVM | Support Vector Machine |
| UCL | University College London |
| UN | United Nations |
| USA | United States of America |

# 1 INTRODUCTION

Even though a large number of legal professionals work in the field of law, access to justice remains limited with significant adverse effects on citizens' lives. The increasing expenses and the complexity of the judicial process in particular raise obstacles to vulnerable individuals from seeking justice. Results of a study conducted by the Law and Justice Foundation of the New South Wales in Australia revealed that the majority of the participants, involved in civil cases, reported that the difficulty in accessing justice had a "severe" or "moderate" effect on the quality of their daily lives[1].

This situation has become more pronounced in the last few years as new challenges have emerged for all participants who are involved in the judicial system. Increasing functional complexities, delays in the prompt award of justice, and human errors mark the current legal landscape. As a result, there is a compelling need for the modernization of the judiciary, including the integration of advanced technology in the practice of justice. To this end, the advent of AI technology can substantially contribute to the improvement of the judicial ecosystem by reducing the judicial workload, supporting judges and lawyers in their decision-making processes, and further expediting and simplifying the related legal procedures.

However, the envisaged integration of AI technology in the judicial system may encounter serious challenges. Automated decision-making, driven by big data processing, lack of transparency and emotional intelligence, as well as potential bias in the outcomes raise important concerns about the AI's capabilities regarding the validity of its judgments, the integrity of the judicial proceedings based solely on AI recommendations, and the protection of fundamental and human rights where only AI judges are involved. Moreover, the phenomenon of AI-generated hallucinations, where AI systems may produce flawed outputs, poses a significant risk to the judiciary because it can lead to judicial errors and distortion of the legal proceedings. Such erroneous outcomes can harm the public's trust in justice and lead to an erosion of the rule of law and order.

Despite the aforementioned challenges, though, the ultimate objective of implementing AI into the legal system is to ensure that justice operates efficiently and effectively for the public and that judges and lawyers can rely on these AI tools to facilitate their work, mitigate errors, and overall help deliver justice equitably in line with human rights.

Nevertheless, some fundamental concerns are likely to persist in the future. Firstly, there is a question of whether trust and law can truly coexist with an automated system driven by AI. Despite its considerable integration into the field, AI continues to prompt doubts among legal professionals regarding its reliability and fairness. Secondly, open issues remain about the broader implications of reliance on AI both for the judicial system and for the public. Finally, a major question centers on the possibility of AI models to fully substitute for attorneys and judges.

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[1] (Tito, 2017)

This thesis explores the impact of AI tools on the judicial system, examining both their advantages and the challenges they pose, including the emergence of AI hallucinations. The analysis relies on relevant cases, European and international examples of AI's use, as well as references to the current legal framework for AI applications in Europe, the USA, and China.

# 2 DEFINITIONS OF ARTIFICIAL INTELLIGENCE

## 2.1 Definition of AI Types

AI is a domain of Computer Science. Since this term was coined by Professor John McCarthy in 1956 at the Dartmouth Workshop for the Dartmouth Summer Research Project on AI, the definition of the term has undergone several improvements[2, 3]. According to ISO / IEC 22989/2022[4], AI today is defined as "*a technical and scientific field devoted to the engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives*". In other words, AI is a technology that enables computer systems and machines to perform activities similar to human abilities, such as problem-solving, reasoning, perceiving, planning, learning, creating content, decision-making, and communicating[5]. However, owing to its definition, AI should be perceived as being discrete from human intelligence. Significant research efforts have been expended since the inception of the term in 1956 to mark the boundaries and the relationship between AI and human intelligence[6, 7, 8, 9, 10, 11]. Because AI can enable computer systems and machines to perform activities similar to human abilities, it differs fundamentally from advanced software and the key difference lies in its capability to learn from the data it processes[12]. Thus, AI is a wider concept that includes subcategories based on functionalities (Machine Learning, Deep Learning, Theory of Mind, Self-Awareness) and capabilities (Artificial Narrow Intelligence, Artificial General Intelligence, Artificial Super Intelligence), which are outlined in the sequel [13, 14, 15, 16, 17].

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2 (Wolfgang Ertel, 2017)

3 (Klontzas et al., 2023)

4 (*What Is Artificial Intelligence (AI)?*, n.d.)

5 (Russell Stuart & Norvig Peter, 2004)

6 (McCarthy, 2013)

7 (McCarthy & Hayes J., 2013)

8 (Rainie, 2018)

9 (Korteling et al., 2021)

10 (Baeza-Yates & Villoslada, 2022)

11 (Gignac & Szodorai, 2024)

12 (Juijn Daan, 2024)

13 (Coursera Staff, 2024)

14 (Dronadulai & Bhaskar, 2023)

15 (IBM Data and AI Team, 2024)

16 (*Types of Artificial Intelligenc1.Pdf*, n.d.)

17 (Betz Sunny, 2024)

### 2.1.1 Machine Learning Systems – Reactive Machines

Machine learning (ML) systems do not have any memory and, therefore, they function as reactive machines using data-driven algorithms to imitate human behaviors. Memoryless systems are designed to undertake a specific task, resulting in the same output for the same input, and usually, they require human oversight. While these systems can be easily learned and quickly trained in smaller data sets, they tend to produce less accurate output results with high error rates. In general, supervised operation is necessary for machine learning systems that represent the inceptive implementation of AI and have found their way into applications such as ChatGPT, Netflix, Tesla (car driving), and Google Translate.

### 2.1.2 Deep Learning Systems – AI Systems with Limited Memory

Limited memory systems represent the next advancement of AI to imitate how the neurons function in the human brain. Hence, such a system could be best described as an artificial neural network simulating the learning process of the human brain but with limited memory. These systems employ deep learning algorithms so that they can be trained in large datasets, including unstructured data. Consequently, they require longer training sessions but they are more accurate. Such systems are, also, called self-learners because they tend to improve their performance by sequential training on more data and by accounting for their past errors. Limited memory systems have been implemented in natural language processing, image recognition, self-car driving, virtual assistants, and chatbots.

### 2.1.3 Theory of Mind

This is an advanced type of AI's future development which does not currently exist. When developed, the Theory of Mind is envisaged to be able to understand the contextual world as well as the thoughts and emotions of interacting humans, imitate human relationships by observing intentions, including interactions, and respond accordingly.

### 2.1.4 Self-Awareness

The next and highest level of AI's future evolution refers to the development of AI systems in which the key feature will be their self-awareness capability. Such systems are visualized to be mindful of their existence, to be able to understand their emotions and the reasons triggering them, including sensing the emotions of other entities and responding accordingly.

### 2.1.5 Artificial Narrow Intelligence

ANI or Weak AI systems are trained to perform one single task related to a specific cognitive capability, thus lacking any ability to learn further skills. Such systems function using ML and neural network algorithms. Practical applications of these systems include natural language processing, image/voice recognition, virtual assistants (Amazon's Alexa, Apple's Siri), autonomous vehicles, and online browsing.

### *2.1.6* Artificial General Intelligence

AGI or Strong AI systems are under current development aiming to have the capability of reasoning, problem-solving, perceiving, learning new skills on their own, and performing multi-functional tasks beyond predetermined domains, without the need for operators training them, thus acting as intelligent assistants to humans. Potential AGI applications include computer vision, game playing, machine learning, natural language processing, robotics, and AI safety.

### 2.1.7 Artificial Super Intelligence

Super AI is conceived to be the crown jewel of AI but it still is a theoretical concept. Its systems are theorized to include cognitive abilities such as thinking, reasoning, judging, learning, planning, communicating, feeling emotions/needs, or projecting beliefs in a manner that exceeds human intelligence. In this regard, Nick Bostrom, founding Director of the Future of Humanity Institute, Oxford University (2005—2024), and Principal Researcher at the Macrostrategy Research Initiative, defines superintelligence most appropriately as "*any intellect that greatly exceeds human cognitive performance in nearly all areas of interest*".

## 2.2 Definition of AI-Generated Hallucinations

Although the term “hallucination” describes unreal perceptions of the human brain, AI-generated hallucinations are produced by Generative Artificial Intelligence (GEN AI) systems that return inaccurate, false, fictitious, and even meaningless (and, thus, unreliable) responses to their users or misinterpret the users’ requests[18, 19]. More specifically, GEN AI is a branch of AGI that uses natural language processing in order to create new content such as text, images, audio, and videos, at the prompt of the user. The AGI systems require big data sets for their training and engage deep learning algorithms to identify and learn patterns out of these data sets which they, subsequently, structure to synthesize novel content based on these patterns and structure[20, 21 22]). Despite the apparent growth of GEN AI, though, its limitations provide the root cause for the appearance of hallucinations.

The emergence of AI hallucinations is a global issue today and could cause significant damage to its routine applications, especially in the legal field that has been working on embracing it lately. More specifically, according to a new report, by January 2024, 26% of the respondents were using generative AI tools on a monthly basis, up from an estimated 11% in July 2023. Although generative AI instruments are so useful that many legal technology experts continue to use them, the same experts remain hyper-aware of the risks that AI hallucinations may raise. In particular, 90% of the experts recognize these risks, and only about 10% of them express no concerns. Moreover, slightly above than half (57%) of legal professionals admit that they fear hallucinations, while 55%

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18 (Dahl et al., 2024)

19 (Perov & Perova, 2024)

20 (Banh & Strobel, 2023)

21 (*Singh - Principles of Generative AI A Technical Introducti.Pdf*, n.d.)

22 (Ivanova, n.d.)

of the same professionals state that they have a trust issue with them. Apparently, if legal technology experts select GEN AI to assist them in improving their work but the answers it produces are erroneous, this situation can result in flawed legal advice with disastrous consequences. For example, a wrong result might lead to losing cases and clients, breaching confidentiality, undermining testimony, and contributing to the rise of ethical issues in legal practice. Despite the perceived advantages of the GEN AI tools, AI hallucinations limit the applicability of GEN AI systems and prevent their wide adoption in the legal context to avoid GEN AI-caused misinterpretations and reduce related implications[23].

## 2.3 Historical Background

The history of AI began in the year 1950 while the first program was written in 1951 for the Ferranti Mark I machine at the University of Manchester. During the same time frame, Allen Newell and Herbert A. Simon also created an AI system, demonstrating mathematical theories and discovering new ones. The programs were used in both private industry and governments. Businesses took this progress one step further by expanding AI systems for production and manufacturing, while the governments used them, too, to enhance language processing and data management. Into the early 2010s, AI had been assimilated into a growing number of firms, but this integration has brought changes and ethical concerns in the workplace[24].

The history of AI and Law dates back to 1987, when the International Conference on AI and Law (ICAIL), a crucial event for the field's future, was conducted. This conference hosted members of the research-to-practice community from all around the globe to present advancements in AI applications within the legal sector.

The First Conference at Northeastern University in 1987 took place in Boston, Massachusetts, marking a significant milestone in the formation of the AI and Law Community. In more specific terms, the conference focused on addressing challenges and opportunities of deploying AI to tackle the complexities of legal reasoning — particularly with respect to handling incomplete or inconsistent information in law. The key topics of the conference included Conceptual Information Retrieval, Case-Based Reasoning, Rule-Based Reasoning, Neural Networks, and Hybrid Knowledge, including Executable Logic Programs as outlined below[25]:

a) Conceptual Information Retrieval refers to the challenge of efficiently retrieving relevant legal information from vast databases. This research examined the possible ways in which AI could enhance information retrieval systems applicable to the legal domain. The work has been primarily focused on developing methods and systems that go beyond basic keyword searching to grasp and retrieve intelligible legal information. Using conceptual indexing, these systems attempt to understand the hidden legal concepts and documents as well as to provide more relevant search feedback. Such tools, like the Issue/Case Discrimination Trees, structure case law knowledge and promote advanced legal reasoning.

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23 (Halls, 2024)

24 (Dhankhar, 2023), see chapter "*B. History*", p. 2029

25 (T. Bench-Capon et al., 2012), see chapters 2.1 -2.4

b) Case-Based Reasoning (CBR) emphasizes the importance of previous court rulings (precedents) to guide decisions in new cases. Some of these systems, like HYPO presented in 1998, showed that AI can think like an attorney in law by using examples from similar cases to help make decisions in new legal situations.
c) Rule-Based Reasoning was based on applying legal rules to cases, further considering that exceptions and conflicts might appear. The key insight was that legal reasoning is nonmonotonic — conclusions can shift as more information comes in, especially when exceptions are involved. This approach emphasizes that legal rules are not absolutes; therefore, a legal rule can apply differently depending on the specific circumstances of each case. Furthermore, natural language understanding systems that automate legal decision-making must incorporate these exceptions and the non-monotonic reasoning structure of law in order to accurately capture real-world legal nuances. Gordon's 1987[26] contribution is considered a key example that has argued for the necessity of assimilating nonmonotonic reasoning in legal systems so that they might comply with legal drafting practices.
d) Neural Networks and Hybrid Knowledge became important to AI and Law as they replaced the symbolic AI systems with new ones that were flexible to dynamic learning and could adapt to legal data that was not complete or consistent. This advancement was a major innovation in how AI could model complex legal relationships and ambiguities with more rigor than before. Such a modeling capability would later form the basis for sophisticated legal reasoning technologies. In fact, the adoption of neural networks made AI in law even more powerful at understanding complex legal situations.
e) Executable Logic Programs were critical in demonstrating that logic programming could be engaged to represent and automatically apply legal rules written in natural language. This evolution had practical, real-world implications: the approach was developed and implemented to create expert legal systems, like Softlaw, which has been broadly accepted by both government and other organizations for legislative compliance purposes

The Second Conference in 1989 was held at the University of British Columbia, Vancouver. This conference has argued for the use of AI applications not just in litigation but, also, in the offer of legal advice and, thereby, it has welcomed the next-generation AI systems that adopt legal reasoning in complex cases. Its key topics are outlined as follows:

a) The first topic, discussed by Trevor Bench-Capon[27], referred to the advantages and disadvantages of the deep conceptual models of legal reasoning compared to shallow rule-based expert systems. More particularly, the deep models aimed to capture the fundamental principles and structures of law while the shallow systems focused on implementing predetermined rules to individual cases. The Conference highlighted the importance of striking a balance between the two approaches, acknowledging that different legal situations may demand other types of AI.

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26 (Gordon, 1987)

27 (T. J. M. Bench-Capon, 1989)

b) The second topic, analyzed by Kevin D. Ashley[28], was about the use of logic with particular emphasis on the combination of nonmonotonic logic and case-based reasoning. The attention of this endeavor shifted to past cases (precedents) and applied logical rules to determine which rule should apply in case of conflicts. For this purpose, Ashley developed specific devices intending to assist in choosing a suitable rule that had been decided upon by previous decisions, thus finally helping in legal decision-making.
c) The third topic of the Conference referred to legal planning, especially estate planning. Schlobohm and McCarty[29] presented a refined version of their existing expert system (EPS II) that was designed to simulate an in-depth model of legal tax estate planning and assist in the generation of customized estate plans for clients. While prior systems employed legal argument and taxed statutory inference to provide the client with a general prototype of an estate plan, this system generated simple "base level" plans which could then be adapted to tax regulations pertaining specifically to individual clients. This development demonstrated the promise of such systems to innovate in legal planning education, which is often deprioritized by law schools.

The Third Conference was held for the first time in Europe and took place at the University of Oxford in 1991. The Conference dealt with the following main topics:

a) A salient issue was the division of world context and law information. More specifically, Joost Breuker and Nienke den Haan[30] argued that in AI systems the knowledge must be distinguished into general knowledge (space, time, causation, etc.), and legal knowledge (regulations, norms). This difference is critical because legal reasoning often involves both types.
b) The Deontic Logic, a field of philosophical logic concerned with obligation, permission, and prohibition, was another key topic of discussion. Henning Herrestad[31] wished for Deontic Logic to be used as a representation tool for legal knowledge in AI and the management of conflicting obligations and breaches. The discussion was centered around the Deontic Logic of Ideality and Sub-ideality by Jones and Pörn[32], which would be a more appropriate framework for discussing contrary-to-duty obligations, while an important matter for legal reasoning is the deployment of automated reasoning systems.
c) Finally, argument strategies were advocated by Skalak and Rissland[33] to be central for legal reasoning, especially where the legal issues are complex and there is a need to combine past cases and rules to guide new decisions. Four primary strategies were proposed for building compelling legal arguments: (a) broadening a rule's scope, (b) confirming that the rule applies, (c) arguing that the rule does not apply, and (d) contesting the application of a rule even if conditions for its application are met. These strategies can be exercised through

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28 (*Ashley-1989-*, n.d.)

29 (Schlobohm & McCarty, 1989)

30 (Breuker & Den Haan, 1991)

31 (Herrestad, 1991)

32 (Jones and Pörn, 1985)

33 (Skalak & Rissland, 1991)

specific actions, such as comparing cases to examine either whether they have similar features or whether they are different and, hence, they must be distinguished. To implement these argument strategies in a computational context, the CABARET system was developed to make legal decisions by combining case-based reasoning (using precedents) and rule-based reasoning (applying rules of law)[34].

The appraisal of the first three ICAIL events is particularly significant since they attempted to connect the field of law with AI. More specifically, the first conference established the AI and law community, the second one contributed to increasing the AI applications in law and diversifying the approaches to it, while the third one addressed additional AI developments as the field matured.

Over the years after 1991, many subsequent ICAIL events were held to address the ongoing challenges of AI in law, attempting to rise and meet them by providing a framework for effective and productive AI mechanisms within legal systems that can assist legal professionals toward a more transparent and fairer judgment-making. Uniting a global community of interest, the exchange of ideas and research would result in an emerging AI body of work that promises different but complementary ways to help lawyers. Although the subsequent ICAIL events were also important in their own merit, the first three seminal Conferences are most often emphasized because these pioneering events laid the groundwork for the field, defined its path, and tackled initial difficulties in applying AI to legal reasoning.

[34] (T. Bench-Capon et al., 2012), *supra note* 25, see chapter 4.3

# 3 LEGAL FRAMEWORK OF ARTIFICIAL INTELLIGENCE

## 3.1 Europe

The Council of Europe (CoE) is a major European human rights organization, representing more than 830 million Europeans. Ever since its establishment in 1949, it has steered societal and technological progress toward human rights, democracy, and the rule of law.

AI's rapid advancement has greatly benefited society, particularly in the areas of communication, education, information access, and administration. AI's ability to find patterns has facilitated the completion of complex tasks, further contributing to the chances of increasing overall human prosperity. Nevertheless, serious concerns have arisen about the potential impact of AI on individuals and society, such as the emergence of discrimination, loss of human agency and autonomy, enforced surveillance, misinformation, and election manipulation.

To tackle these issues, national legislative bodies of member states must incorporate the CoE's norms for democracy, human rights, and the rule of law into their legal systems. In Europe, frameworks such as the **European Convention on Human Rights** (ECHR) govern the protection of human rights with a number of related regulations. However, these regulations cannot guarantee that they will respond appropriately to AI challenges, which raise new ethical, legal and practical issues. Thus, new legislation must be centered around AI in order to regulate this modern technology and safeguard against its ramifications.

As a result, on 11 September 2019, the Committee of Ministers resolved to set up an Ad hoc Committee on Artificial Intelligence (CAHAI) to conduct a feasibility study and propose possible elements of a legal framework for AI in line with the CoE's principles. The feasibility study, developed by CAHAI, took into account existing international legal instruments as well as work carried out by other regional and international organizations, including the UN, EU, and OECD[35].

One year earlier in December 2018, the CoE's European Commission for the Efficiency of Justice (CEPEJ) released the **European Ethical Charter**, which included guidelines for the application of AI in justice. Respect for fundamental rights, equality, non-discrimination, quality assurance and security, transparency, accountability, justice and fairness, user control, and autonomy are the main topics dealt with in the Charter. That year, CEPEJ was also considering whether to certify or label AI products used in justice. Lastly, the **European Committee on Legal Co-operation** (CDCJ) established guidelines to guarantee that CoE's member states comply with the Convention of Human Rights, while the **European Committee on Crime Problems** (CDCP) examined a proposal regarding AI and criminal law[36].

On 8 and 9 December 2021, the CEPEJ published an action plan for 2022-2025, titled "**Digitalization for a Better Justice**". The objective of the plan was to achieve efficiency in implementing new technologies, but also adequate protection of fundamental rights. More specifically, the plan

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35 (Council of Europe Study, 2021), see chapter "*General Introduction*"

36 (Council of Europe Study, 2021), *supra note 35*, see chapter 4.4

aimed to guide the CoE's member states and courts on the digital transition while upholding fundamental principles, such as Article 6 of the ECHR. Additionally, the plan focused on pursuing a human-centric approach and top-quality public justice services for all, accelerating justice by prioritizing transparency, humanness, teamwork, and accountability. Most importantly, it provided support for the digitization of courts, building connectivity among justice professionals[37].

On 12 July 2024, the first regulation on AI was published in the EU's Official Journal and it took effect on 1 August 2024. The **AI Act** is a Regulation of the EU on broadly governing AI, introduced to create standardized rules across the EU's member states regarding the placement of AI systems in the market and their use based upon risk. The AI Act is part of a wider landscape for trustworthy AI, involving the AI Innovation Package and the Coordinated Plan on AI. All three intend to secure the protection of individuals and businesses over AI on safety and fundamental rights while promoting investment in and innovation of AI solutions within the EU[38]. More particularly, the Regulation includes strict rules about the AI systems, deemed as "high-risk", because their use may have an impact on the fields of health, safety, or fundamental rights. Consequently, these AI systems must adhere to rigorous criteria for reliability and compliance assessments before they are marketed in the EU, while AI providers must conform with existing key rights throughout the products' lifecycle. Lastly, the Regulation prohibits behaviors that exploit human weaknesses associated with age or disabilities[39].

The AI Act attempts to build trust in AI systems. Most AI systems present relatively low or no risk at all, and they aid in addressing various societal challenges. However, other AI systems present high risk. For example, the lack of transparency in AI decision-making could cause unfair results, such as biased hiring decisions or disproportionate allocation of public benefit programs, prioritizing certain applicants over others, possibly due to poor algorithms or prejudiced models. The existing legislation does not currently cover all these areas, thus raising the need to enact an AI Act. The AI Act provisions focus on risks associated with AI applications, forbid some of the related practices, and closely regulate others. Hence, the AI Act clears the situation for high-risk AI systems since it necessitates a pre-market conformity assessment and post-market enforcement mechanisms. This way, the AI Act creates a regulatory system in the EU and the member states to supervise the AI use[40]. According to the AI Act, there are four common types of AI systems based on their level of risk: Banned AI systems, High-Risk AI systems, Limited-Risk AI systems, and Minimal or No Risk AI systems outlined as follows[41].

a) The Regulation forbids the use of banned AI systems, including the government social scoring system (Social Credit System in China), because they pose a safety risk.

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37 (*AI in Judicial Systems*, 2021)

38 (*AI Act | Shaping Europe's Digital Future*, 2024), see chapter "*AI Act*"

39 (*The Artificial Intelligence Act - Regulation (EU) 2024/1689*, n.d.), see chapter "*What is the Artificial Intelligence Act?*"

40 (McCarthy, 1955), see chapter "*Why do we need rules on AI?*"

41 (*AI Act | Shaping Europe's Digital Future*, 2024), *supra note 38*, see chapter "A risk-based approach, High risk, Limited risk, Minimal or no risk"

b) High-Risk AI systems are those used in critical infrastructure and public safety, education and employment, essential services (credit scoring), and legal and justice systems. These products are associated with high risks of harm, so they must meet rigorous requirements. In principle, the use of Remote Biometric Identification Systems is prohibited in public spaces, except for limited exemptions that are subject to enforcement.
c) Limited-Risk systems have a low level of transparency-related risks: The Regulation mandates their fair and transparent use, ensuring users are aware when interacting with AI voices (Chatbots) and labeling AI-produced content, especially in instances of deep-fakes or public interest situations.
d) Minimal or No Risk systems are products that can be used by anyone across the EU without restrictions, such as video games.

In December 2022, the EU and the U.S.A. cooperated and published a "Joint Roadmap on Evaluation and Measurement Tools for Trustworthy AI and Risk Management", defining the responsible development of AI and ensuring that both parties will apply the AI recommendations proposed by the Organization for Economic Cooperation and Development (OECD). This Roadmap aimed at standardizing the terminology and classification of information, while risk management measures will assist in identifying and mitigating potential risks. The approach intended to build trust in AI systems and, ultimately, boost public trust, innovation, diminish trade obstacles and safeguard human rights. Finally, the Roadmap highlighted the importance of establishing trusted AI as a fundamental condition for ensuring responsible AI in use and development since both parties strive to meet this goal[42].

Eventually, the EU's AI Act is the first law worldwide that regulates the challenges and concerns of all general-purpose AI models in order to make them more transparent, while it sets risk management obligations for models with higher capabilities. This objective is achieved through self-assessments, systemic risk reduction measures, serious incident reporting, testing and evaluation, including cybersecurity measures[43] which must be observed by companies operating in the 27 EU member states regardless of where a company is headquartered[44].

## 3.2 United States of America

As a predominant developer and user of AI systems, the U.S.A. has enacted several legislative and executive acts governing the control and management of AI products. The most important of these acts are the following[45].

**The National Artificial Intelligence Act of 2020** (H.R. 6216): This act set up a federal initiative to expedite and coordinate federal investments in AI research, standards, and education aiming to ensure that the U.S.A. remains a world leader in the development and use of reliable AI systems.

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42 (Cortez & Maslej, 2023)

43 (*AI Act | Shaping Europe's Digital Future*, 2024), *supra note 38*, see chapter "*A solution for the trustworthy fuse of large AI models*"

44 (Fraser Lindsay, 2024)

45 (*United States Approach to Artificial Intelligence*, n.d.)

**The AI in Government Act** (H.R. 2575) was a law instituting an AI Center of Excellence within the General Services Administration (GSA) tasked to advance the adoption of AI systems, enhance cross-compatibility when adopting and using such systems, as well as ensure that the implementation of these systems in the GSA will benefit the public, improve productivity, and boost efficiency of GSA operations.

**The Advancing American AI Act** (S. 1353) inspired federal agencies to advance national AI initiatives that should maintain the U.S.A.'s leadership in the global AI competition while aligning with such U.S.A. values as the protection of privacy, civil rights, and civil liberties.

**President Biden's Executive Order (EO) on AI** (30 October 2023): The key objective of this EO was to enable the federal administration to benefit from the development and implementation of AI systems while managing their misuse risks in line with new standards for AI safety and security, Americans' privacy protection, equity and civil rights safeguarding, support of consumers, patients, workers, innovation and competition enhancement, advancement of American leadership abroad, as well as responsible and effective use of AI in government.

**AI Risk Management Framework by the National Institute of Standards and Technology,** (26 July 2024): Developed in response to the above EO, this framework is intended to help organizations identify prime risks posed by generative AI and formulate mitigative actions for generative AI risk management that best align with their operational goals and priorities.

**A Blueprint for an AI Bill of Rights** (October 2022): This is a guide conceived to protect the public against threats from AI misuse such as unsafe, ineffective, or biased applications that may propagate undesired inequities, violate privacy, or compromise individual rights, opportunities, and access to key resources or services. The Blueprint defends civil rights and democratic values by demanding that the design, deployment, and use of AI systems are governed by the principles of safe and effective systems, non-discriminatory algorithms, decision-making fairness and transparency, including the ability of the users to promptly opt-out from these systems with swift access to remedial action as needed[46, 47].

**The U.S. Algorithmic Accountability Act** (S. 3572, introduced on 02 March 2022): This Act refers to entities employing automated decision-making systems to make critical decisions and requires them to assess the impact of such systems on consumers. Critical decisions are defined as those having a significant effect on consumers' lives such as the cost or availability of health care, housing, employment, educational opportunities, or financial services. Essentially, the Act seeks to ensure transparency and responsibility in the use of automated decision-making systems. Thus, organizations that apply these systems must test them to confirm that decisions made will be unbiased and non-discriminatory. If, however, decisions made are prejudiced, the Act foresees that the accountability lies with the organizations that engage the automated decision-making systems[48].

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46 (Cortez & Maslej, 2023), *supra note 42*

47 (*Blueprint for an AI Bill of Rights | OSTP*, 2022)

48 (Cortez & Maslej, 2023), *supra note 42*

The preceding analysis indicates that AI regulation in the U.S.A. is more fragmented than in the EU. Moreover, its landmark EO of the Biden Administration (30 October 2023) addresses primarily how the federal government should use AI systems more effectively. In contrast, the EU has centered on addressing AI's major systemic risks such as bias or human rights compromise[49]. Note should be taken, though, of the fact that Biden's Administration efforts toward a rigorous framework to govern the development and use of AI locally and internationally have been in consultation with Australia, Brazil, Canada, Chile, the EU, France, Germany, India, Israel, Italy, Japan, Kenya, Mexico, the Netherlands, New Zealand, Nigeria, the Philippines, Singapore, South Korea, the UAE, and the UK[50].

## 3.3 China

China was a latecomer in using AI technology to support judicial proceedings. However, due to East Asians' trust in AI, the need to address an increasing number of cases, and an overloaded judicial workforce, China began to support its judicial system by enacting laws and ethical guidelines that relate to AI governance. These efforts include the National Security Law, the Network Security Law, the Data Security Law, the Personal Information Protection Law, the Governance Principles of New-Generation Artificial Intelligence, and the Code of Ethics for New-Generation Artificial Intelligence[51].

**The National Security Law** encompasses Article 53, which promotes the use of modern technologies in intelligence information work, criminal investigations, or national security. Such work comprises a vital part of criminal justice because the assistance of AI applications facilitates the analysis and decision-making based on intelligence data. Intelligence data, on the other hand, is generated when AI equipment and machine learning turn voluminous information into useful data. Hence, this procedure helps decision-makers make effective use of whatever information they might have and arrive at more informed decisions[52]**.**

**The Network Security Law**, implemented in 2017, provides a list of technical measures in Articles 21, 28, 44, and 52 to ensure the effective protection of critical information infrastructure and data as well as the safe use of networks, which is essential for sectors like criminal justice and national security.

**The Data Security Law**, adopted in 2021, creates a new governance landscape for safeguarding data. Its provisions stress the significance of data security, storage, and processing, which are indispensable in AI technologies. The law intends to guarantee secure data spaces where AI decision-making will occur without the risk of sensitive data being revealed.

Article 24 of the **Personal Information Protection Law** (PIPL), which came into force in 2021, expressly addresses automated decision-making for the first time. The Article dictates that entities,

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49 (Fraser Lindsay, 2024), *supra note 44*

50 (The White House, 2023)

51 (Wang, 2023), see chapter "*2.3 Relevant industry rules or standards*"

52 (*What Is Data Intelligence?* n.d.), see chapter "*What is Data Intelligence?"*

using AI for decision-making, must take the necessary measures to ensure transparency and fairness during this process. According to the law, individuals must have the opportunity to be aware of and appeal against these decisions, in particular when these rulings affect them in a very important way.

Additionally, Article 55 of the PIPL emphasizes that in the case of processing personal data through AI systems, a privacy impact assessment must be conducted in order to corroborate that individuals' data is protected and potential risks are managed effectively[53].

**The Governance Principles of New-Generation Artificial Intelligence**, issued in 2019 by the National Professional Committee for the Governance of New-Generation Artificial Intelligence, focus on fairness, transparency, privacy protection, and responsibility which must guide the development of new AI.

**The Code of Ethics for New-Generation Artificial Intelligence**, enacted in 2021, establishes ethical guidelines that should govern throughout an AI system's lifecycle. It applies to natural and legal persons as well as organizations engaged in AI practices mandating them to follow ethical rules so that AI technology is developed and implemented in line with fundamental rights and social values.

A preliminary issue of the proposed **"Artificial Intelligence Law of the People's Republic of China"** was published on 16 March 2024. The draft law presents a legal framework regulating the responsible development and use of AI in China. It further includes provisions regarding AI such as ethical principles, provisions for those who develop or provide AI products and services, protection of users' rights, and risk control around AI. Moreover, it regulates the utilization of AI tools by the state, and justice, including some key applications like biometric recognition and autonomous driving. Finally, the draft law defines the landscape for international cooperation and the legal consequences in case its provisions are breached[54].

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53 (Wang, 2023), *supra note 51*, see chapter "*2.2 Laws and regulations*"

54 (Artificial Intelligence Law of the People's Republic of China (Draft for Suggestions from Scholars), 2024)

# 4 CAN MACHINES SUBSTITUTE LAWYERS? / AI AND LEGAL THINKING

## 4.1 AI Legal Tools

With the increasing integration of AI into the legal field, numerous AI-powered tools are emerging, changing the legal landscape by facilitating attorneys and law firms to expedite their workflows and concentrate on the core of their mandates. The applications presented below belong to the most successful and well-known ones that exist in the legal arena for completing tasks swiftly, effectively, and rigorously. Nevertheless, due to their evolving nature, there are concerns about their transparency and operational outcomes. The room for errors, misinterpretations, and inaccuracies can lead to severe implications for clients, attorneys, and even the justice system. The subsequent analysis will present specific cases outlining the assimilation of AI technology in the legal profession, thus delineating the extent to which AI applications are able to undertake tasks of the legal professionals.

The 2014-founded business Ross Intelligence created **ROSS Intelligence** which advanced the field of legal research through the application of AI. This application became known for its ability to analyze legal texts and extract case laws, legislation, and other precedents. The application was used via a legal platform driven by AI that enabled lawyers to perform more accurate, efficient, and faster legal research. However, despite the early success of the application, Thomson Reuters filed a lawsuit against the company, claiming copyright infringement, following ROSS's unauthorized use of the legal information provided by Thomson Reuters' Westlaw platform offering legal research services. As a consequence of the incident, ROSS was unable to attract further funding and closed in January 2021[55].

Additionally, a legal research tool, called **CoCounsel** by Casetext, was developed to help lawyers locate case laws, legislation, and regulations more productively. The developer employed advanced AI to build this platform in 2013, further using dedicated servers to access ChatGPT-4. This approach guaranteed that user data would not be used for open AI model training, a deterrence that became one of the CoCounsel's primary advantages[56].

**JusticeBot** is an AI-driven program designed to give people access to accurate and specific legal information vetted by legal experts. More particularly, the system is intended to assist users in defining their issue, after they respond to a series of questions about it, and to show them past cases that may share similarities with their current conflict. Although it is primarily concerned with landlord-tenant disputes, it applies to other situations as well[57].

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55 (*Legal Research Company ROSS to Shut Down Under Pressure of Thomson Reuters' Lawsuit | LawSites*, 2020)

56 (*5 AI Tools Lawyers Can Use Today | Gavel*, n.d.), see chapter "*Casetext*"

57 (*JusticeBot*, n.d.)

As the leader in legal analytics, **Lex Machina**, a part of LexisNexis, helps businesses and law firms develop compelling legal strategies that win cases and close transactions. To this end, it delivers critical information forecasting the response of judges, courts, law firms, and parties involved in litigation across the legal landscape by merging data, software, and an expert attorney assessment. Thus, legal professionals can forecast results more rigorously with the aid of its output[58].

An AI and machine learning tool for contract diligence analysis, **Kira Systems** extracts key data from contracts. Hence, it can assist legal firms with identifying salient clauses and provisions, finding important information, and enhancing the overall review, analysis, and accuracy vetting of contracts[59].

## 4.2 ChatGPT As a Legal Tool

Legal self-help has been a new direction of AI technology in recent years, enabling users to ask questions about their disputes and explore alternative solutions and remedies for their cases. Furthermore, AI can make legal services more accessible to the public, lowering legal costs and increasing legal efficiency by compressing legal research or expediting evidence review, for legal cases of low intensity, which benefits both underserved clients and small businesses[60].

In this direction, the most well-known AI platform, ChatGPT, provides free and simple access to legal information, thus being an innovation in the legal field. More particularly, ChatGPT is an interactive chatbot of GEN-AI, developed by OpenAI, that uses natural language processing to simulate human speech via large language modeling. It can generate many types of material such as articles, social media posts, and essays, and it can respond to queries[61]. Although trained with large data and for tasks not specifically related to law, ChatGPT can deliver legal information to laypeople and can create legal documents, annotate papers, as well as use case law to clarify legal principles[62]. Most notably, ChatGPT exhibits some capability of legal reasoning which emanates from the combination of basic logical reasoning with specialized legal domain knowledge included in its large training data[63]. This remarkable capability of the latest ChatGPT version was assessed by testing ChatGPT's responses against the USA Bar exam and law school exams which the ChatGPT passed with performance ranging from top to mediocre, respectively[64]. However, ChatGPT's capability of legal reasoning, even for low-intensity legal cases, is often compromised by the very substance and volume of its training data, which are not related exclusively to the legal domain knowledge. As a result, ChatGPT may generate responses containing fictitious information, or legal hallucinations, by quoting fake legal documents in its effort to develop answers to posted

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58 ('About Lex Machina', 2024)

59 (*Here Are the Top AI Tools for Lawyers*, n.d.), see chapter "*Document and Contract Analysis*"

60 (Stanford Law School, 2023)

61 (Hetler, n.d.)

62 (Tan Jinzhe et al., 2023)

63 (Jinzhe Tan et al., 2023), *supra note 62*

64 (Tan Jinzhe et al., 2023), *supra note 62*

queries[65, 66]. Consequently, with questionable accuracy and reliability of its legal answers, ChatGPT cannot provide a dependable source of legal advice, even for low-intensity legal cases, without re-course to a legal professional who will critically check such AI-generated answers because the implications can be grave, especially, for legally laypeople in case of legal hallucinations[67].

## 4.3 AI's Contributions to the Legal Profession

Historically, law firms have contested the potential of AI and automation in the legal profession and have relied on largely partner-driven models. The rapid progress in AI applications related to legal aspects lately, though, resulted in many legal professionals turning to AI-based technologies that can automate legal tasks in response to growing customer requests for more efficient services[68]. With this notable progress expanding within the legal profession, the subsequent sections address how these automated legal resources contribute to the delivery of legal work and services.

### 4.3.1 E-discovery Tools

These tools can assist lawyers and law firms in the identification, retrieval, and delivery of digital evidence, e.g., from emails, social platform messages, website contents, and databases, to be used in litigation or a legal inquiry[69, 70]. For example, with AI-engineered e-discovery applications such as NetDocuments and LexisNexis, legal professionals can efficiently search large databases of legal material for necessary and important data, by entering specific requests, and receiving prompt responses for the legal case under consideration.

### 4.3.2 Document Generation

AI has radically impacted legal document generation; for example, the nondisclosure agreements (NDAs)[71], which are conventional contracts containing confidential information that forbid parties from disclosing it to unauthorized entities. In addition to providing templates, AI can compose material, introducing greater efficiency in a lawyer's work. However, as AI cannot comprehend legal concepts or handle complex legal reasoning, human monitoring remains essential[72]. To realize the extent of efficiency that can be introduced in the legal work, an American debt collection law firm submitted approximately 80,000 claims annually, while employing only 14 attorneys.

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65 (Tan Jinzhe et al., 2023), *supra note 62*, see chapter "Related Work"

66 (Guo et al., 2023)

67 (Tan Jinzhe et al., 2023), *supra note 62*

68 (Remus & Levy, 2016), see chapter II A

69 (*The Basics*, 2018)

70 (*What Is E-Discovery? Definition and How It Works | Proofpoint US*, n.d.)

71 (*Non-Disclosure Agreement (NDA)*, 2023)

72 (Board, 2023), see chapter Part II D

Hence, each attorney delivered about 5,700 claims per year. This output could only occur with the assistance of the automated AI models that handled the related cases[73].

### 4.3.3 Document Review

AI can also undertake a document review function that works based on machine learning, natural language processing algorithms, and optical character recognition to promptly scan, analyze, and interpret a great volume of legal documents[74]. By engaging the typical four key stages in AI document review, namely, data collection, document sorting, relevance assessment, and detailed analysis, this function can use predefined criteria to identify relevant clauses and provisions in a legal document, verify if there is conformity of content with current applicable laws and regulations, or historical data, contribute to the removal of human errors or inconsistencies in the review process, as well as enhance quality assurance in the legal document review process[75, 76, 77, 78, 79].

### 4.3.4 Risk Management Tools

Risk detection refers to the review of legal information to identify ambiguities in language, poorly defined clauses in contracts, improper references to regulations, or monitoring of legislative changes, which could, separately or jointly, expose clients to legal risks. Therefore, early detection of legal risk represents a key task of attorneys in mitigating potential legal liabilities of their principals. Since early legal risk detection requires the review of large volumes of legal data, AI-assisted document review has proven indispensable in the efficient implementation of this task by legal professionals. Owing to the very large amount of data needed to be reviewed, the detection process often engages the AI predictive coding technology to use machine learning to recover the most relevant information first. As a result, legal firms are equipped with the knowledge necessary to evaluate risk more precisely and efficiently, thereby implementing better risk management techniques to protect their customers in the process[80,81, 82].

### 4.3.5 AI Predictive Technology

AI Predictive Analytics technologies can play a significant role in the legal profession because they have the potential to predict a legal case's outcome before a judge does by examining the case's features, the judge's background, and previous relevant court decisions. Consequently, law-

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73 (Martin, 2010)

74 (Sahin, 2024)

75 (*AI Document Analysis*, n.d.)

76 (Wu Jonah, 2019)

77 (*AI in Claims Processing: The Ultimate Guide*, 2024)

78 (*7 Benefits of AI in the Legal Industry*, 2024)

79 (Sahin, 2024), *supra note 74*

80 (*7 Ways Artificial Intelligence Can Benefit Your Law Firm*, 2017)

81 (Thomson Reuters, n.d.)

82 (logickull, n.d.)

yers can utilize predictive analytics to formulate and enhance their legal strategies as per the anticipated outcome of a case. Additionally, attorneys can better advise their clients and manage their expectations by aligning them with more realistic outcomes. Finally, law firms can handle more effectively their resources by employing experts, time, and funds for the legal case which most needs them, if they have a clearer view of the potential risks and consequences of the case at an early stage[83]. The most characteristic example of these technologies is the predictive model, created at the University College London, which was centered on the ECtHR case and successfully predicted court outcomes with an average accuracy rate of 79%[84].

### 4.3.6 Fraud Detection

Fraud detection in legal documents is an additional task assisted by AI technology. In the past, this work was very time-consuming but, currently, due to the advent of AI applications for this specific task, the process has been significantly shortened. More specifically, AI can identify suspected fraud by validating a document's authenticity and legitimacy, inspecting signatures for potential forgeries, and searching the text for suspicious wording or discrepancies. Additionally, AI can identify patterns linked to suspicious activities by confirming data accuracy and supporting regulatory and legal compliance[85].

## 4.4 AI and Legal Thinking

The engagement of AI technologies in the legal profession has already demonstrated its value to legal professionals. The preceding exposition outlined AI applications that have contributed to making legal work more productive and efficient[86, 87], while further enhancing the quality of the final output, by automating mainly administrative or low-intensity legal tasks which can be commoditized such as those referred to in Sections 4.1 and 4.3, respectively[88]. These applications are characterized by technical capabilities that range from features such as database search, template provision, text generation, content relevance assessment, document classification, and review to pattern recognition and forecast by using advanced statistical procedures, machine learning, natural language processing, and optical character recognition. As a result, legal services have been anticipated to be subject to a significant occupational transformation due to advances in GEN-AI[89], while Goldman Sachs estimated that 44% of current tasks in the legal profession could be automated by AI applications[90].

A fundamental aspect of legal work, however, is legal thinking conducted by lawyers via the legal syllogism defined as deductive logic in which reasoning is performed with the aid of the major

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83 (*AI in Law*, 2024),

84 (Aletras et al., 2016)

85 (*AI in Law*, 2024), *supra note 83*

86 (Whitfield Brennan, 2023), see chapter "*Can AI Give Legal Advice?*"

87 (*7 Benefits of AI in the Legal Industry*, 2024), *supra note 78*

88 (McGinnis O. & Pearce G., 2014)

89 (Felten et al., 2023)

90 (Hatzius et al., 2023)

premise (the law), the minor premise (the fact), and the conclusion (the judgment)[91]. Although, mainly administrative or low-intensity tasks of the legal thinking process have already been amenable to AI automation, concluding the legal syllogism is ultimately an exercise in a human judgment requiring identification of the applicable legal framework, validating the factual evidence, and applying the legal framework to the collected evidence, also considering further pertinent contextual circumstances in producing the judgment. This highly intensive evidentiary procedure can hardly be commoditized[92] and, therefore, substituted by AI systems in the future[93] as such a replacement will require GEN-AI to do more synthetic work than today's essential pattern recognition and prediction[94]. It should be noted, though, that research in the direction of training AI models in the prediction of legal judgment based on legal syllogism prompting is currently underway[95]. Consequently, although modern AI tools have already been quite advanced in helping lawyers formulate legitimate legal syllogisms and draft legally comprehensive documents, they should be used in conjunction with human oversight to deliver trustworthy legal advice. Even though GEN-AI technology, such as ChatGPT, exhibits some capability of legal reasoning in generating a convincing and reasonable output, it presents serious shortcomings in its final results that impede it from completely replacing attorneys in the legal profession. AI is still unable to understand the law as required under specific conditions and relying solely on the strict application of the legislation is not sufficient either. In these situations, the interpretation of human nature can be vital to the generation of the best legal judgment for the case at hand.

It has also been noticed that GEN-AI tends to hallucinate, namely, to fabricate information in its effort to revert with a response to a legal case. This false response may cause grave implications, though, as the information it produces is not true and, hence, it cannot be used by legal professionals in the legal process where precision is the key. A prime example of such a hallucination occurred in 2023 when a New York-based lawyer asked ChatGPT to search for legal documentation supporting his personal injury claim. ChatGPT reverted to several related previous court rulings that proved to be false after the lawyer had annexed them to his claim, as they were all fabricated by ChatGPT. This hallucination resulted in a fine of $5,000 being imposed on the lawyer by the court engaged in the case. This incident serves to warn of the risks associated with engaging AI in legal work without human oversight. Understandably, the legal profession remains cautious, while several US Federal Judges have asked attorneys to disclose when they use AI, both of which cast doubt on AI's reliability[96].

While AI can support lawyers with primarily transactional tasks, it also gives rise to important concerns related to the extent to which AI can substitute for the legal thinking process of the legal field[97]. Thus, hallucinations are not the only issue associated with AI's efforts to approximate or

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91 (Jiang & Yang, 2023)

92 (McGinnis O. & Pearce G., 2014), *supra note 88*

93 (OBE & OBE, 2010)

94 (Whitfield Brennan, 2023), *supra note 86*, see chapter "Will AI Replace Lawyers?"

95 (Jiang & Yang, 2023), *supra note 91*

96 (Kern, 2021), see chapter "*Will AI replace lawyers?*"

97 (Kern, 2021), *supra note 96*

emulate the legal thinking process. Another major issue relates to the liability for AI's outputs when it is integrated into this process and, more broadly, in the legal system. Such an incorporation raises questions about who, ultimately, bears the responsibility for potentially erroneous recommendations made by AI systems, such as ChatGPT, and the degree to which these erroneous recommendations can be covered by professional indemnity insurance[98].

Having due consideration to the preceding fundamental concerns, AI appears to need transformative advances before it becomes capable of approximating the legal thinking process as currently practiced in the legal profession.

[98] (Levin, 2019)

# 5 SHOULD MACHINES BE JUDGES? / AI AND JUDGES

AI's introduction in the legal field could not have left the judiciary unimpacted. For example, automation of transactional procedures was a notable advancement aiming to shorten time and reduce cost. In this regard, a consequential question for the judicial system is whether AI will be assimilated into courts and substitute for the role of a judge. The idea of AI taking over human judges, however, raises serious ethical, legal, and practical issues that will be explored subsequently, including whether human judgment in court may be fully replaced as AI becomes smarter.

## 5.1 Legal Concerns

Legal issues arise when assessing the impact of AI on justice. Predominant among them are as follows:

### 5.1.1 Adversarial Principle

The adversarial principle is a key component of most legal systems that may be threatened by automation. The adversarial principle is defined as the legal process by which the parties are required to present their case before a neutral third party, usually a judge or a jury, who hears the case and renders a verdict. This process confirms each party's awareness of the facts, legal arguments, and supporting documentation if required. Judges must allow the parties to reply before presenting any new legal arguments. Moreover, the European Court of Human Rights (ECtHR) highlights and protects the privilege of parties to participate actively in the judicial procedure, including their right to respond and argue appropriately. Although the ECtHR supports the adversarial principle, automated decisions weaken its horizontal implementation as they do not permit litigants to discuss during the hearing of their case. Typically, if the judge considers a legal issue not discussed by the parties, he cannot rely on this argument in his decision unless he has previously allowed the litigants to elaborate on it.

Substituting human judges with AI systems in the legal process would add further difficulty because the AI machine cannot understand the human language or the emotional and moral conditions that influence a case. As a result, for example, in the automatic penalties for speeding violations, an AI machine would not take into account all relevant factors to lower the severity of the penalty. Article 47 of the Charter of Fundamental Rights[99] and Article 6, paragraph 1, of the ECHR[100] define that the adversarial principle is a fundamental right that requires litigants to interact with each other during the decision-making process of a legal case[101].

### 5.1.2 Legal Depenalization

Another legal concern associated with AI automation in the judiciary is the transfer of law matters from the judicial system to administrative bodies, which may lack close monitoring by human

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99 (*Article 47 - Right to an Effective Remedy and to a Fair Trial,* 2015)

100 (*European Convention on Human Rights - Article 6,* 2018)

101 (Gans-Combe, 2022)

judges. By holding authority and control, such bodies may not be impartial or fair in their actions. Moreover, this transfer could result in "Legal Depenalization", which pertains to two categories. The first one involves the conversion of criminal offenses into misdemeanors, which carry softer penalties. The second one entails shifting the legal classification from criminal to civil or administrative, where the punishment will be imposed by a different kind of authority. This shifting process is typically encountered in cases of road traffic crimes, parking fines, and tax violations, which are increasingly handled by automated systems. Consequently, the automated adjudication of a legal case, without the involvement of a human judge, can lead to discrimination and prejudice[102].

### 5.1.3 Violation of the Presumption of Innocence

A significant legal issue resulting from the automation of justice is the potential breach of the presumption of innocence in criminal trials. More particularly, because of their design, automated AI systems typically focus on the alleged violations of a case. As a result, the likelihood of these systems initially determining an offender as guilty is increased because they rely mostly on data and predefined rules, whereas a human judge considers the broader context, such as possible mitigating factors. Therefore, AI automation may lead to bias in favor of punishment and against acquittal. Profiling people and taking action against them before a crime is committed is another example of how the presumption of innocence is violated. This profiling usually relies on factors other than an individual's behavior, such as social interactions and demographic information[103].

### 5.1.4 Degrading of Justice to Mere Decision-Making

Justice has traditionally involved both the trial and judgment processes ending up with the issue of the court ruling. These processes inform the defendant about and under-stand the issued sentence. However, the use of automated decision-making eliminates the traditional judicial procedure with the presence of a human judge and further limits the access of offenders to information about the reasoning leading to their sentences. Consequently, instead of the traditional scheme of law – judge - citizen, the new scheme is the law - administrative authority - citizen, where the judge is called to validate the interpretation determined by the administrative authority that manages the automated decision-making tools. The judge is no longer responsible for deciding about the fault of the offenders but he is only tasked to determine if the imposed sanction is appropriate for the offense committed, a situation which degrades the role of justice and requires it to confirm or reject automated decisions solely[104].

### 5.1.5 Legal Authority / Liability of AI Judge

A critical question regarding automated decision-making in courts is whether such an automated system is authorized to make legal decisions on behalf of human judges. Putera et al. (2021)[105] examine whether AI has the legal power to act in place of human judges. The emergence of AI in

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102 (Gans-Combe, 2022), *supra note 101*

103 (*AI, Data Analysis and Algorithms | Campaign*, n.d.), see chapter "*What are the problems with AI?*"

104 (Gans-Combe, 2022), *supra note 101*, see chapter 14.2

105 (Mohd Shith Putera et al., 2021), see chapter "*The Legal Authority of AI Judge*"

judicial processes has led to ambiguities surrounding the legal position of an AI judge. The use of AI in adjudication is not yet fully covered by current rules but some countries are testing the invasion of it in justice. For instance, the Dutch government is installing a system where AI judges will make decisions and a human judge will, subsequently, confirm them. As a result, the human judges' duties will be minimized to only validate the judgments made by AI machines. This new situation raises justifiable questions because it diminishes the human element and elevates AI to the role of, at least, the legal assistant.

However, the main question remains about who is liable for these automated decisions, namely, the AI programmer, the policy maker (legislators, government bodies), or the human decision-maker. This issue continues to be debatable and unclear to date because uncertainty exists about who has the legal authority to assign responsibilities to AI-driven systems. In only a few cases so far, legislators have enacted provisions clarifying who is accountable for the decisions made by algorithms. For example, the Therapeutic Goods Act, enacted in Australia in 1989, defines that decisions made by a computer program are deemed to have been made by the Secretary (high government office, a government department, or a Ministry[106].

## 5.2 Practical / Ethical Concerns

Further to the legal concerns, the AI applications in justice raise additional practical/ethical concerns the most salient of which are outlined in the sequel.

### 5.2.1 Biased Input

Automated decision-making is essentially implemented through computer programs and algorithms that require data inputs. It follows that when these inputs are incomplete or biased, the output of the program/algorithm will be flawed, too. Moreover, if the automated decision-making system is fed with discriminatory data, the generated decision will be partial as well. The preceding risks practically exist with automated decision-making although, in theory, analysis of large data logged into extensive databases should produce less input data deficiencies including data characterized by impartiality and objectivity[107]. On the other hand, human judges cannot be biased because they should follow and comply with fundamental judicial requirements, while they must provide, when demanded, all reasons which contributed to their final decision. Thus, human judges lead to a fair and open justice[108].

### 5.2.2 Predictive Justice and the Performative Effect of Predictive Tools

An additional issue is the role of AI in predictive justice, where legal outcomes are predicted ahead of a trial. Such AI predictive tools use advanced statistical procedures to forecast case outcomes based on past data and can have a performative effect on judges, lawyers, and litigants. More particularly, these predictions could make judges rely too heavily on statistical insights instead of

106 (Sourdin, 2018), see chapter VI A

107 (Foglia Charlotte, n.d.)

108 (Dawn, 2021)

using their own judgment, case-specific details, and creative legal arguments. The resulting alignment could further standardize jurisprudence, as judges adapt to what AI systems suggest without applying legal reasoning. Therefore, the performative effect of AI predictive tools is, ultimately, a deteriorating justice because it accepts that AI's role is not only to assist but to actively participate in and form legal outcomes. In this sense, AI predictive tools can constitute an obstacle to the judicial system. For example, litigants and lawyers may decide to abandon a case or not bring claims to the court if AI predictive tools suggest that the case will be dismissed. Consequently, fewer cases would enter the court, thereby limiting access to justice. As a result, AI predictive tools can make legal redress more inaccessible to litigants who need it most, thus preventing valid legal cases from being heard in a courtroom. Furthermore, judges resolve cases, by considering principles like proportionality and good faith, to interpret key concepts, drawing on human intelligence and moral judgment. The absence of these abilities in AI systems makes it challenging for them to implement the aforesaid doctrines to predict decisions. Accordingly, predictive justice may lead to discrimination, unfairness, and inequality because the future outcomes will rely on algorithms that may undermine rather than uphold the fundamental principles of the judicial system[109, 110].

### 5.2.3 The Black Box Effect and Transparency

The Black Box effect refers to an AI decision-making mechanism which processes data to decide in an unknown manner. More specifically, this system arrives at a decision without informing its users of the reasoning it applied to reach the decision, thus behaving as a black box. Additionally, due to the privileged nature of these AI products, it is hard to impossible for an outsider to understand how the foregoing systems infer their outputs. Therefore, the soundness and the accuracy of the concluded decision cannot be verified[111].

The resulting lack of transparency creates a knowledge gap between those who have access to data or systems, such as governments, private companies, or legal experts, and non-experts who are not technologically literate. Due to the vulnerability of those who do not understand the operation of AI-driven decisions, the preceding gap may cause inequality and discrimination. Consequently, the limited access to information and knowledge for a specific part of the population threatens social cohesion. Thus, since laypeople can hardly comprehend the function of algorithms and since AI reasoning cannot become transparent and explained, human, political, and social rights may be compromised, breaching the core principles and institutions of society[112].

Furthermore, transparency itself presents an enormous challenge. Researchers face difficulties in checking the accuracy and impartiality of AI decision-making systems, especially where human

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109 (Kramer et al., 2021), see chapter 4

110 (Gans-Combe, 2022), *supra note 101*, see chapter "*Predictive or Prophetic Justice*"

111 (Kelly, 2024)

112 (Tzimas, 2021), [..] "*The lack of knowledge about how an algorithm reaches decisions and our incapacity to predict the outcome—the black box effect of AI—or about the data with which this specific AI entity is trained makes it impossible to monitor and control AI holistically. In addition, it creates a potentially huge gap between those who possess part of this knowledge—state, private entities or elites of experts—and those who do not. The lack of transparency and the inequality constitute major challenges too. They can erode human, civil and political rights as well as the—whatever existing—cohesion of human societies.*" [..]

life is concerned (e.g., criminal sentencing). One of the risks of using AI-driven decisions in criminal cases is that the defendants are frequently unable to ascertain whether factors like gender or race have influenced or not the judge's final ruling when assisted by AI-driven decisions. As highlighted in the case of Loomis v. State, the aforementioned lack of transparency can effectively lead to real-life ramifications. Here, the defendant alleged he could not evaluate the outcome of a proprietary AI tool, used by the court for the defendant's sentence, as regards its accuracy and trustworthiness. Consequently, this inability raised critical concerns about the extent to which the defendant could contest the court decision and the degree of fairness during the judicial procedure[113].

### 5.2.4 Risk of Groupthink and Judicial Independence

Groupthink is defined as "*a psychological phenomenon that occurs within a group of people in which the desire for harmony or conformity in the group results in an irrational or dysfunctional decision-making outcome*"[114]. Historically, groupthink has not affected justice because judges were institutionally independent in making decisions. However, the use of AI in courts raises concerns about judicial independence. Judges, for example, may feel pressured to follow the predictions and suggestions generated by AI decision-making systems, especially under time constraints. Due to the AI's high-tech advice and the processing of a large amount of data, judges may fear not following the AI suggestions and, hence, they may choose to comply with these suggestions rather than trusting their own judgment[115].

### 5.2.5 Legal Concerns about Human Rights and AI's Adaptability

The use of AI in the judiciary raises legal concerns related to potential breaches of individuals' rights. The EU General Data Protection Regulation and the Protocol amending the Council of Europe Convention on the Automatic Processing of Personal Data highlight "the right not to be subject to a decision based solely on automated processing", particularly when these decisions can have a substantial impact on litigants. The human element in justice contributes to making detailed legal analyses considering not only the relevant past cases but also the social context and repercussions for litigants. Due to its nature as a computer code, AI lacks the "reflective autonomy" which would allow it to adapt its decisions to changing societal norms. As a result, this inability could possibly lead to AI-driven decisions that are inconsistent with the current values and norms of society[116].

### 5.2.6 Dehumanization of Justice

Traditionally, legal procedures and courts rely on human-to-human interaction and communication, human interpretation, empathy, and discretion. However, the introduction of AI into the judicial system could undermine the fundamental principles of justice. Justice is not merely a matter of rule-following but it requires the qualitative assessment of all facts and circumstances in each case.

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113 (Mohd Shith Putera et al., 2021), *supra note 105*, see chapter "*The Legal Authority of AI Judge*"

114 ('Groupthink', 2024)

115 (Kramer et al., 2021), *supra note 109*, see PART I, chapter 4

116 (Kramer et al., 2021), *supra note 109*, see PART I, chapter 2.5.1.

Substituting judges with AI machines could create a negative perception for justice because AI is impersonal, inflexible, not sensitive, and without emotional intelligence. AI mechanisms cannot understand the behavior, emotions, and life circumstances, which are important for making fair decisions. As a result, this dissociation of justice from its human side may risk public distrust in it[117].

This issue is more evident in civil justice, particularly in claims for moral damages or family disputes, where judges must carefully evaluate the emotional factors involved to ensure that the result will be fair, conscious, and humane. For example, the Georgian Civil Procedure Code permits judges to also use their discretion in sensitive family cases to make decisions instead of solely following a standardized set of legal rules[118].

There is a viewpoint that not every legal case requires human participation, suggesting that machines are better at handling simple or routine cases. Accordingly, a hybrid system could be the solution, allocating complex cases to humans and routine cases to algorithms. This dual system would seem to imply, though, that human judgment is a "premium" service available only to complex and higher-stake cases, thus perpetuating inequality and dehumanization. Furthermore, as the justice system relies more and more on AI applications, users must be digitally literate to enjoy fair access to the judiciary, which is supposed to exist for their benefit. Consequently, the mitigation of dehumanization and inaccessibility to legal proceedings will occur by guaranteeing digital inclusivity and easy interaction of humans with AI instruments[119].

### 5.2.7 Translation of Legal Framework into AI

The legal system with its regulations, jurisprudence, and judicial discretion, is difficult to translate into a computational code since the majority of legislation is written for humans and not in a format amenable to programming. When translating legal concepts into algorithms, a function performed by programmers who typically lack a legal background, AI must express the legislative intent. Transactional regulations are more straightforward to convert into an AI code, while regulations that require a more flexible interpretation cannot be readily converted into an AI program. This difficulty of conversion emanates from the adherence of AI systems to syntax rules of programming which cannot comprehend semantics, namely, the underlying meaning and interpretation of legal context and data[120]. Moreover, while laws are evolving every day, AI systems need to continuously update for these amendments, otherwise, they risk providing outdated and noncompliant judgments[121].

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117 (Kramer et al., 2021), *supra note 109*, see Part I, chapter 1.2

118 (Kharitonashvili, 2022), see chapter "*AI towards vulnerable persons in civil proceeding*"

119 (Kramer et al., 2021), *supra note 109*, see Part I, chapter 1.2

120 (Sourdin & Cornes, 2018), see Part 2, chapter 3.6

121 (Sourdin and Cornes, 2018), *supra note 120*, see Part 2, chapter 3.5

## 5.3 AI vs the Human Judge

The development of advanced AI systems generated high expectations regarding the role they could undertake in the judiciary. These systems were envisioned as able to reduce the workload in the judicial system and even pass legal judgments. Their further evaluation, though, raised questions concerning the extent to which AI-driven decision-making systems would be capable of substituting for human judges in the courts.

The foregoing sections examined legitimate concerns expressing caution in the indiscriminate adoption of such systems to support the production of court rulings. Since the award of justice goes beyond the mere application of logical reasoning by also considering the social context, and interpretation of the law, including individual behaviors, AI-driven decision-making systems cannot be elevated to the role of the human judge because, although they can perform logical reasoning, they lack appreciation of the social context, capability to interpret the law, and emotional intelligence to evaluate individual behaviors. Moreover, a complete automation of the decision-making process in the courts and a significant reliance on the AI's judgment could pose a significant risk to the core values of justice and neglect the human aspect which is a necessary part of an effective legal system. Eventually, AI can assist in small claims or simple cases but it cannot replace human judgment since human intervention guarantees that the core principles of justice are upheld[122].

[122] (Dawn, 2021), *supra note 108*, see chapter "*Can we expect to see an AI judge in the near future?*"

# 6 CONTRIBUTIONS OF ARTIFICIAL INTELLIGENCE TO THE JUDICIAL SYSTEM

Although important concerns have been raised regarding AI's potential substitution for human judges, there is no doubt, both in the legal profession and academia, that the incorporation of AI technology in the judicial system brings positive effects with it. These effects have been argued to include improved efficiency and accuracy in the outputs of the judicial system, more effective resource allocation, and reduction of work backlogs[123]. However, AI technology has advanced to the point where specific AI applications have been developed to assist or support the function of criminal, civil, and administrative justice. The European Commission for the Efficiency of Justice of the Council of Europe has supported these developments and adopted in December 2018 a guideline about the safe application of AI in justice systems, emphasizing that Europe takes into account the adaptation of the field to the digital era[124], but many other countries outside the EU, that are presented subsequently apply these systems. Other countries have also employed such AI applications in their judicial systems. The following sections aim to present an overview of the aforesaid applications in the fields of criminal, civil, and administrative justice.

## 6.1 AI and Criminal Justice

Traditionally, criminal justice mirrors the core values of society, including perceived acceptable behaviors, criminalizing and decriminalizing conducts when a social consensus develops. Such a broad context, though, is not readily amenable to AI modeling. Thus, current AI applications in criminal justice relate to the subsequent key phases of the criminal procedure: the prevention of crimes and the assessment of recidivism, the pre-trial proceedings, and the trial stage[125]. An overview of such applications is presented in the sequel.

### 6.1.1 Prevention of Crimes

Although prognostic crime mapping is a widely used method together with analysis of historical data and geographical areas to forecast future crime hot spots, the engagement of additional AI systems during the first phase contributes to an improved prediction of criminal activities. For example, knowledge-based crime forecasting in Trento, Italy, has been more successful at a 60%–65% rate, while the UK's PREDPOL software has reached the 78% mark compared to the 51% figure of traditional methods[126]. COMPAS and PSA (Public Safety Assessment) are two of the most known and used AI instruments in American criminal justice for risk assessment. On one hand, COMPAS collects behavioral data of criminals and uses it to predict the likelihood of reoffending, thus impacting bail decisions. On the other hand, PSA anticipates general and violent recidivism based on specific risk factors, such as the age of the defendant when he committed his

123 (Garg Manish, 2024)

124 (*CEPEJ European Ethical Charter on the Use of Artificial Intelligence (AI) in Judicial Systems and Their Environment - European Commission for the Efficiency of Justice (CEPEJ) - Www.Coe.Int*, n.d.)

125 (Quattrocolo, 2019), see chapter 1

126 (Demura and Klepka, 2021)

first crime, pending charges, and prior convictions[127]. Moreover, according to the case of the State of New South Wales vs. Barrie (Final) [2018] NSWSC 1005, Static-99R, an automated risk assessment instrument, was used to predict the sexual recidivism of offenders who had been charged with or convicted for sexual crimes, while LSI-R (Level of Service Inventory-Revised) was reported as another automated risk assessment tool for assessing general reoffending[128]. Further to these applications, AI can additionally monitor websites and social media for the detection of unusual language or patterns of language that may lead to illegal activities, such as human trafficking, drug trafficking, child pornography, fraud, and abuse. Another AI development is the "box camera" which analyzes facial expressions and characteristics to identify suspicious individuals before any unlawful act occurs[129].

### 6.1.2 Pre-trial Proceedings

In the second phase, AI technology is engaged to analyze large amounts of data and suggest either the continuation of the legal procedure and the assignment of the case to the court or its closure. For instance, the British police uses Connect, which is software to process data in financial transactions and detect patterns that could relate to criminal activity, while Interpol uses ICSE DB (International Database on Child Sexual Exploitation) to process audiovisual content identifying victims and offenders. In Spain, the police face the problem of false reports, namely, reports referring to the information of authorities that a minor crime has happened, but either it did not occur or the informant disclosed false or inaccurate information. Thus, the Spanish National Police developed an AI tool in conjunction with the University of Cardiff and Charles III University of Madrid helping them examine whether such a report is false. Consequently, in the event of a false report, the police closed the case thus preventing the meaningless use of police resources[130]. In the U.S.A., the Standford University Computational Policy Lab created software that assists judges in making pre-trial decisions for the appropriateness of detention or bail[131]. In Greece, the Supreme Court Prosecutor highlighted that criminal acts and the identification of offenders can be established not only with the types of evidence stated in Article 178 of the Criminal Procedure Code but also with other forms of evidence derived from modern science and technologies, such as sound or video recording[132]. In addition, monitoring and locating criminals and victims of child trafficking by tracking their mobile phones or any other device they might use is another AI benefit[133]. AI can further support criminal investigations by detecting DNA and fingerprints and using forensic technology to recognize criminals. Even if difficulties arise in the identification of fingerprints due to skin color, damage, or scars, specific machine-learning techniques such as Artificial Neural Networks, Deep Neural Networks, Support Vector Machine, and Genetic Algorithms can address these

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127 (Tahura and Selvadurai, 2022), see chapter "*C. International Perspectives*"

128 (McKay, 2020), see chapter "*Predictive tools in action*"

129 (*How AI Facial Recognition Technology Identifies Criminals?*, n.d.)

130 (*AI-X | VeriPol - Detect False Police Reports*, n.d.)

131 (Demura and Klepka, 2021), *supra note 126*

132 (Sakellaropoulou N. Katerina et al., 2019), see chapter Γ11

133 (Dr. Sadulski Jarrod, 2024)

challenges[134]. AI can also facilitate facial recognition to swiftly pinpoint suspects, even when they conceal their faces with masks or other accessories to alter their facial structure by comparing this information with existing images from cameras and drones[135]. Finally, AI sensors can detect the location of gunshots and automatically inform the police without direct police calls[136].

### 6.1.3 Trial Stage

In the third phase, AI applications can assist judges in their decision-making process. A survey from the Universities of Pennsylvania and Sheffield found that the AI judges, reviewing many cases from the ECtHR jurisprudence, reached the same decisions as human judges did in 74% of the cases. This survey showed that AI can approximate human rationale. Additionally, the use of AI in justice, which is more common in the U.S.A. than in Europe, could be useful in examining the likelihood of recidivism. For example, applications like RAVEL LAW and ROSS foresee whether an offender is likely to re-offend and if the current imposed penalties are appropriate considering all the facts and circumstances of the case[137].

## 6.2 AI and Civil Justice

AI participation in civil justice is more prevalent in the U.S.A. than in European countries. However, AI can play a major role in civil disputes because civil procedures are, in principle, written rules and require many documents to be used and reviewed as evidence during adjudication.

### 6.2.1 AI in Family and Employment Disputes

In disputes concerning family and employment law conflicts, the complexity of the cases and the degree to which the outcome can be predicted are the two main factors that determine the final judgment. In such disputes, the automation of judgments is more feasible as these cases are predicated on established legal precedents and principles, which facilitate the forecasting of their rulings. For instance, AI instruments can automate the decision-making process in divorce, parental authority, or employment termination cases, without requiring extensive human intervention[138]. Other examples include the standardization of the appointment of a temporary administration, the issuance of payment orders, or lawsuits for a two-year separation. Furthermore, since the rulings in these cases are based on data inserted by the parties, AI processing of the paperwork eliminates human error. Therefore, human judges can assign routine cases to AI algorithms while they focus on handling more complicated ones[139].

[140].

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134 (Yurdasen, 2023)

135 (*How AI Facial Recognition Technology Identifies Criminals?*, n.d.), *supra note 129*

136 (Chowdhury, 2021)

137 (Demura and Klepka, 2021), *supra note 126*

138 (Petrakou Dionisia, 2020)

139 (Reiling, 2020)

140 (Carneiro et al., 2014), see chapter 3.2

### 6.2.2 AI and Personal Injuries Disputes

The process of filing for personal injury claims has increasingly benefited from AI technology since both legal and medical-related practices rely, essentially, on collecting and analyzing evidence. For instance, automated tools are employed for data searches, including medical, financial, and other records, for computer simulations of crash scenes, and real estate assessments, while communications via social networks allow the gathering of additional information about involved individuals or possible witnesses. At the same time, professionals frequently use virtual and augmented reality in court to provide visuals that support legal arguments. Furthermore, AI and data analytics simplify evidence handling, pattern recognition, and comparison with similar cases to meet requirements for a potential compromise, whereas machine learning is also used to verify witness statements[141]. Moreover, AI contributes to the decision-making process in insurance claims, especially for road traffic accidents (RTA). A UK study, from 2018 to 2022, focused on the accuracy and speed of handling low-value RTA claims (up to £25,000) through the employment of AI systems. The study collected 88 UK cases using various predictive analytics and natural language processing techniques to seek a link between injury severity and compensation costs. The results showed that AI models can significantly increase the accuracy of injury cost predictions over classical methods that heavily rely on the subjective judgment of legal professionals. The AI models automated the extraction and analysis of injury details from medical reports and reduced discrepancies in compensation assessments, speeding up negotiations[142].

### 6.2.3 AI and Inheritance Law

Natural language processing can expedite legal document processing by automating wills, motions, and court filing, classifying legal terminology, and by extracting important data such as asset distribution and beneficiaries from a will. It can also significantly accelerate procedures, greatly reducing delays and the human error associated with such procedures. Additionally, AI systems can scan data, along with other patterns, in search of the possibility of fraudulent activity and notify legal professionals to promptly react. Another AI contribution refers to the standardization of the issuance of inheritance certificates and wills' publication through automated decisions, which would ultimately be reviewed by human judges to verify their reasonableness[143]. Thus, AI assists in the preparation and provision of the necessary documents that are organized and aligned with the regulatory requirements. Consequently, AI can ensure that legal processes will run smoothly, maintaining procedural accuracy and consistency, in the adjudication of inheritance cases[144,145].

### 6.2.4 AI and Consumer Protection Law

AI systems can enhance consumer protection law enforcement by identifying unfair trading practices, especially those concerning consumer contracts. The CLAUDETTE research project is a

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141 (Barshinger, 2023)

142 (Zhang et al., 2023)

143 (Petrakou Dionisia, 2020), *supra note 138*

144 (*How AI Will Transform Probate Lawyer - HogoNext*, 2024)

145 (Blanchards, 2023)

machine learning system that recognizes and exposes unfair and unlawful provisions in consumer contracts with supervising learning models. The system has been trained with a large dataset of 100 terms of services inserted by legal professionals to automate the identification process by categorizing clauses as fair, potentially fair, or unfair. Based on experiments, the effectiveness of the system reached the rate of 80%[146]. This system is anticipated to be beneficial to judges because it enables quick scanning and identification of unfair clauses in consumer contracts, thus allowing more informed decisions and contributing to greater accuracy of outcomes.

## 6.3 AI and Public Administration / Administrative Justice

Although Greece is gradually incorporating greater automation into its public administration and administrative justice, several European countries have already made significant progress by leveraging AI models in their administration and decision-making process. This progress has been made possible because both the civil and administrative justices rely substantially on written documentation, unlike the criminal justice which mainly centers on oral procedures. The subsequent sections will present examples of automation and AI models used in administrative justice.

### 6.3.1 ADM in Administrative Procedures

There is no common legal framework for AI's use in administrative justice. Some member states of the Council of Europe apply general administrative and data protection laws, whereas each country further applies its national legislation. Automated decision-making (ADM) refers to the concept where the computer carries out the full decision-making process without human involvement. These decisions are based on facts, computer-generated inferences, or conclusions derived from data analysis[147]. Norway, Spain, and Switzerland have adopted national legislation regulating ADM in specific administrative sectors to align with Article 22, paragraph 1, of the GDPR or other data protection regulations. This Article refers to the individuals' freedom not to be subject to automated decisions, including profiling, in case the decision has legal effects or essentially affects the interested party, except for certain conditions. Particularly, in Norway, taxation and welfare laws regulate the extent of the ADM application. Other countries, such as Sweden, do not adopt the GDPR regime. Instead, Sweden has adopted the Administrative Procedure Act (APA) which explicitly allows ADM in its Section 28, while it concurrently applies general decision-making principles because APA has not resolved several key issues such as data protection safeguards and transparency[148]. Article 35a of Germany's law "Verwaltungsverfahrensgesetz" legalizes automated administrative decisions, unless administrative discretion is necessary for the issuance of administrative acts. France also aimed to digitize the Republic by enacting the 2016 Law to govern the relationship between the public and the administration. In Latvia's case, ADM systems are used solely when an offense has been recorded through technical means and the minimum fines

146 (Lagioia et al., 2022)

147 (Information Commissioner's Office, 2024)

148 (Reichel, 2023)

are to be imposed, while in Poland, ADM systems are engaged only in positive outcomes when assessing the application of national and Schengen visas[149].

### 6.3.2 AI and Taxation

AI systems control tax evasion and fraud through data mining and analysis. This method may undermine taxpayers' trust in the state and has prompted the French Constitutional Court to decide that such information extraction must align with the taxpayer's defense rights outlined in Article 47 of the Charter of the Fundamental Rights of the EU[150]. Even though Greece has not yet fully applied automated procedures, Article 4, paragraph 14, of Law No. 4038/2012 specifies that indirect acts for assessing citizens' tax status can occur through data collection and processing from sources other than the tax return and official records of taxpayers. In addition, France has initiated AI into its tax practices to limit tax evasion via the use of the "Mission requêtes et valorisation" (MRV) system. More specifically, the Ministry of Economy and the French Tax Authority, Direction Générale des Finances Publiques (DGFiP), have developed this system to compare and match the income-build-up data derived from sources like e-business platforms and social media accounts to identify concealed income and tax frauds. In fact, the ruling of the Constitutional Council, which allows the DGFiP to process data from social networks visible by tax-payers to boost its detection capacity, has supported the aforementioned initiative[151]. Such AI systems can significantly assist justice in detecting unlawful activities, accelerating the detection procedure, and supporting more informed decisions. Germany, has, also, embraced AI technologies in tax administration through the Act to Modernize the Taxation Procedure. This advancement enables the automated issuance of tax assessments without the need for human intervention. By streamlining processes, it alleviates the workload on tax authorities while ensuring accuracy and consistency in tax-related decisions[152]. Another issue that can be addressed with AI is the lack of judges' valuation of assets expertise, which is critical in taxation. Although judges can interpret the law, they do not have the specialized knowledge to effectively assess the value of taxpayers' assets, leading to inconsistencies and tax disputes. As the valuation disputes in tax cases demand financial, economic, and business knowledge, this facility can be offered by AI systems employing, for example, machine learning models[153, 154.] These systems are used today in various cases of asset valuation, such as real estate valuation, where machine learning models analyze large datasets and provide up-to-date valuations. Zillow Group's Zestimate tool makes real estate assessments of over 104 million properties by conducting property sales transactions and tax evaluation, setup of public documentation, as well as estimation of other property features including house size and location. Another AI use can be seen in the estimation of the value of private companies. Goldman Sachs, JP Morgan, and

149 (Prof. Dr. Wolswinkel Johan, 2022)

150 (Karadima Alexandra, 2024)

151 (*Artificial Intelligence and Indirect Tax Audit Techniques*, n.d.)

152 (Djeffal, 2020)

153 (Brown, 2021)

154 (*What Is Machine Learning?*, n.d.)

Morgan Stanley bankers designed a machine learning model to estimate the value of private companies. This model analyzes publicly available financial information and stock market data to offer real-time valuations of listed private companies[155].

## 6.4 Common AI Applications in Civil, Criminal, and Administrative Justice

### 6.4.1 Routine Tasks Management

As stated at the outset of this chapter, AI can substantially reduce the courts' workload by handling a greater volume of low-intensity cases that end up in litigation. The substantial current work backlog could be mitigated with the aid of AI tools carrying out the major part of the court's administrative routine, which encompasses repetitive and procedural duties that are usually time-consuming, thus accelerating the legal process and the administration of justice. Taking into consideration the words of William Ewart Gladstone, former Prime Minister of the UK, that "justice delayed is justice denied", makes the necessity of AI engagement in the court's operation even more compelling because it can shorten delays and guarantee that justice is provided promptly. A country that endorsed this endeavor is China which has made progress in incorporating AI into its legal system over the years since 2017, when the concept of a "smart court" was first introduced and platforms like "Court2Judge" became operational in the country's judicial landscape. One standout example is the Robot Xiaofas which has been deployed in Beijing courts where it offers advice and addresses numerous legal queries related to litigation cases. To date, over a hundred robots are being utilized in various capacities within China's court system with some of these robots focusing specifically on fields such as business or labor laws. These robots; among other tasks, assist in managing routine tasks, thereby enabling judges to concentrate on complex cases, that require human involvement[156, 157].

### 6.4.2 AI-driven Case Distribution to Judges

AI can greatly support the allocation of legal cases to judges based on the complexity and urgency of each case as well as the expertise and availability of judges, thus enhancing the effectiveness and efficiency of the judicial system. Brazil, for example, has implemented AI systems, such as the Victor Project, to classify relevant legal cases for adjudication allocating them based on their legal, social, and economic significance to accelerate proceedings. Ultimately, AI-driven classification guarantees effective case allocation by entrusting high-priority claims to the most qualified judges[158, 159].

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155 (Jay A. Soled and Kathleen DeLaney Thomas, 2022)

156 (Kharitonashvili, 2022), *supra note 118*

157 (Reiling, 2020), *supra note 139*

158 (Bell et al., 2022)

159 (*AI in Claims Processing: The Ultimate Guide*, 2024), *supra note 77*

### 6.4.3 AI Translation and Transcription

Many disputes involve parties which do not come from the same country, thereby not having the same native language, or having a poor command of the official court language. As a result, AI can support overcoming language barriers, thus allowing multilingualism in judicial procedures. More specifically, AI technology allows the submission of documents and other obligatory evidence for the court hearing in multiple languages because AI tools can analyze this information and be able to translate it[160]. Meanwhile, AI systems performing transcription is another great achievement. These systems capture every spoken recorded word and transcribe it in real time by using voice recognition mechanisms. This way, they can assist both the court staff in avoiding time-consuming tasks and legal professionals who wish to refer to the resulting transcripts. Combined, these two key applications promote fair access to the judicial system, as everyone can participate in the court proceedings without having linguistic barriers, whereas they further ensure integrity, efficiency, speed, accuracy, and assurance that the judicial system operates equitably[161].

### 6.4.4 Claim Review

AI-driven systems, such as Clerks by Judicata, can support courts in the evaluation of the validity and compliance of the submitted claims, such as those related to consumer and insurance disputes. These tools aim to assist judges in reviewing the argument of the claimant's requests, case law, and all necessary evidence provided in support of the pleadings, comparing citations with predefined rules and historical data, checking for inconsistencies, as well as confirming the validity of the provided information, thereby confirming the accuracy of the legal analysis and accelerating the whole procedure[162].

## 6.5 Adaptation of AI in International Courts

Efforts have been made internationally for the integration of AI in the judicial systems of various countries with varying degrees of success. The subsequent two sections outline two key examples of such an integration in China and Latin America.

### 6.5.1 China

The implementation of AI-equipped "Smart Courts" in China was a huge initiative. Chinese AI legislation has been ambitious in terms of using AI technology to improve judicial efficiency and public access to justice. This integration is part of the national strategy laid out in the 2017 "New Generation Artificial Intelligence Development Plan" announced by the State Council. The Plan aims that China will have a dominant global power in AI technology by 2030. There have already been three Chinese smart courts in operation, namely, the Suzhou Intermediate Court of China (Court 206), the Beijing Internet Court, and the Hangzhou Internet Court. These three courts are

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160 (Laptev A. Vasiliy & Feyzrakhmanova R. Daria, 2024)

161 (Forino, 2024)

162 (Wu Jonah, 2019), *supra note 76*

linked with the local courts and they all comprise a smart ecosystem that favors evidence verification using the power of blockchain. The smart ecosystem includes AI-assisted judgment generation, automated transcription, as well as robotic guidance for litigants, and automation of low-level tasks so that judges can focus on more qualitative work. Chinese Courts, especially these three smart courts, also adopted the "Automatic Reason-Generation Framework", a system that combines AI with a reasoning process. The system gathers legal facts and applies them to laws and regulations related to that field of law, building up an inherent reasoning on the court judgment. In other words, the system attempts to emulate the logical reasoning of a human judge to deepen consistency and efficiency in the decision-making process. However, the same system was also criticized due to its lack of transparency about how decisions are generated[163, 164].

### 6.5.2 Latin America

The Public Prosecutor's Office of the City of Buenos Aires developed an AI system, called Prometea, intending to improve justice and its processes as implemented by the Argentinian and Colombian courts. The system is able to analyze legal precedents, avoid black-box reasoning incidents, and present clearly how it has concluded an outcome with an overall rate of 96% in successful predictions. The application also constitutes an intelligent assistant because it advises its users, through voice recommendations (chatbots), on how to undertake more complicated activities such as drafting legal documents or managing judicial deadlines. Each of the foregoing capabilities of the Prometea system may operate in two modes: either generating documents without human intervention or automatically executing tasks by using a minimum number of human guidelines. Finally, Prometea's operation also covers classifying received legal documents according to specified criteria, such as keywords. For example, in Colombia, Prometea was used for selecting urgent cases, reducing the time of this task from 96 days to 2 minutes. In Buenos Aires, it streamlined administrative procedures and helped with the drafting of judicial sentences. Another Prometea's application involves forecasting the results of court cases on traffic accidents. The system analyzes case files to establish a causal link between an accident and the damages resulting therein. The resulting analysis assists judges in making quicker and more flawless decisions. The forecast accuracy of Prome-tea's real-case testing on traffic accidents was 94.4%. Therefore, Prometea emerges as a pioneering AI tool which demonstrates that high technology can foster productivity, enhance the decision-making process, and transform the judicial sector into a fair, effective, efficient, and unambiguous field[165, 166].

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163 (Vasdani, n.d.)

164 (Wang, 2023), *supra note 51*, see chapter "*2.3 Relevant industry rules or standards*"

165 (Corvalán, 2020b)

166 (Corvalán, 2020a)

# 7 GENERAL ISSUES OF ARTIFICIAL INTELLIGENCE IN RELATION TO THE GREEK JURISDICTION / ECHR

## 7.1 AI and the Greek Legislation

The Greek Constitution guarantees the ethical and regulated use of AI. Despite its potential to improve justice, though, applications of AI often conflict with certain constitutional provisions, raising issues which are addressed subsequently.

### 7.1.1 AI's Introduction to Justice through Constitutional Interpretation

The constitutional foundation of AI's introduction to Greek justice was presented by Petrakou (2020)[167]. The analysis focused on Articles 5A (right to information)[168], 20 (right of judicial protection)[169], and 93 (governance of the structure and operation of courts)[170] of the Greek Constitution. To elaborate, according to Article 5A, everyone has the right to be informed and equitably participate in the digital world. This provision includes tools that can automate the generation of information, disseminate it easily and promptly to the public, and allow access to cyberspace. Thus, it can be deemed that AI systems are appropriate for modernizing justice as long as they meet the aforementioned criteria. Article 5A also emphasizes that the engagement of citizens in digital information is a responsibility of the State in accordance with Constitutional Articles 9, 9A, and 19. Moreover, Article 20 refers to the right of people to have free and complete access to impartial and autonomous courts that must adjudicate the cases within a reasonable period. In fact, this is a serious issue in Greece due to the long-lasting trials for which the country has been condemned by the ECtHR. As a result, this provision might encourage the use of AI technology in the judiciary because it would expedite legal proceedings as well as enhance the effectiveness of the judicial system.

### 7.1.2 AI Conflicts with Constitutional Rights

Although AI models have not been used widely in the judicial system so far, they have already influenced legal communities such as the Greek one. The slow transfer of AI into law raises concerns due to AI's potential violation of certain constitutional guarantees that defend essential human rights and freedoms, as highlighted in "The AI and Justice" document[171]. The subsequent articles highlight the constitutional rights which need protection. Firstly, Article 4 of the Constitution[172] preserves the right to equality, while Article 5 paragraph 2[173] proclaims that discrimination

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167 (Petrakou Dionisia, 2020), *supra note 138*

168 (*Article 5A - Constitution of Greece - Right to Information*, 2014)

169 (*Article 20 - Constitution of Greece - Legal Protection, Right to Prior Hearing*, 2014)

170 (*Article 93 - Constitution of Greece - Distinctions of the Courts*, 2014)

171 (Petrakou Dionisia, 2020), *supra note 138*

172 (*Article 4 - Constitution of Greece - Equality of Greek People*, 2014)

173 (*Article 5 - Constitution of Greece - Free Development of Personality, Personal Freedom*, 2014)

of any kind linked with nationality, race, language, religion, or political beliefs shall be prohibited. Key examples of breaches of these rights by AI are outlined in the sequel.

Firstly, bias has been found in American court practices involving AI, a situation that challenges equality and anti-discrimination provisions. Risk assessments usually rely on a race-based criterion (e.g., sex and age), or indirect parameters linked to minority groups (e.g., place of residence and socioeconomic status), often disproportionately affecting black people[174]. According to a study by ProPublica[175], an AI system produced prejudiced outcomes in favor of white people over blacks during the recidivism prediction. The system inaccurately evaluated that blacks have a higher risk of reoffending than observed, while it underestimated the risk for whites. Another example is Amazon's machine learning system, which automated hiring based on resumes. As Amazon found in 2015, the resume-trained model had learned that the industry was dominated by men and learned to favor male candidates. Therefore, it was discriminatory against female candidates[176]. Consequently, despite the belief that AI systems avoid making decisions based on stereotypes, they are still capable of harboring or perpetuating preconceived, subconscious, or emotionally based biases, which the human mind is also prone to.

Furthermore, the AI use may breach Article 8 of the Constitution[177] that introduces the fundamental principle of the natural or legal judge. Article 8 refers to a judge who is pre-appointed by the Constitution and the current procedural laws to adjudicate a case[178]. In general, this Article holds that human judges must be present during the trial and the AI system cannot replace them. However, this provision can be infringed by AI models, if they fully replace the human element and automate the judicial procedure. Therefore, the balance of AI with Article 8 can take place if AI models cooperate and provide judges with all the necessary assistance, acting as supportive tools. Such an approach enables judges to remain autonomous and capable of making unbiased decisions.

Additionally, AI may come into conflict with Article 87[179] of the Greek Constitution. According to this Article, justice is composed of independent regular judges, who are bound by the Greek Constitution and legislation. The Article affirms that only human judges handle legal cases, leaving no room for robots to substitute humans. A fundamental change of introducing AI to justice would require the amendment of the Constitution by adding a provision for algorithms to serve as independent Greek judges. However, this addition would be tantamount to automated legal decision-making, which is currently uncertain and immature[180].

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174 (Papadimitrakis, 2019)

175 (Larson et al., 2016)

176 (Dastin, 2018)

177 (*Article 8 - Constitution of Greece - Right to a Legal Judge,* 2014)

178 (Dimitropoulos A. et al., n.d.)

179 (*Article 87 - Constitution of Greece - Independence of Judges,* 2014)

180 (Kofinis Stergios, 2021)

### 7.1.3 AI under Article 932 of the Greek Civil Code

According to Article 914[181] of the Greek Civil Code, in case of tort, whoever acts unlawfully and in fault causes pecuniary damage and must financially compensate the victim. Article 932[182] of the Greek Civil Code supplements Article 914 underscoring that, regardless of financial losses, the court may award monetary compensation for moral damages in a tort case, especially for breaches of health, honor, virtue, or deprivation of freedom. Moreover, the Greek jurisprudence and Article 25, paragraph 1, of the Greek Constitution[183] stipulate that all judges must adhere to the principle of proportionality. When evaluating pecuniary remuneration, they must decide an appropriate award for the caused damage without exceeding the limits of their discretionary power. The incorporation of the proportionality principle in the Constitution demonstrates that it is not merely a general guideline but rather a constitutional mandate which must be strictly respected by all legal professionals as it forms a fundamental pillar of justice.

Taking into account the aforementioned provisions, AI must also adhere to these Articles in resolving civil matters, particularly in calculating compensations. Predictive AI applications such as LexMachina[184] ,Tractable[185] and DataJust[186] perform damage assessments and determine appropriate remuneration for victims. To grant fair indemnity amounts, though, AI must award compensation determined on the basis of objective criteria, such as the severity of the infringement, the socioeconomic conditions of the parties involved, as well as the fault of both the perpetrator and the victim[187] , while they should comply with the principle of proportionality at the same time. However, this balance proves to be difficult as the lack of human judgment in AI hinders the effective application of the proportionality principle. AI cannot assess the victim's harm, the surrounding circumstances of each case, and the broader social context. The specific inability of AI stems from the absence of empathy, a human trait which assists in understanding others' feelings, creating emotional connection, and facilitating compassionate decisions. Finally, AI's inability to evaluate the moral and emotional damage of the victim arises from the manner of its very development. These systems cannot assess such cases as they rely on pre-defined rules and input data. As a result, due to the absence of an assessment of the severity of harm and the unique features of a case, AI struggles to implement the principle of proportionality[188, 189].

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181 (*Article 914 - Civil Code - Meaning*, 2014)

182 (*Article 932 - Civil Code - Compensation for Moral Damage*, 2014)

183 (*Άρθρο 25 - Σύνταγμα της Ελλάδος - Αρχή του κοινωνικού κράτους δικαίου, προστασία θεμελιωδών δικαιωμάτων*, 2014)

184 (*Legal Analytics by Lex Machina*, n.d.)

185 (*Helping People Live and Work Better, through the Power of Applied AI*, n.d.)

186 (Desfontaines Charlotte, 2020)

187 (Petrakou Dionisia, 2020), *supra note 138*, see chapter 8.1

188 (Georgieva Valeriya, 2024)

189 (Kharitonashvili, 2022), *supra note 118*

## 7.2 AI and the European Convention of Human Rights

The Council of Europe is an organization which guarantees the rule of law, democracy, and respect for human rights. In 1953, the member states of the Council signed the European Convention of Human Rights (ECHR), the first legally binding document to implement rights from the Universal Declaration of Human Rights. This Convention is the first globally binding instrument that commits its signatories to share the same human rights principles and reduces the possibility of AI undermining them. Although AI systems can benefit human rights by detecting, for example, their abuses and violations, they can also affect them negatively[190, 191]. The following sections explore concerns regarding the alignment of AI systems with the core principles of the Convention, especially those in Articles 6, 7, 8, and 14 of the ECHR[192].

### 7.2.1 Potential Breach of Article 6 of ECHR

Article 6 of the Convention guarantees that everyone is entitled to a fair trial, namely, everyone has the right to participate in a public hearing conducted by an unbiased court, while the fair trial requires an independent and impartial court. Its decisions must be accessible to everyone, but the public and press may be excluded from such access for security, morality, and protection purposes. The implementation of AI technology must adhere to the fundamental principles of the Convention in order to confirm that the decision-making process will be fair, transparent and that the human element will still control the trial process. More particularly, according to the European Ethical Charter, human judges must be a part of and oversee the judicial procedure to guarantee that the Convention's core values and freedoms will be respected. Thus, AI tools may not be able to replace judges, but they can still offer substantial assistance to legal professionals, aiming to reduce their workload.

Nevertheless, AI applications may erode the impartiality, required for a fair trial. Firstly, these models may rely on biased or inaccurate training data, which can lead to ambiguous, and unfair conclusions. Without strict legislative control, AI risks perpetuating inequalities, and breaching people's right to impartial rulings. Regarding accessibility and transparency, a fair trial typically mandates that parties have access to and can contest AI-generated outcomes, which must provide the required reasoning clarity so that both judges and defendants fully understand all reasons, leading to a conclusion. However, the ambiguity, complexity, or lack thereof of the rationale behind the AI's judgments creates significant barriers to litigants who wish to comprehend the decision-making process. This lack of clarity undermines the trust in legal procedures and the broader judicial system. Moreover, the use of AI in justice raises critical concerns about the independence of courts, an essential pillar of the right, enshrined in Article 6 of the ECHR. Judicial independence is defined as the ability of courts and judges to exercise their functions in a way free from improper

190 (*European Convention on Human Rights - ECHR Official Texts - ECHR - ECHR / CEDH*, n.d.)

191 (*Council of Europe and Artificial Intelligence - Artificial Intelligence - Www.Coe.Int*, n.d.)

192 (Moreira, 2022)

governmental or commercial interference[193]. A key question is whether those who design or develop procedural algorithms for court cases acquire excessive influence, which could jeopardize judicial independence and violate the separation of powers. Judicial independence does not necessitate the total exclusion of AI but a balanced approach. The incorporation of AI models should empower judges to freely decide how to apply AI-generated insights and critically evaluate the AI's evidence, ensuring that the human element is still central in judicial decision-making[194].

### 7.2.2 Potential Breach of Article 7 of ECHR

Article 7 prohibits retroactive punishment and mandates that an act is considered a crime if outlined in national or international law, endorsing the principle "Nullum Crimen, Nulla Poena Sine Lege" (No crime, no punishment without law). Article 7's provision, essentially, establishes the principle of legality. In the case Cantoni v. France, §29[195]; Del Río Prada v. Spain, §91[196], the aforesaid provision does not solely include the legislation but, also, the jurisprudence. Article 7's provision further adheres to the principles of accessibility and foreseeability. More specifically, a law is accessible when it is available and intelligible to the general public, while foreseeability requires that laws must be sufficiently explicit so that people are aware of the violation and the legal sanctions of their actions. An example of misuse of this provision applies to machine learning systems which use pre-existing data to formulate predictions. These data patterns may be sometimes erroneous or biased, leading to the penalization of individuals not for their proven behavior but for their perceived behavior, ultimately infringing the principle of legality. Lastly, due to their current lack of transparency and clarity of reasoning ("black box effect"), AI-driven rulings make it difficult for people to predict which laws were applied and how they were interpreted in their case. Thus, when rulings are unforeseeable and incomprehensible, this can ultimately violate the principle of legality.

### 7.2.3 Potential Breach of Article 14 of ECHR

Article 14 describes that people should be able to enjoy all fundamental rights and freedoms. They should not be allowed to face discrimination according to their sex, race, ethnicity, or any other feature stated in the Convention. Both Article 14 of the ECHR and Article 1 of the Protocol No. 12[197] of the Convention prohibit direct and indirect discrimination, while violations of Article 14 must be evaluated alongside other provisions of the Convention and its Protocols, as Article 14's provision has a supplementary character (Inze v. Austria, §36, case[198]).

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193 (*Judicial Independence | Definition, Scope, & Facts | Britannica*, 2024)

194 (Sroka, 2024)

195 (*Cantoni v. France*, 1996)

196 (*DEL RÍO PRADA v. SPAIN*, 2013)

197 (PROTOCOL No. 12 TO THE CONVENTION FOR THE PROTECTION OF HUMAN RIGHTS AND FUNDAMENTAL FREEDOMS, 2000)

198 (*Inze v. Austria*, 1987)

Direct discrimination takes place intentionally and refers to the different treatment of someone who has a protected characteristic such as pregnancy, while indirect discrimination occurs unintentionally and involves a neutral rule that impacts disproportionately a group of people. For example, indirect discrimination occurs when a company requires all its employees to have a specific height. Although this requirement applies to everyone, it may excessively affect members of specific ethnicities and women who are usually shorter than men[199].

The core issue of the integration of AI algorithms in the judicial field emanates from the possibility that the prohibition of discrimination may not be respected. Even though AI machines attempt to avoid human subjectivity and make neutral decisions, this is hardly possible in reality if their training datasets include biased or inaccurate / misleading information which may perpetuate inequalities, especially in criminal justice. As a result, if the data the AI machines process to reach their conclusions is not selected carefully, these conclusions may not be objective and fair, if humans do not interfere in the process. Therefore, AI judgments could lead to possible discrimination.

## 7.3 Legal Framework Principles for AI Introduction in the Judiciary

The previous sections focused on key issues associated with public and human rights which an indiscriminate introduction of AI systems into the judicial system would raise in relation to specific provisions of the Greek Constitution and the ECHR. More particularly, the foregoing exposition highlighted the possible breach of the aforesaid rights by such AI-driven decision-making applications, if these applications are left to operate without human supervisory control and human overarching decision-making authority. Therefore, the engagement of AI in justice is in critical need of a strict legal framework that will safeguard the public and human rights advocated in the Greek Constitution and the ECHR., warrant the primacy of core human rights over AI machines, and preserve the judicial autonomy, transparency, fairness, and trustworthiness in the judiciary

[199] (Campbell and Smith, 2023)

# 8 ARTIFICIAL INTELLIGENCE IN PRACTICE / CASES

Two significant American cases are presented in the sequel to demonstrate the impact of AI on legal practice. The first one refers to the Loomis versus Wisconsin decision of 2016, while the second one pertains to the Mata versus Avianca case of 2023.

## 8.1 Loomis v. Wisconsin U.S.A. 2016 case

### 8.1.1 Background

One of the most significant criminal cases in the U.S.A. is the Loomis v. Wisconsin case. In February 2013, offender Eric Loomis was arrested on five crimes following his participation in a drive-by-shooting at La Crosse, Wisconsin, including "*first-degree recklessly endangering safety, attempting to flee or elude a traffic officer, operating a motor vehicle without the owner's consent, possessing a firearm by a felon, and possessing a short-barreled shotgun or rifle"*. The defendant admitted that he was driving the car but denied the allegation of being involved in the shooting. He confessed his guilt to two minor charges, while the remaining charges were dismissed but considered in his sentencing. The Wisconsin Supreme Court reviewed his criminal record and requested a pre-investigation sentencing report (PSI), which included a risk assessment score for recidivism generated by COMPAS (Correctional Offender Management Profiling for Alternative Sanctions). The results indicated a high risk of recidivism, severely influencing the court's sentencing decision. Consequently, the judges denied probation and convicted Loomis to six years in prison followed by five years of supervision.

Loomis appealed asserting a violation of his due process rights on the basis of the following arguments. Firstly, he argued that the risk assessment infringed his right to access the information, due to the proprietary nature of the risk assessment algorithm which, being protected by intellectual property rights, impeded him from challenging the data's accuracy. Secondly, he mentioned that this algorithm violated his right to a personalized sentence as it generates results based on group data rather than an individual's characteristics, thereby deteriorating the fairness of the decision. Thirdly, Loomis claimed that the COMPAS model's consideration of gender in its risk assessment breached his right to due process as it resulted in discrimination[200, 201, 202, 203].

### 8.1.2 Court Decision

Upon hearing of the defendant's appeal, the Wisconsin Supreme Court rejected all of Loomis's claims challenging the COMPAS risk assessment tool. Regarding the first claim, the court stated that although the proprietary nature of COMPAS conceals its decision-making process, the information it uses is derived from criminal records, accessible to the defendant, thus providing him

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200 (*State v. Loomis 371 Wis. 2d 235, 881 N.W.2d 749, 2016 WI 68 (Wis. 2016),* n.d.)

201 (Liu et al., 2018)

202 (Rankin, 2020)

203 (Kofinis Stergios, 2021), *supra note 180*

the opportunity to review and contest the input data. Regarding the second claim, the court acknowledged the importance of personalized sentences further noting that Loomis's judicial punishment was not based solely on COMPAS but also on other important factors in determining his sentence. Finally, in response to the third claim, the court highlighted that including gender in risk assessments is not discriminatory; on the contrary, it can enhance the accuracy of predictions benefiting both the offender and the justice system.

Loomis's plea failed to overturn the ruling influenced by the COMPAS results. Even though the court upheld the COMPAS application, it emphasized limitations on the COMPAS role in sentencing decisions. More specifically, COMPAS should not determine sentence severity; it should rather assist in informing judges in assessing a defendant's risk of reoffending. However, the extent to which judges can rely on its results or simply consider them remains ambiguous. To resolve COMPAS-related concerns on its lack of transparency, arising from its proprietary nature, the Wisconsin Supreme Court mandated that a warning label should be included in the pre-sentence investigation report (PSI). This caution sign aimed to clarify the limitations of COMPAS in judicial sentencing decisions and encompassed the subsequent five key points as noted in the PSI.

At first, COMPAS's decision-making process is unclear as it does not provide a transparent explanation of how it weighs important data in its assessments and calculates risk scores. Second, COMPAS has a limited ability to evaluate the score of individuals' recidivism because it uses group data identifying high-risk groups rather than high-risk individuals. Third, research indicates that COMPAS can cause prejudice against marginalized groups by assigning a high likelihood of reoffending to minority defendants. Fourth, COMPAS compares defendants to national data from across the United States rather than Wisconsin-specific data; given the ongoing population movements, the aforementioned AI tool needs to be often updated to maintain accuracy. Fifth, COMPAS was designed to support the Department of Corrections in decisions related to treatment, oversight, or parole, and not as a tool for determining sentences.

Finally, Loomis applied for review in the United States Supreme Court but this request was ultimately denied in 2017 [204, 205, 206, 207].

## 8.2 Mata v. Avianca U.S.A. 2023 case

### 8.2.1 Background

On August 27 or 28, 2019, Roberto Mata asserted that he took an overnight flight with Avianca Inc. to travel from El Salvador to John F. Kennedy Airport in New York. Mata claimed that during his flight a metal serving cart struck his left knee and caused him a serious injury that forced him to undergo medical treatment and prevented him from work. In July 2020, Mata filed a lawsuit against the airline company Avianca Inc. seeking damages for his injury but, due to the bankruptcy

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204 (*State v. Loomis 371 Wis. 2d 235, 881 N.W.2d 749, 2016 WI 68 (Wis. 2016)*, n.d.), *supra note 200*

205 (Liu et al., 2018), *supra note 201*

206 (Rankin, 2020), *supra note 202*

207 (Kofinis Stergios, 2021), *supra note 180*

of the defendant, American law mandated the automatic stay of the proceedings. On February 2, 2022, Mata voluntarily dismissed the previous claim against Avianca and refiled a new same motion at the New York state court, under the Montreal Convention 1999, after being informed that the defendant had recovered from bankruptcy.

On February 22, 2022, Avianca moved the case to the federal court, arguing for the dismissal of Mata's claim. Avianca's legal counsel relied on the Montreal Convention, a multilateral treaty governing disputes from international air travel and regulating an airline's liability, to support his argument. According to Article 35 of the Convention, every injured person must submit a claim against the liable entity within a strict two-year limitation period from the moment of the accident.

In response, Mata's attorney, Steven Schwartz working in the Levidow firm, prepared an Affirmation of Opposition, signed off by the attorney Peter Loduca, and submitted it on March 1, 2023, without verifying its content. Schwartz stated in this document that the two-year deadline had not expired as the statute of limitations lasts three years and that the airline's bankruptcy had suspended the deadline. To support his objection, Schwartz used ChatGPT to search for legal precedents, as his firm lacked access to traditional legal AI tools such as Lexis or Westlaw. During the aforesaid search, ChatGPT fabricated several past cases affirming that, under the Montreal Convention, bankruptcy suspends the time limit for filing a claim.

Schwartz and Loduca asserted that they had requested ChatGPT's assistance to search for legal precedents and that ChatGPT did confirm their availability. Based only on this information, the lawyers did not search any further. Avianca's attorneys could not locate these past cases sub-mitted by Schwartz and asked for copies, but the court had no one available. Since the claimant's lawyers could not offer evidence on the submitted past cases and Judge P. Kevin Castel could not also find these legal precedents, he ordered Loduca to file an affidavit before the court and explain the inconsistencies.

Mata's official attorney, Loduca, filed an affidavit, prepared by Schwartz, admitting that they did not check the accuracy and authenticity of the content of the ChatGPT responses, without aiming to mislead the court though. According to the statement, they used AI to supplement their work and quickly do legal research, but when asked about the authenticity of the cases, ChatGPT affirmed their validity[208, 209, 210, 211].

### 8.2.2 Court Decision

Judge Castel of the United States District Court for the Southern District of New York analyzed the three fictitious cases as Mr. Loduca provided their excerpts in his affidavit. According to the Judge, these cases included significant errors, indicating their lack of authenticity, such as the "Clerk of the Eleventh Circuit" case, the "Varghese" judgment, the "Petersen v. Iran Air" case, the

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208 (*MATA v. AVIANCA INC (2023),* 2023)

209 (Scott Benjamyn, 2023)

210 (Ryan A. et al., 2023)

211 (Rao & Ramstad, 2023)

"Miller" judgment, and the "Zicherman v. Korean Air Lines Co" case which was referenced but lacked an excerpt. All these legal precedents were fabricated by ChatGPT leading to the phenomenon known as AI hallucinations.

The court confirmed the application of the Montreal Convention in this case. The Convention regulates that the time limit for filing a claim is strictly two years from the day of the flight's arrival. Thus, implementing the Montreal Convention in Mata's case, the court rejected the counterarguments of Mata's attorneys, who alleged that the treaty strictly rules the deadline for the lawsuits' submission and that the airline's bankruptcy does not pause the time limit. Hence, Mata's claim, filed on February 2, 2022, was barred since the conflict started on August 27 or 28, 2019; therefore, the complaint should have been submitted by August 28, 2021. Referring to past judgments, such as the Fishman v. Delta Airlines case, the court pointed out that the timeframe set by the Montreal Convention constitutes a strict condition for filing a claim and not a deadline that it can be tolled. Thus, once this time limit expires, the right to submit a claim should be barred regardless of other factors which might otherwise pause the legal proceedings.

Finally, according to the Federal Rule of Civil Procedure no. 11, on June 22, 2023, the court ruled that Mata's lawyers had behaved in "subjective bad faith" because they presented non-verified cases misleading the court. Therefore, the court dismissed Mata's lawsuit and imposed on both of his lawyers and their law firm a 5,000 penalty[212, 213, 214, 215].

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212 (*MATA v. AVIANCA INC (2023),* 2023), *supra note 208*

213 (Scott Benjamyn, 2023), *supra note 209*

214 (Ryan A. et al., 2023), *supra note 210*

215 (Rao & Ramstad, 2023), *supra note 211*

# 9 CONCLUSIONS AND RECOMMENDATIONS

The traditional legal system, which involves the physical presence of human judges in the adjudication of disputes and the exclusive responsibility of lawyers to prepare and defend their clients in court, has been profoundly affected by the increasing incorporation of AI in justice. Undoubtedly, AI has the potential to enhance the judicial ecosystem by streamlining procedures, aiding legal research, predicting case outcomes, and, generally, contributing to civil, criminal, and administrative justice. However, AI's widespread application still remains uncertain and immature as it raises several legal, ethical, and practical concerns. Key among them, the current lack of transparency, the unclear allocation of accountability, the potential return of biased decisions, and the possibility of false predictive rulings are all open issues which may breach core human values, principles, rights, and freedoms that constitute the foundation of democratic societies. Consequently, the enactment of legal frameworks across the world related to AI applications is critical as it will set the boundaries of its use in the legal domain.

At present, even though AI experts design and oversee AI tools, their lack of legal knowledge makes the evolution of AI regulations even more imperative in order to safeguard legal principles and fundamental rights of individuals. To address biases, inequalities, unfairness, and in-accuracies that may arise from AI's applications in the legal decision-making process, a number of possibilities exist which can be implemented as potential solutions with the aim to ensure that justice will be equitable and unambiguous. Firstly, the development of AI systems by private entities may lead to a lack of transparency and accountability which could result in public distrust in AI judicial outcomes. To combat this issue, proposed legal frameworks should mandate the use of fairness metrics that can detect when AI's decisions are discriminatory to a certain group, the disclosure of AI's reasoning algorithms, the employment of de-biasing methods for AI outcomes, and the release of AI training data sources. Secondly, the engagement of diverse AI models and training data is essential because, sometimes, these models or the input data fed into the AI systems may be biased resulting in prejudiced outputs. Thus, the importance of this diversity is attributed to the prevention of biased rulings generation by AI and the enhanced ability of legal professionals to obtain a wider spectrum of legal analysis and understanding without having to rely solely on the interpretation and decision-making process of a single AI tool. Thirdly, another possibility is the adoption of public benchmarks comprising the execution of standardized tests for the evaluation of AI systems' capabilities, efficiency, and performance. As a result of the implementation of the aforementioned improvements, legal professionals would have a clearer view of AI's problem–solving capabilities, limitations, and potential biases [216].

Taking into account the current state and evolution of AI in the justice system, AI machines have not yet reached the level required to operate independently and questions remain as to whether they ever will. Many essential human traits, which play a critical role in the legal proceedings, are absent from AI systems to date. Thus, AI systems can serve as a supportive tool to the legal profession by mitigating functional insufficiencies and human flaws, while allowing legal professionals to focus on more complex and human-centered issues.

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[216] (Beithon Rachel & Germann Jonathan, 2024)

It is envisaged that AI's integration in the legal field is feasible under appropriate human supervision and control. Despite its accepted potential, AI cannot currently have an in-depth comprehension of human judgments or thoroughly evaluate complicated legal cases to reach fair conclusions. Therefore, arguments about the AI's full substitution for human judges in the judicial system are premature, as such a change at present could distort justice's values and principles as well as disrupt the judicial system's stability. For a considerable time to come, the human element is anticipated to have a compelling role when dealing with involved legal cases.

However, in the longer run, the extent to which machine learning systems will evolve remains uncertain. There are thoughts that future AI training methods, data processing, and decision-making algorithms might become very complex for non-experts to understand, thus making it challenging for legal professionals to evaluate the reasonableness of AI's outputs and substantially control the AI's decision-making mechanisms. Such advanced AI models are on the path to artificial superintelligence (ASI), surpassing the human brain in knowledge and reasoning skills. Although ASI may be possible in the future, massive breakthroughs must take place before its potential emergence in the world and further in the judicial domain. As a result, the extent of AI's incorporation in the legal profession and the judicial system remains open and subject to ongoing research and debate.

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