TECHNOLOGY IN CRIMINAL PROCEEDINGS: ALGORITHMIC OPACITY AND FAIR TRIAL RIGHTS

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Summary: The use of artificial intelligence (hereinafter – AI) in legal proceedings, and specifically in criminal proceedings, is a topic gaining increasing attention. This article discusses how AI is applied at different stages of criminal proceedings and argues that the main issue is not AI system itself, but the opacity behind how it reaches its conclusions, which can affect the right to a fair trial under Article 6 of the European Convention on Human Rights (hereinafter – the Convention).

Introduction

Contemporary technological advancements are increasingly integrated across diverse spheres of society. Among these, AI technology is developing and influencing various aspects of human life, one of which is legal proceedings. Despite its advantages, AI also presents challenges, primarily due to insufficient understanding of its regulation, functioning, and use. For that, this article examines the concept of AI, its application in criminal proceedings, and considers which human rights may be at stake. Subsequently, in the light of the Convention, the paper analyzes which main guarantees may be affected in this context.

At European Union level, the European Commission, in the communication "AI for Europe", described AI as systems that display intelligent behavior by analyzing their environment and taking actions to achieve specific goals.[1] The EU AI Act defines AI systems as machine-based systems designed to operate with varying levels of autonomy and capable of generating outputs such as predictions, recommendations, content, or decisions that influence physical or virtual environments.[2]

The Application of AI across Criminal Proceedings

Current applications of AI in the judicial environment include making court documents searchable by detecting patterns in text, advising parties on solutions to their disputes, and predicting litigation outcomes based on patterns in past case law.[3] By

[1] European Commission, "Artificial Intelligence for Europe", COM (2018) 237 final, 25 April 2018.

[2] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act), [2024] OJ L1689.

[3] "Courts and Artificial Intelligence", Dory Reiling, International Journal for Court Administration 11(2), 2020, p. 1.

comparing cases, AI systems make it easier to make consistent legal conclusions. As AI becomes more integrated into legal systems, its use raises significant legal and ethical challenges concerning the proper administration of justice.

The growing role of AI in the justice system becomes clearer when we look at the specific stages where it enters criminal proceedings. The use of AI in criminal proceedings can be divided into four distinct stages. The first is the pre-investigative phase, which takes place when there is not a specific suspect or even an illicit act to be investigated yet.[4] In this context, a major application is predictive policing, which uses algorithmic models to combine past crime statistics and surveillance data in order to determine where future crimes are most likely to occur and to direct police enforcement to those areas. Although this may improve the allocation of police resources, it can pose a significant risk related to the data itself. Specifically, if historical data reflects unequal policing, AI systems will be more likely to repeat those patterns. As a result, AI may not merely reflect existing patterns but may also contribute to their continuation.

Moving into the investigative phase, AI serves as a tool for obtaining and verifying evidence; once a specific crime is identified, automated systems assist prosecution authorities in analyzing text structures to evaluate the truthfulness of initial reports.[5] During the trial phase, AI may assist judicial decision-making through automated risk assessment platforms. These systems process an individual's personal factors to assess a statistical probability of recidivism. Judges rely on these assessments to determine precautionary measures or specific sanctions.[6] Finally, although AI can assist in various stages of legal proceedings, it cannot yet replace judges in sentencing decisions. The determination of a sentence remains solely with the judge, as judicial decisions must be founded on the judge's own conviction.[7] AI applications therefore require human intervention. Ultimately, the integration of AI across these phases requires a strict human rights evaluation under the Convention.

The Impact of Algorithmic Opacity on Fair Trial Rights in Criminal Proceedings

Algorithmic opacity is one of the main issues that can arise in this context. First, it is important to understand what opacity actually means. An algorithm's output can be used as evidence in criminal proceedings or to support decision-making. Errors in algorithmic systems may arise from the input, the programme's code, or human

[4] "Artificial Intelligence in Criminal Proceedings: Human Rights at Risk?", Teresa Januário, Revista Mexicana de Ciencias Penales 7, 2023, p. 85.
[5] See, Januário, 2023.
[6] See, Januário, 2023.
[7] "The Role of Artificial Intelligence in Criminal Procedure Law: Can It Be Considered a Legal Subject?", Kamila T. S., Law and Justice 10(2), 2025, p. 152.

intervention in the process.[8] There are various types of algorithmic opacity. Deliberate corporate or state secrecy, technical illiteracy, or a lack of interpretability can all contribute to opacity.[9] Specifically, this computational secrecy makes it impossible to detect hidden technical errors, discover the underlying methodology of the system, or verify the legality of its final outputs. Therefore, algorithmic opacity poses a serious risk to the right to a fair trial by preventing contestability.

The concept of a fair trial as defined by Article 6 of the Convention[10] is particularly relevant in this context. The guarantees of a fair trial are applicable from the pre-trial phase because the criminal proceedings are seen as a whole, and fairness can be harmed from the beginning of the proceedings. In the context of algorithm-based evidence, the right to confrontation is very important. Article 6 §3 (d) of the Convention enshrines the principle that, before an accused can be convicted, all evidence against him must normally be produced in his presence at a public hearing with a view to adversarial argument.

This issue was further illustrated in *Yüksel Yalçınkaya v. Türkiye*,[11] where the applicant's conviction relied on digital evidence to which he lacked full and timely access. The Court held that electronic evidence differs from traditional forms of evidence due to the specialized technologies required for its collection, processing, and analysis. Its complexity may make it difficult for judges to establish its authenticity, accuracy and integrity, while also creating challenges for the accused in effectively examining and challenging such evidence. Consequently, without access to the information or resources needed to understand such evidence, an accused cannot challenge its authenticity.

AI systems should therefore be developed in line with human rights principles and designed to facilitate the practical realization of those rights. Some proposals already try to reduce this risk. The Commission for the Efficiency of Justice of the Council of Europe[12] adopted five ethical principles for AI in judicial systems, one of them being "under user control". Based on that principle, judicial specialists should be able to check and review the data, information, or decisions entered into a system. This

[8] "The Black Box on Trial: The Impact of Algorithmic Opacity on Fair Trial Rights in Criminal Proceedings", Francesca Palmiotto, European Journal of Legal Studies 11(1), 2019, p. 6.
[9] See, Palmiotto, p. 10.
[10] Convention for the Protection of Human Rights and Fundamental Freedoms, adopted 4 November 1950, entered into force 3 September 1953, 213 UNTS 222, art. 6.
[11] *Yüksel Yalçınkaya v. Türkiye*, ECtHR [GC], App. No. 15669/20, Judgment of 26 September 2023.
[12] "European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and Their Environment", European Commission for the Efficiency of Justice (CEPEJ), Council of Europe, 2018.

is a reasonable point, but it depends on specialists actually having the technical capacity to review these systems.

As discussed above, AI systems need to be contestable by criminal defendants. One of the major issues preventing the sufficient contestability of AI systems in criminal proceedings can be the lack of notification. If a person is never informed that they have been the subject of an automated decision made by an AI system, they will not be able to challenge that decision, as they will not even know there is something to challenge.

Conclusion

In conclusion, while technology offers significant advantages, it is also demonstrated that the use of these technologies does not come without obstacles. The main idea behind this article is not to argue that the use of AI should be fully excluded from criminal justice, nor that every use of it poses serious concern, but to show the real risk that opacity poses to the rights of those involved. Therefore, technological advancements should not come before the fundamental rights of individuals.