

ARTIFICIAL INTELLIGENCE AND THE METAVERSE FOR SUSTAINABLE  
CRIMINAL JUSTICE: ENHANCING LEGAL KNOWLEDGE AND  
ACCESSIBILITY IN THE DIGITAL ERA\*

F. Coppola\*\*

SUMMARY: 1.- A preliminary Caveat; 2.- Artificial Intelligence for Enhancing the Knowability and Predictability of Criminal Law; 3.- The Metaverse for the Sustainability of Criminal Justice; 4.- Conclusion.

*ABSTRACT: This paper examines how Artificial Intelligence (AI) and the Metaverse can enhance legal knowledge, accessibility, and sustainability within criminal justice systems worldwide. In the context of Asia's rapid digital transformation and its pursuit of regional integration, these technologies represent not merely tools of efficiency, but potential catalysts for a more transparent, participatory, and sustainable model of justice.*

*The first part of the paper explores the role of AI in improving the knowability and predictability of criminal law. It considers the development of judicially trained chatbots - AI systems trained exclusively on transparent, court-sourced datasets - that could enable citizens, lawyers, and judges to identify how similar cases have been decided in the past. Such systems would not replace judicial reasoning but rather democratize access to legal interpretation, allowing citizens to understand complex jurisprudence through explainable language models (LLMs). By promoting consistent and comprehensible case-law reasoning, these tools could reduce informational asymmetries and foster a more sustainable relationship between citizens and justice institutions.*

*The second part focuses on the Metaverse and its potential to reshape procedural and evidentiary practices. Through digital twin environments, virtual "Meta Court Rooms" could host remote hearings, improving access to justice while reducing economic and environmental costs. Similarly, immersive platforms within the Metaverse may facilitate access to restorative justice programs by creating a controlled and less confrontational virtual environment, where victims and offenders can engage in dialogue and reconciliation without the emotional impact and tension often associated with face-to-*

---

\* Il testo riproduce la versione rielaborata e corredata delle note bibliografiche dell'intervento alla Annual Asian Law Institute (ASLI) Conference "Empowering Asia's Rise: Legal Knowledge for Sustainability, Justice and Regional Integration", ospitata dalla Faculty of Law, Universitas Indonesia (Jakarta), 3-4 giugno 2026.

\*\* Ricercatore RTT di Diritto penale presso l'Università degli Studi di Salerno.

*face encounters. Furthermore, the Metaverse could revolutionize evidentiary analysis by recreating crime scenes to assess causation and intent. The paper presents a pioneering American case in which a judge used the Metaverse to evaluate a self-defense claim under the stand-your-ground law.*

*Ultimately, the research argues that AI and the Metaverse, if governed responsibly, can serve as key instruments for advancing legal knowledge in the pursuit of sustainability, justice, and integration, aligning criminal law systems with the overarching need to protect fundamental rights*

Il presente contributo esamina il modo in cui l'Intelligenza Artificiale (IA) e il Metaverso possano accrescere la conoscenza giuridica, l'accessibilità e la sostenibilità dei sistemi di giustizia penale a livello globale. Nel contesto della rapida trasformazione digitale, tali tecnologie non rappresentano soltanto strumenti di efficienza, ma possono costituire veri e propri catalizzatori di un modello di giustizia più trasparente, partecipativo e sostenibile. La prima parte del lavoro analizza il ruolo dell'IA nel migliorare la conoscibilità e la prevedibilità del diritto penale. In particolare, viene presa in considerazione la possibilità di sviluppare chatbot giuridici addestrati esclusivamente su dataset giudiziari trasparenti e provenienti da fonti giurisdizionali ufficiali, capaci di consentire a cittadini, avvocati e magistrati di individuare come casi analoghi siano stati decisi in passato. Tali sistemi non sarebbero destinati a sostituire il ragionamento del giudice, bensì a democratizzare l'accesso all'interpretazione del diritto, permettendo ai cittadini di comprendere orientamenti giurisprudenziali complessi attraverso modelli linguistici spiegabili (Explainable Large Language Models). Favorendo una giurisprudenza più coerente e comprensibile, questi strumenti potrebbero ridurre le asimmetrie informative e promuovere una relazione più sostenibile tra cittadini e istituzioni della giustizia.

La seconda parte si concentra sul Metaverso e sul suo potenziale nel ridefinire le pratiche processuali e probatorie. Attraverso ambienti digitali basati sul concetto di digital twin, le cosiddette "Meta Court Rooms" potrebbero ospitare udienze da remoto, migliorando l'accesso alla giustizia e riducendo al contempo i costi economici e ambientali. Analogamente, le piattaforme immersive del Metaverso potrebbero agevolare l'accesso ai programmi di giustizia riparativa, offrendo un ambiente virtuale controllato e meno conflittuale nel quale vittime e autori del reato possano intraprendere percorsi di dialogo e riconciliazione senza il forte impatto emotivo e le tensioni tipicamente associate agli incontri in presenza.

Inoltre, il Metaverso potrebbe rivoluzionare l'analisi probatoria mediante la ricostruzione virtuale delle scene del crimine, consentendo una più accurata valutazione del nesso causale e della plausibilità di una ricostruzione alternativa della vicenda. A tal proposito, il contributo esamina un innovativo caso statunitense nel quale un giudice ha utilizzato il Metaverso per valutare una richiesta di riconoscimento della legittima difesa ai sensi della normativa "stand-your-ground".

In conclusione, la ricerca sostiene che l'Intelligenza Artificiale e il Metaverso, se governati in modo responsabile, possano rappresentare strumenti fondamentali per la promozione della conoscenza giuridica al servizio della sostenibilità, della giustizia e dell'integrazione. In tale prospettiva, queste tecnologie possono contribuire ad allineare i

## Opinioni

sistemi penali contemporanei all'esigenza, sempre più avvertita, di garantire un'effettiva tutela dei diritti fondamentali.

KEYWORDS: Criminal law, AI, Metaverse

### 1.- *A preliminary Caveat*

The integration of Large Language Models (LLMs) into high-stakes evaluative workflows has significantly reconfigured the operationalization of judgment, progressively displacing normative reasoning in favour of statistical approximation. As connectionist systems grounded in distributional statistics and learned heuristics, LLMs are capable of generating outputs that may appear consistent with expert human benchmarks. Yet, such alignment often conceals a deeper structural divergence. Rather than engaging in contextual reasoning or evidence-based verification, these systems rely on lexical associations and statistical priors internalized during training. This dynamic gives rise to what may be defined as Epistemia: a condition in which linguistic fluency and surface plausibility generate an illusion of knowledge that is mistakenly equated with epistemic reliability<sup>1</sup>. In this sense, automation bias may induce undue deference to machine-generated outputs, while the underlying mechanism remains one of pattern-based generation rather than genuine deliberative reasoning.

This hypothesis has been empirically explored through an experimental design aimed at benchmarking six Large Language Models, among them GPT, Gemini, and Llama, against expert rating systems, including NewsGuard and Media Bias/Fact Check, as well as against human judgments collected in a controlled setting<sup>2</sup>. To ensure comparability, a structured agentic framework was implemented, requiring both models and non-expert participants to follow an identical evaluative process: selecting reliability criteria, retrieving relevant content, and producing justificatory outputs. A particularly significant finding emerged from the models' ability to generate consistent reliability assessments even when prompted exclusively with a domain's URL, without access to the underlying content. Such behaviour indicates that the evaluative output does not stem from real-time contextual analysis, but rather from the activation of pre-existing lexical associations and statistical priors embedded in the training data.

Although the outputs often display a superficial convergence with expert benchmarks, the experiment reveals a clear structural divergence in the underlying processes. Human evaluators tend to integrate intuitive and analytical reasoning, whereas LLMs operate through a simulation of judgment grounded in linguistic markers and structural cues. Epistemia thus manifests precisely at the point where statistical plausibility substitutes for evidence-based deliberation, producing outputs that appear authoritative while lacking genuine epistemic grounding.

---

<sup>1</sup> See “*Epistemia*” (Neologism 2026), Treccani: [https://www.treccani.it/vocabolario/neo-epistemia\\_\(Neologismi\)/](https://www.treccani.it/vocabolario/neo-epistemia_(Neologismi)/).

<sup>2</sup> See E. LORU – J. NUDO – N. DI MARCO – A. SANTIROCCHI – R. ATZENI – M. CINELLI – V. CESTARI – C. ROSSI-ARNAUD – W. QUATTROCIOCCI, *The simulation of judgment in LLMs*, *PNAS*, vol. 122, n. 42/2025.

Further empirical support for this structural limitation can be found in the behaviour of ChatGPT when confronted with the query “Who is Brian Hood?”. In several instances, the system responds with a generic refusal, claiming an inability to provide an answer. However, the factual background is more complex: Brian Hood is an Australian mayor who was erroneously associated with defamatory corruption allegations by the model, despite having acted as a whistleblower<sup>3</sup>. This episode illustrates a critical deficit in what is commonly perceived as machine “intelligence”, particularly in relation to the capacity for error recognition and correction. The problem is exacerbated by algorithmic opacity, which prevents any meaningful reconstruction of the internal evaluative pathway leading to the erroneous output. It is plausible - albeit not demonstrable - that the system privileged a statistically dominant association (“mayor” and “corruption”) over a less frequent but factually accurate narrative. In this respect, the case exemplifies the core logic of Epistemia, whereby surface-level linguistic regularities are substituted for context-sensitive reasoning.

Equally significant is the system’s inability to internally correct the error, requiring instead external intervention to suppress the inaccurate association. This limitation highlights the absence of reflexive self-correction and iterative learning, which constitute defining features of human intelligence. While LLMs may simulate judgment in a manner that aligns, at least superficially, with human evaluative standards, their operation remains rooted in statistical regularities rather than normative reasoning. This distinction is decisive when considering the role of AI in social and judicial contexts. Systems that function through Epistemia lack the capacity for moral responsibility and contextual understanding that is indispensable in high-stakes decision-making processes.

Within this framework, particular attention must be devoted to the data-processing and analytical capabilities of advanced AI systems, as well as to the simulation potential of the Metaverse, understood as a digital twin of real-world environments capable of reproducing ordinary social interactions. From this perspective, and without ever relinquishing the centrality of the human decision-maker, it becomes possible to advance preliminary reflections on the potential contribution of AI and immersive technologies to the administration of criminal justice.

## 2.- *Artificial Intelligence for Enhancing the Knowability and Predictability of Criminal Law*

The capacity of Large Language Models (LLMs) to process complex data and convey it in an accessible and intelligible form renders them particularly suited to enhancing both the accessibility and the predictability of criminal justice systems<sup>4</sup>. This observation applies across legal traditions. Even within civil law systems, where statutory law formally occupies a central role, the practical application of legal norms is inevitably mediated by

---

<sup>3</sup> See T. GERKEN, *ChatGPT: Mayor starts legal bid over false bribery claim*, BBC, 6 april 2023: <https://www.bbc.com/news/technology-65202597>.

<sup>4</sup> See S. J. RUSSEL– P. NORVIG, *Artificial Intelligence. A modern approach*, 4th edition, Global Edition, 2022.

## Opinioni

interpretative frameworks developed through judicial practice<sup>5</sup>. Accordingly, the following considerations may be generalised and, subject to necessary adaptations, extended to different legal contexts.

The core issue concerns access to judicial data and its potential to orient individual conduct in a virtuous manner, enabling individuals to distinguish, in concrete terms, between conduct that is criminally relevant and conduct that is not. Within criminal law systems, this objective reflects two fundamental dimensions: on the one hand, the principle of equality among citizens, understood as equal access to legal information irrespective of economic means or technical expertise; on the other hand, the predictability of criminal sanctions, conceived as the capacity of individuals to regulate their behaviour by reasonably anticipating whether their actions may entail criminal liability.

These concerns have been significantly exacerbated by the increasing technical complexity of the law and by the expansionist tendencies of criminalisation associated with contemporary forms of penal populism<sup>6</sup>. In civil law systems, this has led to the proliferation of broadly formulated statutory offences, the precise contours of which are effectively delineated through judicial interpretation. In common law jurisdictions, by contrast, the repressive function is inherently entrusted to the judiciary, whose interpretative role tends to expand in response to societal demands for punishment. In both cases, the result is a structural condition in which the individual citizen is no longer in a position to fully apprehend the scope of criminalised conduct, thereby becoming exposed to a heightened degree of uncertainty regarding potential sanctions.

Before assessing the extent to which such informational and cognitive deficits may be mitigated through artificial intelligence, it is necessary to clarify the notion of “judicial data” that is to be rendered accessible. For reasons of investigative secrecy and the protection of privacy, the aim cannot be the indiscriminate disclosure of all data pertaining to criminal proceedings, as this would entail the exposure of confidential investigative material and sensitive personal information. Rather, for the purposes of this analysis, “judicial data” refers exclusively to judicial decisions concerning the factual and legal requisites for the application of criminal offences. Such data must be anonymised, with all identifying elements, such as the names of defendants or victims, removed, and must be limited to information contained in the reasoning of judgments of conviction and acquittal, to the exclusion of investigative materials. Furthermore, only those portions of judicial decisions that articulate the factual and legal reasoning underpinning the affirmation or exclusion of criminal liability are relevant for extraction and subsequent re-presentation.

Having defined the scope of the inquiry, it becomes possible to assess how artificial intelligence may contribute concretely to the administration of criminal justice in a manner consistent with the requirements of the European AI Act. We may begin from an empirical observation: an increasing number of individuals rely on widely available AI systems, such as ChatGPT, to obtain information, including information concerning their legal

---

<sup>5</sup> On the growing role of creative case law within the Italian criminal justice system, see, most recently, F. PALAZZO – R. BARTOLI, *Mutamenti giurisprudenziali sfavorevoli, colpevolezza ed irretroattività*, Sistema penale, 2025.

<sup>6</sup> See J. V. ROBERTS - L. J. STALANS - D. INDERMAUR – M. HOUGH, *Penal Populism and Public Opinion. Lessons from Five Countries*, Oxford University Press, 2002.

rights. However, as previously noted, such systems may produce outputs affected by so-called “hallucinations,” which arise from the qualitative heterogeneity of the underlying data. An algorithm operating through statistical approximation on non-homogeneous and qualitatively impure datasets cannot, by definition, ensure results that are both precise and technically reliable.

Against this background, the proposal is to conceptualise an algorithm specifically designed to provide judicial information, that is, “judicial data” as defined above. To this end, the system should be trained exclusively on judicial decisions, duly anonymised to exclude any sensitive information. Within such a framework, when a citizen queries a judicial chatbot as to whether a particular form of conduct may be criminally relevant, the response would derive from a corpus of judicial decisions and would therefore possess a higher degree of qualitative reliability, insofar as it reflects established judicial practice. To enhance the explanatory capacity of the algorithm, it is essential that the system illustrate to the user, through practical examples drawn from judicial practice, how specific factual circumstances have been assessed in terms of criminal relevance. By way of illustration, one may consider the following scenario. A citizen, a lawyer, or a judge queries the system with the question: “*Is it a criminal offence to insult someone through a video on TikTok?*” The system would then retrieve and process relevant case law concerning defamation in the context of social media, specifically TikTok, and generate a response grounded in the judicial precedents contained within its database.

A further application of artificial intelligence within the justice system, conceived as a structured repository of judicial decisions, consists in providing judges with a comparative overview of how analogous criminal cases have been sanctioned in prior practice. In a separate study, we have explored the theoretical implications of an algorithm designed to support sentencing decisions, denominated “Ex-Aequo”<sup>7</sup>.

It is now appropriate to examine its concrete functioning and practical utility from the perspective of the sentencing judge.

To this end, an experimental prototype of Ex-Aequo has been developed and made freely accessible<sup>8</sup>. At the current stage, however, the dataset incorporated into the system is entirely synthetic, as the prototype serves an illustrative function aimed solely at demonstrating the operational logic of an AI-based tool. As can be observed from the initial interface, the system requires the judge, called upon to impose a criminal sanction in a specific case, to input the core coordinates of the case, including its legal classification, any sentence reductions associated with the procedural framework adopted, and the presence of aggravating or mitigating circumstances.

Subsequently, the judge is invited to provide a narrative account of the factual circumstances deemed relevant for comparison with analogous judicial decisions. Finally, the system requests the judge to articulate, in advance, the preliminary sentencing inclination formed prior to the algorithmic query. Once this information has been entered, the process

---

<sup>7</sup> See F. COPPOLA, *Intelligenza Artificiale, Metaverso e Sistema Penale: prevenzione, repressione, opportunità, rischi*, Wolters Kluwer, 2026, 139 ff.

<sup>8</sup> The Ex-Aequo prototype was developed using the software platform “Base44” and is available for simulation at the following address: <https://exaequo-sentencing-assistant.base44.app>.

## Opinioni

advances to a second phase, in which the system performs a structured search within the database underpinning the AI.

### Precedent search

Enter case details to find comparable precedents

⚠ Ex-Aequo provides comparative and statistical support for sentencing; the final decision remains entirely at the discretion of the judge.

Legal qualification — Circumstances — Sentencing options

**Offence type \***

Select offence ▾

**Subcategory**

E.g. aggravated, attempted...

**Type of offence \***

Select offence ▾

← Back Next →

## Precedent search

Enter case details to find comparable precedents

⚠ Ex-Aequo provides comparative and statistical support for sentencing; the final decision remains entirely at the discretion of the judge.

🔗 Legal qualification — 📄 Circumstances — ⚖️ Sanctioning hypotheses

Mitigating circumstances

Aggravating circumstances

Description of circumstances to be considered in sentencing

Enter here the detailed description of the circumstances you intend to consider for the purposes of sentencing...

← BackNext →

The search query submitted to Ex-Aequo enables the algorithm to identify, within its internal database, all prior judicial decisions containing circumstances analogous to those described through the narrative account of the facts, together with the corresponding sentencing outcomes. The screenshots below illustrate a hypothetical search concerning sentencing outcomes and the circumstances considered relevant by previous courts for the offence of theft.

The most significant feature of Ex-Aequo lies in the fact that it does not merely return the sanction imposed in comparable theft cases. Rather, the system provides a percentage-based measure of similarity between cases, assessed by comparing the circumstances already evaluated in prior judgments with those entered by the judge who must sentence the defendant in the case at hand. In addition, the platform offers a structured overview distinguishing between circumstances that fully coincide in both cases, circumstances present only in the previously decided case, and circumstances present exclusively in the

## Opinioni

judge's current query, which therefore constitute the distinctive elements of the matter requiring adjudication.

From a sentencing perspective, Ex-Aequo also indicates, for each precedent contained in the database, the penalty imposed under those specific circumstances. Furthermore, through its "statistical report" function, the system provides the concrete sentencing range adopted by courts in the comparable cases stored in the database, the most frequently imposed sanction, the average sentence applied, and the statistical distribution of penalties.

In other words, it reveals how often judges selected one sentencing range rather than another, thereby offering an empirical overview of prevailing sentencing practices.

The screenshot displays the 'Comparative results' interface. At the top, it shows the search criteria: 'Theft' and 'Ordinary offence', with a note that 9 precedents were found. A warning message states: 'Ex-Aequo provides comparative and statistical support for sentencing; the final decision remains entirely at the discretion of the judge.' Below this, there are two tabs: 'Comparable precedents' (selected) and 'Statistical report'.

The first comparison is for a case with 'Theft' and 'Ordinary offence' (65% similarity). The judgment is No. 567/2024, dated 22 May 2024, with a sentence of 2 years and 6 months. The coinciding factors are: 'Type of offence' (Type of offence), 'Mitigating circumstances' (Mitigating circumstances), and 'Valued circumstances' (The defendant unlawfully entered the victim's home during nighttime hours, taking jewellery and cash. Precedents specific to offences against property. No mitigating circumstances recognised). The differences are: 'Only in current case' (None) and 'Only in precedent' (Aggravating circumstances).

The second comparison is for a case with 'Theft' and 'Abbreviated procedure' (45% similarity). The judgment is No. 89/2024, dated 10 Jan 2024, with a sentence of 8 months. The coinciding factors are: 'Type of offence' (Aggravating circumstances) and 'Valued circumstances' (The defendant unlawfully entered a commercial establishment, taking goods and cash. Precedents specific to offences against property). The differences are: 'Only in current case' (Ordinary procedure) and 'Only in precedent' (Abbreviated procedure, Mitigating circumstances).

### Comparative results

Theft Ordinary offence 9 precedents found

← Edit search Confirm and save →

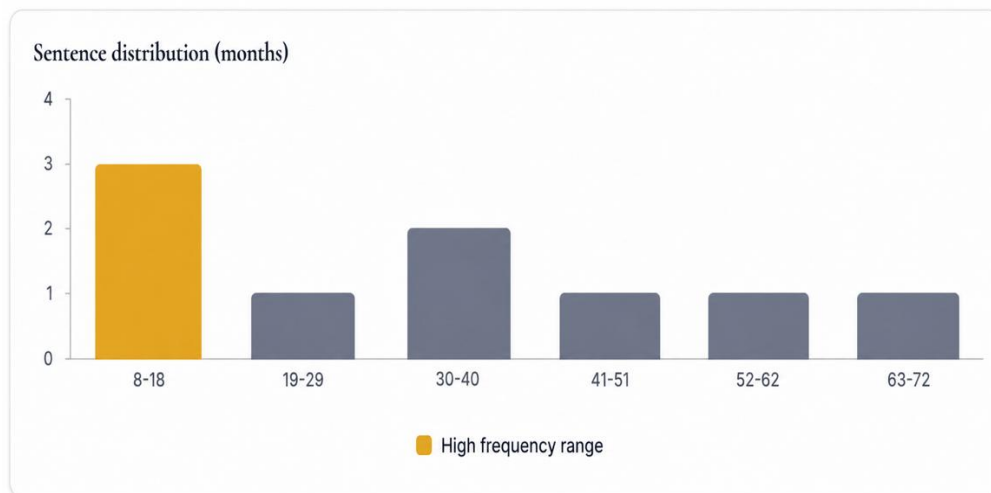
⚠ Ex-Aequo provides comparative and statistical support for sentencing; the final decision remains entirely at the discretion of the judge.

☰ Comparable precedents 📊 Statistical report

📄 Mean 2 years and 8 months	📊 Median 2 years and 6 months	🎯 Mode 2 years and 6 months	↗️ Range 8 months - 6 years
--------------------------------	----------------------------------	--------------------------------	--------------------------------

🎯 High-frequency range  
**8 months - 1 year and 6 months**  
3 cases out of 9 (33%)

Analysis based on 9 comparable precedents



Once the judge has been able to compare the preliminary sentencing inclination, which, as previously noted, had to be entered before the search for analogous precedents, with the sentencing outcomes adopted in comparable cases previously decided by other courts, the system invites the judge to make a final determination as to the appropriate penalty. This stage is illustrated in the final screenshot below.

## Opinioni

The underlying rationale is that, having considered the circumstances that characterised similar precedents together with their corresponding sentencing outcomes, the judge may be better placed to individualise the sanction in light of the more nuanced features of the case at hand. In this way, the system seeks to support a more refined and context-sensitive exercise of judicial discretion, while reducing the risk that sentencing decisions be unduly influenced by round-number preferences or other well-documented cognitive biases<sup>9</sup>.

### Final sentence and decision data

---

#### Imprisonment sentence imposed

YEARS MONTHS DAYS

Minimum: 15 days  
Leave at zero if only a fine is provided

---

€ Fine (fine / penalty)

---

Date of decision  Decision reference

Judicial office

Final notes

In conclusion, in the two scenarios outlined above, artificial intelligence may prove to be an important instrument of knowledge, awareness, and accessibility in relation to judicial data. If the information contained within algorithmic databases of precedents is made available not only to judges, but also to citizens, scholars, and legal practitioners, it may generate a virtuous dynamic of legal understanding while enabling a more pervasive form of scrutiny over how justice is administered “in the name of the people.”

---

<sup>9</sup> See D. KAHNEMAN–O. SIBONY– C. R. SUSTEIN, *Rumore. Un difetto del ragionamento umano*, italian translation by Gallitelli, Milanofiori Assago, 197 ff.

At the same time, these potential applications of AI within criminal justice must be assessed in light of the legal framework governing the jurisdiction concerned. In Europe, for example, the AI Act requires that artificial intelligence operate solely as a support to judicial activity and never as a substitute for human decision-making. Moreover, within the criminal justice sphere, AI systems are generally regarded as high-risk applications and, accordingly, may operate only if they satisfy a range of technical and legal safeguards, including the quality of the underlying data, transparency regarding the functioning of the algorithm, and the effective possibility of human intervention.

Subject to these conditions, AI systems may constitute a valuable aid to criminal justice, enhancing the informational basis of adjudication while preserving the centrality of human judgment.

### 3.- *The Metaverse for the Sustainability of Criminal Justice*

The first reference to the Metaverse is literary in origin, tracing its roots to the novel *Snow Crash* by Neal Stephenson, published in 1992. In that work, the Metaverse is depicted as a fully developed digital universe, structured through streets, buildings, clubs, and commercial spaces, within which individuals may move through their own avatar, namely a three-dimensional representation of the self. It is conceived as a parallel reality in which one may become something other than what one is in the physical world<sup>10</sup>.

Today, the Metaverse is generally understood as a digital architecture capable of recreating digital twins of real-world environments<sup>11</sup>. The parallel universe thus generated within virtual reality may be explored through an avatar, that is, a digital counterpart of the human agent capable of moving within the Metaverse by means of VR headsets. In this respect, the Metaverse may be characterised as a digital ecosystem endowed with significant simulation capacity, capable of reproducing almost every sphere of human activity.

Its distinctive features lie both in this expansive replicative potential and in the immersive experience it provides through virtual-reality devices and the use of a digital alter ego through which the user navigates the virtual environment.

It is precisely this capacity, combined with the possibility of relocating human activities to a digital environment that may be easily accessed through an ordinary computer workstation, that renders the Metaverse potentially valuable for the sustainability of criminal justice<sup>12</sup>. A preliminary clarification is, however, required. Sustainability, as employed in the present context, is understood primarily in economic terms, namely as the pursuit of

---

<sup>10</sup> See A. G. PARISI, *Metaverso e Intelligenza Artificiale*, Giappichelli, 2025, 3.

<sup>11</sup> See M. DIETZ-G. PERNUL, *Digital Twin: Empowering Enterprises Towards a System-of-Systems Approach*, *Business & Information Systems Engineering*, 62(2)/2020, 179-184.

<sup>12</sup> To assess, conversely, the use of the Metaverse for the commission of criminal offences, see F. DE SIMONE, *Il locus commissi delicti nel Metaverso: eterotopia o non lieu?*, *De Iustitia*, 2023 and S. A. FERRO, *Delitti commessi nel Metaverso: un terreno scivoloso dai contorni repressivi*, *Iura and Legal System – Special Issue: “Ubi Robots Ibi Ius? Le sfide dell’intelligenza artificiale al diritto”*, 3/2025, 259-270

## Opinioni

greater efficiency within the criminal justice system through the reduction of timeframes and associated costs.

This perspective acquires particular relevance in an era marked by recurring energy instability linked to ongoing geopolitical conflicts, in which several countries have already contemplated the possibility of energy lockdowns or comparable emergency restrictions. In such circumstances, technological infrastructures capable of preserving institutional continuity while reducing physical and logistical burdens assume increasing significance. At the same time, the present approach does not purport to resolve, still less to eliminate, the need to balance technological innovation against the fundamental guarantees of due process in criminal proceedings. Principles such as orality, immediacy, and the symbolic solemnity of the spaces in which criminal justice is administered remain central components of the judicial function. Any recourse to immersive technologies must therefore be assessed within a framework that preserves the essential safeguards of a fair trial while exploring opportunities for greater procedural sustainability<sup>13</sup>.

Within the limits of the perspective outlined above, the Metaverse may prove to be an instrument of considerable efficiency and economic rationalisation for criminal justice. First, it may enable criminal hearings to be conducted within digital Metacourts, thereby reducing or eliminating the need for physical attendance at traditional courthouse premises. Subject to certain inevitable approximations arising from the digital stylisation of reality, virtual courtrooms recreated in the Metaverse may nonetheless reproduce aspects of the solemnity, symbolism, and formal structure traditionally associated with judicial spaces.

In such a framework, witnesses, defendants, counsel, and judges may participate remotely, thereby reducing travel time, physical fatigue, and related logistical burdens. The resulting benefits may include lower financial costs, reduced environmental impact, and diminished energy consumption when compared with the conventional model requiring all procedural actors to gather in a single physical location.

The countervailing consideration, however, lies in the potential loss of authentic and unmediated interpersonal perception between the judge, or jury, and defendants or witnesses. Participation through an avatar may make it more difficult to perceive subtle behavioural cues: the blush of a witness who is being untruthful, the arrogance of a defendant, or, conversely, signs of remorse. For these reasons, many jurisdictions do not yet permit the fully delocalised conduct of criminal hearings, often requiring at least that the judge participate physically from the bench within the courthouse.

A particularly promising field of application for Metacourts, by contrast, concerns legal education and professional training. Through the simulation of trials within immersive digital courtrooms, trainee lawyers may refine their advocacy techniques in a highly realistic procedural environment before entering actual court practice. In this way, Metacourts may foster greater awareness of the practical skills required for effective criminal defence, including oral advocacy, strategic reasoning, and case preparation.

---

<sup>13</sup> See B. GALGANI, *Innovazione tecnologica e tradizione personalistica. Dalla partecipazione “a distanza” alle cc.dd. “Metaverse Courtrooms”?*, *Archivio penale*, 2/2023, 1-18.

An experiment of this kind was conducted in 2023 at the School of Law of the University of Salerno, involving students from the campus in a simulated trial within a digital Metacourt. Beyond the unsurprising enthusiasm generated among participating students, the exercise produced a marked improvement in oral advocacy and case analysis among those required, through their avatars, to assume the role of prosecutor or defence counsel before a criminal court composed of professors from the School of Law.

A further and potentially valuable application of the Metaverse within criminal proceedings lies in exploiting its simulation capacity to reconstruct a factual scenario and submit its plausibility to judicial scrutiny through the immersive representation of an alternative narrative of events<sup>14</sup>. Such an approach cannot, of course, aspire to become proof of how the facts actually occurred. At most, its function would be to assist the judge or jury in assessing whether a reasonable doubt may arise concerning the prosecution's reconstruction when compared with a plausible alternative scenario reproduced within a virtual environment.

By way of illustration, consider a case in which a judge remains unconvinced that the defendant injured another person while acting in lawful self-defence, allegedly compelled to react to the imminent threat of aggression because the injured party had approached in an excessively close and hostile manner. In such circumstances, the dynamics of the event, as emerging from the testimonial evidence gathered during the proceedings, could be reconstructed within the Metaverse. Through the use of VR headsets, the judge might then experience the reconstructed scene from the defendant's perspective, thereby directly perceiving the intensity and immediacy of the sense of danger invoked by the defence.

This perspective should not be regarded as excessively remote from practical reality. Comparable experiments have already taken place in the United States<sup>15</sup>, demonstrating that immersive technologies are increasingly capable of entering evidentiary and adjudicative settings. Moreover, the possibility of accessing such digital judicial experiments with lower costs may encourage a fuller examination of alternative hypotheses advanced by defence counsel. In this respect, immersive reconstructions may enrich adversarial proceedings and, if properly regulated, become an instrument for strengthening rather than weakening the guarantees associated with a fair trial.

Finally, the digital ecosystem of the Metaverse may facilitate recourse to restorative justice pathways. As is well known, Restorative Justice represents a distinct paradigm of justice in which the traditional binary relationship between the State and the defendant, ordinarily culminating, upon a finding of responsibility, in the imposition of punishment, is replaced by a more plural and dialogic framework<sup>16</sup>. Within that framework, the of-

---

<sup>14</sup> See N. GALLO, *Esperimenti giudiziari nel Metaverso. Nuove prospettive per un istituto inattivo*, Archivio penale, 2/2024.

<sup>15</sup> See L. DANIELS, *Historic First-Judge Dons Oculus VR Headset To Experience Crime*, Forbes, 6 January 2025.

<sup>16</sup> See F. PALAZZO, *Plaidoyer per la giustizia riparativa*, Sistema penale, 2023.

## Opinioni

fender is placed in direct contact with the victim through the assistance of qualified mediators, with the aim of addressing the “harm” generated by the offence through instruments other than punishment alone, including dialogue, acknowledgment, apology, and, where possible, forgiveness.

Such alternative responses to the conflict created by crime may (*rectius*: may in the future if adequately implemented) contribute to the sustainability of traditional custodial systems, insofar as imprisonment would become necessary only in a more limited category of cases: namely, those in which restorative justice cannot satisfy legitimate penal expectations, or in which restorative processes fail to achieve meaningful outcomes. By reducing the number of criminal proceedings resolved principally through punitive sanctions, the system may also enhance the effectiveness of punishment where its use remains necessary.

The success of restorative justice, however, depends upon a broader cultural transformation within criminal justice institutions and among their participants, beginning with victims themselves. It cannot be assumed that victims will readily agree to confront the person who caused them harm, particularly given the emotional burden that such encounters may generate. It is precisely at this point that immersive technologies may offer a constructive contribution.

One may envisage restorative encounters between victim and offender taking place, at least in an initial phase, within virtual environments such as the Metaverse. Such settings may permit a less immediate and emotionally overwhelming form of interaction, aided by the physical distance separating participants. At the same time, through VR devices and a controlled simulated environment, they may provide a meaningful first point of contact within a secure space in which a gradual process of engagement and reconciliation can begin.

The potential value of this model lies not in replacing the human dimension of restorative justice, but in creating conditions under which that human encounter becomes more feasible. If appropriately designed and carefully supervised, virtual restorative environments may lower psychological barriers to participation, widen access to mediation processes, and strengthen the practical viability of restorative justice as a complementary response within contemporary criminal justice systems.

### 4.- Conclusion

In conclusion, artificial intelligence presents a number of promising opportunities for enhancing knowledge, participation, and operational efficiency within criminal justice systems, while also contributing to their sustainability in economic terms. At the same time, the immersive capacity of the Metaverse, if appropriately harnessed, may revitalize procedural instruments that have become underused because of financial costs or organizational constraints, and may further facilitate the development of restorative justice pathways within “virtual comfort zones” designed to encourage meaningful engagement.

These possibilities, however, depend upon an indispensable premise: the recognition of artificial intelligence as a tool serving human purposes rather than as an alternative model

of intelligence. This distinction is not merely semantic. It concerns the normative architecture within which new technologies are introduced into institutions charged with the administration of justice.

To regard a mathematical model that generates statistically plausible outputs by reference to a queried dataset as genuinely “intelligent” risks fostering a dangerous illusion. Such systems may display remarkable efficiency, linguistic fluency, and predictive utility, yet these capacities should not be confused with understanding, moral judgment, or responsibility. As has been observed in other contexts, technological performance may too easily create unwarranted confidence in capacities the system does not in fact possess.

The challenge, therefore, is not to resist innovation, but to integrate it without surrendering the primacy of the human decision-maker. Criminal justice systems are ultimately grounded not only in accuracy or efficiency, but in accountability, dignity, and reasoned judgment. These remain irreducibly human attributes. Ensuring that technology supports rather than supplants them is essential if innovation is to strengthen, rather than erode, the original and distinctive role of the person at the centre of justice.