



A Comparative Analysis of Algorithmic Sentencing and the Right to a Reasoned Order and Due Process in India

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ABSTRACT

The inclusion of Artificial Intelligence (AI) into criminal sentencing, specifically through Risk Assessment Instruments (RAI) like COMPAS, threatens and challenges the constitutional principles of Due process and Right to a Reasoned Order. These tools that are proprietary trade secrets are constitutionally inadequate and violative of "Due process of law" under Article 21 of the Indian Constitution. This study provides a comparative analysis of the landmark US case *State v. Loomis* (2016), where the Wisconsin Supreme Court upheld the use of opaque algorithms provided they carry a "warning label" as a procedural safeguard regarding their potential bias and limitations. The court relied on narrow standards of procedural due process that is fundamentally incompatible with India's broader doctrine of Substantive Due Process, laid down under Article 21 in *Maneka Gandhi v. Union of India*.

The central argument of the research is to highlight critical areas where the Risk Assessment tool fails the Indian constitutional tests. First, it violates the "Right to a Reasoned Order", a judge relying on a trade-secret score cannot explain the reasoning behind a sentence, rendering the judicial order void for non-transparency. Second, it constitutes an "abdication of judicial function," as the reliance on a private corporation's secret formula amounts to the non-application of the judicial mind. Finally, the paper argues to prove that shielding algorithms as trade secrets fails the test of "fair, just, and reasonable" procedure. Indian jurisprudence prioritizes the Fundamental Right to Liberty over commercial secrecy. The paper concludes that without full open-source transparency, the use of such tools in Indian sentencing is inherently arbitrary and unconstitutional.

Introduction

The convergence of advanced computing technologies and the administration of criminal justice has led to a new era in global legal history. At the heart of this transformation is the integration of Artificial Intelligence (AI) and Machine Learning (ML) into the sentencing process, primarily through Risk Assessment Tools (RATs), such as the Correctional Offender Management Profiling System for Alternative Sanctions (COMPAS) and the Public Safety Assessment (PSA). These tools are presented as objective mechanisms designed to help judges address the complexities of predicting recidivism, flight risk, and public danger. However, the implementation of such tools within the judiciary has triggered a huge constitutional crisis, particularly concerning the fundamental principles of due process and the right to a reasoned

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judicial decision.³ Indian legal landscape is anchored upon the highly expansive and human-centric interpretation of personal liberty under Article 21 of the Constitution. Therefore, the use of opaque, proprietary algorithms presents a challenge that is fundamentally incompatible with established constitutional jurisprudence.⁴

The core of this research revolves around the tension between the perceived efficiency of algorithmic governance and the non-negotiable requirements of constitutional morality. RAIs are marketed as evidence-based solutions to sentencing disparities and the age old problem of judicial backlogs, which in India currently exceed five crore cases. Their internal logic is a black box shielded by commercial trade secret protections. This lack of transparency creates a vacuum in the reasoning process. How can a judge relying on a score produced by a private corporation's secret formula directly leads to deprivation of Right to a reasoned order.

From the perspective of Indian constitutionalism, this is not merely a technical obstacle; it is an unconstitutional abdication of the judicial function and a violation of the "Golden Triangle" of Articles 14, 19, and 21. These Articles collectively guard against arbitrary state action and stand right at the foundation of Right to Liberty. This study seeks to provide a comprehensive comparative analysis of this algorithmic turn, contrasting the narrow procedural standards of the United States with the robust substantive due process requirements in India. This paper argues that without absolute open-source transparency, algorithmic sentencing remains an inherently arbitrary exercise of power.

The Theoretical Framework of Algorithmic Sentencing and Risk Assessment

To understand the constitutional challenges posed by RAIs, it is necessary to first examine the underlying technical and systemic logic in its use. Risk Assessment Instruments are predictive models that operate through that use a process of supervised machine learning. They use historical data of the offender to calculate the probability of him failing to appear in court or committing a new offense.⁵ The function is defined to map various input features—such as criminal history, age, education, and social status—to specific outcome variables. The effectiveness of these tools is predicated on function optimization. The algorithm updates its internal parameters to fit "big data" training samples, resulting in predictive accuracy rates that outstrip human intuition.⁶

However, the supposed evidence-based nature of these tools is often an optical illusion. Machine learning models are heavily conditioned by the quality of the data they are fed. They are often based on data collected for administrative purposes rather than scientific research. In many cases, this data imperfectly indicate the actual behavior they are intended to predict. For example, the data collected is frequently used as an indicator of crime, even though arrests often reflect policing patterns and systemic biases, rather than the actual commission of crimes.⁷ When this data is fed into a risk recognition (RRI) AI, the algorithm learns and

³ Journal of Contemporary Law and Society, Volume 2, Issue 4, December 2025, pp. 236-246

⁴ Comparative and Empirical Perspectives on the Judicial Practice, pp. 458 - 541

⁵ Melissa Hamilton, "Risk-Needs Assessment: Constitutional and Ethical Challenges" (2015) 52 American Criminal Law Review 231.

⁶ Jennifer L. Skeem & Christopher T. Lowenkamp, "Race, Risk, and Recidivism: Predictive Bias and Disparate Impact" (2016) 54 Criminology 680.

⁷ Hassan, Tasnimul Md, "The Perils and Promises of Artificial Intelligence in Criminal Sentencing" (2024) 19(2) Indian Journal of Law and Technology Article 1.



reinforces these biases. Thereby, recoding historical prejudices as objective mathematical certainty.

This Technological shift towards algorithmic prediction also alters the nature of judicial responsibility. Traditionally, sentencing involves a responsibility where a judge must weigh the specific humanity of a defendant's circumstances. The judge analyses every individual's circumstances including certain mitigating factors that might not be captured in a digital spreadsheet.⁸ RAIs focus on group-based probabilities. A COMPAS or PSA score does not predict what *this specific* individual will do rather it identifies how individuals in a similar demographic group have behaved in the past. This logic directly challenges the legal principle of individualized sentencing, which requires the state to treat each person based on their own conduct and merits rather than as a statistical percentage. The technical invisibility of these models makes it impossible for even the developers to provide a human-readable explanation for why a particular score was reached.⁹ This absolute opacity tends to disrupt the flows which is necessary for coordination between the rule makers and the adjudicators. The rule maker that designs the system and the adjudicator that applies it. When a judge presents a sentence based on a score they cannot explain, the judicial order is essentially unreasoned. This creates a gap in that gravely effects the legitimacy of the entire adjudicatory process.

State v. Loomis and the Warning Label Solution

The landmark American case of *State v. Loomis* (2016)¹⁰ serves as a primary point of reference for how judiciaries have attempted to positively link RAI opacity with due process rights. Eric Loomis was sentenced to six years of imprisonment based on a COMPAS risk assessment. He challenged this algorithmic sentencing process. He said that because the algorithm's methodology was a trade secret, he was denied the ability to verify its accuracy. The COMPAS uses gender as one of the factors to decide on sentencing. He thereby claimed that he was sentenced on the basis of gender thereby infringing his right to an individualized sentence and abdication judicial responsibility.

The Wisconsin Supreme Court, in a 5:2 majority, upheld the use of the algorithm. It ruled that it did not violate Loomis's due process rights so long as the court followed certain procedural safeguards. The court's solution was to mandate a written advisement or warning label that must accompany any COMPAS report in a presentencing investigation.¹¹ These warnings are intended to alert judges to the following critical limitations:

The Wisconsin court's approach relies on a narrow standard of procedural due process, where the requirement is merely that the judge be "informed" of potential bias. The defendant has the opportunity to contest the *input data* such as their own criminal history even if they cannot see the *logic* used to process that data. This warning label approach has been heavily criticized for its psychological inadequacy. Behavioral economics research suggests that judges are susceptible to anchoring bias, where the presence of a numerical score exert an influence on their judgment even if they are told the score is flawed. Furthermore, most judges lack the

⁸ Mishika Bhargava et al., "A Study On The Future Of The Indian Judiciary Through Artificial Intelligence" (2024) 30(1) Educational Administration: Theory and Practice 8270.

⁹ Laurel Eckhouse et al., "Layers of Bias: A Unified Approach for Understanding Problems with Risk Assessment" (2019) 46 Criminal Justice and Behavior 185.

¹⁰ *State v. Loomis*, 881 N.W.2d 749 (Wis. 2016).

¹¹ M.R. Mcmanus, "10 Trade Secrets We Wish We Knew", *How Stuff Works* (13 May 2015), available at money.howstuffworks.com



technical expertise to meaningfully calibrate their interpretation of an algorithm based on a vague warning study.

From an Indian legal perspective, the *Loomis* solution is fundamentally constitutionally inadequate. Indian jurisprudence, specifically through the transformation of Article 21 in *Maneka Gandhi v. Union of India*, has moved beyond mere procedural compliance to Substantive Due Process. In India, a procedure that is arbitrary, fanciful, or oppressive is void, even if it is enacted by law.⁴ To allow a person's liberty to be determined by a formula that neither the defendant nor the judge can examine would be seen in India as a failure of the principles of natural justice. It is a clear violation of the right to a fair trial. The dissent in *Loomis* by Justices Bradley and Abrahamson aligns more closely with the Indian constitutional ethos than the majority's warning label compromise.

Article 21 and Substantive Due Process

The constitutional framework governing personal liberty in India is based on Article 21, which states: "No person shall be deprived of his life or personal liberty except according to procedure established by law".¹⁴ The evolution of this single sentence represents the core of the Indian judicial revolution. In *A.K. Gopalan v. State of Madras* (1950), the Supreme Court adopted a strict approach, holding that as long as a procedure was enacted by the legislature, the court could not question its fairness or reasonableness.¹²

This narrow approach was overruled in the landmark case of *Maneka Gandhi v. Union of India* (1978)¹³. The Supreme Court ruled that any procedure affecting life or liberty must satisfy the test of being fair, just, and reasonable and non-arbitrary.¹⁴ This decision fundamentally brought the essence of the American Due Process doctrine into the Indian text of "procedure established by law. The two effectively became synonymous in practice. Thus, *Maneka Gandhi* established the interconnectedness of rights, known as the Golden Triangle.

Under Article 14, any state action that is arbitrary and lacks a rational basis or its logic cannot be explained becomes unconstitutional.⁴ An opaque algorithm cannot provide a human-understandable rationale for its output. Its use in sentencing leads to an arbitrary deprivation of liberty. The Supreme Court's recognition of the right to privacy as a fundamental right under Article 21 in *Justice K.S. Puttaswamy v. Union of India* (2017)¹⁵ adds a further layer of protection. *Puttaswamy* case established that any restriction on fundamental rights must meet the doctrine of proportionality. Thus, requiring that the measure pursue a legitimate aim and maintain a balance between state interests and individual liberty.¹⁶

When we talk about sentencing, the goal of preventing future crimes is important, but it shouldn't serve as an excuse to use secret, "black-box" software. Using an algorithm that no one can explain or challenge is a direct hit to a person's right to a fair trial.

In India, the courts have always been clear: your right to life and freedom is far too precious to be signed away by hidden math or unproven technology. We've seen this before. In the

¹² S. Bedi, *Artificial Intelligence and Constitutionalism: The Challenges in Law* (Bharat Law House, New Delhi, 2024).

¹³ *Maneka Gandhi v. Union of India*, (1978) 1 SCC 248.

¹⁴ P. Pokhariyal, A.K. Kashyap & A.B. Prasad, *Artificial Intelligence: Law and Policy Implications* (Eastern Book Company, Lucknow, 2025).

¹⁵ *Justice K.S. Puttaswamy v. Union of India*, (2017) 10 SCC 1.

¹⁶ *Advanced International Journal of Multidisciplinary Research*, Volume 4, Issue 1, January-February 2026



landmark case *Selvi v. State of Karnataka* (2010)¹⁷, the Supreme Court banned forced narco-tests and brain mapping. They decided that a person's mental and physical integrity matters more than the state's desire for a more efficient investigation.

Therefore, relying on a private company's sentencing algorithm is just a modern, digital version of that same old problem it's an unconstitutional intrusion into a citizen's life that we simply cannot afford to ignore.

Black Box and the Right to a Reasoned Order and

A Reasoned Order isn't just a formality but a mandatory requirement for judicial legitimacy in India. As laid down by the Supreme Court in *Kranti Associates (P) Ltd. v. Masood Ahmed Khan* (2010)¹⁸, the recording clear, explicit, and cogent reasons is essential for maintaining the rule of law and ensuring that justice is not only done but seen to be done. The absence of reasons indicates a non-application of mind. It renders a judicial order void as it violates the principles of natural justice.

Algorithmic tools pose a huge challenge to this requirement. They operate through complex and recursive mappings that defy standard representation in human language. This means that a judge who accepts a RAI score as the basis for sentencing is, in effect, adopting an unreasonable conclusion. If the judge cannot explain why the defendant's record of three minor offenses outweighs their stable employment history within the context of the secret formula, the court order is a mere formality devoid of substantive reasoning.¹⁹

This lack of accountability is aggravated when commercial interests are prioritized over judicial transparency. Companies that provide artificial intelligence systems often demand confidentiality agreements that prevent the court from disclosing even the variables used in scoring to the defendant. This directly conflicts with the principle that the accused has the right to examine the reasoning processes when constitutional functions, such as sentencing, are at stake.

Every AI outcome used in court should be traceable to specific legal provisions and statutes. This aims to prevent the algorithm from overriding the rule of law. When an algorithm suggests a five-year sentence instead of three but cannot explain its obiter dicta, it constitutes a systemic failure. In the Indian context, a judge must act as a moral guide, providing empathy and understanding of the context. The mechanical adoption of a probability score shows a rejection of this judicial mandate.

Abdication of Judicial Function and the Non-Application of Mind

One of the most important arguments against algorithmic sentencing is that it leads to an abdication of judicial authority. In India, the requirement that a judge apply judicial mind to each case is absolute. Courts have overturned judicial and quasi-judicial rulings that appear to have been issued mechanically. The tendency to overturn rulings based on printed forms or pre-printed stamps sets an important precedent.

When a magistrate or trial judge fills out a form without considering the specific evidence of the case, the resulting ruling constitutes an abuse of the judicial process. The RAI score functions as a high-tech printed form. If a judge accepts a COMPAS average risk score without understanding the underlying calculations, they are essentially allowing a private company's software to perform the adjudication function. This automation bias is the psychological

¹⁷ Smt. Selvi v. State of Karnataka, (2010) 7 SCC 263.

¹⁸ M/s Kranti Associates Pvt. Ltd. v. Masood Ahmed Khan, (2010) 9 SCC 496.

¹⁹ Emily Berman, "A Government of Laws and Not of Machines" (2018) 98 Boston University Law Review 1277.



tendency to accept an automated outcome as neutral and infallible. This leads to a loss of judicial nuance and consideration of mitigating circumstances.

Case law illustrating the "Non-Application of Mind" doctrine is extensive:

Case	Ground for Interference	Observation on Mechanical Orders
<i>Ankit v. State of U.P.</i> (2009)	Use of printed proforma.	Magistrate filling blanks on a court employee's template shows no judicial mind.
<i>Saurabh Dewana v. State of U.P.</i> (2010)	Ready-made seals on plain paper.	Passing judicial orders through filling gaps is a tendency to be deprecated.
<i>Sumit Khandelwal v. State of U.P.</i> (2018)	Routine summoning.	Summoning is serious; doing so without considering material and assigning reason is illegal.
<i>X v. State Of Kerala</i> (2020)	Mechanical bail grant.	Failure to assess credibility of allegations and victim statements led to remand.
<i>Manirul Haque Sk. v. State of W.B.</i> (2007)	No legal reasoning offered.	Recorded opinions based on perversity and arbitrary casualness cannot stand.

The common thread in these cases is that judicial functions are sacrosanct and cannot be delegated, even in part, to external agencies or mechanical processes. The 2025 White Paper strictly prohibits Robo-judges for final decision-making. It asserts that the final judge must remain a human mind. If a sentencing algorithm suggests a suggestive Sentencing Score, and the judge accepts it without scrutiny, the system transitions from a living, empathetic judiciary to a mechanistic exercise. This would that reduces a human being and its mind to a percentage or score.⁹

Conflict between Trade Secrets and the Right to Liberty

The legal shield used by the developers of RAI systems is the protection of trade secrets. In India, trade secrets are generally protected through contract law (Section 27 of the contract act, 1872), the doctrine of breach of confidence, and principles of common law.²⁷ India has no separate statute for trade secrets. The 2024 Law Commission Report No. 289 proposed the Protection of Trade Secrets Bill, 2024, similar to the international standards like TRIPS.

However, Indian jurisprudence maintains a hierarchy where fundamental rights of the right to life and liberty under Article 21 are at the highest tier. Commercial secrecy cannot be invoked to suppress evidence that is essential for a fair trial. In criminal proceedings, the accused has an absolute right to access all evidences used against them. When an RAI score is presented at sentencing, the algorithm's internal methodology effectively becomes the logic of evidence. To shield this as a trade secret is to deny the accused their constitutional right to cross-examine the basis of their punishment.²⁰

²⁰ Circuit Court of Cook County, Bail Reform in Cook County: An Examination of General Order 18.8A and Bail in Felony Cases (2019), available at cookcountycourt.org



Existing balancing tests in India, such as those used by the High Court of Delhi in *Varun Tyagi v. Daffodil Software* (2025)²¹, emphasize that proprietary interests must yield when they are "unreasonable" or "violate the fundamental right of an individual".²⁷ In the specific context of criminal justice, the harm caused by wrongful incarceration or arbitrary sentencing far outweighs the potential commercial loss of a software vendor. The Supreme Court's outlawing of intrusive forensic techniques in *Selvi* based on fair trial guarantees suggests that any black box evidence that cannot be verified by the accused will be held unconstitutional. The move toward statutory protection of trade secrets in India must, therefore, be reconciled with the Public Interest and Government Use exceptions already proposed in the draft 2024 Bill. In matters of criminal sentencing, the public interest in preventing arbitrary state action and ensuring the integrity of the judicial process mandates that any such tool must be open-source and fully transparent.

Algorithmic Bias and the Social Reality of Digital Casteism in India

A critical problem that extends beyond the logics of procedure of sentencing is the threat of digital Casteism. This phenomenon occurs when algorithms trained on historical crime data inherit and amplify the prejudices of the system against marginalized communities. RAIs are not neutral. They act as mirrors of the data used to train them. In the India, if policing has disproportionately targeted certain specific castes, religions, or socioeconomic clusters, the AI will internalize these patterns as indicators of risk.

This creates a data poisoning effect, where marginalized populations are falsely labelled as high-risk. Eventually leading to harsher sentences and creating a loop of discriminatory surveillance. The 2025 White Paper explicitly warns against this Digital Caste Panopticon, mandating that attributes like caste and religion must never be used as variables for criminality.²²

The generalizability of these algorithmic tools is a huge empirical risk. A global study of the Public Safety Assessment (PSA), involving a massive sample of 215,738 cases across three diverse US jurisdictions (Illinois, Kentucky, and New Mexico), found that even a natively built tool fails to generalize consistently across different demographic settings. A tool built for a western population is scientifically and legally invalid if applied to India's unique social matrix. In order to incorporate such tools it would be required to make them go through rigorous auditing.

The Supreme Court of India has already encountered AI hallucinations in trial courts, where non-existent cases were cited to justify judicial orders. The court declared that this constitutes misconduct rather than a mere error. It signals a high degree of institutional skepticism toward unverified technologically driven content. In India, the preservation of the philosophy of justice from the logistics of law. It is the primary mandate for the future of a hybrid judiciary.

The A Well-Calibrated Machine Decision as an Alternative

While the Right to a human decision has been in international laws like the EU's GDPR (Article 22). Legal scholars argue for a different approach which is the Right to a well-calibrated machine decision.²³ This theory states that human judges are also black boxes prone to

²¹Varun Tyagi v. Daffodil Software Private Limited, FAO 167/2025, Delhi High Court..

²² Leslie Meltzer Henry, "The Jurisprudence of Dignity" (2011) 160 University of Pennsylvania Law Review 169.

²³ Chris Baird et al., A Comparison of Risk Assessment Instruments in Juvenile Justice (NCCD, 2013), available at nccdglobal.org



heuristics, noise, and implicit bias. A well-designed and a well-calibrated machine could achieve lower error rates and greater consistency than a human substitute.

However, for such a right to exist in the Indian context, it must be justiciable. This means that the internal mechanics of the calibration must be open to scrutiny. This requires not only transparency but also contestability. Such a machine would need to provide:

1. non-repudiable evidence of all algorithmic actions and nodes;
2. the ability to test how small changes in individual facts would alter the classification;
3. a meaningful ex post review by a human mind capable of empathy and moral reflection.

In the absence of these essentials, any attempt to transition to algorithmic sentencing is a move towards a state that violates the essence of democratic agency. The issue surrounding this shift from human to machine is more about the loss of human agency. In India, the right to a human decision is essentially the right to a reasoned mind and any technology that threatens this is constitutionally invalid.

Rulemaking Inscrutability and the Coordination Barrier

The integration of AI into sentencing is not merely an adjudicatory act. It is a form of rulemaking. When a jurisdiction adopts an RAI, it delegates the authority to create decision criteria to the data scientists and private vendors who build the tool. Katherine Strandburg's analysis of Rulemaking and Inscrutable Automated Decision Tools states that this delegation disrupts the traditional flows of explanation within the state.

In a conventional distributed decision system, rulemakers (legislatures or agencies) provide criteria that are understandable to adjudicators (judges) and subjects (citizens).¹ RAIs disrupt this because the rules they generate are so complex and interdependent that they defy practical inspection.²⁴ This creates a coordination barrier between the data scientists, who understand the math, and the subject matter experts (judges and lawyers), who understand the law.

Strandburg argues that even if a machine fits its training data perfectly, its lack of generalizability to unusual cases—cases that often characterize the most significant criminal trials—makes its rule-like character inherently suspect. In the Indian context, where the judiciary prides itself on contextual application and the "deep, empathetic weighing of circumstances," the move toward mechanical rulemaking via AI is a regression that undermines judicial independence.

Conclusion

The incorporation of Artificial Intelligence into the Indian criminal sentencing framework is not a technical inevitability. It is a choice that lies in the jurisprudential essence of constitutional morality. The comparative analysis of *State v. Loomis* demonstrate that the American courts rely on technologically limited procedural warnings. This procedural warning is fundamentally incompatible with the Indian doctrine of Substantive Due Process established in *Maneka Gandhi*. In India, the right to liberty is sacrosanct, and any procedure that deprives a person of this right must be fair, just, and reasonable.

The imposition of sentences by algorithms fails the Indian constitutional test in three crucial respects. First, it violates the Right to a Reasoned Judgment, as a judicial authority relying on a proprietary formula cannot record the explicit and compelling reasons necessary for a valid judgment and an effective appeal. Second, it constitutes an "abdication of judicial function,"

²⁴ Wisnubroto A & Nusanto TS, "Algorithmic Justice and AI Judges: Reconsidering the Due Process of Law in the Digital Era" (2025) 6(6) International Journal of Educational Research Social Sciences 100.



since delegating procedural discretion to automated scoring amounts to a failure to apply judicial judgment—an omission that Indian courts have consistently refuted in the context of printed forms and pre-printed stamps. Finally, protecting algorithms as trade secrets is unconstitutional in the realm of criminal justice, where the Right to a Fair Trial demands full transparency and the prioritization of personal liberty over trade secrecy.

For AI to have a future in the Indian judicial system, it must evolve into a support technology within a framework that includes human involvement. This necessitates a shift towards a hybrid judicial system, where tools like SUPACE and SUVAS manage the administrative logistics of the law, but the philosophy of justice remains the exclusive domain of the human judge. As the 2025 White Paper rightly concludes, technology must serve justice, not define it. Without absolute open-source transparency, mandatory bias audits to prevent "digital casteism," and the preservation of the human judge as the ultimate arbiter of the accused's humanity, the use of algorithmic sentencing in India is inherently arbitrary, unconstitutional, and a fatal blow to the rule of law.