DECIPHERING THE NEXUS OF ARTIFICIAL INTELLIGENCE AND CRIMINAL JUSTICE SYSTEM

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ABSTRACT

In the present time, artificial intelligence (AI) has shifted from being a concept found in ancient literature and science fiction to a tangible reality that greatly affects our everyday lives. This shift, like the impact of the Industrial Age, goes beyond traditional areas and impacts various aspects of our existence such as communication, transportation, finance, and healthcare. As AI progresses from following preset instructions to independently replicating human thinking, it becomes a force for change with endless possibilities. This potential for change is especially evident in the field of criminal justice systems, where the integration of AI presents complex challenges and opportunities. This article examines the diverse uses of AI in justice systems, along with highlighting concerns regarding data usage, privacy protection, accountability, and reliability.

Introduction

Artificial intelligence (AI) has long been a dream of civilization, appearing in works like Homer's Iliad, science fiction films from the 20th century, and Da Vinci's humanoid robot.[1] We now live in a time when artificial intelligence (AI) is a reality, and it is having very real and profound effects on our daily lives. Although the idea of AI started out as a fantasy, and occasionally as a dystopian future, as in Steven Spielberg's film Minority Report, which portrays a concerning use of cutting-edge technology in law enforcement. AI is changing how we live in a variety of ways, including phones, transportation, finances, and health care. Today, there is a rapidly growing consensus that artificial intelligence can revolutionize human existence across spheres in an unprecedented manner, even greater than the rise of machines in the Industrial Age.[2] While there are disparities in how different people understand and define the term *artificial intelligence* (AI), there are some agreed features that such tools and technologies must manifest. Given the human ability for thought, judgment and intention, AI reacts to stimulation in a way that is fundamentally similar to how conventional humans react.

The technology has evolved from obeying (executing) pre-designed and pre-configured codes, into a more sophisticated end product, imbued with human-like cognition. It now works not only automatically but autonomously as well. The robotic technology is now replacing humans by machines which work efficiently without any hazard to which human beings are prone. The potential of AI is endless and it is still in its evolutionary phases. It is unfolding its potential to newer areas of human activity. This is what gives it real potential to transform justice systems worldwide.[3]The introduction of AI technology in the criminal justice systems may have a number of effects on both justice professionals and the citizens who will be impacted by the process. Examples of these implications include how data is used, how privacy is protected, how systems are accountable and responsible, and how reliable they are.

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[1] Asma Idder, "Artificial intelligence in criminal justice: invasion or revolution?" *available at* https://www.ibanet.org/dec-21-ai-criminal-justice (last visited on 16-09-2022 at 10:09 PM).
[2] Vidhi Centre for Legal Policy and TCG-Crest, "Artificial Intelligence for the Indian Justice System A StrategyPaper", *available at* https://vidhilegalpolicy.in/research/responsible-ai-for-the-indian-justice-system-a-strategy- paper/ (last visited on 18-09-2022 at 6:53 AM).
[3] *Ibid.*

Definition of Artificial Intelligence

Artificial Intelligence and machine learning were thought of long ago and are not new in the race, going back to the classical age, when machine and mechanical men were well considered. Talos, under Greek mythology, was a giant animated bronze warrior who was programmed to guard the Island of Crete.[4] In 1950, Alan Turing publishes his paper on creating thinking machines. He creates a Turing Test to determine whether or not a computer can think intelligently like a human being.[5] It was followed by an important year in the invention of Artificial Intelligence - 1956 when John McCarthy, who has been credited as the father of Artificial Intelligence (AI) presents his definition of AI at the Dartmouth Conference, as "the science and engineering of making intelligent machines".[6]

Nexus of Artificial Intelligence and Criminal Justice System

The increasing capacities of artificial intelligence and its seeming competence at tasks formerly restricted to the human realm raise significant questions for the impact this technology may have on crime and criminal justice. AI technology could affect not only how crimes are committed, but also how law enforcement operates and how the criminal justice system functions. Of course, these drastic changes are not restricted to the administration of justice, as all sectors of human activity will be disrupted by AI. Criminal justice needed to be equally prepared and equipped to use technology like AI to improve crime prevention and control due to concerns about the disparities between offenders and law enforcement as the offenders are indulging in hi-tech crimes.[7]

In order to help with investigations and enable criminal justice professionals to better protect public safety, artificial intelligence has the potential to become a permanent component of our criminal justice ecosystem. Pattern recognition is crucial from the perspective of criminal justice.

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[4] Alisha, *Use of Artificial Intelligence in Criminal Justice System 1,*(BlueRose Publishers, 2021).
[5] *Ibid.*
[6] Christopher Rigano, "Using Artificial Intelligence to Address Criminal Justice Needs," *NIJ Journal 280, January 2019, available at* https:// www.nij.gov/journals/280/Pages/using-artificial-intelligence-to-address-criminal-justice-needs.aspx. (last visited on 22-09-2022 at 10:14 AM).
[7] Korean Institute of Criminology, "Artificial Intelligence in the Context of Crime and Criminal Justice A Report for the Korean Institute of Criminology" (December, 2018)., *available at* https://www.academia.edu/40999602/Artificial_Intelligence_in_the_Context_of_Crime_and_Criminal_Justice. (last visited on 22-09-2022 at 11:20 AM).

Humans are adept at identifying patterns, and through practice, we develop the ability to distinguish between many objects, individuals, complicated human emotions, facts, and circumstances on a regular basis. Artificial intelligence (AI) aims to imitate this human capability in computer hardware and software. Self-learning algorithms, for instance, use data sets to comprehend how to recognize individuals from their images, carry out complex computational and robotics tasks, comprehend online shopping habits and patterns, identify medical conditions from challenging radiological scans, and forecast stock market movements.[8]

The scope of AI in criminal justice system is varied and evolutionary. It may not be possibleto cover all the aspects which may be unwieldy. The focus will remain mainly on three areas only *viz,* AI as a legal personality; AI for crime detection and AI for crime prevention. Artificial intelligence interface is bound to raise a host of legal issues that have to be addressed some of which are precisely presented hereunder:

1. AI as a legal personality

The main question to ask when examining the legal and regulatory implications of artificial intelligence adoption is whether the current legal framework is adequate to address potential legal problems or whether new legislation is required to govern these technologies. Such as who will be held accountable for any criminal liability arising from the actions of AI. A robot or artificial intelligence program cannot currently be held liable or accountable if a third party is harmed as a result of any act or omission on the part of the program under the current legal system. For instance, let us consider a situation where a self-driven car controlled via an artificial intelligence programgets into an accident. In November, 2021, two men were killed in driverless Tesla car crash. How will the liability be apportioned in such a scenario?[9]

Personhood of an entity is an incredibly essential legal aspect in assigning rights and liabilities. Personhood can be either natural or legal and whatever comes in between are tools, instruments, agents etc. Attribution of personhood is important from the point of view that it would help

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[8] *Supra* note 6.
[9] Pramit Bhattacharya, "Core Legal Issues With Artificial Intelligence In India" *Fox Mandal Solicitors and Advocates*, *available at https://www.foxmandal.in/core-legal-issues-with-artificial-intelligence-in-india/* (lastvisited on 27-02-2023 at 8:10 AM).

identify as to who would ultimately be bearing the consequences of an act or omission. However, this is a complex scenario and involves a plethora of issues but the two most important questions that crop up in this regard and need tobe answered are? Firstly, is it possible to confer legal personality on AI? And secondly, in what way can the legal personality be conferred on AI? Thirdly, what can be the limit of liability of AI?

2. AI Forensics for Crime Detection

Crime detection is the act of attempting to ascertain whether or not certain crimes are beingor have been committed.

1) DNA Analysis

A scientific and evidence-processing perspective on AI can help the legal sector. This is especially true in the case of forensic DNA testing, which during the past few decades has had an extraordinary effect on the criminal justice system.

When committing a crime, contact with persons or items can convey biological material like blood, saliva, semen, and skin cells. The sensitivity of DNA analysis has increased along with DNA technology, enabling forensic professionals to find and use DNA evidence that was previously inoperable due to low levels, degradation, or other factors. For instance, laboratories are increasingly receiving decades-old DNA evidence from serious crimes like sexual assaults and cold instances of homicide for examination. Smaller amounts of DNA can be detected due to greater sensitivity, which makes it possible to detect DNA from many contributors even at very low levels. For crime laboratories, these and other innovations are creating new difficulties.

For instance, it may be possible to detect DNA from multiple offenders or from someone who was not involved in the crime at all using highly sensitive methods on items of evidence, raising the issue of DNA mixture interpretation and the need to separate and identify (or "deconvolute") individual profiles in order to produce crucial investigative leads for law enforcement.[10]

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[10] Nipuni Wickramarathna and E.A.T.A Fairisuriya, " Artificial Intelligence in the Criminal Justice System: A Literature Review and A Survey" *available at:*
*https://www.researchgate.net/publication/358635259_Artificial_Intelligence_in_the_Criminal_Justice_System_*

AI has the capacity to solve this problem. More advanced artificial intelligence (AI) algorithms are being created in an effort to extract DNA profiles and determine if a DNA sample was accidentally transferred or came straight from a person who was at the crime scene. But the problem here is that currently it is impossible to ascertain how this AI reaches its conclusions and thus, there can be a violation of a fundamental tenet of law that evidence must be open to scrutiny. As a result, the fundamental questions which arise are Does AI-driven DNA Analysis also qualify for admissible evidence on the analogy of DNA which is an admissible evidence? Can AI-driven DNA analysis be considered as conclusive proof of the fact established through it?

2)   Gunshot Detection

It is not uncommon for witnesses or patrolling police officers to hear "shots fired!" however, pinpointing the exact spot of the gunfire takes valuable time when each second matters. Gunshot detection software seeks to detect the occurrence of gunfire and detect the precise location of the gunshot. Acoustic gunshot detection systems typically use a set of microphones distributed over large populated areas that detect and isolate the staccato sounds of gunfire, which can be then confirmed by humans who may notify law enforcement where the gunshot went off. When police used Shot Spotter to apprehend a murderer in 2017 in Fresno, California, it had a significant impact. Authorities were able to track the murderer's whereabouts and apprehend him in 4 minutes, 13 seconds, thanks to technology.[11] Does this mean that the provisions dealing with the investigation of any crime can be dispensed with or these provisions can be supplemented by the Artificial Intelligence? Where there is a lapse in following mandatory investigating procedure, is it possible to supplement it by AI and plug the loopholes which may otherwise result in the acquittal on mere technical grounds?

3)   Digital Forensics

Finding and analyzing electronic data is the process of digital forensics. By gathering, identifying, and validating the digital data, the process aims to preserve any evidence in its most authentic form

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A_Literature_Review_and_a_Survey_N_A_Wickramarathna_1_and_EATA_Edirisuriya (last visited on 22-09-2022 at 08:45 AM).
[11] Scott Smith, Gunfire Sensors Credited with Quick Arrest in Fresno Rampage" *AP News, available at* https://apnews.com/article/us-news-ap-top-news-fresno-arrests-ca-state-wire-977b4025bc334e8ab50d24486cb9fa03 (last visited on 27-01-2023 at 8: 30 AM).

while conducting a structured investigation to retrace historical events[12] The context is most often for the usage of data in a court of law. The criminal justice and law enforcement sectors use video and image analysis to gather data on individuals, objects, and actions to aid in criminal investigations. However, video and image analysis is a very labour-intensive process that calls for a sizable investment in subject-matter experts. Due to the enormous amount of information, the quick pace of changing technologies like smart phones and operating systems, and the dearth of specialized personnel with the knowledge to process such information, video and image analysis is also vulnerable to human error.[13]

AI-based technologies give us the ability to correct such human errors and perform expert-level tasks. For facial recognition and pattern analysis, conventional software algorithms are restricted to predetermined features such as eye color, eye shape, and distance between the eyes. Beyond what humans may think of, AI video and image algorithms not only learn complex tasks but also create and establish their own independent complex facial recognition features/parameters to complete these tasks. These algorithms may be used to match faces, recognize weapons and other objects, and recognize complex events like accidents and crimes (whether they are occurring now or later).[14] The most important point is will courts be prepared to accept these developments or we have to bring necessary changes in the criminal justice system to accommodate these technological developments?

3. AI for Crime Prevention

1) Predictive Policing

Predictive policing is an application/tool that is supported by artificial intelligence technology. Investigation teams and law enforcement organizations around the world are currently using these tools to prevent crimes from happening. These programs analyze the data from the available crime records using sets of data quantities that have been processed through analytical methods. The aim is to identify the likely targets of threats to mitigate possible risks and to forecast crimes and

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[12] How We;,ll Do You Know Digital Forensics, *available at https://www.eccouncil.org/what-is-digital-forensics/* (last visited on 22-09-2022 at 09:21 AM).
[13] See Toward Mass Video Data Analysis: Interactive and Immersive 4D Scene Reconstruction, *available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7570841/ (*last visited on 22-09-2022 at 09:17 AM).
[14] *Supra* note 10.

locations which are prone to them through such data analysis. Thus, in order to achieve the objective, these tools process the large sets of policedata including historical crime data collected with the aim to flag the prospective hotbeds of crime.[15]

Once the hotbeds or likely miscreants (individuals or groups) are identified that can potentially commit a crime, the flagging is done followed by deployment of law enforcement agencies to prevent occurrence of crime. Hence, the whole purpose of these tools used in law enforcement mechanism is to tend the focus on preventing the crime from taking place on the first hand rather than curing the damage that has been caused after commission of crime. Predictive policing aims to prevent crime by providing risk assessments, but these risk assessments have risks of their own. One of the concerns that arises is since the risk analyses often lack transparency and explainability, it is not possible to weigh the crime risks to be prevented and the risks of crime prevention properly, which may lead to disproportionate intrusions with the right to privacy and violation of the related rights to equal treatment inequal cases and to protection against discrimination, stereotyping and stigmatization.

2) Bail Proceedings and Predictive Justice

India's bail laws revolve around judicial discretion. The use of judgment and discretion in bail proceedings has drawn a variety of criticisms from a variety of sources. The courts have come under fire for 'gravity' of the offense being given too much weight, according to some.[16] In 2012, the Supreme Court in *Sanjay Chandra vs. CBI* [17]held that an offense's seriousness and gravity should not be the only criteria used to deny an accused person's request for bail. While factors important to conducting an efficient investigation and whether the accused poses a flight risk should be taken into account when deciding whether to grant or deny bail. The Supreme Court recently reiterated the same in *Prabhakar Tewari v. State of U.P. & Ors*[18]. The nature and

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[15] Sahajveer Baweja, "Predictive Policing: A Criminal Justice Tool That Threatens Human Rights", *Centre forCriminal Law Studies, The Criminal Law Blog, National Law University, Jodhpur, available athttps://criminallawstudiesnluj.wordpress.com/2022/09/14/predictive-policing-a-criminal-justice-tool-that- threatens-human-rights/* (last visited on 04-12-2023 at 5:39 PM).
[16] "Alexa….Jail or Bail? Use of Artificial Intelligence in Bail Proceedings", *available at https://bharatchugh.in/2021/11/24/alexa-jail-or-bail-use-of-artificial-intelligence-in-bail-proceedings/* (last visited on 04-12-2023 at 5:54 PM).
[17] Criminal Appeal N0. 2178 of 2011).
[18] Criminal Appeal No. 153 of 2020).

seriousness of an offense should not be taken into account when conducting a risk assessment during the bail process, according to the 2017 Law Commission Report on Bail in the Code of Criminal Procedure. However, different sessions courts, high courts, and even the Supreme Court frequently disregard this legal standard in bail jurisprudence and regard the nature of an offense as a key consideration in their risk assessment.

Many people have criticized the Courts for placing an excessive emphasis on the "gravity" of the offense. Due to the lack of a statutory foundation for the Supreme Court's opinion noted in the preceding sentence, Abhinav Sekhri has contended that this discretion has grown increasingly unchecked over time. Hence, the absence of uniformity, he says- *"Till the exercise of discretion in bail remains a black-box into which we cannot peer, the only conclusion is that no procedure established by law decides how bail applications are denied or granted."[19]*

AI-based technologies have the potential to significantly influence bail jurisprudence by merging data that is already available from various parts of the criminal justice system. Empirical data is used to evaluate the "risk" of releasing an accused before trial in the artificial intelligence-based "bail algorithms" that are employed by the American criminal justice system to forecast future outcomes based on historical trends. An AI-powered tool, called COMPAS or Correctional Offender Management Profiling for Alternative Sanctionshas been used to assess recidivism risk and thus, inform parole and sentencing decisions.[20]

The UK has also employed a similar technique called HART (Harm Assessment Risk technique) to identify criminals who are most likely to commit new crimes and to recommend the level of prison monitoring that should be provided. The tool, which uses random forest forecasting (a ML technique), has been developed to aid decision-making by custody officers to predict whether suspects are at low, moderate or high risk of committing further crimes within a two-year period. It does not decide whether the suspect should be kept in custody but is intended to help police officers pick if a person should be referred to a rehabilitation programme called Checkpoint.[21]

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[19] *Supra* note 16. *See also, https://theproofofguilt.blogspot.com/search?q=%22gravity+of+an+offence%22*
[20] Fuso Jovia Bohemaa, "The impact of Artificial Intelligence on Justice Systems" *available at https://www.biodiritto.org/ocmultibinary/download/3879/45815/2/f075ebb40b0edec59574dd6d4f9ca2cc/file/paper+25.pdf* (last visited on 04-12-2023 at 6:10 PM).
[21] *Ibid.*

To lighten the load on the court, Brazil is using an AI technology named VICTOR to undertake preliminary case analysis. The tool provides document analysis and natural language processing methods to analyze the cases that are brought before the Brazilian Supreme Court. The goal of this tool is to accurately and quickly track resources that deal with issues of 'general repercussions'. This concept of general repercussion is intended to ensure that only questions that are truly relevant to the wider society are heard by the courtand exclude appeals that reflect only the unsuccessful party's unwillingness to accept defeat.[22]

While these use cases show the diversity of the application of AI in justice systems, predictive justice experiments have also raised some legitimate concerns around lack of transparency of decision making, curtailing judicial autonomy, impacting sentencing policyof the judges, balancing between law and facts, etc.

4. Improving the Efficiency of Prisons & Correctional Services

Correctional institutions play a key role in reformation of the convicts and re-integration ofthem back to the mainstream society. But nowadays it has been observed that jails are becoming prime point of criminals and mafias to plan and execute crime. Inmates are having unauthorized access to mobile phones, weapons, cigarettes etc. It's tough for the jail authorities to make a close watch on such activities. However, with the help of AI-based powered surveillance system and using UAV's, activities inside the jail premises can be closely monitored. AI based monitoring is ideal solution to:[23]

- End violence inside jail Crowd analysis

- Detection of security threats

- Detection of prison breaches or unauthorized entry.

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[22] Daniel Becker and Isabela Ferrari, "VICTOR, The Brazilian Supreme Court's Artificial Intelligence: a beautyor a beast? ", *available at: https://sifocc.org/app/uploads/2020/06/Victor-Beauty-or-the-Beast.pdf* (last visited on 22-09-2022 at 10:41 AM).
[23] Varun VM, "The Role of Artificial Intelligence in Improving The Criminal Justice System in India", *available at: https://thelawbrigade.com/wp-content/uploads/2020/04/Varun-VM-JLSR.pdf* (last visited on 22-09-2022 at 09:51 AM).

The UP Government in association with Staqu has launched AI powered video analytic solution with a 'video wall' that covers CCTV footage from all of seventy prisons of Uttar Pradesh.[24]

To accommodate the AI based surveillance system in jails, there arises a need to change the jail manuals.

Conclusion

'Artificial Intelligence' ('AI'), comprising machine-learning and other analytical algorithm- based automated systems, has become an important aspect of our lives. This technology has been used in criminal justice systems all around the world in recent years, and it has become more and more important to how justice is administered in criminal cases. Perceptions about the dependability and objectivity of technology solutions, as well as demands for cost reductions in policing and judicial services, are frequently the driving forces behind this trend. While the AI in the Indian Judiciary might still be in its nascent stage of development, across the globe AI has found a lot of inroads within justice systems. For instance, crime prediction and recidivism risk assessment tools like COMPAS (assessing recidivism risk, informing decisions); HART (forecasting reoffending criminals); VICTOR (tracking resources related to 'general repercussions,) have been introduced in U.S.A, U.K and Brazil respectively. These tools though have proved to be highly beneficial, nevertheless have invoked controversies. Linkedto this, risk assessment tools in the United States of America have been critiqued as unfairdue to the disproportionate targeting to minority individual and communities by the police. In fact, such tools have miscalculated the risk of recidivism for individual from minority versus majority communities.

Related to this, in December 2018, the European Commission for the Efficiency of Justice settled out the first ethical principles, associated to the use of Artificial Intelligence in a Charter[25], which

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[24] See This Indian startup has launched an AI led 'Video Wall' for Surveillance in India's Prisons, *available at:https://www.businessinsider.in/business/startups/news/staqu-launches-jarvis-an-artificial-intelligence-video- analytics-platform-for-india-prisons/articleshow/71955239.cms#:~:text=Staqu%20launched%20an%20AI%20powered,%2C%20viole nce% 2C%20and%20intrusion%20detection.* (last visited on 22-09-2022 at 09:54 AM).

[25] CEPEJ European Ethical Charter on the use of artificial intelligence (AI) in judicial systems and their environment, *available at, https://www.coe.int/en/web/cepej/cepej-european-ethical-charter-on-the-use-of-artificial-intelligence-ai-in-judicial-systems-and-their-environment#:~:text=The%20European%20Commission%20for%20the,(AI)%20in%20judicial%20systems.* (last visited on 04-12-2023 at 6:23 PM).

provides basic principles that can guide judicial professionals when they confront with the rapid development of Artificial intelligence in the national judicial process. Particularly, the Commission has identified five principles that must be respected in the field of Artificial Intelligence and justice: i) principle of respect of fundamental rights- make sure that the ECHR and the Convention on the Protection of Personal Data (Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data, ETS No. 108 as amended by the CETS amending protocol No. 223) fundamental rights are compatible with the design and implementation of artificial intelligence tools and services. ii) principle of non –discrimination; which implies that AI must not be used as an excuse to discriminate marginalized individuals or minority groups; iii) principle of quality and security; Use verified sources and intangible data with models created in a multidisciplinary manner, in a secure technology environment, while processing court judgments and data; iv) principles of transparency, impartiality and fairness; which means that the Data processing methods must be accessible and understandable to individuals. A balance must be struck between the intellectual property of some processing methods and the necessity for transparency (access to the design process), impartiality (absence of bias), fairness, and intellectual integrity (prioritizing the interests of justice) when tools are used that could have legal repercussions or could significantly affect people's lives. v) the principle of 'under user control' which implies that user must have a clear information about the data processing in order to make their choices. Justice system professionals should always be allowed to assess court rulings and the data that led to a conclusion and not necessarily be bound by them given the unique circumstances of each case.

The author submits that there are many ways in which the employment of AI in policing and criminal justice systems goes against the previously mentioned core principles. For instance, AI systems may be provided by private companies, which may rely on their intellectual property rights to deny access to the source code; AI systems are trained on massive datasets, which may be tainted by historical bias; resource constraints, time pressure, lack of understanding, and deference to or reluctance to deviate from the recommendations of an AI system may lead officers and judges to become overly reliant on such systems. Thus, there arises a need to introduce a comprehensive legislation in India to regulate the introduction of Artificial Intelligence in Criminal Justice System.