

BALANCING THE SCALES OF JUSTICE THROUGH ARTIFICIAL INTELLIGENCE

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Abstract

The docket of Indian judiciary, at all levels, is clogged with unmanageable numbers waiting for final disposals of the disputes. The huge pendency of the cases results from insufficient infrastructure, inadequate manpower and inefficient court management system. Artificial Intelligence (AI) techniques, like machine learning, natural language processing, expert systems, and predictive analytics, holds the potential to restructure the justice delivery process and improve the administration and governance of law in the society. Justice delivery is an important function of state. It must be equipped with the latest state-of-the-art techniques of AI for timely, efficient and effective resolution of dispute. Integrating AI into judicial system requires digitalisation of Courts and online repository of courts documentation. In almost all the states of India this task is either completed or is under way towards completion. What is needed then is to implement AI technologies to facilitate court-processes, improve judge-case ratio, assist lawyers in giving their clients AI based prediction of case outcomes, and speedy disposal of cases. The authors in the paper aim to study and map the various state-of-art AI techniques with the help of illustrative examples, from India and abroad, and assess the general applicability of AI systems in the judiciary.

I Introduction

ARTIFICIAL INTELLIGENCE (AI) is a field of science, engineering and technology which involves creation of complex algorithms, to emulate human reasoning or thought processes. From general purpose areas like perception and logical reasoning, to specific tasks such as playing chess, proving mathematical theorems, writing poetry and diagnosing diseases, AI encompasses them all.¹ But what is AI and what is the role of AI in the administration and governance of law in the legal system? In the first part of the paper, the authors will address the question by providing a realistic understanding

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1 S. Russel and P. Norvig, *Artificial Intelligence: A Modern Approach* (Prentice Hall of India Pvt. Ltd., India, 1st edn.,1995).

of AI systems and its major processes² which is reflective of the actual capabilities of the state-of-the-art AI technology. The technical aspects of the AI systems are presented in a clear and lucid language so that it is also understandable by non-technical person. The aim is to primarily understand the underlying process of current AI technology and highlight the potential and limitations of existing AI technology, so that the AI processes and techniques can be realistically utilised in the legal domain for solving real-world problems. In the later part of the paper, the authors will explicate how AI systems are being used or suggested to be used by lawyers and law firms in the practice of law; by the judges in the administration of law; and by user like ordinary people and businesses, who are governed by law.

What is artificial intelligence?

Defining AI is a challenging task, as it has no universal meaning. Some scholars have defined AI as *systems that think like humans*. Haugeland defines AI as who possess a mind and are capable of thinking.³ Bellman defines AI as automating human activities like thinking, decision-making, problem solving, learning.⁴ Other scholars like Charniak and McDermott have defined AI as *systems that think rationally* by means of computer generated models.⁵ Winston defines AI as the domain of study which deals with computer generated models that make it possible to perceive, reason and act.⁶ Other scholars have given more action-oriented definitions of AI. Primarily, when *systems that act like humans*. Kurzweil defines AI as an art of developing machines that can behave intelligibly like humans.⁷ Rich and Knight define AI as the field of study that engages in the development of machines that can perform tasks better than human.⁸ Lastly scholars have defined AI as *systems that act rationally*. Schalk off defines AI as a

2 Speculative trends associated with the growth and development of AI's, suggest that machines 'synthetic' intelligence will one day surpass human 'cognitive' intelligence and enslave the mankind. This view has been circulated in the popular media like movies and TV shows. These speculative trends give an exaggerated and often misleading view of current state of the art AI systems. Imaginative speculations often distracts the policy-makers and legal experts from taking important AI-law and policy decisions. The speculations also poses a barrier for the non-technical person to truly appreciate and employ the AI techniques in solving real-world problems. See Bilge Ebiri, "The 15 Best Robot Movies of All Time" *Vulture*, Mar. 6, 2015, available at: <https://www.vulture.com/2015/03/15-best-robot-movies-of-all-time.html> (last visited on Feb.22, 2021).

3 J. Haugeland, *Mind Design* (MIT Press Massachusetts, 1981).

4 R.E. Bellman, *An Introduction to Artificial Intelligence: Can Computers Think?* (Boyd and Fraser Publishing Company, San Francisco, 1978).

5 E. Charniak and D. McDermott, *Introduction to Artificial Intelligence* (Addison-Wesley, Reading, Massachusetts, 1985).

6 P.H. Winston, *Artificial Intelligence* (Addison-Wesley, Reading, Massachusetts, 3rd edn., 1992).

7 R. Kurzweil, *The Age of Intelligent Machines* (MIT Press, Cambridge, Massachusetts 1990).

8 E. Rich and K. Knight, *Artificial Intelligence* (McGraw-Hill, New York, 2nd edn., 1991).

field of study that develops computational models to emulate human intelligence and achieve real world tasks.⁹ Luger and Stubblefield define AI as the branch of computer science that is involved in developing automated machines that can work intelligibly.¹⁰

Upon assimilation of all the aforementioned definitions, what emerges out is a practical and useful definition of AI. Where AI can be understood as ‘using computer technology to solve problem or make automated decisions or predictions for tasks that, when thought or done by humans, typically require intelligence.’¹¹ A few illustrations will help in understanding this depiction of AI.

Researchers have applied AI technology to automate some complex tasks like playing chess, translating languages and driving automobiles.¹² What is common in these tasks with relation to AI is that, when people are entrusted with performing these activities, they employ higher-order cognitive processes associated with human intelligence.¹³ This ability of computer systems to perform complex tasks associated with human intelligence have led to create an impression that computer systems are intelligent, thus earning a reputation of AI. But is it correct to assume that an AI is really as capable as a human in performing all complex tasks? *Is AI really intelligent?*¹⁴

Is AI actually intelligent?

Computer scientist who engage themselves in automating complex tasks like translating languages, driving cars, have termed these computers systems as possessing some sort of AI. These computer systems performs complex tasks that looks very similar to that

9 R.I. Schalkoff, *Artificial Intelligence: An Engineering Approach* (McGraw-Hill, New York, 1990).

10 G.F. Luger and W.A. Stubblefield, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving* (Benjamin/Cummings, Redwood City, California, 2nd edn., 1993).

11 H. Surden, “Artificial Intelligence and Law: An overview” 35(4) *Georgia State University Law Review* 1305 (2019).

12 For instance, when a person is playing chess, he employs a range of cognitive functions including reasoning, strategising, planning and decision-making. See J.M. Unterrainer *et al.*, “Planning Abilities and Chess: A Comparison of Chess and Non-Chess Players on the Tower of London Task” 97 *British Journal of Psychology* 299, 299–300, 302 (2006). Likewise when translating a language, a person activates higher-order thinking to process context, symbols, language and meaning. S. Russel and P. Norvig, *supra* note 1. Similarly when driving a car, a person engages a variety of brain functions which includes spatial recognition, situational awareness, vision, movement and judgement. D. Shunichi, “Technological Development of Driving Support Systems Based on Human Behavioural Characteristics” 30 *LATSS Research* 19, 20–21 (2006).

13 H. Surden, *supra* note 11.

14 This becomes a pertinent field of enquiry because AI systems have generated a lot of hope for resolving real-world issues and making human lives better. J. Anderson and L. Rainie, “Artificial Intelligence and the future of humans” *Pew Research Centre*, Dec. 10, 2018, available at: <https://www.pewresearch.org/internet/2018/12/10/artificial-intelligence-and-the-future-of-humans/> (last visited on Feb. 22, 2021).

when performed by a human, from the outside, but it employs a completely different ‘synthetic’ process for problem solving, from inside.¹⁵ When people hear the term AI they misconceive AI systems as thinking machines, which produces results through an application of some sort of ‘synthetic’ cognitive ability that matches or surpasses human-level thinking.¹⁶ By contrast the reality is that these systems apply heuristics, *i.e.*, they detect patterns in the given data and use knowledge, rules and logic which are specifically coded into them by people, in computer readable language, to produce automated results.¹⁷ Through these computational techniques, the system is able to perform complex tasks and produce intelligent results, which when done by human would require higher-order cognitive skills. However the computational mechanism followed by the AI system does not match the mechanism employed by humans,¹⁸ while doing cognitive functions.

The AI makers and developers have since long had the vision of making a Strong Artificial General Intelligence (AGI) which can surpass the human-level cognition¹⁹ and can engage in arbitrary conversations about abstract topics like philosophy, can comprehend concepts and ideas, and can perform broad spectrum of functions that are associated with human intelligence.²⁰ But these aspirational ideas have long since fuelled AI makers to arrive at the current state-of-the-art AI technology, which on contrary is nowhere near achieving strong AGI. Researches in the field of AI suggest that, systems of today excel in narrow, limited settings²¹ where there are clear cut right or wrong answers like playing chess, or where there are underlying patterns and structures, like translating languages, visual recognition, speech recognition. There is

15 The word ‘intelligence’ in artificial intelligence is a misnomer, which creates an ‘illusion of similitude’ with the cognitive process of human intelligence. Computers are deduction engines that are also capable of induction, as is the case when they succeeded at mastering chess or Go. They are not capable of abductive reasoning or creating a story, and hence there are limits to their creativity. For more discussion on the topic *see* R. Logan M. Tandoc, “Thinking in Patterns and the Pattern of Human Thought as Contrasted with AI Data Processing”, *available at*:<https://www.mdpi.com/2078-2489/9/4/83/htm> (last visited on Feb. 23, 2020).

16 H. Surden, “Machine Learning and Law” 89 *Washington Law Review* 87, 89 (2014).

17 *Id.* at 89-90.

18 *Id.* at 87.

19 T. Mills, “AI v. AGI: What’s the Difference?” *Forbes*, Sept. 17, 2018, *available at*:<https://www.forbes.com/sites/forbestechcouncil/2018/09/17/ai-vs-agi-whats-the-difference/#8b957b638ee1> (last visited on Feb. 23, 2021).

20 J. Krupansky, “Untangling the Definitions of Artificial Intelligence, Machine Intelligence and Machine Learning” *Medium* Jun. 13, 2017, *available at*: <https://medium.com/@jackkrupansky/untangling-the-definitions-of-artificial-intelligence-machine-intelligence-and-machine-learning-7244882f04c7> (last visited on Dec. 24, 2020).

21 The ability of today’s AI to excel in specific, constrained, well-defined areas is sometimes referred to as “narrow” intelligence. *See* R. Desai, “Artificial Intelligence (AI)”, *Rajiv Desai: An Educational Blog*, Mar. 23, 2017, *available at*: <http://drrajivdesaimd.com/2017/03/23/artificial-intelligence-ai/> (last visited on Dec. 24, 2020).

little actual evidence which suggests that a strong AGI is anywhere possible within the realistic time frame of five-ten years, from 2019 to the next decade.²²

II AI technology: Major AI approaches

AI as a discipline is considered to be a sub-field of computer science.²³ But recent growth in AI research, indicates that AI isn't an isolated stream of computer science, rather it is an interdisciplinary enterprise which incorporates ideas, techniques and processes from various fields, like statistics, linguistics, mathematics, robotics, electrical engineering, logic, neuroscience, economics and philosophy.²⁴ AI in its truest essence, is a bundle of technologies that are compiled together under an umbrella term of 'Artificial Intelligence'. There are some major under-lying technologies that are at play, when an AI system is used to automate complex tasks like advising judges on sentencing and bail pleas, translating languages court languages and assisting lawyers in e-discovery and e-reviews of court related documents. The most successful artificial intelligence technological approaches can be classified into two broad categories: (i) logical rules and knowledge representation, and (ii) machine learning.²⁵ Let's us look into each approach in some detail.

Logical rules and knowledge representation

A major branch of AI, logical rules and knowledge representation technique is used for modelling real-world processes and phenomena in a computer readable form.²⁶ The programmer provide the machine with a set of rules which represents the underlying logic and knowledge of the activity which the machine is desired to model or automate.²⁷ The knowledge is provided deliberately to the machine before hand in a computer readable format, which is used by the machine to process and 'deductively (use and) reason about them'.²⁸

22 H. Surden, *supra* note 11 at 6.

23 B. Marr, "The Key Definitions of Artificial Intelligence (AI) That Explain Its Importance", *Forbes*, Feb. 14, 2018, available at: <https://www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/#139a6a954f5d> (last visited on Sep. 24, 2020).

24 R. Desai, *supra* note 21.

25 R. Buest, "Artificial Intelligence Is About Machine Reasoning—or When Machine Learning Is Just a Fancy Plugin" *CIO*, Nov. 3, 2017, available at: <https://www.cio.com/article/3236030/artificial-intelligence-is-about-machine-reasoning-or-when-machine-learning-is-just-a-fancy-plugin.html> (last visited on Feb. 24, 2021).

26 H. Surden, "The Variable Determinacy Thesis" 12 *Columbia Science & Technology Law Review* 1, 20 (2011).

27 *Id.* at 20.

28 *Id.* at 21-22.

Knowledge representation is the oldest form of AI which is still in use and relevant. It is the underlying process in modern day expert systems.²⁹ A good example of such an expert system from the field of law which uses logical rules and knowledge representation system is TurboTax.³⁰ Legal expert systems, like TurboTax is created by software developers in consultation with the tax attorneys and other experts in the field of personal income tax laws, who help in ‘translating’ the meaning logic of tax provisions into a set of formal rules which a computer can use.³¹ ‘Most of the laws whether made by legislature, courts, agencies or anyone else can be understood as if-then statements’.³² Once the rule gets programmed into the system, the computer can use the rule to filter out relevant information from the data and calculate the appropriate income tax liability of the clients. This tool has been successfully used in United States and a similar tool like this is also being used in Europe to calculate the income tax duties.³³ The tax authorities also defer to the calculations made by these legal “expert systems” in their day to day proceedings.

Important features of knowledge representation system can be summarised here. First, it is a top-down approach³⁴ of programming where the programmer encodes the logical rules, ahead in time, into the computer software. This is in contrast to the bottom up approach of the ML software,³⁵ where the system trains itself to identify and use patterns for complex tasks. Second, once the rules are implemented in the system, the computer uses such rules to form deductive chains to come to non-obvious conclusion about the world.³⁶ The system also engages in complex chains of computer reasoning that is very difficult for a human being.³⁷ Third, knowledge based systems through use of power of computing can reveal hard-to-detect details- such as contradictions and

29 R. E. Susskind, “Expert Systems in Law: A Jurisprudential Approach to Artificial Intelligence and Legal Reasoning” 49 *Modern Law Review* 168 (1986).

30 *H. Surden, supra* note 26 at 78.

31 Suppose the tax code says that a person whose income is more than Rs. 15,00,000, he or she will be taxed at a rate of 30%. A programmer with the help of a legal expert ‘translate’ it into if-then computer rule which directly represents the underlying knowledge of the tax provision. IF income > 15,00,000 THEN tax rate =30%. *Id.* at 78.

32 W. Farnsworth, *The legal analyst: A toolkit for thinking about the law* (University of Chicago Press, 2007).

33 P. S. Sajja and R. Akerkar (eds.) *Advanced knowledge-based systems: Models, applications and research* (2010).

34 *H. Surden, supra* note 26.

35 *Id.* at 72.

36 *Id.* at 21-22.

37 M. Hutson, “Computers Are Starting to Reason Like Humans” *Science*, Jun. 14, 2017, available at: <http://www.sciencemag.org/news/2017/06/computers-are-starting-reason-humans> (last visited on Mar. 26, 2021).

hidden patterns in the data- which is not obviously visible to a human eye.³⁸ This makes the logical rules and knowledge representation system a very powerful tool in modern AI systems.

Machine learning

Machine learning (ML) refers to a family of AI techniques that share common characteristics.³⁹ Most of the machine learning methods employs detection of pattern in large volumes of data.⁴⁰ These patterns are then used to undertake various complex tasks and produce useful results, like driving cars, recognising faces and speech, translating languages, or detecting fraud *etc.*⁴¹ ML is a predominant approach of AI, which employs techniques like neural networks/deep learning, naive Bayes classifier, logistic regression and random forests.⁴² However the ability of AI to 'learn' does not imply that these systems are replicating the higher-order neural activities that occur in human brains,⁴³ when a person is in the process of learning. Rather the word learning is used in machine learning as a rough metaphor for human learning.⁴⁴

For better understanding of how ML works can be illustrated with the help of a very common tool that is used in our daily lives to communicate, *i.e.*, the email. Most of the email suites use ML to automatically detect spam mails (unwanted private or commercial mails) and divert them into a separate spam folder.⁴⁵ ML software uses the technique

38 See MC de Marneffe *et. al.*, "Finding Contradictions in Text", *46th Annual meeting of the association for computation linguistics: Human language technologies* 1039 (2008).

39 D. Fumo, "Types of Machine Learning Algorithms You Should Know" *Towards Data Science* Jun. 15, 2017, *available at*: <https://towardsdatascience.com/types-of-machine-learning-algorithms-you-should-know-953a08248861> (last visited on Mar. 26, 2021).

40 "What Is Machine Learning? 3 Things You Need to Know", *Mathworks: Machine Learning*, *available at*: <https://www.mathworks.com/discovery/machine-learning.html> (last visited on Mar. 26, 2021).

41 B. Marr, "The Top 10 AI and Machine Learning Use Cases Everyone Should Know About", *Forbes*, Sept. 30, 2016, *available at*: <https://www.forbes.com/sites/bernardmarr/2016/09/30/what-are-the-top-10-use-cases-for-machine-learning-and-ai/#6e7f4c3094c9> (last visited on Mar. 26, 2021).

42 M. Sidana, "Types of Classification Algorithms in Machine Learning" *Medium*, Feb. 28, 2017, *available at* :<https://medium.com/@Mandysidana/machine-learning-types-of-classification-9497bd4f2e14> (last visited on Feb. 26, 2021).

43 The word 'learning' is used in ML in a functional sense- when humans learn, they get better at a particular task through experience. In the same way, machine learn by examining more data and improve their performance over time by looking for additional patterns in it. See *H. Surden*, *supra* note 11 at 1312.

44 *H. Surden*, *supra* note 11 at 1311.

45 "Customize Spam Filter Settings", *Google*, *available at*:<https://support.google.com/a/answer/2368132?hl=en> (last visited on Mar. 27, 2021); "Overview of the Junk Email Filter", *Microsoft*, *available at*: <https://support.office.com/enus/article/overview-of-the-junk-email-filter-5ae3ea8e-cf41-4fa0-b02a-3b96e21de089> (last visited on Mar. 27, 2021).

of word probability to detect words and phrases that more often appear in spam mail, than your daily e-mails. However, for this process to kick-in, the software has to be ‘trained’. The training starts when the users receive a mail, and they are given an option to mark a mail as spam or not.⁴⁶ Every time the user marks a mail as spam, the ML software detects and analyses the patterns in mail and makes reasonable automated decisions based on its analysis.⁴⁷ The result is spam mails are automatically segregated from daily mails and is sent to spam folder without the knowledge of the user.

There two important features of ML software. First, that the software learns a pattern on its own without having a programmer explicitly program the pattern ahead in time.⁴⁸ Second, the software learns over time through analysis of more data⁴⁹ and drawing of additional patterns. This ability of the machine to learn and improve its performance overtime has been analogously compared to human learning. However it is clear from the illustration, that ‘learning’ in machine does not involve ‘replicating higher order brain function and cognitive processes of human mind’, rather it involves detection of useful patters through statistical analysis of more data.⁵⁰

One limitation of ML also emerges out from the ensuing discussion. The ML software needs data to train itself in identifying useful patterns. It depends upon large amounts of high quality, structured, machine processable data enhance its capacity and improve its performance. It cannot function well in an environment where there is little or poor quality data.⁵¹ This becomes absolutely relevant, when ML software’s are used in

46 N. Moline, “Combating Spam Emails and Contact Forms” *Justia Legal Marketing & Technology Blog* Dec. 4, 2018, available at: <https://onward.justia.com/2018/12/04/combating-spam-emails-and-contact-forms/> (last visited on Mar. 27, 2021).

47 *An instance*: Suppose that the user has initially marked 100 mails as spam. The ML software then analyses the pattern in it and finds that in almost 85% of the mails the word used is ‘Cashless Claims’ whereas the same word appears in the average mail only 15% of the time. The ML uses this pattern to create a proxy model in which ‘Cashless Claims’ becomes a statistical indicator, of the mail to be likely a spam mail. The software then implements this model to segregate all future mails. If the words ‘Cashless Claims’ appears in the mail, the ML software automatically diverts that mail into the spam folder. The machine gets better over time by examining more data and identifying additional useful patterns.

Now suppose that the ML software finds another correlating factor, in the 100 mails that were initially identified as spam, that emails originating from Angola is likely to be a spam than emails emerging from anywhere else. The ML software trains itself to draw a correlation between the existing parameter ‘Cashless Claims’ and new parameter of mails ‘emerging from Angola’. Now when a mail comes from Angola containing word ‘Cashless Claims’, the ML software will in all likelihood mark it as a spam with ‘high degree of likeness’. See generally, N. Moline, *supra* note 46.

48 H. Surden, *supra* note 11 at 1314.

49 *Id.* at 92.

50 *Id.* at 89.

51 R. Desai, *supra* note 21.

the field of law because law is one of those domains where high-quality machine processable data is comparatively scarce in public domain. However recent technological developmental efforts, relating to the digitisation of court systems⁵² and creation of online databases⁵³ in countries like India, have raised hopes for more intensive utilisation of AI systems in improving the administration and governance of law in the society.

Hybrid systems

Hybrid system as the name suggest is a combination of either ML and knowledge representation systems or its a combination of human with the AI hybrids. The authors will explore these two systems in more detail.

AI hybrid: Combination of knowledge based representation and ML

Modern AI systems today, do not use ML or knowledge representation systems separately, but, rather a combination of these two systems.⁵⁴ For example a self-driving car uses a hybrid approach of knowledge representation and ML techniques to run. The system learns to drive itself through a series of training whereby it keeps improving its performance through repeated training of appropriate behaviour.⁵⁵ However a majority of its behaviour coded into the system, beforehand by a programmer, through implicit rules and knowledge representation,⁵⁶ which the system uses to deduce what is legally and socially appropriate behaviours. For example all self-driving cars are programmed before hand to obey the road signs and signals. They are coded to stop if the signal is red and go if the signal points at green. They are also coded to use indicator lights on a turning and use horns if necessitated by the situation. Thus a successful AI system uses a mixed approach of AI techniques, including machine learning models and encoded knowledge representation rules.⁵⁷

52 ET Edit, “Move to complete digitization of courts”, *The Economic Times*, Aug. 4, 2020, available at: <https://economictimes.indiatimes.com/blogs/et-editorials/move-to-complete-digitisation-of-courts/> (last visited on Mar.28, 2021).

53 “National Judicial Data Grid”, available at: <https://njdg.ecourts.gov.in/njdgnew/index.php> (last visited on Mar. 28, 2020).

54 C. Corthell, “Hybrid Intelligence: How Artificial Assistants Work”, *Medium*, May 4, 2016, available at: <https://medium.com/@clarecorthell/hybrid-artificial-intelligence-how-artificial-assistants-work-eebfabd5334> (last visited on Mar. 28, 2021).

55 A. Sagar, “How to Train Your Self Driving Car Using Deep Learning” *Towards Data Science* Aug. 29, 2019, available at: <https://towardsdatascience.com/how-to-train-your-self-driving-car-using-deep-learning-ce8ff76119cb> (last visited on Mar. 28, 2021).

56 “Self-driving cars explained: How self driving cars work and what do they mean for future”, *Union of concerned scientists* Feb. 21, 2018, available at: <https://www.ucsusa.org/resources/self-driving-cars-101> (last visited on Mar. 28, 2021).

57 *H. Surden*, *supra* note 11 at 1313.

Human and AI hybrid

Another category of successful AI systems are those who are not fully autonomous, but rather they 'keep a human in the loop' for decision making.⁵⁸ An autonomous system is one which make all the important decisions about itself. However such a system is very rare. All modern systems AI are autonomous to a certain extent after which they defer to human judgments, when a decision making falls outside its area of competency. One such problem is a long tail problem which refers to the idea that there are so many unanticipated and extenuating circumstances while driving on the road that it is impossible to train the AI systems or encode appropriate behaviour in such cases. An illustration will give a clear meaning to the idea. Suppose a self driving car is on running on the road. Due to some road maintenance, the police has diverted all the vehicles to use the pedestrian lane to cross the section. In such a case the self-driving car is unable to make a decision. In such a situation, where the self-driving car cannot make its own decision, it can call for help to a call centre staffed by human experts.⁵⁹ The human counterpart is spurred into action, he/she assess the situation in which the car is struck by gathering data from the cars sensors, picks up the control of the car and steers it out of the situation.⁶⁰ When the situation is normal for the car to function, he/she delivers the control back the system.⁶¹ This type of system if known as human in a loop, which has lot of utility in situations where the systems is faced with choices which the system is not trained or programmed to do. Such a system is also desirable for the field of law.

Potential and limitations of AI

For optimum and best utilisation of a technology, it becomes essential to understand the strengths and weakness of it. From the ensuing discussion we can deduce the strengths as well as weakness in the state-of-the-art AI technology. This will allow us to assess what tasks AI can fulfill and where AI will fall short when the techniques and process of AI are used in the domain of law.

One thing that has to be clearly put forth is that AI, of today, is a narrow intelligence, *i.e.*, it is narrowly tailored for performing specific tasks with a particular set of

58 Ravi Mehta, "Demystifying AI: Can Humans and AI coexist to create a 'hyper-productive' HumBot organisation?" *Indian Express*, Jun. 12, 2020, *available at*: <https://indianexpress.com/article/technology/tech-news-technology/can-humans-and-ai-coexist-6453996/> (last visited on Mar. 29, 2021).

59 Alex Davies, "Nissan's Path to Self-Driving Cars? Humans in Call Centres" *Wired*, May 1, 2017, *available at*: <https://www.wired.com/2017/01/nissans-self-driving-teleoperation/> (last visited on Mar. 29, 2021).

60 M. Kumar, "Self-Driving cars to be operated from Call Centres?" *Geo* Jan. 11, 2017, *available at*: <https://www.geoawesomeness.com/self-driving-cars-operated-call-centres/> (last visited on Sept. 29, 2020).

61 *Ibid.*

characteristics.⁶² Just because a machine has automated complex tasks, like playing chess, driving cars and translating languages, it does not mean that the machine can do almost anything. What is important is to understand that different problem areas require different type of approaches and sometimes the approach used in one domain, like self-driving cars, cannot be successful in other domain, like automating legal process. Thus a blanket assumption over the omnipotent capacity of AI technology will lead us to nowhere in the real-world.

Potential applications of AI systems

AI technology works best in areas where there is underlying patterns and rules,⁶³ well defined right or wrong answers⁶⁴ and formal or semi-formal structures that make up the process.⁶⁵

AI performs speedily and with high degree of accuracy, in areas which requires computation, search or calculations.⁶⁶

AI performs well when there is availability of high quality, structured, machine processable data.⁶⁷

Limitations in use of AI systems

AI is inadequate in areas of abstract thinking, open ended discussion, policy matters which are value laden,⁶⁸ and equity oriented decision-making.

AI is inadequate in areas that require common sense or intuition or conceptualization or understanding of ideas and concepts like equality, liberty, justice, reasonableness or good will.⁶⁹

62 R. Desai, *supra* note 21.

63 B. Kleyman, "The Art of AI: Understanding Architecture and Use Cases", *Data Center Frontier* Jul. 25, 2018, available at: <https://datacenterfrontier.com/the-art-of-ai-understanding-architecture-and-use-cases/> (last visited on Oct. 1, 2020).

64 "What Is Artificial Intelligence? How does AI work?" *Builtin*, available at: <https://builtin.com/artificial-intelligence> (last visited on Mar.1, 2021).

65 I. Rowan, "The State of AI in 2020", *Towards Data Science* Jan. 27, 2020, available at: <https://towardsdatascience.com/the-state-of-ai-in-2020-1f95df336eb0> (last visited on Oct. 1, 2020).

66 S. Russell and P. Norvig, *supra* note 1 at 1.

67 R. Desai, *supra* note 21.

68 J. Byrum, "Artificial Intelligence: The values that should guide the AI revolution" *Analytics*, available at: <http://analytics-magazine.org/artificial-intelligence-the-values-that-should-guide-the-ai-revolution/> (last visited on Oct. 1, 2020).

69 J. Pontin, "Greedy, Brittle, Opaque, and Shallow: The Downsides to Deep Learning" *Wired*, Feb. 2, 2018, available at: <https://www.wired.com/story/greedy-brittle-opaque-and-shallow-the-downsides-to-deep-learning/>; R. Waters, "Why We Are in Danger of Overestimating AI", *Financial Times*, Feb. 5, 2018, available at: <https://www.ft.com/content/4367e34e-db72-11e7-9504-59efdb70e12f> (last visited on last Mar. 1, 2021).

AI performs inadequately in areas of persuasion or arbitrary conversations or court room argumentation.

AI performs poorly in domains where there is little or poor quality, unstructured data.⁷⁰

III AI systems in administration and governance of law

Artificial intelligence has a lot of potential in the administration and governance of law in the society. For countries where there are huge arrears of cases and the judiciary is overburdened,⁷¹ AI techniques could be employed to ease the burden and reduce the backlog of cases, bringing efficiency in the judicial sector. Up until now administration of law was solely a human activity, but with the increased sophistication of AI techniques like machine learning, logical rules and knowledge representation, administration of law will no more be a human activity, and those who are involved in the process will see a rapid change in their roles. With supportive new technologies like predictive coding, predictive analytics, e-discovery, e-reviews, knowledge representation, natural language processing, deep neural networks and machine learning, AI has changed the way in which lawyers practice law, judges and police administer the law and users assess their accountability towards their legal systems.

AI in law involves application of computer and mathematical techniques to make law more understandable, manageable, useful, accessible, and predictable.⁷² The use of mathematical techniques and formal rules to law was first anticipated and expounded by mathematician Gottfried Leibniz in the 1600's,⁷³ who was also a lawyer by profession. In the 20th Century, around 1970-80's, all applications of AI into law was based primarily on logical rules and knowledge representation technique, where legal rules, legislation and legal arguments were essentially modeled into computer readable language.⁷⁴ But at the start of 21th Century, in 2000's, knowledge representation techniques were supplemented by machine learning techniques of AI in the field of

70 R. Desai, *supra* note 21.

71 Report No. 245, "Arrears and Backlog: Creating Additional Judicial (wo)manpower", *Law Commission of India*, Jul. 2014, available at: http://lawcommissionofindia.nic.in/reports/report_no.245.pdf; S. Rautray, 'Arrears a concern, says Justice Chelameswar', *Economic Times*, Jan. 22, 2018, available at: https://economictimes.indiatimes.com/news/politics-and-nation/arrears-a-concern-says-justice-chelameswar/articleshow/62609506.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst; R. Bhushan, 'The fundamental reason why Indian courts have a huge backlog of cases', *CNBC*, Jan. 13, 2020, available at: <https://www.cnbcv18.com/legal/the-fundamental-reason-why-indian-courts-have-a-huge-backlog-of-cases-5045901.htm>; (last visited on Mar.9, 2021).

72 H. Surden, *supra* note 11.

73 Enrico Pattaro (ed.), *Legal Reasoning* 389-90 (Springer, 2005).

74 T. Bench-Capon *et. al.*, "A History of AI and Law in 50 Papers: 25 Years of the International Conference on AI and Law" 20 *Artificial Intelligence and Law* 215, 277 (2012).

law.⁷⁵ From then onwards, a sudden growth was witnessed in the field of AI and law, where interdisciplinary associations began between technology and law in the form of legal-tech start-ups,⁷⁶ and public and private universities started interdisciplinary courses and centres among law and technology departments.⁷⁷ This led to development of unique applications of AI techniques, in the administration and governance of law in the society. The application of AI has impacted almost all the domains of legal system—from the practice of law by lawyers, to administration of law by judges and government offices, to common usages of law by ordinary people and businesses in assessing their rights and liabilities in the legal system.⁷⁸

AI use by lawyers and legal practitioners

Lawyers have been an integral part of every legal system. They are traditionally incharge of various roles from client counselling, to gauging the strength of legal positions, to drafting contracts, complaints and other documents, to legal research and document review and analysis, avoiding risks, pursuing litigation, to name just a few.⁷⁹ Some of these tasks now face the risk of partial or complete automation by AI.

E-discovery and e-review of documents

Law firms and lawyers around the world are now employing tools of machine learning like natural language processing for document discovery and document review.⁸⁰ In modern litigation, especially in common law jurisdiction where the primary source of litigation is case precedents, the lawyers spend most of their crucial time in discovery of relevant legal documents and case laws. This is followed by reviewing documents to sort out relevant documents from irrelevant one. Traditionally it was done manually by lawyers or their juniors who did this task by a quick reading,⁸¹ which was not only

75 ICAIL 2015, “First Call for Papers”, *International Association for Artificial Intelligence and Law: ICAIL* Sept. 10, 2014, available at: <http://www.iaail.org/?q=article/icail-2015-first-call-papers> (last visited on Mar. 3, 2021).

76 D. L. Farris, “Top 5 Trends in Legal Tech and Privacy for 2019” 25 *Westlaw Journal Class Action* 15, 15 (2018).

77 See “CodeX: Stanford Center for Legal Informatics”, *Stanford Law School*, available at: <https://law.stanford.edu/codex-the-stanford-center-for-legal-informatics/> (last visited on Mar. 3, 2020).

78 *H. Surden*, *supra* note 11 at 1328.

79 “Role of lawyers in the administration of justice”, *Advocatetamoy Law Library*, Oct. 11, 2020, available at: <https://advocatetamoy.com/2019/03/14/role-of-lawyers-in-the-administration-of-justice/> (last visited on Mar. 11, 2021).

80 J. Brickell, “AI-Enabled Processes: And You Thought E-Discovery Was a Headache!” *New York Journal*, Jan. 31, 2020, available at: <https://www.law.com/newyorklawjournal/2020/01/31/ai-enabled-processes-and-you-thought-e-discovery-was-a-headache/?sreturn=202009111015817> (last visited on Mar. 3, 2021).

81 *Ibid.*

time consuming and laborious, but also was fraught with inadequacies and prone to human errors.

With the development of electronic discovery which uses machine learning techniques, predictive coding and technology assisted reviews have replaced the manual review of documents.⁸² For example ROSS, which is a legal research engine that uses artificial intelligence to automate legal processes making them more efficient and less expensive.⁸³ It uses natural language processing to search and provide legal information from citations to full legal briefs.⁸⁴ These AI tools has changed the way legal documents are analysed completely by quickly review millions of pages of contract, merger documents and others, *en masse*, in real time.⁸⁵ This saves lots and lots of man hours which can now be effectively utilised by lawyers in other areas which involves abstraction and conceptualisation, like case argumentation, court strategising, and other cognitive tasks, like client counselling, that AI technology is not good at.⁸⁶ Technology assisted document discovery and review has an implicit effect on the time-taken by the court in disposing the case. From initial filing of suits to final dispositions of the suits in the courts, the lawyers are now taking less time to prepare and present their cases before the judges, which has speed up the justice delivery process, by some significant margin.⁸⁷

Predictions on case-outcome and other related issues

Also with techniques like predictive coding and predictive analytics,⁸⁸ lawyers are predicting the success-failure probability of their clients in going to the court. Earlier lawyers used to make case predictions on the basis of their instincts and prior experience in the courtroom, which has now changed as machine-learning algorithms now make predictions about cases based upon facts and data.⁸⁹ This has helped the litigants in making informed decision about the cost of litigation, time taken from initial filing to

82 C. Yablon and N. L. Roos, “Predictive Coding: Emerging Questions and Concerns” 64 *South Carolina Law Review* 633, 634,637 (2013).

83 “The intelligent legal research choice”, ROSS, *available at*: <https://www.rossintelligence.com> (last visited on Mar. 4, 2021).

84 *Ibid.*

85 “Demystifying Artificial Intelligence”, *Thomson Reuters*, *available at*: <https://legal.thomsonreuters.com/en/insights/white-papers/demystifying-ai> (last visited on Mar. 4, 2021).

86 *Supra* note 80.

87 *Ibid.*

88 Predictive coding and analytics. *See* B. Marr, “How AI and Machine Learning Are Transforming Law Firms and the Legal Sector”, *Forbes*, May 23, 2018, *available at*: <https://www.forbes.com/sites/bernardmarr/2018/05/23/how-ai-and-machine-learning-are-transforming-law-firms-and-the-legal-sector/#3d0d039832c3> (last visited on Mar. 4, 2021).

89 R.A. Shaikh, *et.al.*, “Predicting Outcome of Legal Cases based on Legal Factors using Classifiers” 167 *Procedia Computer Science* 2393–2402 (2020).

final disposition of the matter, success-failure probability of their case.⁹⁰

Alternate dispute resolution

The litigants are being prompted to use alternate dispute resolution (ADR) in resolving their cases,⁹¹ based upon the prediction scores generated by AI. Litigants have successfully shifted from court based litigation to AI assisted ADR and have resolved their dispute through AI-assisted ADR.⁹² This has effectively reduced the court burden without compromising on the justice needs of the society. There is a decline the number of litigants who visit the court in order to seek justice as their need for justice is being met by other ADR techniques.⁹³

AI use by judges

The possibility of using AI system to assist judges in speedily disposing off a case is being explored now all over the world. Government official systems are using AI to make substantive legal or policy decisions.⁹⁴ For countries like India, which suffer from huge backlog of cases in the judiciary,⁹⁵ the administration and governance of law and justice in the courthouses are in tatters. It's imperative to use AI systems to speed up the justice delivery process, making it more transparent and efficient, thereby reducing the arrears.

Risk-assessment of criminal defendants

There are good examples of AI techniques being used by judges in making sentences and delivering bails for criminal defendants.⁹⁶ A judge when deciding whether to release a criminal defendant on bail pending trial has to make a risk assessment if the defendant

90 D. Faggella, "AI in Law and Legal Practice – A Comprehensive View of 35 Current Applications", *Business Intelligence*, Mar. 14, 2020, available at: <https://emerj.com/ai-sector-overviews/ai-in-law-legal-practice-current-applications/> (last visited on Mar. 5, 2021).

91 R.J. Kartez, *et.al.*, "AI and its impact on future ADR", available at: https://nysba.org/NYSBA/Sections/Coursebooks/Dispute%20Resolution/2019%20Fall%20Meeting/_Panel%205.pdf (last visited on Mar. 5, 2021).

92 J. South and A. Rogers, "What might artificial intelligence mean for alternate dispute resolution?", *Kluwer Mediation Blog*, Aug. 30, 2018, available at: <http://mediationblog.kluwerarbitration.com/2018/08/30/might-artificial-intelligence-mean-alternative-dispute-resolution/> (last visited on Mar. 5, 2021).

93 D. Ashman, *The impact of alternate dispute resolution (ADR) in employment law* (2011) (Unpublished College of Technology Master Theses, Purdue University).

94 Cathy O'Neil, *Weapon of Math Destruction: How Big Data Increases Inequality and Threaten Democracy* (Crown Publishers 2016); D. Kehl, *et.al.*, "Algorithms in the criminal justice system: Assessing use of risk assessment in sentencing", 2017, available at: https://dash.harvard.edu/bitstream/handle/1/33746041/201707_responsivecommunities_2.pdf?sequence=1&isAllowed=y (last visited on Mar. 5, 2021).

95 *Supra* note 72.

96 *Supra* note 94.

is likely to re-offend or run-away.⁹⁷ For this the judges are employing AI tools to quantify a defendant's risk of reoffending or running-away.⁹⁸ The machine learning algorithm attempts to make a prediction based on past crime data, which is then presented to a judge in the form of a score.⁹⁹ Though the judges are not bound to defer to the automated scores, however these scores play an influential role in the judges' behaviour¹⁰⁰ while granting sentences or bails.

Translations of legal documents

Other good example is, AI techniques are being employed in court houses to make good quality translations of court related documents from vernacular languages to English and *vice versa*.¹⁰¹ Court houses operate primarily in their official languages, *i.e.*, English and therefore require all the documents in the same language. For most countries, including India, English is the official language of the higher courts. However the lower courts use vernacular languages to function on their day to day hearings. The 'problem of translation' arises when the case *via* appeal reaches the higher courts. Due to paucity of good translators who can translate from vernacular to English and *vice versa*, there are huge delays in resolving disputes. Judges in India have come up with an effective solution and are using AI systems to translate documents from vernacular languages into English and *vice versa*. Through natural language processing techniques, the courts have successfully translated hundreds of documents from nine vernacular languages into English and *vice versa*.¹⁰² These techniques are working between the accuracy range of 60%-80%,¹⁰³ which is likely to increase in future, because the machine learning algorithm keeps 'learning' by processing more and more high quality and structured data. The citizens of India can now easily access and read judgments from higher courts in their native, vernacular language. This AI tool has democratized access to justice by making impactful courts decisions, of the higher courts, easily accessible to common people in their vernacular language. It has also hastened the process of justice thereby improving the administration of law in the court houses.¹⁰⁴

97 *Cathy O'Neil, supra* note 94.

98 *Ibid.*

99 *Ibid.*

100 *Ibid.*

101 SUVAS "Supreme Court Vidhik Anuvad Software", *Supreme Court of India Press Release*, Nov. 25, 2019, available at: <https://main.sci.gov.in/pdf/Press/press%20release%20for%20law%20day%20celebratoin.pdf>; SUVAS "Supreme Court Vidhik Anuvad Software' translation tool India", *Deccan Herald*, 2019, available at: <https://www.deccanherald.com/national/national-politics/software-to-translate-sc-judgments-in-9-languages-784940.html> (last visited on Mar. 6, 2021).

102 *Ibid.*

103 Justice L. N. Rao, "Artificial Intelligence and Law", *Legal Empowerment Through Interaction Online Lecture Series*, Aug. 6, 2020, available at: <https://youtu.be/ZJslQwPn5AU> (last visited on Mar. 6, 2021).

104 *Ibid.*

E-analysis of legal documents

With the help of technology assisted review and predictive coding,¹⁰⁵ judges can now analyse and extract relevant information from thousands of pages of legal documents, within a matter of minutes. In India, the courts have envisaged an AI system that can sift through thousands of pages of criminal petitions and extract relevant information out of them and present it to the judges and judicial officers.¹⁰⁶ Earlier judges had to go through the documents manually which usually took a month or even more to read each and every line of the criminal petition. The AI system does this task quickly and accurately. The AI system ‘trains’ itself by analysing court judgments and learn patterns on- How a judge asks questions in a criminal case? What questions are commonly and most frequently asked in a criminal petition? How a judge is going to react in a particular case? And based upon this ‘training’ the system is able to pick out most relevant information on 150 data points from thousands of pages, and presents the concise information to a judge in not more than two-three. All this process happens in a matter of minutes which earlier used to take more than a month, when done manually. It is estimated that the application of AI system will drastically reduce the time taken by a judge in for the final determination of criminal petitions and appeals, in the courtrooms.

AI use by individuals and businesses

The third important facet of administration of law is those who are governed by it, *i.e.*, the ‘users of law’. The users of law are ordinary people, organizations, and companies that are governed by the law and use the tools of law, *e.g.*, contracts, wills, grants *etc.*, to conduct their personal and business activities.¹⁰⁷

Individual users and companies use legal expert systems, like Turbo Tax, to *calculate their tax liabilities*.¹⁰⁸ Many companies use private expert systems, like business-logic policy systems, that use computer-based rules about company affairs to *assess whether they comply with legal regulations or not*.¹⁰⁹ Government authorities are now deferring to the outcomes of these legal expert systems in their formal assessment of rights and

105 B. Marr, *supra* note 88.

106 Justice L. N. Rao, *supra* note 104.

107 H. Surden, *supra* note 11.

108 W. Farnsworth, *supra* note 32.

109 “Legal and Compliance”, *Expert System*, available at: <https://expertsystem.com/use-cases/knowledge-discovery/legal-and-compliance/>; “Expert System Achieves a World First by Enhancing Different AI Capabilities Accelerating Human-Like Language Comprehension for Text Analytics”, *PRNewswire*, May 15, 2018, available at: <https://www.prnewswire.com/news-releases/expert-system-achieves-a-world-first-by-enhancing-different-ai-capabilities-accelerating-human-like-language-comprehension-for-text-analytics-300647843.html>; (last visited on Mar. 7, 2020).

liabilities.¹¹⁰ These legal expert systems use logic based knowledge representation to help identify the violators of law.¹¹¹ Also AI is being used in *legal self-help systems*, which uses automated chatbots to provide user with answers to basic legal questions. Also users of law are using *computer generated computable legal contracts* for purposes of online trading and other trade related activities.¹¹² These contracts are expressed electronically in computer-readable languages,¹¹³ which could be executed automatically without the help of human or legal experts.

IV Challenges with the use of AI systems in the legal sector

It is important to take into consideration emerging issue with the use of AI in the legal field. The authors would briefly point out certain contemporary issues that are emerging out of the use of the artificial intelligence tools and techniques in the legal field.

Potential of learning-bias in algorithmic decision making

Many researchers have raised the issue that machines that learns patterns from data can be biased against certain group of individuals due to the biases embedded in data.¹¹⁴ For instance, a machine learning software that was used for calculating the risk of re-offence of criminal defendants, used large number of judgements from the courts. The judges gave their judgments, which were biased against a certain group of individuals from that of the other group, in a similarly situated situation. This led the machine to pick up bias from the data-set, and perpetuated it in all future automated decision making.¹¹⁵ All machine learning tools are susceptible to these learn these inherent biases in the data-set, which gets encoded in the machine during ‘training’ processes.

110 D.F. Engstrom *et.al.*, “Government by algorithm: Artificial Intelligence in Federal Administrative Agencies” available at: <https://www-cdn.law.stanford.edu/wp-content/uploads/2020/02/ACUS-AI-Report.pdf> (last visited on Dec. 7, 2021).

111 Justice L. N. Rao, *supra* note 106; D. Fracassa, “California courts look to modernise with chatbots, video tech” *San Francisco California*, May 14, 2017, available at: <https://www.sfchronicle.com/business/article/California-courts-lookto-modernize-with-11143095.php>(last visited on Mar. 7, 2021).

112 H. Surden, “Computable Contracts” 46 *UC Davis School of Law* 629 (2012).

113 *Ibid.*

114 Cathy O’ Neil, *supra* note 94; B. Boessel, “Can AI Be Problematic in the Legal Sector?” *Kira System*, Apr. 16, 2020, available at: <https://kirasystems.com/learn/can-ai-be-problematic-in-legal-sector/>(last visited on Mar. 7, 2021).

115 S. Mattu, L. Kirchner and J. Angwin, “How we analysed the COMPAS recidivism algorithm”, *ProPublica*, available at: <https://www.propublica.org/article/how-we-analyzed-the-compas-recidivism-algorithm> (last visited on Mar. 20, 2021).

Transparency and interpretability in algorithmic decision making

Also commonly referred as the ‘back box problem’.¹¹⁶ Machine learning software are designed particularly to train itself with data-sets. This changes the algorithmic design of the systems and it becomes complex as the machine starts to train itself.¹¹⁷ It so happens that ML software becomes so complex that they become unreadable, even by their own programmers, except by their input or output.¹¹⁸ This is a serious issue when it comes to making reasoned decision in law, where important questions dealing with life and liberty of an individual is at stake.¹¹⁹ It is almost impossible to give a reasoned decision of how the machine has arrived at such an outcome. This raises further questions on the transparency of algorithmic decision making, which in the opinion of the researcher, must be interpretable, explainable and transparent at the very least.

The illusion of mathematical objectivity and fairness

While the algorithmic decision making perpetuates.¹²⁰ It is generally assumed that a computer is more neutral, objective and accurate than a human. Quite contrary an AI system’s working is far more obscure and subjective than they appear to be.¹²¹ Government official, individuals and other beneficiaries of AI systems who rely on the mathematical nature of output which the systems provides them, often defer to its decision making without bothering about the processes that are involved in the system to arrive at a certain conclusion. For *e.g.*, if a machine give a result that a person has a high risk of recidivism or he is highly likely to commit a felony if released on bail, a judge will acquiesce to the systems prediction rather than apply his own mind. The judge does not even bother to inquire what parameters were being used to calculate the risk score of the criminal defendant. This raises doubts over keeping a ‘human in the loop as well’, who is placed in the loop to ascertain whether the system maintains its neutral and objective poise. But it seems that human intelligence is quite susceptible to the illusion of mathematical objectivity which the AI system creates.

116 S. Montgomery, “What’s in an Algorithm? The Problem of the Black Box”, *Tuftsobserver*, Feb. 25, 2019, available at: <https://tuftsobserver.org/whats-in-an-algorithm-the-problem-of-the-black-box/> (last visited on Oct. 8, 2020).

117 *Ibid.*

118 *Ibid.*

119 See *Loomis v. Wisconsin* (2016) 881 N.W.2d 749; Also see J. Tashea, “Courts Are Using AI to Sentence Criminals. That Must Stop Now”, *Wired*, Apr. 17, 2017, available at: <https://www.wired.com/2017/04/courts-using-ai-sentence-criminals-must-stopnow/> (last visited on Mar. 8, 2021).

120 *Ibid.*

121 *Ibid.*

Issues related to data privacy

With the development of sophisticated AI tools there is high probability of using personal information of users in ways that can intrude on privacy interests.¹²² For example natural language processing tools that are employed in translation of court related documents and other confidential resources, learns patterns and critical information about clients, judges and lawyers, which can be leveraged against them. These datasets might contain some other relevant information that are not visible to the human eyes, but can be picked up by AI system, like political affiliation, sexual orientation, and other likes and preferences, which may then be used to influence their choices and decision making.¹²³ Also tools like facial recognition which are employed by the police in surveillance at airports, railways and bus-stands¹²⁴ also raises privacy concerns about the sensitive information of the users. With the availability of rich data on social media platforms like Instagram and Facebook, these machine recognition software's have a potential to manipulate sensitive data like retina scans and other facial attributes of individual persons. Another serious concern with the facial recognition technology is the probability of misidentification of individuals leading to their wrongful convictions, which is a 'damaging prospect for our society'.¹²⁵ Such tools, without robust privacy protection policy, also hold the potential to be abused by law enforcement agencies and other governmental and private agencies for constant surveillance of the public.¹²⁶

V Conclusion

Artificial intelligence has unique abilities to perform tasks with great speed and accuracy. It holds the potential to reform the legal system, reduce arrears and backlog of cases, enhance the capacities of judges and lawyers and serve justice to the litigants' at-their-door-steps. Since the advent of modern societies, the invention of AI technologies is one of the major revolutions in the information technology sector. Its techniques, therefore, must be harnessed to improve the administration and governance of law in the society.

122 C.F. Kerry, "Protecting privacy in an AI-driven world", *Brookings*, Feb. 10, 2020, *available at*:<https://www.brookings.edu/research/protecting-privacy-in-an-ai-driven-world/> (last visited on Mar. 9, 2021).

123 I. Lapowsky, "How Cambridge Analytica Sparked the Great Privacy Awakening", *Wired*, Mar. 2019, *available at*: <https://www.wired.com/story/cambridge-analytica-facebook-privacy-awakening/> (last visited on Mar. 9, 2021).

124 D. Andone, "Police Used Facial Recognition to Identify the Capital Gazette Shooter. Here's How It Works", *CNN*, Jun. 29, 2018, *available at*:<https://www.cnn.com/2018/06/29/us/facialrecognition-technology-law-enforcement/index.html> (last visited on Mar. 9, 2021).

125 N. Martin, "The Major Concerns Around Facial Recognition Technology Nicole Martin" *Forbes*, Sept. 2019, *available at*: <https://www.forbes.com/sites/nicolemartin1/2019/09/25/the-major-concerns-around-facial-recognition-technology/#6db40cd64fe3> (last visited on Mar. 9, 2021).

126 *Ibid.*

The state of the art AI technologies have certain limitations. It is not good in dealing abstract thinking, open ended discussion, policy matters which are value laden, judgment oriented decision making. Also performs poorly in domains where there is little or poor quality, unstructured data. However, it has been very useful in areas where there is underlying patterns and rules, well defined right or wrong answers, and where there is availability of high quality, structured, machine processable data. Thus AI must be deliberately used, but with caution, in the legal systems knowing its potentials and limitations. Justice delivery institution works primarily on the 'faith and trust' of the people. The faith on Judiciary is on the precipice and the 'scale of justice' have long lost their alignment, due to the huge arrears of cases and poor court management, which adds to the long hearing of cases in the courtrooms. It is important, therefore, to 'balance the scales of justice' and re-instate the trust and faith of the people on the judiciary by making the justice delivery mechanism more efficient, reliable and transparent through the application of AI technologies.