Artificial Intelligence for Construction Dispute Resolution: Justice of the Future

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Abstract

The industrial practices have witnessed immense growth in the application of Artificial Intelligence (AI) in the field of construction. More precisely, AI applications are becoming more mundane in democratizing dispute resolution processes in construction as AI becomes prominent in its functions. Regardless of its ground-breaking contributions – for example, making the decision-making process faster, cheaper, and more predictable – this technology has significant legal implications. This research is divided into two parts: Part 1 and Part 2. The objective of Part 1 is to outline the contribution of AI in automating the court processes and supporting the adjudicative role of human judge. Then the discussion proceeds to highlight the adoption of AI in the construction industry particularly its prospects for Online Construction Dispute Resolution (ODR). The automation brought about by AI systems challenges us to reconsider fundamental questions of adjudication. Judicial decision-making is a challenging area of complexity, requiring highly advanced legal knowledge as well as cognitive and emotional abilities. Therefore, Part 2 examines the technology of AI in relation to the rule of law. It investigates the extent to which the rule of law is being susceptible as AI is becoming entrenched within society. This part of the research explores the importance of legal metaphor and analogy in reasoning with new technologies, thereafter, describing the legitimate expectations. This depiction of jurisprudential development is evaluated by assessing the role of metaphor used in 42 Malaysian case law embodying the phrase 'robot' as the equal of AI in the real world. Finally, Part 2 ensues on discussing the legal authority of AI judge to deliberate on judicial decisions. This research indicates that the turn towards AI adjudication will certainly foster the development of digitalized dispute resolution by offering efficiency and at least a glance of impartiality. However, drawing the boundaries of acceptable Judge AI requires consideration of legal and jurisprudential questions, as well as issues concerning the development of algorithm and the extent to which discretion and oversight can be preserved within the adjudication process.

Introduction
Artificial Intelligence Supporting Court Processes and Adjudicative Role of Human Judge

Artificial Intelligence (AI) has begun to pervade many aspects of the society. Digital technologies persist to emerge with tremendous reliance to Machine Learning algorithms in processing vast quantities of data and producing highly accurate predictions that consistently

outperform its human counterpart's ability to perform similar tasks (Atabekov & Yastrebov, 2018). More recent deviation in the context of technological transformation are likely to have immense implications on some human functions that have formerly been largely uninterrupted (Sourdin & Cornes, 2018). In the context of the present research, technology is already revolutionising the practice of law and may, redesign the process of adjudication by either replacing, supporting or augmenting the adjudicative role. Such changes will possibly restrict the extent to which humans are involved in producing judgments with AI progressively dealing with intricate disputes. Consequently, the latent utility of AI in the legal field and the many application domains has not gone unnoticed, with dialogue beginning to observe its repercussion to the legal system (Volokh, 2019).

Principal Building Blocks of Artificial Intelligence in Courts

Undoubtedly, Machine Learning capable of producing fully automated determination on a legal or factual question is still a trajectory than a reality. However, numerous trends in recent years have transpired, signalling movement towards materialising the adoption of automated AI adjudication. To date, the principal building blocks of AI in the courts include the digitization of court filings and processes, the introduction of algorithmic tools for partial criminal court decisions, and the emergence of online dispute resolution as an alternative to traditional court proceedings (Coglianese & Dor, 2019). In this regard, 'AI' is a general term denoting interdisciplinary field of studies centred on the development of intelligent machines encompassing Machine Learning, Natural Language Processing, Expert Systems, vision, speech, and robotic systems. Given the absence of a universally accepted definition of AI, a practical understanding of AI signifying the theory and development of computer system equivalent to human intelligence is therefore notable (Scherer, 2015). That being said, AI is an evolving concept and over the years, as machines become more proficient, routine tasks and functions once measured as integral to AI are aloof from the definition and no longer perceived to be a novelty, permitting the field to peruse on the prominence and complex functions of intelligence (Miller, 2019).

AI adjudication used in the context of the present research is deliberated on its ability to disrupt judicial function that time was, the realm of human activities. Sourdine articulates three manners in which technology is already reforming the justice system (Sourdin, 2015). At the early stage, supportive technologies assist in informing, supporting, and instructing stakeholders involved in the justice system through the provision of legal support and services online aided by the growth of virtual legal firms. This phase is then advanced to replacement technologies capable of substituting functions and activities that were previously carried out by humans via web-based information, video conferencing, teleconferencing, email and other telecommunication technologies that may replace physical in court interaction (Soars, 2016). Ultimately, the third phase represents the integration of disruptive technologies that are potential of viably transforming the way that judges function and provide for very distinct forms of justice, particularly where processes vary significantly and predictive analytics is a determinative tool (Sourdin, 2015).

In this setting, a sophisticated AI-supported advice offers options and alternatives as well as a different form of engagement. Contrary to the traditional decision-making deliverables, this technological advancement is programmed to promote the development and enhancement of several outcomes rather than singling out a specific one (Sourdin & Cornes, 2018). It is at the latter phase that issues pertaining the implications of technology on the role and function of judges surfaced inasmuch as the adjudicative function is concerned.

Within the legal framework, AI adjudication entails an array of opportunities from the ever-increasing use of technology in legal and judicial processes preceding to trial, all the way through to performing a prominent role in court and decision-making practices. There are already evidence of AI advising human decision-making in the justice sector. For authorities in the United States and the European Union, the fascination over AI has manifested in the use of a series of digital tools, the digitisation of courts and the incorporation of semi-autonomous risk assessment tools as part of bail, sentencing, and parole decisions procedures (Siboe, 2020b). AI use cases in Austrian justice include digital and physical mail income, digitization assistant of existing analogue files, analysis and preparation of investigation data and anonymisation of court documents (Stawa, 2020). In Mexico, the Expertius system is informing judges and clerks relating to the determination of pension eligibility for the plaintiff (Carneiro et al., 2014). France in the same vein, invested in the so-called "predictive justice" applications in civil and criminal matters (Council of Europe, n.d.). England and Wales on the other hand, focus on optimising data science to transform legacy data into an understanding of users to help redesign judicial services (Grove, 2018). Existing studies on decision outcome prediction adopting predictive analytics development and natural language technique in the judicial sector obtained spectacular accuracy rates of 70-80 percent, albeit containing important limitations (Re et al., 2019). The impacts of these technologies are currently emerging in some civil disputes, forecasted to have more significant future impacts, particularly in the criminal jurisdiction.

Artificial Intelligence in the Construction Industry

Construction disputes are prevailing and vary in their nature, size, and complexity. The complexity delves in the orchestration of numerous interdependent components including information, materials, tools, equipment, personnel working for independent engineers, contractors, and providers (Soni et al., 2017). Construction disputes, therefore, devour considerable resources ranging from finance, personnel, time, and opportunity costs if not resolved in a timely manner. Within the field of construction and construction management, the use of AI dates back to as early as the 1990s and covers a wide range of applications such as construction scheduling and management; construction cost estimation; resource allocation; and construction litigation (Iyer et al., 2012). It has been noted the rather costly and time-consuming nature of litigation (Chaphalkar et al., 2015), thus cost-efficient alternatives are much sought after by the construction industry. With the advancements made in the field of AI, experts have opined that litigation can be avoided by utilising case-based reasoning systems as intelligent prediction tools to anticipate the outcome of construction litigation (Iyer et al., 2012). Considering the complexity of construction disputes are complicated, the prediction of its outcomes– if brought to court – would be extremely beneficial to the parties concerned. Iyer et al., (Iyer et al., 2012) notes that parties to the dispute are more likely to opt for out of court settlement if given the insight on the possible outcome ahead of time with some certainty rather than encountering the expenses and aggravation associated with court proceedings. With such prediction of outcomes, AI tools could facilitate negotiations in the shadow of the law swifter and more accurate (Rabinovich-einy & Katsh, 2021) and encourage parties to employ other alternative dispute resolution mechanisms such as arbitration and mediation in resolving the issues at hand.

Researches the multitudes of benefits associated with the use of AI in dispute resolution. For instance, AI could increase the efficacy of dispute resolution by studying third-party interventions and identifying successful ones, identifying characteristics of common

solutions to specific disputes, and identifying origins of recurring conflicts (Rabinovich-einy & Katsh, 2021). Additionally, it has been suggested AI's capability of analysing and harnessing big data efficiently and effectively may have a strategic advantage in dispute resolution as parties involved can gain a better insight on the facts disputed and ultimately make more informed choices (Sinclair, n.d.). Legal firms are increasingly employing AI-powered algorithmic tools, including those involving machine-learning algorithms, to assist in tasks such as reviewing legal documents, subsequently facilitating dispute outcome predictions (Coglianese & Ben Dor, 2020). The advantageous nature AI-based decision-making or predictions combined with ODR can facilitate a dispute resolution mode that takes away from the constraints of of time and space associated with courtrooms and even mediation or arbitration sessions subsequently improving cost-efficiency, speed, as well as convenience and access to the concerned parties (Rabinovich-einy & Katsh, 2021).

Prospects of AI within the Online Construction Dispute Resolution
Eventually, the surging of construction disputes has given rise to the remarkable progress in developing more efficient methods of dispute resolution within the construction industry, precisely in the area of Alternative Dispute Resolution (ADR) (Kolb, 2018). Correspondingly, Online Dispute Resolution (ODR) as one of the components of ADR has intrigued substantial and growing attention in academic literature. In principle, ODR implies the application of information and telecommunication technologies via the Internet to alternative dispute resolution. ODR is also described more extensively as the spectrum of alternatives for dispute resolution outside of litigation process, which is performed by communications and technological means, for the most part, the Internet (Ojiako et al., 2018) . More fully, ODR is often regarded as encompassing disputes fully or partially adjudicated or resolved using technology-mediated interfaces or rather recognized as the 'fourth party'. Formerly introduced by Ethan Katsh, the 'fourth party' depicts technology as another party sitting at the table, alongside the disputants and the third party (the neutral human, such as a mediator or arbitrator) (CIArb, 2018). The growth of ODR corroborates the development of two generations of dispute resolution approaches. The first generation represents human beings as the central focus in the planning and decision-making processes, therefore leveraging computational tools as mere equipment, non-autonomous and with minimal role in the course of action. This ODR system relies on the use of technologies like instant messaging, forums, video and phone calls, video conference, mailing lists, and more recently, video presence (Mania, 2015). While the second generation of ODR fares beyond the first generation and adopted for idea generation, planning, strategy definition and decision making. This new generation is supported by technologies that allow for an unvarying connectivity among all the entities involved, providing services with more added value. This is where AI adjudication situates to empower the ODR's predecessor, bringing a new paradigm in which reactive communication tools are used by parties to the dispute. AI adjudication offers two hallmarks of codified justice: efficiency by way of maximising resources and uniformity or elimination of bias and arbitrariness.

As to efficiency, AI adjudication is capable of mass deployment at a large scale and speed surpassing human-oriented administration processes. Drawing from Machine Learning technique, algorithmic decision-making system could resolve an indefinite number of cases and would not be daunted by time and space in the way that a human judge or a team of human decision-makers would be (Siboe, 2020). A single device could bypass the mandatory training processes, performance monitoring, securing personnel benefits and instead, prompt

adjudication for a vast number of cases, limited only by computing power and energy resources – eventually, lowering the involved cost. Since the same AI adjudicator could be deployed to resolve many disputes—certainly, as a single program is capable of solving a stretched of caseload, it would accord an otherwise futile degree of uniformity (Beatson, 2018). In this context, AI adjudication could abate, to certain extent eliminate, the arbitrariness or biasness hereditary of human judge (Re & Solow-Niederman, 2019). These emblems of AI adjudication perhaps, are expected to rise above the quandaries of Malaysian construction dispute resolution landscape. While Malaysia's construction sector remains competitive through mega infrastructure projects taking place across the country, rising disputes due to contracts clarity and payment avoidances have blemished the sector's growth impinging many parties and causing project delays. According to the statistics from the Asian International Arbitration Centre (AIAC), majority of the domestic arbitrations registered with the centre concerned the resolution of construction disputes. In the realm of statutory adjudication, the number of cases registered with the AIAC have seen a steady growth and it is expected that the number of cases registered with the AIAC will reach 1000 in year 2020 (AIAC, 2018). It is therefore not an understatement to say that a change in the law and practice of arbitration and statutory adjudication will have a significant impact on the construction ADR users and other stakeholders. Conventionally, Malaysian construction disputes are resolved in either arbitration or in the normal courts. These construction disputes are labelled with technical complexity involving mixed issues of facts and law (Fong, 2016). Both modes of dispute resolution have in recent years been increasingly criticized as inadequate and unsatisfactory by the users particularly in respect of cost and time taken to resolve the dispute. The literature review reveals a continuous development of ADR and dispute resolution methods in the Malaysian construction industry in addition to the current dispute resolution and ADR practices.

For instance, the Malaysian construction industry through the Construction Industry Development Board (CIDB) has attempted to introduce an Act called by its acronym as Construction Industry Payment Adjudication Act (CIPAA) 2012, to facilitate a faster dispute resolution mechanism for payment dispute through a statutory adjudication (Suhaimi et al., 2012). In addition, there is also an effort to continuously develop measures for the timely, cost effective and efficient disposal of court cases by introducing a specialised construction court in Malaysia (EdgeProp.my, 2014). Indeed, the practise of dispute resolution for the construction industry by diverting from the burdensome traditional litigation justifies the transformation for a speedier, cost effective and efficient legal regime through a continuous development and improvement of ADR and dispute resolution methods for the Malaysian construction industry. Seemingly, as ADR is often recognised as a faster and cost-saving alternative to litigation, AI supported ODR advances these benefits even further by offering arbitration, mediation, and negotiation online, developing a competitive advantage of data-driven justice (Kate Beioley, 2019). Despite the promises, AI has been deemed to be only as good as the data it possesses, thus its applications and accuracy will be heavily dependent on enough historical data to form a general rule that can be applied to novel scenarios in dispute resolution (Kasap, 2021). The amount of training data will play a significant role in the accuracy of any prediction (Kasap, 2021) and if said data are flawed or bias, chances are the AI will only magnify said bias rather than reducing it (Coglianese & Ben Dor, 2020). In addition to this, it has been posited that while the use of AI outcome prediction tools can predict with high degree of accuracy, concerns have arisen surrounding the lack of reasoning given in the conventional sense (Kasap, 2021). Although AI experts may be able to understand the

reasoning behind why the AI algorithm decided in favour of one party over another, the parties themselves would face difficulties in comprehending the reasons underlying the outcome (Re & Niederman-Solow, 2019). Furthermore, a growing number of literatures are currently exploring the future of the AI judge where AI tools will step into the role of the judge or arbitrator (Kasap, 2021) directly and make judicial determinations using the large volume of data available in electronic filing systems to help in making actual judicial determinations (Coglianese & Ben Dor, 2020).

The Promise of Artificial Intelligence Adjudication: A Legal Analysis
In general, the advent of AI permeates the overall function of judges in conflict resolution. This advancement is susceptible to the positioning of AI judge within the appropriate legal context as well as addressing the question of under what circumstances human judges should retain most adjudicative functions.

The Importance of Legal Metaphor in Understanding New Technologies
This research identified that a successful attempt of regulating AI adjudication relies on the ability of the legal system in identifying the right metaphor for this technology. At this background, law and technology scholarship acknowledge the significance of selecting a metaphor or analogy for emerging technologies. The selection of one metaphor over another is partly outcome determinative (Calo, 2016). In its literal meaning, a metaphor is means of achieving a rhetorical effect by objectively equating distinct concepts. Presumably, every metaphor is, in its entirety, an argument; in as much as the saying "all religions, arts and sciences are branches of the same tree," be born as confrontational, it was intended to enlist the reader or listener's imagination in arguing for a common kernel of thought (Calo, 2016). The same is apparent for metaphor's equivalent, analogy, as Justice Brandeis' famous dissent in the early warrantless wiretapping of phone lines case illustrates, convicting that the United States Supreme Court is obligated to safeguard that the "progress of science" does not erode Fourth Amendment protections as "subtler and more far-reaching means of invading privacy... become available to the Government". This is the classic example of metaphor used concerning the warrantless wiretapping of phone lines by investigating police officers as to whether it constitute a 'search' as what would initially require a warrant. The court delivered its judgment based on the understanding of physical search rather than the emerging capabilities of new technology and held that the Fourth Amendment is not applicable to wiretapping (Liu et al., 2019). It was through the dissenting judgment by Justice Brandeis that the issue was given a new breath when he conceded that the court's direct reading of the Fourth Amendment was significantly inaccurate. Rather, he laid the cornerstone for the understanding of newly emerging technologies by according the right metaphor to wiretapping and grasping the nature of the technology. Purportedly, law confides in metaphor and analogy when reasoning with new technologies. In the context of cryptography, for instance, metaphor has fostered the understanding of the concept of encryption by illustrating it as a "car" collecting information, a kind of "language," a "safe" that conceals secrets, or a "house" in which conversation occurs. The exploration of these four metaphors appeared to be most favoured by the judges, which accordingly, determines the level of First and Fourth Amendment protections the judge is inclined to apply to encrypted communications (Froomkin, 1995). It is observed too that Internet offers an intriguing metaphorical discussion referred as the "problem of perspective." Professor Orin Kerr offers several examples from criminal procedure in which the way a court envisions a

technology can reveal the scope of Fourth Amendment protection it warrants. It should come as no surprise, therefore, that cyber law nurtures the importance of getting the right metaphor when it first encounters the flow of the global information infrastructure and on this account, perceiving cyberspace as a place (Lessig, 1999). The question of where in the geographical world a net-based transaction occurred is now turned to what rules or mechanisms are best suited for this new boundary.

Getting the Right Metaphor for AI Judge

AI and robotics have not missed the importance of metaphor either (Calo et al., 2016). As the advent of AI and robotics are rapidly entering the mainstream, eventually courts and officials will have to contend with the best metaphor for a given contrivance in a particular legal context. Arguably, they have begun to do so already. In this part, the analysis of robot cases is presented as correlated with AI given the overlapping of these two fields whereby robots are the AI acting in the real-life situation. Robots appeared repetitively in appellate and subordinate court opinions analysing judicial bias. The analysis of case law for this part is aligned with (Calo et al., 2016) in purporting that the judge uses the phrase 'robot' as a metaphor for a person who lacks discretion, implying the following: (1) neither society nor legal institutions should require people to be robots; (2) courts should discredit a person with robotic qualities; or (3) the law should absolve responsibility for people who harm others by acting as mere robots of a party not before the court. For instance, confronted with a variety of allegations, many opinions established that judges ought to be natural people. Regardless of litigants expecting judges to be robotics, dispensing human judgment is amiss. Oftentimes, the context in which the spectre of the robot judge arises is in the discussions of judicial discretion (Calo, 2017). A judge need not, for instance, reside in ivory towers and seclude human interaction, association and relationship – resembling robots. Thereupon, the issue on recusal will only persist to be relevant if such interaction, association and relationship birth real likelihood of bias, in the event the judge having to adjudicate on matters involving such people. However, the intuition that justice meted out by robots is invulnerable from bias as they are devoid of social interactions is seemingly flawed as intelligent systems 'absorb arbitrariness and biasness' from the data training process. Dismissing the idea that a jury or judge must be a robot brings to mind that the legal process refuses to dispense with humanity, experience, or even frailty.

In addition to this case, the Court of Appeal rejected the appellant's claim to strike out the respondent's application for possession of the property citing non-compliance to the requirement of r 3 (c) of Order 89 on the basis that '*courts are manned by judges who are human and not by robots*'. They exist to serve the ends of justice and not to act mechanically with no application of the mental faculty' (Shaheen bte Abu Bakar v Perbadanan Kemajuan Negeri Selangor and Other Appeals, 1996). Implicit in the court's reasoning was the idea that there would be no question of any discretion being exercised or any error being overlooked if the court is presided by robots. Similar premise is applicable to the counsels and parties of a case. The High Court in *Abdul Hai bin Haji Masud Ahmad v Kwang Yuet Song* (1994) emphasised that counsels are not to act mechanically like a robot in receiving instructions and data from their clients. As officers of the courts, they should apply their mind subjectively in filtering and assessing the instructions given to them by their clients and eventually present to the courts only issues relevant to the facts of the case to avoid their character and integrity from being jeopardised. In *Pendaftar Hakmilik Negeri Selangor v Caesius Development Sdn Bhd & Ors* and another appeal (2020), the Court of Appeal quorum made it clear that since

the officers of the 7th defendant are not robots, they are obligated to exercise their roles with care in adhering to Section 378 of the National Land Code. Hence, the officers were not supposed to passively process the applications submitted, rather, applying their mind and attention to the applications so they would be able to notice if something was amiss. In sum, as the Malaysian judges are entrusted to state legal concepts in layman's language robots can be a useful rhetorical device. The concept of the 'third entity', a human equivalent bedded in a machinal form is useful where a judge hopes to justify the preservation or suspension of agency. Under this view, the role of the robot is justice enhancing because it meets the citizen reader on his or her terms by appealing to a popular theme over dry, technical, and inaccessible legalisms to explain the court's decision.

The Legal Authority of AI Judge

This research also identified the issue of whether a computer programme or automated procedure has the legal capacity to make decisions in place of a human judge. Despite the prevalence of using AI in adjudication, the position of an AI judge is rather elusive within the view of existing legal framework. Its incorporation in the laws and regulations is not to be expected soon, although there are currently some reconsiderations underway. For instance, the Dutch government is enforcing a legal engineering of rendering the verdict delivered by a digital judge in the name of the human judge (Coglianese, 2020). Consequently, the task of the human judge is confined to a random testing of the verdicts. To date, there has not been one case in which the human e-Court judge was able to improve the verdict by the digital judge. An early issue posed alongside this breakthrough is the legality of computer program or automated process in delivering decisions in place of a human judge. In this context, automated system delivering adjudicative decisions bears questions such as who makes the decision, and who possesses the legal authority to make such a decision. Is it the computer programmer, the policymaker, the human decision-maker or the computer or automated system itself? (Perry 2019) The law and technology literature are replete with discussions on the attribution of liability and the accordance of legal status to AI systems (Miller, 2019). Lehman-Wilzig argues convincingly, for example, on the acceptance of the personhood model for AI, that no certain answers are conceivable (Lehman-Wilzig, 1981). The future is expected to manoeuvre beyond the philosophers, theologian, biologist, psychologist and others with the unfathomable reality (Čerka et al., 2017). He went further on quoting:

> "What is it to be a person? It can hardly be argued that it is to be human. Could an artefact be a person? It seems to be the answer is clear and the first R. [Robot] George Washington to answer 'Yes' will qualify. A robot might do many of the things we have discussed: moving and reproducing; predicting and choosing; learning; understanding and interpreting; analysing (translating, abstracting and indexing); deciding; perceiving; feeling– and not qualify. It could not do them all and be denied the accolade."

Legislators and scholars have addressed some of the intricacies of this issue. For example, a decision made under the Therapeutic Goods Act 1989 by a computer program is deemed to have been made by the Secretary (Sourdin, 2018). Psychologist, Peter Kahn and his colleagues in their proposition of a new ontological category, suggested a new category of a legal subject, the midway between person and object – the 'halfway status' to resolve the dichotomy of either/or' when treating the status question of AI (Balkin, 2015). This was

then translated into Germany's partial legal status of AI known as *Teilrechtsfähigkei* (Schirmer, 2019). It is also maintained that the legal lacunae of synthetic persons reside in the adversity of holding "electronic persons" accountable for violating the rights of others which arguably, outweigh the highly perilous moral interests that AI legal personhood preserves (Bryson et al., 2017). How such deeming premises would fare in court litigation involving intelligent systems with self-learning abilities remains untapped. Another argument sitting strategically in this discussion is one raised by Justice Kirby in his writing to enunciate the need for the public and open nature of adjudication which may present difficulties with the adoption of electronic courts (Kirby, 2020)

> *The right to see a judicial decision-maker struggling conscientiously, in public, with the detail of a case is a feature of the court system which cannot be abandoned, at least without risk to the acceptance by the people of courts as part of their form of governance.*

Without a public, open forum for the administration of the court's judicial powers, would the exercise of these powers be accepted by the populace? But next to no work examines the inverse: how the need for a transparent court process can be balanced with the black-box nature of AI? Black-box AI is another leap of discussion raised by the adoption of AI in criminal sentencing, holding significant bearing to the present research. Evidently, the deployment of AI powered criminal sentencing ought to be supplemented with commitment to negate the reproduction of systemic discrimination (Rigano, 2019). However, AI-driven outcomes in the context of criminal sentencing remain impenetrable. This relates to the algorithm being proprietary or "black boxed" in nature - only the owners, and to a limited degree the purchaser, can understand the delivery of decisions by the software (Dressel & Farid, 2018). The transparency issue of AI is two-fold. First, the evaluation for accuracy and bias for researchers and external experts is arguably a hurdle. The know-how of the system weighing the different factors and if some of them are more important than others are thus, indefinite (Zou & Schiebinger, 2018). The lack of information as to the internal operation of AI impede the utilisation of its application in criminal sentencing. Criminal defendants cannot say for sure whether or how suspect factors like gender or racial proxies may have influenced the risk assessment score or the judge's ultimate sentencing decision (Stobbs et al., 2017). The transparency challenges of AI have real life consequences, evident in *Loomis v State;* where the non-transparency inherent in a proprietary system has led the defendant to argue his inability to independently verify the accuracy of the tool. In Loomis, for example, the court dismisses the gender claim because the sentencing judge did not mention it specifically when explaining his decision - a distinction which seems to ignore the fact that a judge may never explicitly mention a factor like gender when it is quietly incorporated into an opaque risk score rather than considered openly in the presence investigation report or at a hearing (Calo, 2018). Hence, predicting the outcome of the algorithm is onerous, hampering the defence case. Secondly, while predictive algorithm in courtrooms are considerably "black boxes" to outsiders and are susceptible to concerns about opacity, the proprietary tools developed by for profit companies present distinct challenges.

To remain competitive, these companies possess greater interest in keeping their algorithms away from public scrutiny (Roselli et al., 2019). In contrary, academic researchers and governments are more inclined to make the details of their algorithms publicly available and ensure that they are subject to appropriate scrutiny and oversight. The risk of bias on

the other hand is compounded by algorithms that utilise other potentially biased data sets, such as those that are used for predictive policing. Arguably, police primarily respond to two types of crimes: (1) reported crimes which referring to violent crimes (such as assault, homicide, and rape) and property crimes, and (2) found crimes such as when individuals are stopped and found to possess a small quantity of drugs or be engaged in otherwise illegal activity. Due to the historic policing patterns exploited by the new predictive tools—largely poor and minority neighbourhood are inclined to face a disproportionate amount of police activity with respect to found crimes. Consequently, data set concerning "found" crimes are likely biased to suggest that poor and minority communities commit a higher proportion of these crimes than they actually do (Sukhodolov & Bychkova, 2018).

Conclusion

AI is entering the construction industry intrusively, bringing profound impact. But the convenience of this disruptive technology comes at a cost – one that deals with the domain humans were conventionally the sole actor. In the framework of adjudication, cognisant legal rationality, intuition, empathy, and compassion are the fundamentals of judicial responsiveness. The manner of which the judicial role is anticipated to expand is a question that many posed, as numerous aspects of human domain inclusive of dispute resolution and court procedures are not only augmented, but even taken over entirely by AI-powered systems. To equate judging within the confinement of data processing is rather erroneous, thus a proper legal construct in demarcating the line separating that of human judge and data-driven system will help ensure that AI plays a principled and appropriate role in advancing dispute resolutions. Insights from psychoanalytical thought will aid in that understanding, and in developing the code that drives future applications of AI in dispute resolution.

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