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# THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE AND DIGITALISATION AND POSSIBLE AREAS OF USE IN THE JUDICIARY FROM A HUNGARIAN PERSPECTIVE*

ADRIENN NAGY**

Though AI has been discussed and developed since the 1950s, what is new in the computational power that has markedly increased both the capability of processing data and the availability of training "data" and "big data" that leads to practical breakthroughs is AI. These two factors, coupled with complex algorithms, have resulted in beneficial outcomes for areas such as medical diagnoses and self-driving vehicles among many other AI applications that number in the tens of thousands. This article will not address the use of artificial intelligence and its effect on the practice of law. We are surrounded by daily stories that AI legal applications will allegedly replace judges and lawyers and result in a legal profession revolution.

***Keywords:*** *artificial intelligence, robot judge, Judge AI, AI used in judicial system*

A mesterséges intelligencia az 1950-es évektől folyamatosan fejlődik, és a szakirodalom is gyakran tárgyalja ezt a témakört. A 21. században azonban újdonság ezen a területen, hogy a számítástechnikai fejlődés óriási léptékű az adatfeldolgozási képesség, illetve az adatok elérhetősége terén, mely a mesterséges intelligencia gyakorlati hasznosíthatóságában nagy áttöréseket eredményezett. Jelen tanulmánynak nem az a célja, hogy sorra vegye a mesterséges intelligencia alkalmazhatóságának területeit, sokkal inkább arra a kérdésre keresi a választ, hogy a mesterséges intelligencia alkalmazható-e és milyen mértékben az igazságszolgáltatásban. Az utóbbi két évben többször olvashattunk olyan tanulmányokat, melyek elővetítették annak a lehetőségét, hogy a mesterséges intelligencia felválthatja a bírákat, jogászokat, és a jogászi szakmában forradalmi megújulást fog hozni.

***Kulcsszavak:*** *mesterséges intelligencia, robotbíró, mesterséges intelligencia alkalmazása az igazságszolgáltatásban*

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## Introduction

The impact of artificial intelligence (AI) can be felt in many areas of life: within the business world, AI is now making its way into how we recruit, select and retain talent, design and deliver our products and services, interact with our customers, drive business innovation etc. No sector of our economy has escaped the influence of artificial intelligence.

However, using AI raises a number of legal issues. What happens when AI discriminates, injures or monopolizes? What are the legal issues from preservation to production to trial when the AI program is continually evolving and subject to an ever-changing set of inputs?

But what does the term 'artificial intelligence' mean? The purpose of this study is not to define this term in detail, but we can mention that it refers to a set of intelligent, non-biological entities and algorithms that are able to receive information, process it rationally, and act on it to achieve a specific goal. The primary goal of AI is to create algorithms with intelligence and cognitive abilities in the human sense. This intelligence must have the ability to think, make decisions, solve problems and learn. According to John McCarthy[1], the 'father' of the term of artificial intelligence: the field of computer science is the creation of computer programs that solve tasks that require human intelligence.[2]

Artificial intelligence – as defined by the European Commission – refers to systems that show intelligent behaviour to achieve specific goals through the analysis of their environment and their actions with a degree of autonomy. AI-based systems can be:

a) purely software-based (exclusively in the virtual word, e.g. voice assistants, image analysis programs, search engines, speech and face recognition systems etc.); or
b) hardware-embedded software (robots, self-driving vehicles, drones or web applications).[3]

AI is sometimes referred to as a separate discipline. According to Hungarian Digital Welfare Program: Artificial intelligence is basically a discipline that seeks to endow machines with human knowledge, memory and synthesizing ability.[4]

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1 John MCCARTHY (1927–2011) was a mathematician, he coined the term 'artificial intelligence' in 1955.

2 *A mesterséges intelligencia ma, és szerepe a XXI. század technológiai forradalmában*. Joghallgatók Önképző Szervezete 2018. http://josz.elte.hu/wp-content/uploads/2019/03/JO%CC%88Sz-MI-projekt-v4.pdf, 30. August 2019, 16.

3 MEZŐ Ferenc – MEZŐ Katalin: Interdiszciplináris kapcsolódási lehetőségek a mesterséges intelligenciára irányuló cél-, eszköz- és hatásorientált kutatáshoz. *Mesterséges Intelligencia* 2019/1., 10.

4 MEZŐ Ferenc – MEZŐ Katalin: Interdiszciplináris kapcsolódási lehetőségek a mesterséges intelligenciára irányuló cél-, eszköz- és hatásorientált kutatáshoz. *Mesterséges Intelligencia* 2019/1., 11.

Though AI has been discussed and developed since the 1950s, what is new is the computational power that has markedly increased both the capability of processing data and the availability of training "data" and "big data" that leads to practical breakthroughs is AI. These two factors, coupled with complex algorithms, have resulted in beneficial outcomes for areas such as medical diagnoses and self-driving vehicles among many other AI applications that number in the tens of thousands.[5]

This article will not address the use of artificial intelligence and its effect on the practice of law. We are surrounded by daily stories that AI legal applications will allegedly replace judges and lawyers and result in a legal profession revolution. In my opinion AI will have and has had an effect on many judicial and law firm functions, including eDiscovery/document review, legal research, summary/insight/predictive tools, billing, contract development, and other useful tools.

## 1. International cases of the application of artificial intelligence in justice

The Council of the European Union adopted the first European ethics document on the use of artificial intelligence in justice systems. This European Ethical Charter[6] summarizes principles that policy makers, legislators and judicial professionals must take into account when applying AI in justice.[7] The technical basis was provided by the European Commission for the Efficiency of Justice (CEPEJ), whose main view was that the use of artificial intelligence in justice could contribute to efficiency and quality.[8]

In addition to professional work in the EU, there are several successful international cases of the use of AI in the justice sector. In Argentina, for example, an intelligent program called 'Promatea AI' has been created. The software, which can be called by telephone, is able to prepare draft decisions based on a case number considering previous precedents, and able to formulate a proposal for the court judgment. The program is able to automate judicial proceedings in cases with simpler legal judgment using appropriate legal language. According to the Argentine District Prosecutor's Office the program is a great help in practice as it can be used to resolve cases that have been settled in six months. The capacity of the program

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5 Michael ARKFELD: Litigating and Judging Artificial Intelligence Cases. *Judges' Journal* 2019 Issue 1, 6–7.

6 https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c, 29. July 2019.

7 See details on this topic PUSZTAHELYI Réka: Bizalmunkra méltó MI – A mesterséges intelligencia fejlesztésének és alkalmazásának erkölcsi-etikai vonatkozásairól. *Publicationes Universitatis Miskolcinensis Sectio Juridica et Politica* 2019/2., 97–120.

8 Ifj. LOMNICI Zoltán: *A mesterséges intelligencia megjelenése az igazságügyi rendszerekben – jönnek az online tárgyalások?* http://alaptorvenyblog.hu/blog/a_mesterseges_intelligencia_megjelenese_az_igazsagugyi_rendszerekben_jonnek_az_online_targyalasok, 10. August 2019.

is also amazing: it can generate more than 300,000 court decisions and 2,000 final judgments, making it easier to make a substantive decisions in similar cases.[9]
Estonia has already created the word's first robot judge, and the application called 'Chatbot' is now available to anyone on the Web, which provides legal advice.[10] The research was led by senior data protection officer Ott Velsberg, and the main objective was to develop a robot judge capable of handling cases with a value of less than € 7,000. The project is still ongoing and is likely to initially play a role in resolving contractual disputes. The contractors upload the necessary documents and other relevant information into the system, and the program makes a decision which can be challenged in a human court.[11]

It is worth referring to the American online service called 'DoNotPay', which provides free legal assistance in parking, traffic fines and airline claims. Due to its success, the service has expanded its scope of activities in recent years, and can also be used in consumer disputes, labour cases and refugee status matters.[12]
After a brief international outlook we examine how artificial intelligence is using in the Hungarian judicial system and how Hungarian lawyers think about the applicability of robot judges.

## 2. The application of artificial intelligence in Hungarian justice

As a result of the work in the European Union, an initiative has been launched in Hungary to promote the practical application of AI. On the initiative of the Minister of Innovation and Technology, the Artificial Intelligence Coalition was formed on October 8, 2018 with the participation of universities, international and domestic companies, scientific workshops, professional and administrative bodies. The basic objective of this Coalition is to define the framework and directions of the development of AI in a professional forum, to participate in the development of Hungarian Artificial Intelligence Strategy and to analyze the economic and social impacts generated by AI.[13]

In recent decades, the administrative part of the Hungarian Judicial system has undergone significant technical development: for example 'Via Video' system has been introduced, which allows the participants of the proceedings to be heard remotely, eliminating the inconveniences and costs associated with personal appear-

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9 MOLNÁR Orsolya: *„Hasta la vista, baby."* https://arsboni.hu/hasta-la-vista-baby/, 30. August 2019.

10 BALOGH Judit: *M.I vs J.O.G – Azaz „mesterséges intelligencia" versus „jogászság okos generációja"*. https://arsboni.hu/m-i-vs-j-o-g/, 30. July 2019.

11 SÁNDOR Lénárd: *A mesterséges intelligencia igazságszolgáltatási szerepkörben*. https://makronom.mandiner.hu/cikk/20190416_a_mesterseges_intelligencia_igazsagszolgaltatasi_szerepkorben, 30. August 2019.

12 RÁCZ Zoltán: Az ügyvédi hivatás jövője a robotika fejlődésének fényében. *ADVOCAT* 2019/1., 11.

13 MOLNÁR Orsolya: *„Hasta la vista, baby."* https://arsboni.hu/hasta-la-vista-baby/, 30. August 2019.

ances. In connection with the Digital Court Project, the 'Judgment Support System', 'Client File Access System' and 'Registry Access System' were introduced.[14] Electronic communication with the courts has become widely mandatory and e-file has been introduced.

In the spring of 2017, Péter Darák, President of the Hungarian Curia reported on the results of an experiment published by University College London, University of Sheffield and Pennsylvania: an artificial intelligence program gave correct prediction of the outcome of hundreds of cases before the European Court of Human Rights. The program examined 584 cases in which specific articles of the European Convention on Human Rights had to be applied and found it to be "infringing" or "non-infringing". AI gave erroneous results only in two similar cases. Despite the excellent result, the research team concluded that the program is unable to detect certain segments of legal rating. The president of the Hungarian Curia also emphasized that the judging activity could not be entrusted to artificial intelligence.[15]

There are also cautious attempts to apply robot in the word of law in Hungary: students of University of Pécs, Faculty of Law can learn civil law from iLex startup AI-based educational tool. iLex built the chat robot on IBM Cloud, which also provides storage space and a development system for cognitive technology innovation.[16]

Contrary to cautious Hungarian positions, the theoretical debate related to the importance of artificial intelligence in justice has developed mainly in Anglo-Saxon law, and seeks to answer the question of whether robot judges can replace the work of human judges. The following lines of this study primarily examine the aspects that arise in this debate.

## 3. Introductory thoughts on robot judges

The role of a judge is complex. It can incorporate activism, complex interactions with people, dispute settlement, case management, public and specific educational activities, social commentary as well as adjudicatory functions that might be conducted with other judges or less commonly in some jurisdictions with lay people. The extent to which judges are engaged in each activity varies across jurisdictions and between judges. Some judges may be more "responsive" than others, and others may show more emotion and compassion or be oriented towards therapeutic

[14] Ifj. LOMNICI Zoltán: *A mesterséges intelligencia megjelenése az igazságügyi rendszerekben – jönnek az online tárgyalások?* http://alaptorvenyblog.hu/blog/a_mesterseges_intelligencia_megjelenese_az_igazsagugyi_rendszerekben_jonnek_az_online_targyalasok, 10. August 2019.

[15] DARÁK Péter: *(Mesterséges) bírói intelligencia*. https://kuria-birosag.hu/sites/default/files/sajto/z_dr_darakpeter.pdf, 10. August 2019.

[16] RÁCZ Zoltán: Az ügyvédi hivatás jövője a robotika fejlődésének fényében. *ADVOCAT* 2019/1., 12.

justice.[17] This is why it is difficult to predict what impact the development of AI may have on justice.

It is possible that development of artificial intelligence may change the interactive nature of the role of judges, varying the adjudicative function with potential to remove judges from an adjudicative function altogether. Whilst developments in 'Judge AI' or 'Judicial AI' are in their infancy, there are indicators that it will become more relevant, although somewhat unpopular, to introduce Judge AI in relation to some categories of dispute.[18]

An important question for the use of a Judge AI is what will judging involve in 10, 20 or 30 years. More specifically, are there aspects of the judicial function that will ensure that judging will remain a human activity in the future, at least in the case of certain legal disputes? These questions can be answered by examining recent changes in the context of how lawyers, courts and others are currently using technology. What is clear is that the roles of judges, lawyers are rapidly changing and technological developments have already reshaped some aspects of the judicial system. Of course, the use of technology by lawyers does not immediately result in a transformation of the judicial role, it will no doubt change how some functions are exercised. For example, the shift to increasing use of AI in the form of predictive coding, predictive analytics and machine learning suggests that lawyers' use of AI is already changing how material is presented to judges and how client risk is assessed.[19]

In the USA predictive coding was already being used to determine whether recidivism was more likely in criminal matters and to assist in making decisions about sentencing.[20] Many of these current developments may have an impact on judges by removing some task related functions, but are unlikely to entirely reshape the judicial function or role. Recent developments in AI are likely to have a more profound impact on judges and judging in the future, but this requires us to consider the role of the judge within modern society as well.

## 4. Three levels of technological change

There are three main ways in which technology is already reshaping the justice system. The first basic level: technology is assisting to inform, support and advice people involved in the justice system (supportive technology). Second level: tech-

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[17] For a broader discussion of the judicial role and responsiveness see Tania SOURDIN – Archie ZARISKI (eds.): *The Responsive Judge: International Perspectives*. Springer Nature Singapore, 2018.

[18] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decison-making. *UNSW Law Journal* Volume 41, 2018/4., 1114–1115.

[19] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decison-making. *UNSW Law Journal* Volume 41, 2018/4., 1115.

[20] Adam LIPTAK: *Sent to Prison by a Software Program's Secret Algorithms*. https://www.nytimes.com/2017/05/01/us/politics/sent-to-prison-by-a-software-programs-secret-algorithms.html, 25. August 2019.

nology can replace functions and activities that were previously carried out by humans (replacement technologies). Finally, at a third level, technology can change the way that judges work and provide for very different forms of justice (disruptive technology).[21] In particular, the second and third levels are suitable for bringing about a change in the judicial activity and role of judges.

At present, most justice reform that is supported by technology has focussed on the first and second level of technological innovation that may or may not use very simplified forms of AI. For example, more recent technological developments supplement and support the operation of many court-based processes (see electronic communication with courts). As a result of this first level of supportive technology, many people now locate justice services online and obtain information about justice processes, options and alternatives through web-based information systems.

Some web-based information (including digital video), videoconferencing, teleconferencing and email can supplement, support and replace many face-to-face in-court approaches and could be defined as a second level, replacement technology. At this second level, justice is supported by technology and in some circumstances this can alter the environment in which court hearings take place. For example, online court processes are increasingly used for some types of disputes (particularly in consumer disputes).[22]

Other technologies may merge into the third level and support negotiation as well as judicial processes by enabling people to access more sophisticated online advice that is supported by AI, or to consider options and alternatives or engage in different ways. Technologies operating at this third level are suitable first to support the work of judges in making decisions, and then they can replace human judges by reaching an ever higher level of development. Initially, the impacts are likely to be confined to lower level decision-making. For example, in New Zealand a project of a university has raised concerns about the use of a computer-based prediction model to handle claims and profile claimants under the country's state accident compensation scheme (Accident Compensation Corporation). In Mexico, simpler administrative decision-making is already being supported by AI: the Mexican Expertius system is currently advising judges and clerks upon the determination of whether the plaintiff is or is not eligible for granting him/her a pension.[23]

Although AI processes have emerged over the past 50 years, until the last decade they have been mainly directed at processes outside the justice sector. Within the justice area they have been directed at technical as well as legal analysis. AI programs can initially focus on the analytical functions or role of judges and it is clear that the AI already utilised in document discovery has the potential to trans-

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[21] Tania SOURDIN: Justice and Technological Innovation. *Journal of Judicial Administration* 2015/25., 96.

[22] See generally Emma ROWDEN: Distributed Courts and Legitimacy: What Do We Lose the Courthouse? *Law, Culture and the Humanities* 2018/14., 263.

[23] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1118–1119.

form some judicial work. Current document discovery programs utilise predictive coding to read and analyse millions of pages of discovered documents and are able to select relevant material in a fraction of the time that human labour would require. There are many advantages in that such AI programs are more time and cost efficient than humans and can work without stopping for sleep or breaks.

## 5. The impact of online courts and online dispute resolution

There are other circumstances relating to technology that are causing a rethink of the judicial role: in this context, there has been a growing focus on online courts. These online dispute resolutions are suitable for providing the right to go to court in some cases in a cost-effective way, thus supporting the work of judges and the judicial system. Such changes are arguably leading to the democratisation of justice and although they are not oriented towards Judicial AI, they may support the development of Judge AI by essentially building a framework which enables Judge AI to be used. At present, few of these proposals engage with Judge AI and are ordinarily focussed on increasing online activity. For example, there has been an increased demand for the creation of online courts in recent years, but these developments essentially involve replacing a physical court and litigation process with an online alternative that encouraged the resolution of a dispute but retains the stature and powers of a physical court of law.[24]

For example, the UK Civil Justice Council recommended the introduction of Her Majesty's Online Court for civil disputes under the value of £25,000.[25] The Court would operate with a tiered system: the first tier would allow disputants to evaluate their problems though inputting information into an online system which would categorise their issues, provide information about their rights and entitlements, and suggest options available to resolve the dispute. This tier encourages parties to resolve the dispute on their own on the basis of the information provided by the system. The second tier involves online facilitators reviewing information and documents provided by the disputants and assisting with the resolution of the matter by mediating, advising or encouraging negotiations. This tier is reminiscent of court-connected alternative dispute resolution. The third and final tier was to involve online adjudication by the judges of the court based on electronic submissions, online pleadings and arguments and telephone conference facilities. This determination could be binding and enforceable, with the same force as a decision made in a physical courtroom.

Chief Justice Warren of the Supreme Court of Victoria has suggested another model where technology is supportive: the so called distributed courtroom.[26] A phys-

[24] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1119–1120.

[25] Online Dispute Resolution Advisory Group: Online Dispute Resolution for Low Value Civil Claims (Report, Civil Justice Council, February 2015) 6–7.

[26] Chief Justice Marilyn WARREN: Embracing Technology: The Way Forward for the Courts. *Journal of Judicial Administration* 2015/24., 227–232.

ical courtroom remains central in this model, but the participants are replaced by life-size screens or holographic projections to enable judges, lawyers, jury members and parties to appear in court from any location of convenience. This model is facilitated through online videoconferencing technology, such as Skype, but still preserves the option of a physical space for the court, and the option of physically attending court. Should such courts be effectively implemented, the foundation for a move to an AI judge would be already in place. An AI judge at the centre of an online court program would allow litigants to provide the system with information remotely, and have a decision dispensed form within the program itself.

The development of an online dispute resolution platform in the European Union (ODR) is another typical case of online litigation. The parties involved in a consumer dispute can settle their dispute cheaply and efficiently using the internet and technology. ODR might also support and enable the development of AI Judge by creating the machinery or platform within which it could eventually flourish. In ODR, disputants are not required to meet in person, as the ODR process can happen remotely through an internet connection. The decision-making by AI is also used on this platform: these processes collect facts from users through interview-style questions and produce answers based on a decision-tree analysis.[27]

In the Netherlands, an advanced ADR program called Rechtwijzer incorporates ODR components that could be used to assist couples in the separation or divorce process. The program asks questions about the parties and their relationship, and provides options based on this input information.[28] The program also provides information, tools, links to other websites and personal advice which encourages the parties to resolve their dispute between themselves. If resolution is not reached, the final step involves Rechtwijzer providing the parties with information and contact details of professional third parties such as mediators, legal representatives, and other dispute resolution processes. Evaluations of Rechtwijzer found participants were satisfied with their experiences, but a majority still felt the need to have a third party check over the agreement made through the system.

These developments in ADR also suggest that the further introduction of AI systems into legal practice is likely. If these Techniques can be used effectively within the field of ADR, then it follows that the introduction of AI programs into the court system is also feasible. Moreover, with the experience gained during the practical application of ADR technologies, the Judge AI can be further developed and refined.[29]

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[27] Learn more Edina BÁNFAI: A digitalizációban rejlő lehetőségek kiaknázása az online vitarendezés terén. *Európai Jog* 2019/4., 27–32.; SZŐKE Gergely László: Online vitarendezés 1. r. *Infokommunikáció és Jog* 2005/6., 41–46.

[28] Esmée A. BICKEL – Marian A. J. VAN DIJK – Ellen GIEBELS: *Online Legal Advice and Conflict Support: A Dutch Experience*. Report, University of Twente, March 2015, 5.

[29] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1122.

## 6. The replacement of judges

Newer technologies can assist people to resolve disputes at an earlier time or refine the issues that need to be presented to judges. For example, technology can assist people to develop options and use AI to develop alternatives, and can be used to run evaluative, advisory and determinative processes. In this regard, some disruptive technologies are linked to Artificial Legal Intelligence which can be viewed as a system that has the capacity to render expert legal advice or decision-making.[30]

The impact of AI on the justice system is significant as it has the capacity to be blended with existing adjudicatory or non-adjudicatory processes. There have been questions raised about whether these processes will have an impact on the role of lawyers and judges as technology replaces some human decision-making and analysis processes.[31] It seems well accepted that the impact outside the justice sector is likely to be significant and there are numerous predictions that AI together with other advances will mean that many current employment arrangements will no longer exist in 20 years with many current tasks being replaced by AI supported processes.[32] However, there has so far been little discussion about more senior legal sector roles and whether these developments (and the creation of Judge AI) will mean that judicial work will change with some judges being completely replaced by newer technologies.[33]

Clearly some aspects of judicial work will be conducted by technological processes into the future, particularly where AI systems can be built. In this regard, legal information and AI systems can already use sophisticated branching and data searching technology to create elaborate decision trees that can suggest outcomes to disputes. In addition, more evolved AI supports systems which do not just emulate human intelligence but create additional and different intelligent systems – neural networks. The system asks a number of questions or uses existing data about users and poses questions about the dispute to enable an accurate description of the dispute to be built. The computer then forms a conclusion by applying the law to the dispute description. It does this by applying rules for specific sets of facts. This process may enable indicative decisions or even final decisions to be expressed. Such systems can be continuously updated and reflective in that machine learning enables systems to improve and be constantly revised with new data sets.

However, does this mean that judges will be replaced by technology? Arguably not, or at least not initially. This is partly because there are so many factors that

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30 Richard SUSSKIND: *The Future of Law: Facing the Challenges of Information Technology*. Clarendon Press, 1996, 120–121.

31 About this topic see more Richard SUSSKIND: *Tomorrow's Lawyers: An Introduction to Your Future.* Oxford University Press, 2017.

32 Learn more MÉLYPATAKI Gábor –LIPTÁK Katalin: Munkajogi és gazdasági kihívások a jövő munkaerőpiacán. *International Journal of Engineering and Management Sciences (IJEMS)* (under publication).

33 Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1122–1123.

impact on judicial decision-making. Such factors include induction and intuition, as well as the capacity to assess the social impact of decisions.[34] However, if technologies can support decision-making (by, for example, enabling more accurate potential outcome identification by participants) they may play an increasing role is some forms of dispute (particularly in the family area) and can support judicial processes and the making of decisions (by producing a draft or template decision that can be considered by a human judge).

These developments of technology raise issues about the role of courts and judges in the future as well as raising challenging issues about how data is managed, categorised, and where and how executive and judicial functions are carried out and separated. In addition, there are issues about intellectual property and who may have control and input into outsourced Judge AI and how transparent algorithms are. Those who support the introduction of Judge AI do not address the role of judges in the development of society, which is an issue beyond the judiciary, but it does have important segments, such as consolidating the rule of law in members of society.[35]

## 7. The Judge AI

In the context of the application of Judge AI, the question is basically that could advances in technology one day replace human judges in the courtroom with an AI programmed to preside over hearings and dispense more complex judgments and in what way might more affective technologies assist or support this work.

Harvey gives a simplified description of the process an AI judge would be required to take, using the example of algorithms already present in legal databases. These databases employ natural language processing to assist with the sourcing of relevant material based on search terms. An AI judge would be required to go further than these databases, by reducing returned sources to a manageable and relevant sample and then deploying tools to compare these sources of law to a present case and engaging in analysis to make a determination of the outcome. This final step requires the development of the necessary algorithms that could undertake the comparative and predictive analysis, together with a form of probability analysis to generate an outcome that would be useful and informative. However, human judge decision-making is largely retained in Harvey's model.[36]

Attempts were made to use AI programs to predict the outcome of cases based on textual information (predictive analysis). Aletras and colleagues developed a program that textually analysed decisions relating to breaches of human rights in the European Court of Human Rights to discover patterns in judgments. The pro-

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[34] Australian Law Reform Commission: *Technology: What It Means for Federal Dispute Resolution*. 1998/23., 101.

[35] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1124.

[36] David HARVEY: From Susskin to Briggs: Online Court Approaches. *Journal of Civil Litigation and Practice* 2016/5., 93.

gram learnt these patterns, and was able to predict the outcome of cases presented to it in textual form with 79 per cent accuracy on average. This is an example of machine learning, where the computer system was able to analyse past data to develop rules that are generalisable going forward. Machine learning allows computer programs to solve complex tasks based on their own experience and not through manually entered functions.[37] Surden notes that machine learning may run into some limitations in the development of effective AIs that can predict legal outcomes. Machine learning techniques are only useful where analysed information is similar to new information presented to the AI. Should an AI program be presented with a novel case where no similar precedent exists, it may not be well-suited in making a prediction or coming to an outcome. These problems can also occur if the pattern of previous cases is not significant enough for a computer program to discover patterns and create effective generalizations.[38]

As AI researchers have had a number of clear successes outside of legal field, these successes suggest that predictive analysis even where there are significant variations in terms of novelty can be learned. For example, researchers at Google DeepMind successfully developed an AI program, AlphaGo, to allow the Go complex game to be played at a higher level than the European master, and this program was also developed by machine learning in mind. There are also many examples in the medical field with AI now increasingly being used for diagnostic purposes and in relation to some human functions.

While the law is more complex than any game, these successes suggest that Judge AI is able to learn how to apply the law by reading legislation and case law, and that applying these principles to factual circumstances is feasible. Given the developments in non-law areas and the rapid expansion of AI and investment in this field, it seems likely that the development of more sophisticated Judge AI is probable within the next decade.[39]

## 8. Issues that arise with the development of an AI Judge

In addition to the general function of judges in society, there are certain special factors that are particularly important for the development of Judge AI and the decision-making function of judges. These factors suggest that AI can replace some adjudicative functions, however, the issues that emerge are whether this is appropriate and under what circumstances human judges should retain most adjudicative functions.

The first initial issue is whether a computer program or automated process possesses the legal authority to make decisions in place of a human judge. Who makes

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[37] Nikolaos ALETRAS: Predicting Judicial Decisions of the European Court of Human Rights: A Natural Language Processing Perspective. *PeerJ Computer Science* 2016/1., 15–16.

[38] Harry SURDEN: Machine Learning and Law. *Washington Law Review* 2014/89., 105.

[39] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1126.

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?[40]

The second issue is how to accurately translate the law onto codes, commands and functions that a computer program can understand. Legal language is nuanced and often requires contextual understandings. Computer programmers and IT professionals rarely have legal qualifications or experience, nor are they policy or administrative experts. However, it is these professionals who are tasked with translating legislation and case law into computer codes and commands to allow an autonomous process to make decisions. The situation is further complicated by these codes will need to be constantly updated due to frequent amendments, new case decisions, and complex transitional provisions.

The third issue that can fundamentally cause difficulties in the development of Judge AI is discretionary judgments. Computer programs operate based on logic, where input information is processed via programmed algorithms to arrive at a predetermined outcome. Such rigidity is arguably incompatible with discretionary decisions. Discretionary decisions may need to take into account community values, the subjective features of parties, and any other surrounding circumstances that may be relevant.[41]

In addition, adjudicative decision-making can be influenced by a range of factors that can influence substantive justice: such as the quality of representation of the parties, the resources available to the parties, or the personal values of the decision-maker, etc. Simpler factors should also be considered such as when and what a person has eaten, the time of day, how many other decisions a person has made that day, reliance on intuition, the attractiveness of the individuals involved, emotion, etc.[42] If the work of judges is taken over by artificial intelligence, obviously these factors will not prevail.

Another problem is the dysfunctions of algorithm-based decision-making, such as potentially built-in bias, it is difficult to filter out operational anomalies, which

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[40] Learn more Justice Melissa PERRY: iDecide: Administrative Decision-Making in the Digital World. *Australian Law Journal* 2017/91., 29–34.

[41] It is interesting that Zsolt Ződi, on the other hand, argues that Big Data algorithms could be used, for example, to determine damages. ZŐDI Zsolt: *Platformok, robotok és a jog.* Gondolat Kiadó, Budapest 2018, 236–237.

[42] Learn more about these factors, for example Bennett HAYLEY – G. A. (Tony) BROE: Judicial Neurobiology, Markarian Synthesis and Emotion: How Can the Human Brain Make Sentencing Decisions? *Criminal Law Journal* 2007/31., 17–20.; Maria AGTHE – Matthias SPÖRRLE – Jon K. MANER: Does Being Attractive Always Help? Positive and Negative Effects of Attractiveness on Social Decision Making. *Personality and Social Psychology Bulletin* 2011/37., 22–30.; Justice Michael KIRBY: Judging: Reflections on the Moment of Decision. *Australian Bar Review* 1999/18., 25–34.; John TIERNEY: Do You Suffer from Decision Fatigue? *New York Times* (online) 17 August 2011.

often stem from the opacity of self-learning processes and thus ultimately make accountability impossible.[43]

Along similar lines, the use of AI in law may be confronted by the philosophical distinction between syntax and semantics: computer programs possess syntax (a formal structure of operation), but do not possess semantics (meaning behind these operations). Digital technology processes information in the form of abstract symbols, namely ones and zeros. The technology possesses the ability to process and manipulate these symbols, but it does not understand the meaning behind these processes. This can be contrasted with the human mind, which can understand the information that it processes. This issue means that computer programs will be able to simulate human ways of thinking, but it will be some time before they can truly duplicate human ways of thinking. However, as the information that is required for human decision-making becomes more complex, humans will have no option but to rely on forms of AI when making decisions.[44]

## 9. Technology supporting judges

In the context of the role of AI in justice, we are most often reminded of Judge AI, which has the potential to replace current human judicial functions in terms of some aspects of adjudicative work. But technological advances are more likely to support human judges in their judicial work. In this regard, the goal of the development of AI systems should be to complement currant human work, allowing for greater efficiencies, rather than total replacement of humans. At times, these developments suggest that 'co-bots' rather robots will play a more important role in Judge AI.

AI programs that can produce a decision based on information input could be used to assist human judges, rather than replace them. These systems could produce a draft judgement based on the system's determined outcome. A human judge could then use this draft judgment to produce their own reasons, allowing for human oversight over the computer program, and enabling discretionary or social consideration to be made that may be beyond the capacity of the computer program.[45]

## Conclusions

The main question is not 'if' technologies will reshape the judicial function but 'when' and to what extent. There are significant changes in the way that courts are working: the programs result in relief, as they perform support functions without

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[43] Learn more Nicholas DIAKOPOULOS: *Algorithmic Accountability Reporting: on the Investigation of Black Boxes*. http://www.nickdiakopoulos.com/wp-content/uploads/2011/07/Algorithmic-Accountability-Reporting_final.pdf, 25. August 2019.

[44] John SEARLE: Can Computers Think? In: David J. Chalmers (ed.): *Philosophy of Mind: Classical and Contemporary Readings.* Oxford University Press, 2002, 669–671.

[45] Tania SOURDIN: Judge v Robot? Artificial intelligence and judicial decision-making. *UNSW Law Journal* Volume 41, 2018/4., 1130.

human intervention, predicting the possible outcome of a dispute, or also encouraging alternative dispute resolutions.

AI can be used in certain areas of the judiciary to gain time by automating certain – less complex, more technical – workflows (e.g. filling out forms or collecting court cases). But at this moment, we can say that AI is not suitable for making decisions on legal issues, so it will not soon replace lawyers and judges. The reason for this is basically that decision-making cannot be considered a technology. Citizens and companies bring conflicting human relationships to court; some of them are property-related, while others are personal, such as the publication of a defamatory article. Decision-making also carries an evaluative element that focuses on the person of the judge: the psychological processes in the judge, the formation of cognition in the context of the facts and the formation of persuasion in the consideration of the evidence. The procedure of decision-making is a creative operation using traditional methods.[46]

Basically we can agree with the above mentioned thought of the President of the Hungarian Curia, but it is also necessary to draw attention to the thoughts of Prof. Richard Susskind: Those who reassure themselves that a machine will never be able to understand legal matters in a complex way, and thus will not be able to make responsible decisions, are perfectly misunderstanding the principle of how artificial intelligence works. The professor cites the computer chess program as an example: it analyzes all the potentially possible steps with unimaginable speed, and finally – without emotion – make the decision that is most likely to win. Meanwhile, it is unaware of whether it is playing 'smartly' or 'beautifully' at the same time with cruel efficiency. Decision-making is best based on knowledge of past cases and written rules.[47]

Zsolt Ződi also emphasizes in his monograph that the connection between law and code has become much more common recently, and in his view it will be very common in the future. The work of lawyers so far has often meant that not only the rules but also the codes need to be well known. Partly because the law is increasingly embracing codes, and partly because knowledge of the code is also needed to bring about concrete changes. And as codes become more and more real computer codes, i.e. algorithms, legal work will increasingly require knowledge not only of rules but also of coercive or technology regulatory codes. This raises several questions for the legal profession, for example are lawyers fit to think in an ecosystem where people and agents, rules and codes are mixed? Today, it is still up to programmers to translate rules into code and define codes, but it is possible that new professions, such as legal knowledge engineer, will emerge in the future as responsibilities are reorganized.[48]

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[46] DARÁK Péter: *(Mesterséges) bírói intelligencia*. 1. https://kuria-birosag.hu/sites/default/files/sajto/z_dr_darakpeter.pdf, 10. September 2019.

[47] *Átformálja a mesterséges intelligencia az igazságszolgáltatást.* https://jogaszvilag.hu/atformalja-a-mesterseges-intelligencia-az-igazsagszolgaltatast/, 20. December 2019.

[48] ZŐDI Zsolt: *Platformok, robotok és a jog*. Gondolat Kiadó, Budapest, 2018, 224–225.

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[14] Emma ROWDEN: Distributed Courts and Legitimacy: What Do We Lose the Courthouse? *Law, Culture and the Humanities* 2018/14., 263–281.

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