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RULE OF LAW IN A TRANSITIONAL SPECTRUM

EDITED BY
Rigmor Argren

Rule of Law in a Transitional Spectrum

EDITED BY RIGMOR ARGREN

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The Concept of Robot Judges Using Generative Artificial Intelligence and the Rule of Law

Magnus Kristoffersson

Abstract

This chapter explores the concept of robot judges using Generative Artificial Intelligence (GAI) within the framework of the rule of law. It specifically focuses on the potential of GAI models, like ChatGPT-4, in the judicial system and their compatibility with the principle of a fair trial. The author discusses the functionality and role of judges in upholding the rule of law, highlighting the importance of impartiality, integrity, and adherence to legal principles. The article delves into the capabilities and limitations of GAI in legal decision-making, considering aspects like the handling of legal disputes, the influence of training data on GAI outputs, and the balance between technological efficiency and human judgment. The discussion includes experiments with ChatGPT-4 and Bing Chat, assessing their proficiency in legal reasoning and potential as robot judges. Furthermore, the paper critically examines the ethical, legal, and practical implications of integrating GAI in the judiciary, pondering the future of legal systems with AI-enhanced decision-making.

1. Introduction

The rule of law stands as a foundational principle integral to the scaffolding of democratic societies, ensuring the equitable and impartial treatment of all individuals under the jurisdiction of the law.¹ This concept, having

¹ A great deal has been written about the Rule of Law, see, for example; Bingham, Tom, *The Rule of Law* (London, Penguin Books, 2011) and Hart, Bulloch, P. A., Raz, J., &

undergone centuries of development and refinement, is indispensable for sustaining a society characterized by justice and orderliness.²

At its essence, the rule of law posits that no individual, inclusive of those occupying positions of authority, is exempt from the purview of the law.³ It mandates the consistent and impartial application of laws, devoid of discrimination or preferential treatment.⁴ This principle necessitates that the laws are transparent, accessible, and publicly disclosed, thereby enabling all individuals to comprehend their rights and responsibilities.⁵

Furthermore, the rule of law acts as a guarantor of individual liberties and human rights.⁶ It assures that every individual is accorded the right to a fair trial and is immune from arbitrary arrest or detention. The principle proscribes cruel and inhumane treatment and safeguards personal privacy and freedom of expression.

Judges, in my view, serve as pivotal components of the legal ecosystem in upholding the principles of the rule of law. It is ultimately the judge who ascertains the resolution of disputes, whether they arise between individuals or between individuals and the state. The expectations placed upon judges are considerably high. They are not only required to possess comprehensive knowledge of the law but also to adhere to it diligently. Furthermore, a judge must exhibit a high degree of integrity and a profound sense of ethical discernment. These qualities are emblematic of an individual of commendable character.

This article will concentrate on the notion of Robot Judges, embodied by Generative Artificial Intelligence models (GAI), and their correlation

Green, L. (2012). *The concept of law* (3. ed.). Oxford University Press, also see the reference list in the end of this chapter.

² See Hart, Bulloch, P. A., Raz, J., & Green, L. (2012). *The Concept of Law* (3. ed.). Oxford University Press.

³ See Hart, Bulloch, P. A., Raz, J., & Green, L. (2012). *The Concept of Law* (3. ed.). Oxford University Press.

⁴ See Leiter, B. (2020). THE ROLES OF JUDGES IN DEMOCRACIES: A Realistic View. *REI – REVISTA ESTUDOS INSTITUCIONAIS*, 6(2), p. 347. <https://doi.org/10.21783/rei.v6i2.508>.

⁵ See Hart, Bulloch, P. A., Raz, J., & Green, L. (2012). *The Concept of Law* (3. ed.). Oxford University Press.

⁶ See Cross, F. B., (1999). The Relevance of Law in Human Rights Protection. In *International Review of Law and Economics* (Vol. 19) p. 87–98.

with one facet of the rule of law concept—the right to a fair trial. The idea that I will look into is whether Robot Judges could replace humans.

GAI tools, as elucidated subsequently, generate unique output predicated on specific input (prompt). The text produced by a GAI tool is, in the majority of instances, accurate, provided that the prompt is pertinent and the model has been exposed to ample training data (texts). Presently, we do not attribute the same level of intelligence to these models as we do to humans. GAI tools do not peruse extensive databases for an accurate answer; rather, they analyze the language in the prompt and, based on their training, furnish a linguistically coherent response.⁷

What I will do in this article is to discuss to what extent the use of GAI to solve legal disputes is in coherence with the rule of law concept. I will focus on whether it is possible for this technology to follow the law, i.e. to provide substantively correct answers. To some extent, I will also discuss whether other aspects of being a judge such as common sense and morals can be included in judgments provided by GAI tools (Robot Judges).

The methodology employed in this study involves an examination of literature pertaining to the rule of law—which can be regarded as legal sources—as well as computer science literature focusing on Generative Artificial Intelligence (GAI) and related areas. Additionally, the study encompasses literature from various other disciplines to a certain extent. I have also conducted two minor experiments utilizing ChatGPT-4 and Bing Chat, thereby rendering this study cross-disciplinary in nature.

The discourse surrounding the role and functionality of judges is, to a significant extent, grounded in individual perspectives. While a substantial body of literature exists on this topic, interpretations often vary depending on the legal system in question and your personal beliefs regarding the dichotomy of right and wrong. Personally, I advocate in favor of democracy and a system anchored in legality. However, the challenge lies in delineating what constitutes legality. In my view, there are fundamental principles that embody what is considered good and, therefore, preferable. This perspective is, in part, shaped by my upbringing in a modern, predominantly secular Western society, which, despite advancements, still grapples with issues of equality, such as those related

⁷ Both ChatGPT-4 and Bing Chat (which is based on the same GAI engine) have access to the internet.

to gender. Naturally, these experiences have influenced my interpretation of the texts I have studied.

In Section 2, I will explore the functionality of judges to provide a foundational understanding of what can be expected from a judge. Subsequently, Section 3 will engage in a discussion on the concept of a robot judge. Section 4 will delve deeper into the concept of robot judges, with a focus on GAI technology. In the concluding Section 5, I will present some conclusions and reflections on how I envision the future in this domain.

2. Functionality of Judges⁸

The function of a judge can be multifaceted, encompassing activism, intricate interactions with individuals, dispute resolution, case management, public and specialized educational activities, social commentary, and adjudicatory responsibilities, which may be undertaken alongside other judges or, less frequently in certain jurisdictions, with laypeople such as juries. The level of engagement in each of these activities can vary widely among judges and across different jurisdictions. Some judges might exhibit a more “responsive” nature, while others may demonstrate greater emotion, compassion, or a leaning towards therapeutic justice—interventions centered on procedural justice that prioritize “voice” and respect.

Judges play a pivotal role in upholding justice and maintaining the rule of law within society. To ensure fairness and adherence to legal principles,

⁸ The role of judges can vary from jurisdiction to jurisdiction and a great deal has been written on this subject. In the following section, I have based my text on Leiter, B. (2020). *THE ROLES OF JUDGES IN DEMOCRACIES: A Realistic View*. REI – REVISTA ESTUDOS INSTITUCIONAIS, 6(2), 346–375. <https://doi.org/10.21783/rei.v6i2.508>, Beiser, Frederick. 2005. Hegel. New York: Routledge, Green, Leslie. 2016. ‘Law and the Role of a Judge’ edited by M. S. Moore and K. Kessler. In *Legal, Moral, and Metaphysical Truths: The Philosophy*, Hart, H. L. A. (1961). *The Concept of Law* (3rd ed.). Oxford University 373 Press.

it is imperative that judges follow the written codes and legality in their judgments.⁹

Judges are bound by the written codes and legality to ensure consistency in their judgments.¹⁰ Consistency is a fundamental aspect of the legal system as it promotes fairness and equality before the law. By adhering to established legal principles, judges create a sense of predictability and ensure that similar cases are treated equally. This consistency helps build public trust and confidence in the judicial system, as individuals can reasonably expect that their cases will be handled fairly and equitably.

When judges follow the written codes and legality, it leads to predictability in judicial decisions. Predictability is essential as it allows individuals to understand the potential outcomes of their actions and make informed decisions. By following established legal principles, judges provide a clear framework for individuals to assess the legality of their actions. Predictability also helps to avoid arbitrariness and ensures that the rule of law is upheld consistently.

Judges are entrusted with the responsibility of upholding the principles of justice, which include fairness, impartiality, and respect for individual rights. By adhering to the written codes and legality, judges demonstrate their commitment to these principles. The legal framework provides guidance on how to achieve a just outcome, ensuring that judges take into account relevant laws, precedents, and legal principles when making their decisions. This respect for the principles of justice helps maintain public confidence in the judiciary and fosters a sense of legitimacy.

Following written codes and legality in judgments acts as a safeguard against personal biases that judges may possess. The legal framework provides a set of guidelines that judges must adhere to, preventing their personal opinions, beliefs, or biases from influencing their decision-making. By relying on established legal principles, judges can ensure that their judgments are objective, fair, and free from any undue influence.

Conscience, often regarded as an innate moral compass, reflects an individual's deeply held values and ethical principles. By incorporating

⁹ For Sweden see 1 Chapter 1 paragraph 2 section Kungörelse (1974:152) om beslutad ny regeringsform (RF).

¹⁰ See Green, Leslie. 2016. Law and the Role of a Judge. In *Legal, Moral, and Metaphysical Truths: The Philosophy of Michael S. Moore*, ed. Kimberly Kessler.

conscience-based judgment, judges can ensure that their decisions align with their personal sense of morality, thereby upholding their integrity. This approach enables judges to make decisions that are not solely based on legal technicalities but also consider the broader implications for justice and fairness.

Legal systems are not infallible, and laws may sometimes fail to address certain moral dilemmas or emerging societal issues adequately. In such cases, judges equipped with conscience-based judgment can step in and fill these gaps, ensuring that justice is served even in the absence of explicit legal guidelines. This approach allows judges to adapt the law to the evolving needs of society, promoting a more just and equitable legal system.¹¹

Conscience-based judgment empowers judges to prioritize the protection of individual rights and liberties, even when they may conflict with established legal norms. By considering the underlying moral principles and the impact of their decisions on the lives of the individuals involved, judges can safeguard the fundamental rights enshrined in legal frameworks. This approach ensures that the law remains a tool for justice rather than a mere mechanism of enforcement.¹²

Legal systems have historically been marred by biases and injustices, rooted in societal prejudices and discriminatory practices.¹³ Conscience-based judgment offers judges an opportunity to challenge and rectify such biases by considering the moral implications of their decisions. This approach encourages judges to critically assess the potential consequences of their rulings on marginalized groups and promote a more inclusive and equitable society.

The conflict between legality and conscience-based judgments poses a complex ethical dilemma, as it involves the clash between following

¹¹ See Hart, H.L.A. (1961) 2012. *The Concept of Law*, 3rd ed. Oxford: Oxford University Press.

¹² See Leiter, B. (2020). THE ROLES OF JUDGES IN DEMOCRACIES: A Realistic View. *REI – REVISTA ESTUDOS INSTITUCIONAIS*, 6(2), p. 348. <https://doi.org/10.21783/rei.v6i2.508>.

¹³ Conaghan, J. (2013), 'Transmissions Through Time: Gender, Law, and History', *Law and Gender*, Clarendon Law Series (Oxford, 2013; online edn, Oxford Academic, 26 Sept. 2013), <https://doi-org.db.ub.oru.se/10.1093/acprof:oso/9780199592920.003.0004>, accessed 23 Sept. 2023.

the letter of the law and adhering to your personal moral compass. This conflict is particularly prevalent in situations where legal requirements may contradict an individual's deeply held beliefs or principles.

One argument in favor of prioritizing legality over conscience-based judgments emphasizes the significance of maintaining social order and stability. Laws serve as the foundation of a functioning society, providing a framework for resolving disputes and protecting the rights of individuals. Upholding the law ensures fairness and equality for all citizens, preventing chaos and anarchy. Deviating from legal standards may undermine the rule of law, leading to societal breakdown and the erosion of trust in the justice system.

On the other hand, proponents of conscience-based judgments argue that individuals have a moral duty to act in accordance with their personal beliefs, even if it conflicts with the law. This perspective asserts that individuals possess a certain level of autonomy and should not be forced to compromise their deeply held values. Conscience-based judgments are often rooted in ethical principles, such as justice, fairness, and human rights, which may transcend the limitations of legal frameworks. Valuing personal conscience promotes a sense of individual integrity and encourages critical thinking.

The conflict between legality and conscience-based judgments presents a complex ethical dilemma that requires careful consideration. While the law serves as the backbone of society, individuals should not be compelled to act against their conscience when faced with morally questionable situations.¹⁴

3. The Concept of Robot Judges

The advent of artificial intelligence (AI) has brought about significant advancements in various sectors, revolutionizing the way tasks are performed. In recent years, there has been growing interest in the use of AI in

¹⁴ A good historical example is the situation of judges in Germany before and during the Second World War.

the legal system, particularly in the role of judges.¹⁵ The concept of robot judges, which involves the use of AI algorithms to make legal decisions, has generated both excitement and concern.¹⁶

One of the primary arguments in favor of robot judges is the potential for impartiality.¹⁷ Human judges possess inherent biases and prejudices that can influence their decision-making process, consciously or unconsciously. Robot judges, on the other hand, are not directly influenced by emotions, personal beliefs, or external factors. In theory they rely solely on the analysis of data and application of pre-programmed laws and regulations to make decisions. This impartiality can ensure fair and consistent rulings, avoiding the pitfalls of human subjectivity.

Moreover, robot judges have the capability to process and analyze vast amounts of information within seconds. They can access and interpret legal precedents, statutes, and case law with unparalleled efficiency, potentially reducing the time and resources required for legal proceedings. This could lead to a more streamlined and efficient judicial system, benefiting both the legal professionals and litigants.

Despite the potential advantages, the implementation of robot judges raises significant concerns. One of the main concerns is the lack of human empathy and understanding of complex human emotions and contexts. Judging is not merely a mechanistic process of applying laws; it involves the interpretation of legal principles in light of the facts and circumstances of each case. This nuanced understanding of human behavior and emotions is currently beyond the capabilities of AI algorithms and could result in unjust decisions.

Furthermore, the use of AI in the judicial system raises questions about accountability and transparency. If a robot judge makes an erroneous decision, who should be held responsible? How can the reasoning behind

¹⁵ See Ulenaers, J. (2020). The Impact of Artificial Intelligence on the Right to a Fair Trial: Towards a Robot Judge? *Asian Journal of Law and Economics*, 11(2), p. 2, <https://doi.org/10.1515/ajle-2020-0008>.

¹⁶ See Strikaitė-Latušinskaja, G. (2023). The Rule of Law and Technology in the Public Sector. *Access to Justice in Eastern Europe*, 6(1), p. 29. <https://doi.org/10.33327/ajee-18-6.1-a000104>.

¹⁷ See Razmetaeva. (2022). ALGORITHMS IN THE COURTS: IS THERE ANY ROOM FOR A RULE OF LAW? *Access to Justice in Eastern Europe*, 5(4), p. 95 f. <https://doi.org/10.33327/AJEE-18-5.4-a000429>.

the decision be explained and reviewed? These questions highlight the potential challenges in ensuring the accountability of AI algorithms and the need for transparency in the decision-making process.

The idea of robot judges presents a compelling vision of a more impartial and efficient judicial system. However, the implementation of such a system must be approached with caution. While robot judges may offer benefits such as impartiality and efficiency, they also raise concerns surrounding empathy, an understanding of human behavior, and accountability. It is crucial to strike a balance between the advantages of AI and the essential role of human judgment in the legal system. As technology continues to advance, the debate surrounding robot judges will undoubtedly evolve, requiring careful consideration of ethical, legal, and practical implications.

4. Robot Judges Based on GAI

GAI technologies, of which ChatGPT¹⁸ is one of many, have reached the stage of being able to produce unique and quite complex texts.¹⁹ Computer programs have long been very good at copying texts and performing fairly complex calculations. However, the ability of algorithms to independently create “new” and unique texts has been limited.²⁰

GAI technology is based on the following concept.²¹ In a first step, the GAI model is trained on a large amount of text to identify structures and patterns in the text. ChatGPT is trained on a specific and limited amount of data, which is also pre-processed to some extent to remove unwanted bias.²² The training involves the algorithm being able to recognize certain

¹⁸ In the following section, the terms ChatGPT and ChatGPT-4 will be used interchangeably but will refer to ChatGPT-4. Where I refer to older versions of ChatGPT, this is made explicit.

¹⁹ See Open AI (2023) p. 4 and Appendix C.

²⁰ The improvements of ChatGPT are described in this article: Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems*, 3, 121–154. <https://doi.org/10.1016/j.iotcps.2023.04.003>.

²¹ See Ray, P. P. (2023) p. 123.

²² See Ray, P. P. (2023) p. 123.

patterns, and to “publish” a sequence of words as a logical consequence of an input (prompt or question).²³

A fully trained GAI model thus analyzes the input it receives in the form of a prompt/question. The prompt is broken down into smaller components, so-called “tokens”, which are analyzed and compared with the training data available to the algorithm. The algorithm then suggests a certain output in the form of text, based on its previous training. This could be described as determining a statistically correct order of a sequence of words based on the prompt.²⁴ When each prompt is fully analyzed, the tool “publishes” a text that is unique in nature. It is not a copy of a text downloaded from the web, but has been created as a result of a statistical model of how words should be chosen and how they should follow each other in relation to the input.

Many of the GAI tools are monitored in various ways and certain undesirable outputs are discarded.²⁵ They have also to some extent been instructed not to perform certain types of tasks. For example, it is not possible to ask ChatGPT-4 and Bing Chat²⁶ to write a student essay or a research report. However, the tools can create the structure of a report, and if the questions are broken down into smaller sub-questions, the answers can then be combined into a larger unit.

It also appears that the quality of the “answers” obtained is closely linked to the training data available to the tools. When training ChatGPT-4 open data from the internet has been used.²⁷ Data behind paywalls has not been included in the training data.

The GAI tools are thus better in areas where it has had access to a large amount of text as training data than in areas where there is less data. This means that they are usually significantly “better” at American law

²³ See Ray, P. P. (2023) p. 123.

²⁴ See UNESCO (2023) Guidance for generative AI in education and research provides with a simple and understandable description about how Generative AI works. (<https://unesdoc.unesco.org/ark:/48223/pf0000386693>).

²⁵ See Open AI (2023).

²⁶ Bing Chat is the search engine Bing’s AI-powered chat using the ChatGPT engine.

²⁷ See Hughes, A., (2023) ChatGPT: Everything you need to know about OpenAI’s GPT-4 tool, BBC Science Focus, September 1, 2023 at 3:35 (<https://www.sciencefocus.com/future-technology/gpt-3>).

than Swedish law.²⁸ Much of the Swedish legal source material is behind paywalls, and what is available from the open internet is therefore limited.

In this context, it should be emphasized that GAI tools are not “infallible”.²⁹ Possibly, from a linguistic statistical perspective, it can be established that they do not do anything wrong. The grammar and sentence structure of the text is always correct (as long as it is trained in the language in question). On the other hand, the meaning of the output text given may be completely wrong in relation to the question asked on the basis of the meaning. Sometimes ChatGPT-4 also “makes things up”.³⁰ Again, however, it should be emphasized that from a language technology perspective, the output is correct, even if an “incorrect” answer is given to a question.

It can thus be concluded that the GAI tools create linguistically correct answers, and the question of whether the answers are also correct in terms of content seems to relate directly to the training data that the algorithm had access to when it was being trained. Thus, it appears that a high degree of correctness can actually be achieved by the static language model given that the training data was sufficient.³¹

We have probably not yet seen the full potential of these models. For example, in the case of the Swedish legal system, the situation is that by far the largest amount of legal data is behind paywalls. However, a service like Juno is in the process of implementing AI tools to assist users.³² It is

²⁸ Note that ChatGPT-4 performed very well in US bar exams, see Open AI (2023).

²⁹ See, for example, this study: Neilson, B. (2023). Artificial Intelligence Authoring Financial Recommendations: Comparative Australian Evidence. *Journal of Financial Regulation*. <https://doi.org/10.1093/jfr/fjad004>. Both ChatGPT and Bing Chat inform the users that the answers could be wrong.

³⁰ In a test that I performed in the spring of 2023, I asked ChatGPT to list articles written by me. Four out of five were correct. The incorrect one seems to be correct but it does not exist.

³¹ See Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M. A., Al-Busaidi, A. S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., ... Wright, R. (2023). Opinion Paper: “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>.

³² See Frick, Anders Karnov: “AI will become an important tool for lawyers” (<https://www.realtid.se/karnov-ai-kommer-att-bli-ett-viktigt-verktyg-for-jurister/>).

entirely possible that these tools utilize GAI technology.³³ It remains to be seen whether the training data is sufficient for these tools to provide reliable “answers”. It should also be natural to allow this type of algorithm to continue to train both on input (prompts) and on ratings that users may provide. Over time, it can then be assumed that the tools become more and more accurate in their output.

Is there anything that GAI cannot do? People often emphasize that human thinking is unique. In many cases, this refers to the cognitive ability to think. Intuitive conclusions are also considered to be typically human. Another, closely related ability is what we call “thinking outside the box”, i.e. not following given rules but actually breaking the rules of thought to try something new. Those who are skillful at thinking outside the box often see other larger contexts and can draw conclusions that others cannot. Many people had probably seen apples fall before Newton. However, it took Newton’s eyes and mindset to link it all to the idea of gravity.

The question is to what extent GAI could be used to replace judges. As ChatGPT-4 has, for example, passed an American bar exam³⁴, it is likely that when it comes to legal reasoning, the technology is fully competent to provide a text that can at least simulate a judgment. It is not unlikely that the models can also be trained to “assess” which of two parties should win a dispute. I have not yet seen a GAI tool that has been trained to do that, but as the technology develops, it is in my opinion only a matter of time, and likely not that far away (as long as there is someone that would like to develop such a tool).

Below is a conversation in Swedish, here translated into English using deepl.com, that I had with Bing Chat and that gives a rather clear picture of the capacity of the GAI tools.

How are dividends to persons who own qualifying shares in a limited liability company taxed under Chapter 57 of the Income Tax Act?

Hi, this is Bing. I can help you with your question on the taxation of dividends on qualifying shares in a limited liability company.

³³ I have not found any details regarding the kind of technology that Norstedts/Juno are implementing in their legal database.

³⁴ See Open AI (2023).

According to chapter 57 of the Income Tax Act (IL), the following rules apply to the taxation of dividends on qualified shares in a limited liability company:

Dividends up to a certain amount (the threshold amount) are taxed as income from capital at 20 per cent (30 per cent on two-thirds of the dividend).

Dividends exceeding the threshold amount are taxed as income from employment at around 32-57 per cent, depending on your total income from employment in the same year.

The threshold amount is calculated according to either a simplification rule or a main rule. You can choose the rule that results in the highest threshold amount.

If you do not use all of your limit in one year, you can save the unused part for the next year (saved dividend allowance). The saved dividend room may be increased by an interest rate each year.

There is a ceiling on the amount of dividends that can be taxed as income from employment. For the income year 2022, the ceiling is SEK 6 390 000 (90 income base amounts). Dividends exceeding the ceiling are taxed in the capital income category at 30 per cent.

I hope this has been helpful to you. If you have more questions about taxation of dividends or other topics, feel free to ask me again. I am always happy to help.

Can you elaborate on how the threshold amount is calculated under the simplification rule?

Of course I can. The threshold amount under the simplification rule is a flat rate that depends on the income base amount for the year before the tax year. The income base amount is an amount determined each year by the government and used to calculate certain taxes and fees. For the income year 2023, the income base amount is SEK 71,000.

The threshold amount under the simplification rule is 2,75 times the income base amount, which is SEK 195,250 for 2023. This amount is then distributed equally among all shares in the company, regardless of whether they are qualified or not. If you own several closely held companies, you can only use the simplification rule in one of them.

Example: You own 50 per cent of the shares in a closely held company with 1,000 shares. Your threshold amount under the simplification rule for 2023 is then SEK 195,250 divided by 1,000 shares, which is SEK 195,25 per share. Since you own 500 shares, your total limit under the simplification rule is SEK 97,625 (SEK 195,25 multiplied by 500 shares).

I hope this has clarified how the threshold amount under the simplification rule is calculated. If you have any other questions about taxes or other topics, feel free to ask me again. I am here to help you.

How is the main rule threshold calculated?

The main rule threshold is calculated based on two factors: the capital you have invested in the company and the salaries paid by the company. To use the main rule, you have to fulfil certain conditions, including that your ownership in the company is at least 4% of the capital and that you or a close relative has taken a sufficient salary.

To calculate the threshold amount under the main rule, do the following:

You multiply the taxable amount you have for your shares in the company by an interest rate determined by the government borrowing rate for November of the year before the tax year plus 0.09. This gives you an amount based on your capital in the company.

You find out the total cash remuneration paid in salaries by the company and its subsidiaries in the previous calendar year. You then deduct any government grants the company has received. You then divide this amount by two. This gives you an amount based on the company's payroll.

You add the two amounts obtained in steps 1 and 2 together. This gives you the maximum amount under the main rule.

You compare the limit amount under the main rule with the limit amount under the simplification rule, which is a standardised amount based on the income base amount for the year before the tax year. You choose the higher amount.

You take into account any dividend room saved from previous years, which you can calculate using an interest rate determined by the government borrowing rate for November of the year prior to the tax year plus 0.03. This gives you the total limit. This gives you the total limit that you can withdraw as dividends and be taxed as capital income.

I hope this has explained how the threshold amount under the main rule is calculated. If you have any other questions about taxes or other topics, feel free to ask me again. I am here to help you.

This conversation shows that Bing Chat can answer a question in respect of a rather complicated area of tax law. The answer is rather detailed but lacks references to the tax code. It should come as no surprise to attorneys who focus their practice on tax law that Bing Chat possesses a high level of “competence” in the aforementioned subject matter. What is lacking are references to the appropriate parts of the tax code. On the other hand, the information is accurate enough to actually calculate an approximation of the taxes of dividends on the ownership of qualifying shares.

It should also be said that when I asked Bing Chat to make a reference to the code, it was unable to do so correctly. The problem might be that the training data of Bing Chat (which uses ChatGPT-4) did not include a sufficient number of texts covering the subject.

It is important to be aware of the fact that Swedish has one flaw when it comes to Large Language Models (LLM), which are the models upon which the GAI is based. This flaw is due to the fact that Swedish is a minor language, which means that only a small number of people around the world are able to speak Swedish. On the other hand, there is a sizable amount of content on the internet that is written in Swedish.

The true limitation of GAI has not been fully explored yet. Looking at the “competence” of Bing Chat (used in this case due to its access to the internet and because it is faster than the Beta version of ChatGPT-4 that has internet access) it seems reasonable that a specially trained GAI model for legal research could be as qualified at finding out the law in force as a human.

The next problem to deal with is how to provide the robot judge with sufficient information. This could either be done by equipping the robot judge with a number of different “sensors” as access to the internet, cameras, microphones and of course a keyboard.³⁵ Due to different perspectives of personal integrity protections, there are a number of obstacles before you can provide a robot judge with more sophisticated

³⁵ To have sensors is an important part of creating an intelligent machine, see Pfeifer, & Scheier, C. (1999). *Understanding intelligence*. p. 181 ff., MIT Press.

input sensors.³⁶ However, it is likely that the keyboard as input sensor is sufficient, i.e., that someone (preferably an expert) actually gives a description of a certain given situation. It does not seem impossible that a GAI model could be developed and trained for the purpose of solving a dispute based on such input. Instead of oral information, the information that is used as input is in written form. At the same time, you should be aware of the fact that voice recognition technology has also become much more advanced.³⁷ Therefore, it is very possible that a person can speak with their computer and in that way provide a robot judge with relevant information.

To summarize the concept of using GAI models as robot judges you should firstly be aware of the fact that the idea deviates to some extent from the general understanding of a robot judge. The idea of robot judges goes back to the aim of creating a machine similar to a human and a human's way of thinking.³⁸ Assuming that human thinking is more than calculating the correctness of a certain word order, as reflection of an input GAI models works in the mentioned way.³⁹ The question is whether this is sufficient for the purpose of using GAI based robot judges. In my opinion, it does not matter from a purely practical perspective. As long as GAI models solve the problems, you can argue that it is sufficient. However, it is likely that the GAI models do not? think as humans at all.

³⁶ These questions relate to the protection of personal integrity under the GDPR.

³⁷ See He, Y., Seng, K. P., & Ang, L. M. (2023). Multimodal Sensor-Input Architecture with Deep Learning for Audio-Visual Speech Recognition in Wild. *Sensors*, 23(4), 1834. <https://doi.org/10.3390/s 23041834>.

³⁸ The Turing test, proposed by Alan Turing in 1950, is a benchmark for assessing a machine's ability to exhibit human-like intelligence in conversation. In a Turing test, a human evaluator engages in a text-based conversation with both a human and a machine (often hidden from view), and their task is to determine which one is the machine based solely on the responses they receive. If the evaluator cannot reliably distinguish between the machine and the human based on their responses, the machine is said to have passed the Turing test, demonstrating a level of intelligence.

³⁹ This is a complicated question, and the fact of the matter is that it may be impossible to find out how a human brain works.

5. Conclusions

I have investigated the use of GAI technology in the form of ChatGPT-4 (and Bing Chat) as it exists today regarding their skill to solve legal problems. My conclusion based in this is that GAI tools can be used as robot judges in the future, and that the future is not necessarily that far away. It is probably a question of access to the relevant data to train a GAI model to provide judgment of legal problems that are correct.

A simple experiment that I conducted demonstrates that ChatGPT-4 might have the potential, given more training and better training data, to become a robot judge. Below is an outline of the conversation with ChatGPT-4:⁴⁰

Act as a judge and settle the following dispute: Anders wants to sell his bicycle and therefore places an advert on Blocket saying that the bicycle is for sale for SEK 2,000. Bengt calls Anders and says that he wants to buy the bike, but that he cannot pick it up the same day, so he comes the next day. However, Anders wants Bengt to pay, so Bengt Swishes SEK 2,000 to Anders. On the same day that Bengt buys the bike, Klas comes to Anders and wants to buy the bike. Klas does not know that Anders has already sold the bike to Bengt. Anders takes the money from Klas and Klas takes the bike home. When Bengt comes the next day to pick up his bike, he gets angry and demands a refund of the SEK 2,000 he paid to Anders. Is Bengt entitled to get his money back?

The answer I received was the following:

In this scenario, we have a dispute between Anders, Bengt, and Klas over the sale of a bicycle. Let's analyze the situation step by step:

1. Anders listed his bicycle for sale on Blocket for SEK 2,000.
2. Bengt expressed interest in buying the bicycle but couldn't pick it up on the same day. To secure the deal, Bengt Swishar (a mobile payment method) 2000 kr to Anders.
3. On the same day, Klas approached Anders and bought the bicycle, unaware that it had already been sold to Bengt.

⁴⁰ The conversation was originally in Swedish but translated into English using deepl.com.

The key issue here is whether Bengt has the right to get his money back.

In this case, it appears that Anders made a verbal agreement to sell the bicycle to Bengt, which was reinforced by the Swish payment. Klas's purchase of the bicycle afterward does not invalidate the initial agreement between Anders and Bengt. Therefore, Bengt has a valid claim to get his SEK 2,000 back from Anders.

To resolve this dispute, Anders should refund the SEK 2,000 to Bengt, as Klas's purchase occurred after the agreement with Bengt was already in place.

ChatGPT-4 was able to deliver a judgment in the case, and that decision was indeed the correct one. Additionally, it is important to be aware of the fact that the majority of the Swedish legal science literature as well as the case law are protected by paywalls. Tools such as ChatGPT-4 and Bing Chat do not have access to this information; in addition, they have not been trained on the text or the data, and are thus unable to make reference to that data.

Even though the technology is most probably not yet capable of resolving more complex legal conflicts, it is only a matter of time, in my opinion, before GAI tools are developed that make use of the relatively enormous databases of legal material that are protected by paywalls. These tools will undoubtedly grow far more knowledgeable over time, and the solutions they provide will also improve. This method ought to be capable of handling at the very least all of the commonplace scenarios (disputes).

The question that needs to be answered is whether or not machines are also capable of evaluating more nuanced scenarios, such as whether or not something is fair. For robot judges using GAI technology there is a good chance that this will be determined by the data that can be used to train the algorithms. It is possible that there is insufficient quantity of data to reach that level.⁴¹ It is important to keep in mind that GAI tools do not possess intelligence in the same sense that we consider humans to possess intelligence. To the best of our knowledge, GAI models do not

⁴¹ The progress in the field of Synthetic Data might be a solution on this problem, see Meyer, D., Nagler, T., & Hogan, R. J. (2021). Copula-based synthetic data augmentation for machine-learning emulators. *Geoscientific Model Development*, 14(8), 5205–5215. <https://doi.org/10.5194/gmd-14-5205-2021> for a description of the concept of using synthetic data for machine learning.

have emotions or political viewpoints of their own. Output that appears to be based on such factors is only possible if the data used for training contains some inherent bias.

If such bias can be found in the data that the model is trained on, then the question of whether or not GAI models can also give answers based on conscience can truly be answered in the affirmative. As a consequence of this, if the data are scrubbed so that they are completely devoid of bias, there is a possibility that a GAI model will no longer be able to produce results that are in line with the user's moral compass. This presents a conundrum in a sense. Although it is argued that decisions should not be based on your conscience since it violates the norms of the rule of law, this principle says that such decisions are necessary in order to preserve moral and ethical standards.

Furthermore, humans have a proclivity toward not relying on "machines", which is something else that should be kept in mind as an important consideration. Even if a machine performs better than a human, the bar to become a judge is definitely set very high and will not be crossed until a great deal more progress has been made. It is not acceptable for a computer to have a 95-percent accuracy rate, even if humans may not be able to attain even a lower rate of accuracy. The obvious flaw with this line of thinking is that it demonstrates a lack of intelligence. One good illustration of this is self-driving automobiles. Even if there are incidents involving self-driving cars, they are still a vast improvement over humans in this regard. Actually, it is quite possible that lives would be saved if the use of self-driving cars was introduced immediately, despite the fact that they are not yet completely perfect.

Despite what has been said, it is quite unlikely that we will agree to accept robot judges, even if they are vastly superior to human ones as long as the robot judge makes one single mistake. Machines will not be utilized to make decisions unless it can be demonstrated beyond a reasonable doubt that the results they produce are accurate (in almost) one hundred percent of the time. If we make the assumption that this is the case, and if robot judges (something which is quite likely) will attain the level of correctness equal to one hundred percent, then another question arises: do we even need appellate courts and supreme courts at all? It could also be the case that for parts of the legal domain we will not have the need for any "courts" at all. Examining the administrative law

aspect, for example, in relation to taxes, raises the following question: If algorithms could assess such cases with consistent accuracy, why would there be a need for a mechanism to contest such decisions?