

Requirements for Tax XAI under Constitutional Principles and Human Rights

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Abstract. Tax authorities worldwide make extensive use of artificial intelligence (AI) technologies to automate various aspects of their tasks, such as answering taxpayer questions, assessing fraud risk, risk profiling, and auditing (selecting tax inspections). Since this automation has led to concerns about the impact of non-explainable AI systems on taxpayers' rights, explainable AI (XAI) technologies appear to be fundamental for the lawful use of AI in the tax domain. This paper provides an initial map of the explainability requirements that AI systems must meet for tax applications. To this end, the paper examines the constitutional principles that guide taxation in democracies and the specific human rights system of the European Convention of Human Rights (ECHR), as interpreted by the European Court of Human Rights (ECtHR). Based on these requirements, the paper suggests how approaches to XAI might be deployed to address the specific needs of the various stakeholders in the tax domain.

Keywords: Explanation, XAI, Tax law, Legal requirements for AI.

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1 Introduction

Artificial Intelligence (AI) systems are increasingly important for modern taxation. Some tax AI systems [1] are deployed to support tax compliance activities; for example, by automating invoice generation [2]. Others are used by tax authorities in their enforcement work: to obtain information about taxpayer behaviour [3, 4], guide tax inspection practices [5], assess fraud risks [6], or even automate the procedures involved in seizing assets in cases of fraud [7]. As these systems become capable of performing tasks that would require specialized human labour, they have the potential to save time and money for both taxpayers and governments [8]. But automation also introduces several risks: AI systems are not error-proof, which means that they can produce biased decisions [9], they may be used for purposes beyond the legitimate scope that motivated their introduction [10, 11], or they may be used in ways that deprive taxpayers of their right to contest potentially wrongful decisions [12]. Such risks are compounded by the various forms of opacity surrounding AI systems, which may preclude taxpayers from learning about how tax decisions are made or even about the existence of a decision based on an AI system in the first place [13]. As a result, the introduction of AI systems into public sector activities may introduce various kinds of risks to taxpayers and to the legitimacy of the procedures using AI.¹

To address such risks, lawyers and computer scientists should work together on approaches that address the potential harms coming from the use of AI technologies in taxation. This paper focuses on one such approach: explainable AI (XAI) in tax law, that is, the development of techniques that make the functioning of an AI system understandable for taxpayers [15]. Its principal purpose is to verify the extent to which constitutional principles and human rights require tax AI systems to be explainable to ensure their validity. In that regard, our work relies on the qualitative analysis of legal sources of fundamental importance for taxpayer rights—constitutional principles and human rights. Our analysis, in turn, draws the contours of a legal framework for lawyers and computer scientists. Such a framework is of utmost importance for ensuring the legality of tax AI systems and thus avoiding protracted litigation stemming from the use of AI systems by tax authorities and building society’s trust in tax administration 3.0.²

The remainder of the paper proceeds as follows. Section 2 examines the general constitutional features of tax systems throughout the world and how AI systems impact them. Since the boom in tax AI technologies described above is a relatively recent development, not all legal systems have dealt with constitutional law challenges

¹ In the broader context of public administration, a recent report by the Netherlands Court of Audit analysed 9 AI systems used by the Dutch government, concluding that only 3 of them met minimum audit standards for governance and accountability, data and model management, and privacy protection: [14].

² A recent report from the Organisation for Economic Co-operation and Development (OECD) [8] used the term “Tax Administration 3.0” to mark a new stage of digitalization, in which taxation is moved closer to taxable events through built-in, automated compliance mechanisms and the interconnection between tax authority systems and the systems taxpayers use to run their businesses.

to tax automation. However, such challenges have already appeared in some European countries, which is why Section 3 examines the relevant aspects of the legal framework of the European Convention on Human Rights (ECHR) as a potential source of explanation requirements regarding XAI in taxation. While this Convention is not a global document, and its applicability to tax issues is somewhat limited, it has been invoked in various cases involving AI and related technologies. As such, an analysis of the legal requirements for XAI in the ECHR provides important insights for the development of tax XAI, developed in Section 4 into an initial set of requirements for explanation in the tax domain, which can also be relevant to efforts to identify such requirements in legal systems not bound to the ECHR itself.

2 Requirements for tax XAI under Constitutional principles

On a fundamental level, every constitution ensures the principle of “no taxation without representation”, which arises out of the rule of law in taxation, i.e., the explicit requirement of statutory provisions for the imposition, calculation and levying of any tax [16]. As a result, the legislators have the sole authority to determine the general principles of tax law and decide on every detail of tax collection. To illustrate this point, we bring four examples. Article 34 of the French Constitution states that “Statutes shall determine the rules concerning the base, rates and methods of collection of all types of taxes; the issuing of currency”. Similarly, Article 217 of the Polish Constitution stipulates that “The imposition of taxes, other public levies, the determination of entities, subjects of taxation and tax rates, as well as the rules for granting reliefs and remissions and the categories of entities exempted from taxes shall be effected by statute”. In the same vein, Article 265 of the Indian Constitution says that: “No tax shall be levied or collected except by authority of law.” Finally, the Brazilian Constitution forbids the Union, States, the Federal District, and Municipalities from imposing or increasing taxes by means other than statutes.³ As a result, the executive power, including tax administrations, has almost no authority over tax law, apart from executing the tax law made by the legislators. Such constitutional principles further imply that tax provisions and their execution must be clear, precise, accessible, and reasonably intelligible to all users and be amenable to disputes in public courts. Tax provisions and their execution must also be subject to express and clear legal safeguards to protect taxpayer rights, meaning that civil servants will have to be shorn of any discretionary powers related to tax provisions.

These constitutional requirements for tax provisions and their application are universal and arise from the constitutional principles of legal certainty and predictability [16]. At the level of applying tax provisions, the tax authorities must be accountable

³ Article 150, I, with a few exceptions presented in the same article As specified by the legislation implementing this constitutional provision, the prohibition encompasses any changes to the constitutive elements of a tax, such as the tax rate, the base, the triggering event or the applicable penalties (Article 97 National Tax Code).

[17]. This accountability manifests, among other things, by applying the tax provisions in accordance with the constitutional principles that require administrative decisions of tax authorities to be understandable by the taxpayers, i.e. the decisions of tax authorities must be sufficiently clear, precise, and predictable as regards their effects on taxpayers. Similar requirements follow from the principle of legal certainty sanctioned under European Union law [18, 19]. These requirements continue to apply when AI is used for tax law purposes.⁴ The challenge here is that AI systems are often opaque,⁵ preventing taxpayers from knowing how AI affects their rights and tax authorities from understanding how their systems operate. Opacity might be an obstacle to understanding whether a system complies with constitutional requirements, putting the lawfulness and legitimacy of tax AI systems into question.⁶ Consequently, XAI techniques—which address technological forms of opacity by providing suitable explanations of how a system works or arrives at a given decision—are directly linked to the accountability of AI systems under the constitutional requirements for tax law.

At the end of the day, the tax provisions that regulate the use of AI systems by tax administrations are not immune to error, which means that the tax administration is constitutionally responsible for miscalculations of taxes or the misidentification of tax risks resulting from their use [17]. Such mistakes may follow from coding errors (bugs) that are inevitable parts of the programming involved in every AI system. Coding errors that produce incorrect or unexpected results in software systems may be non-negligible, i.e. “about 1–25 errors per 1000 lines of code” [22]. At the same time, finding bugs in AI systems related to taxation is extremely time-consuming and expensive because it requires close interaction between tax experts and programmers to properly test such systems [17, 23]. In addition, testing AI systems can effectively identify bugs, but not at showing their absence [24]. Even in AI systems that have been tested very well, various kinds of errors in their software can occur at the empirically observed average rate of about one error per hundred lines of code [25]. Bearing in mind that some software has millions or even billions of lines of code, the risk of a miscalculation of taxes or a misidentification of tax risks by the tax administrations using AI systems is very high (see, for example, [26]). Of course, such a risk is not tolerable under the constitutional requirements concerning the sphere of taxation, which demand that all details of taxation are as transparent as possible, as well as being precise and predictable both at the level of statutory law and its execution.

Such observations have recently gained strong jurisprudential support. Namely, the Slovak Constitutional Court, in its judgment of 17 December 2021 in the *eKasa* case [27], implicitly supported the need for explainability of AI systems in light of constitutional principles by stating that “[t]he law restricting fundamental rights must be specific enough to make its application predictable” (§122) and that “[t]he application of technological progress in public administration cannot result in an impersonal state whose decisions are inexplicable, unexplained and at the same time no one is

⁴ See, for example, the discussion of the Slovak constitutional case law below in this sub-section.

⁵ This article deals with opacity stemming from technological factors, but opacity may also arise due to non-technological factors such as legislative opacity: [20].

⁶ On opacity and its relation to algorithmic accountability, see [21].

responsible for them” (§127). The Slovak Constitutional Court also emphasized that the lack of effective supervision over AI systems fails to ensure the proportional application of the technology (§ 129). To ensure the proportionality, in the Court’s view, the AI systems used by tax administrations must be ex-ante (pre-implementation) and ex-post (post-implementation) effectively supervised, including the access to inputs or assessment criteria, access to the logic of the decision or individual assessment and whether the automated assessment uses patterns, models or other databases that lead to a particular decision (§§ 137-138). Clearly, the effective supervision of AI systems is impossible without their explainability.

In light of the above constitutional considerations, an essential feature of an AI system related to taxation must be its explainability. Only a sufficient level of explainability of an AI system may ensure that its use is compatible with constitutional principles. From a purely legal perspective, it follows from the fact that the execution of tax law must be as transparent and precise as possible for taxpayers. Even if the transparency and precision of the execution of tax law must sometimes be compromised for the sake of effectiveness in preventing tax fraud, this compromise must be well justified, and the justification must be proportional to the goals pursued, striking a balance between various interests of tax authorities and taxpayers.

Sufficient explainability appears to be an essential feature of all constitutionally compliant AI systems in the tax domain. This observation is not trivial at all, considering how general and vague the constitutional principles appear to be relative to AI. It is now interesting to see whether similar observations are valid regarding the ECHR—which, as the European bill of rights [28], incorporates a considerable number of human rights protections.

3 Requirements for tax XAI under the European Convention on Human Rights (ECHR)

Several provisions of the ECHR could be seen as requirements for the explainability of AI systems: the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to property in conjunction with the prohibition of discrimination (Article 14 and Article 1 of Protocol number 1). We do not distinguish here between taxpayers who are individuals (natural persons) and companies (legal persons), as Article 34 of the ECHR stipulates that the European Court of Human Rights (ECtHR) “may receive applications from *any person, nongovernmental organisation* or group of individuals claiming to be the victim of a violation” of the ECHR by any of its Member States. Thus, not only individual taxpayers but also companies have standing before the ECtHR if they are not “governmental organisations” within the meaning of Article 34 of the ECHR [29, 30]. Nevertheless, none of the provisions of the ECHR mentioned above clearly and without doubt provide a clear-cut requirement for the explainability of AI systems in tax law.

3.1 Right to a fair trial (Article 6 ECHR)

The application of Article 6 of the ECHR to tax law has been significantly restricted by the ECtHR (Grand Chamber) in its judgment of 12 July 2001 in *Ferrazzini v. Italy* case [31]. In the judgment, the ECtHR (by a majority of 11 judges to 6) decided that Article 6 does not apply to ordinary tax proceedings because taxation and tax-related disputes fall “outside the scope of civil rights and obligations, despite the pecuniary effects which they necessarily produce for the taxpayer”, as the public nature of the relationship between tax authorities and taxpayers remains predominant (§ 29).⁷ The ECtHR admitted applying Article 6 to tax cases to tax surcharges proceedings that have a “criminal connotation” under the criminal limb of that provision (§ 20). Such proceedings concern the imposition of penalties (tax surcharges) on all citizens in their capacity as taxpayers, essentially as punishment to deter reoffending (a deterrent and a punitive purpose) [33–35]. In other words, according to the ECtHR, Art. 6 applies to tax disputes only insofar as they are triggered by tax surcharges imposed on taxpayers for their behaviour of criminal nature, which is usually related to the criminal offences of lack of tax compliance. The determination of whether or not a tax dispute enters the ambit of Article 6 is, therefore, extremely circumstantial and subject to vast discretion by the ECtHR. This restriction also leads to bizarre outcomes: If a tax surcharge (penalty) was imposed on a taxpayer, even a little one, then they are fully protected under the criminal limb of Article 6. By contrast, if a taxpayer is liable to additional tax with no deterrent/penalized purpose—for example, by paying tax stemming from a decision of tax authorities based on ordinary income tax provisions—they do not enjoy the panoply of rights afforded to criminal defendants under this provision [32], even if the amount charged turns out to be enormous.

Accordingly, Article 6 of the ECHR constitutes a relevant legal source to ensure the right to a fair trial in disputes triggered by an application of AI systems to tax law only when they arise out of the imposition of tax surcharges on taxpayers. In such cases, the two following elements of the right to a fair trial are most relevant for applying AI systems to tax law: (i) the minimum guarantees of equality of arms and (ii) the right of defence. They mean that the taxpayers must be allowed to effectively review the information on which the tax authorities base their decisions [36, 37].

For example, the taxpayer should be entitled to the legal factors relevant to deciding on an application of the tax law and the logic behind the AI systems that prompt the authorities to reach a given tax decision, in order to fully understand how its outcome was reached. Otherwise, taxpayers will be frustrated in their attempts to counter-argue and deliver counter-evidence to the claims made by tax authorities [38, 39]. Likewise, a fair balance between the general public interest upheld by tax authorities and the protection of the human rights of taxpayers before a court will be heavily distorted in favour of the former. The lack of sufficient explainability of AI systems also threatens the right to a fair trial at the judiciary level. The ECtHR explicitly stated that a court

⁷ This judgment is in our view rightly considered by Philip Baker as one of the biggest failings of the ECtHR, since it practically means that under the ECHR, a taxpayer in member States of the ECHR does not have right “in an ordinary tax dispute to a fair trial by an independent and impartial tribunal”. [32]

judgement should contain reasons that are sufficient to reply to the essential aspects of the party's factual and legal—substantive or procedural—argument. Otherwise, the judgment would render the right to appeal against the final decision purely illusory [40]. A reasoned justification demonstrates to the parties that they have been actually heard, constituting a guarantee that the rights of the party have been respected during the dispute, and it also confirms the public scrutiny of the administration of justice [41, 42]. Accordingly, the use of unexplainable AI may undermine the right to a fair trial not just in the context of the ordinary operations of a tax authority but also in the very courts meant to protect taxpayer rights [43]. Consequently, explainability becomes a major requirement for ensuring AI systems in tax law do not disrupt the right to a fair trial as outlined in Article 6 and interpreted by the Court in its case law. Non-explainable AI systems in tax law simply disallow taxpayers to effectively defend themselves in disputes with tax authorities which rely on the outputs of these systems in rendering tax decisions.

The right to a fair trial under the ECHR and the EU Charter is of limited assistance in ensuring the explainability of AI systems in tax law even within their geographical scope of application. The reason for that does not lie with the inadequate merits of that right to XAI in tax law but with its limited personal, substantive and territorial scope of application. Perhaps the constitutional provisions of States might regulate such a right more broadly and explicitly set conditions for applying AI systems in tax law [32]. The verification of this assumption would require a country-by-country analysis, which is outside the scope of this study.⁸

3.2 Right to respect for private and family life (Article 8 ECHR)

The right to respect for private and family life in Article 8 of the ECHR has become one of the key fundamental rights for the legality of AI systems in tax law due to the seminal and widely debated [45–47] judgment of 5 February 2020 of the Hague District Court in the Netherlands in *SyRI* (*Systeem Risico Indicatie*) case [48]. In that case, the focal point of the arguments of the claimants (NJCM et al.) was the alleged violation of Art. 8 of the ECHR. The court's analysis, therefore, focused on the question of whether the *SyRI* legislation met the conditions under Article 8(2) ECHR, which lays down the conditions for restrictions of the right to respect for private life. Apart from the arguments of the claimants, the reason why the court gave so much attention to the ECHR instead of the General Data Protection Law (GDPR) in force in the European Union most likely was that the court assumed that examining the *SyRI* legislation under the international law on human rights sounds more convincing than doing so under a detailed regulation such as the GDPR [49]. Deciding this case under the legal principle

⁸ Also, it is not unlikely that the ECtHR will revise the Ferrazzini case in the near future by allowing the application of Art. 6 of the ECHR to “normal” tax disputes, including those arising out of AI systems in tax law. In doing so, the Court would approach its treatment of tax disputes to the treatment of social security contributions, which are deemed to have private law features that outweigh the public elements of the obligation: [44]

rather than a detailed legal regulation may also constitute a rock-solid juridical precedence.

The court's main task was to assess whether the SyRI legislation met the requirements of necessity, proportionality, and subsidiarity pursuant to Article 8(2) of the ECHR in light of the aims it asserts. Meeting such requirements means striking a 'fair balance' between the purposes of the SyRI legislation and the invasion of private life the legislation causes (§ 6.80). By looking at the substance of SyRI legislation, the court observed that it processed a great amount of data and its risk model and indicators that make up the model and the data which were used in a particular SyRI project were not public, nor were they known to the data subjects (§ 6.82). To determine whether such balance existed, the court weighted the substance of the SyRI legislation, in light of the aims it pursues, against the violation of private life this legislation caused. After this assessment, the court decided that the SyRI legislation did not strike the 'fair balance' required to justify interference with the right to respect for private and family life under Article 8(2) of the ECHR (§ 6.83).

The court justified its decision, *inter alia*, by referring to the ECtHR's judgment in *S. and Marper versus the United Kingdom* case [50], which regarded the retention of DNA profiles for an indefinite term. In particular, the court cited the thesis of the ECtHR according to which "any State claiming a pioneer role in the development of new technologies bears special responsibility for striking the right balance in this regard". Although the Dutch legislator did not claim to be a pioneer in applying the instrument of SyRI in this case, the court held that in this case, too, the State should bear a special responsibility, as expressed by the ECtHR (§ 6.84). This shows—rightly, in our view—that the use of new technologies by public administration, including tax authorities, raises the bar for meeting the requirements under Article 8(2) of the ECHR.

The court further expanded on the characteristics of the SyRI legislation that failed to comply with Article 8(2) of the ECHR. In particular, it did indicate the objective factual data that could justifiably lead to the conclusion that there was an increased risk of tax fraud, and it was also silent about the risk model, the type of algorithm used in the model, and the risk analysis method (§§ 6.87 and 6.89). As a result, addressees of the SyRI legislation were neither able to defend themselves against the fact that a risk report was submitted about them nor were they aware that their data were processed on correct grounds (§ 6.90). This rationale reveals that the court made an implicit connection with the right to a fair trial set forth in Article 6 of the ECHR, since the inability to effectively defend stems from the same features of the SyRI legislation, i.e., its lack of transparency in respect of the functioning of SyRI, thereby rendering that system inexplicable by law. Accordingly, in the court's view, the SyRI legislation was not necessary in a democratic society, and it failed to strike the "fair balance" required under the ECHR between the social interest the legislation serves and the violation of private life to which the legislation gives rise (§§ 6.72, 6.105-106).

Indeed, any legislation that permits the use of an AI system without a respective right to receive a sufficient explanation about its functioning by its addressees (e.g. taxpayers) does not appear to pass the standard of legality in a democratic country [49]. A legislative-made black-box AI system is far away from striking such balance. Since SyRI legislation permitted the functioning of such a black-box system for risk profiling

purposes in the Netherlands, the court was, in our view, correct in deciding that this legislation violates Article 8(2) of the ECHR and, consequently, the first paragraph of the same article.

The court did not examine the compatibility of the SyRI legislation with Articles 6 and 13 of the ECHR due to the judicial economy: once the court decided that the SyRI legislation is illegal due to the violation of Article 8(2) of the ECHR, it was unnecessary to do so in respect of Articles 6 and 13 because the finding of one violation should be sufficient to satisfy the claimants. For the same reason, the court did not analyse whether the SyRI legislation is contrary to specific provisions of the GDPR (§ 6.107). However, it acknowledged the relevance of Article 22 of the GDPR in providing legal protection (a right to an explanation and a meaningful human intervention) to addressees of automated decision-making (§§ 6.35-6.36, 6.55-6.60).⁹

This case demonstrates that invoking a broad legal principle enshrined in the international treaty—the right to respect for private and family life (Art. 8 of the ECHR)—may effectively protect personal data and require States to use AI systems only in a transparent and explainable manner. It also shows that relying on technological and specialized data protection law (e.g., the GDPR) is not necessary to that end, even if such law appears to be bespoke to protect a broader spectrum of personal data than the ECHR.¹⁰

The application of Article 8 ECHR to digital information contexts—in particular, the AI-related contexts that this paper examines—might itself require attention to the technological specificities of the systems at hand. In *I v. Finland* [55], the ECtHR ruled that the Finnish government failed to protect an individual’s right to private life by adopting inadequate access control measures regarding that individual’s medical data (§ 48). According to previous case law, Article 8 ECHR obliges the parties to the convention not just to refrain from interfering with an individual’s private life but also to adopt measures that promote the right to privacy even in the sphere of relations between individuals (§ 36). Even though Finland’s laws on data protection established rules for the processing of medical data that would have been sufficient in abstract (§§ 39–40), the ECtHR ruled that the hospital’s failure to adopt technological measures that protected patients against unauthorized access (§§ 41–45) led to a violation of the right to private life in the case under analysis.

While the ECtHR decision in *I v. Finland* deals with a narrow situation, in which the mere disclosure of the data at hand could lead to substantial intrusions into the applicant’s right to private life, the case has broader implications for the protection of fundamental rights. In a digital society, the right to privacy is directly connected to the information available about individuals, and AI increases risks by enabling the processing and aggregation of large volumes of data [56]. These technologies also play an important role in mediating how individuals interact with one another and with

⁹ It is worth to note that in an unrelated case from 2021, the Amsterdam District Court recognized, for the first time in Europe, a right to an explanation regarding an automated decision, based on the GDPR [51–53].

¹⁰ The ECtHR indicates that the scope of protection under Art. 8 of the ECHR includes only personal data processing which concerns data regarding people’s private lives, or if data processing is extensive. Hence, not all personal data is covered by Art. 8 of the ECHR [54].

institutional actors. As a result, technology plays a normative role in modern societies [57–59], and regulators may thus need to address the technical properties of technologies such as AI.

3.3 The prohibition of discrimination (Article 14) in conjunction with other provisions of the ECHR and its Protocols

The prohibition of discrimination in Article 14 of the ECHR enshrines the right not to be discriminated against in “the enjoyment of the rights and freedoms set out in the Convention”; thereby, it merely complements the other substantive provisions of the ECHR and its Protocols.¹¹ Consequently, Article 14 does not prohibit discrimination *per se*, but only discrimination in the enjoyment of the rights and freedoms set forth in the ECHR, and therefore it is applied in conjunction with other provisions of that Convention and the Protocols thereto [60].

Article 14 of the ECHR, in conjunction with other provisions of this Convention and the Protocols, is rarely successfully invoked by taxpayers in front of the ECtHR, because that Court has recognized a wide margin of appreciation for States in tax matters in respect of discriminatory tax measures [32]. In fact, the ECtHR have found a violation of the prohibition of discrimination in quite unusual tax cases such as those regarding: (i) discriminatory tax treatment of non-resident in comparison to residents due to the possibility to opt out of payment of the church tax only by the latter (a violation of Article 14 in conjunction with Article 1 Protocol No. 1 of the ECHR) [61]; (ii) a differentiation between people declared unfit for military service and exonerated from paying the tax and those declared unfit for this service but nevertheless obliged to pay it (a violation of Article 14 in conjunction with Article 8 ECHR) [62]; or (iii) failing to take into account by the tax authorities the needs of a child with disabilities when determining his father’s eligibility for tax relief on the purchase of suitably adapted property (a violation of Article 14 in conjunction with Article 1 Protocol No. 1 of the ECHR) [63]. In many other tax-related cases, the ECtHR either declared that the applications were inadmissible or found no violation of invoked Article 14 in conjunction with other provisions of the ECHR or the Protocols [64].

The ECtHR has generally not recognized discriminatory tax treatment as a breach of the rights in Article 14 to non-discriminatory enjoyment of the various rights protected under the ECHR [32]. Thus, although XAI may assist in combating discriminatory tax treatment stemming from the use of AI tax-related systems by identifying discriminatory features of such systems—such as biased data and/or factors decisive to deliver a decision in a discriminatory way—the prohibition of discrimination in Article 14 does not seem to be a solid legal basis for ensuring the explainability of AI systems of tax law. Considering that the principle of non-discrimination is among the cornerstones of international human rights and that one of the most frequently reported impacts of AI systems on human rights is the impact on the right to be shielded from discrimination,

¹¹ A general prohibition of discrimination was enshrined in Article 1 of Protocol 12 of the ECHR. The protocol has already been ratified by enough signatories to come into effect, but nevertheless a considerable number of parties to the Convention have not ratified it.

the observation from the previous sentence is clearly unsatisfactory [65, 66]. Currently, it appears that the ECHR, in light of the ECtHR case law, does not include legal instruments that could effectively prevent discriminatory prohibited tax treatment, which may follow from undesired, discriminatory results of AI systems. However, it is worth reiterating that the ECtHR requires states to adopt technological measures that protect addresses of the ECHR against unauthorized access to their data concerning their private life (see [55], discussed above). Meeting such technological requirements does not seem to lie far away from the requirement to adopt technological measures that permit addresses of the ECHR to verify whether the data regarding their private life was not used to discriminatory tax results. This is not an unlikely scenario, as the imbalanced data often used to train AI systems may introduce various kinds of biases into these systems' decision-making processes. In the light of many subjective terms under tax law and a plethora of ambiguous borderline (taxable vs non-taxable) situations, there is a risk of the AI model providing incorrect classifications, resulting in discriminatory tax treatment even if the tax authorities or other stakeholders are not aware of the ensuing discrimination [67].

In this context, explainability appears as a necessary tool to detect discriminatory tax treatment caused by AI systems. However, Article 14, in conjunction with other provisions of the ECHR and its Protocols, does not seem to contribute to the explainability of AI systems and, thus, to the discovery of their alleged discriminatory properties. This state of the art may change if the ECtHR considerably evolves its case law concerning discriminatory tax treatment to encompass more usual situations of tax discrimination, including discrimination caused by the use of AI systems. Until then, discriminatory AI systems could be uncovered and prevented by the principle of non-discrimination as enshrined in constitutions in many countries and EU law. Such an approach, however, goes beyond the scope of the ECHR.

4 Preliminary proposals to meet the explanation requirements under the constitutional principles and the ECHR

Sections 2 and 3 establish that broad principles and fundamental rights under constitutional principles and the ECHR, respectively, may require the explainability of AI systems in tax law. Notably, the constitutional principles demand that all taxation details are as precise, transparent, and predictable as possible, both at the level of statutory law and its execution. Therefore, they do not tolerate inexplainable AI systems in tax matters, as such systems would lead to largely unpredictable tax consequences for taxpayers. The constitutional principles have already proven to be guardians of XAI in tax matters in tax law in the jurisprudence at the highest instance. At least one of the fundamental rights under the ECHR—the right to respect for private and family life—also proved to be explicitly capable of carving out inexplainable AI systems in tax matters from the legislation by the case law. Inexplainable AI systems in tax law deprive taxpayers of awareness that their data were processed correctly, violating their right to respect for private and family life. Although the ECtHR is not supportive of relying on

the right to a fair trial in tax cases (the *Ferrazzini* case), a Dutch court has recently rightly made an implicit connection between the violation of the right to respect for private and family life and the violation of the right to a fair trial because of the one and the same feature of the legislation governing the use of AI systems—the lack of explainability requirements. Therefore, inexplainable AI systems in tax matters do not allow taxpayers to effectively defend themselves against the adverse effects of their application by the tax authorities. This proactive role of national courts in extending ECHR rights beyond ECtHR case law is in line with the subsidiarity principles underlining the Convention, under which the bulk of the responsibility for enforcement falls upon the Member States.

All in all, constitutional principles and the ECHR require from the tax authorities a certain degree of explanation of the functioning of tax AI systems on which they rely to make decisions affecting taxpayers. At the minimum, they need to explain why and how the AI system used by them led to the particular decision in respect of a taxpayer. Only if a meaningful explanation is provided to the taxpayer, they will be able to effectively defend themselves in case of a dispute with the tax authorities, including the verification of whether the tax authorities used their data via AI systems in a non-discriminatory and non-arbitrary way.

Bearing in mind the mind-blowing complexity of some AI systems, mere access to information about their functioning may not help many taxpayers affected by them understand why and how it happens [67], thereby complying with explainability requirements under the constitutional principles and the ECHR. In particular, providing the full code of tax AI system will not be very useful in terms of its explainability for individual taxpayers and small and medium businesses, as these actors seldom have the resources and technical competences needed to assess why an AI system produced a specific decision in their particular case. At most, code transparency might be useful for large corporations and governmental actors, which have the resources to thoroughly analyse what is going on, and—to a lesser extent—well-funded civil society organizations. Even in those cases, however, retrieving the meaning and identifying the reason for a particular tax decision from the entire code underlying AI system would constitute a substantial administrative burden. Thus, code transparency would not meet the requirements of tax XAI in light of the constitutional principles and the ECHR, and it may implicitly lead to discriminatory treatment of taxpayers depending on their size/financial resources. Instead, explanation approaches would be better served by a golden rule of XAI: the explainability of the AI system must be calibrated to the stakeholders' needs, knowledge level, and resources. No one fits all solution exists in the world of XAI, which means that XAI must be appropriate for a given stakeholder.

Before doing so, it is wise to point out that explainability will not always be possible due to pragmatic reasons. Some AI systems are so complex that explaining them would be impossible or nearly impossible even after using the most powerful and overly resource-consuming explainability techniques [68]. In other situations, explainability would be possible given reasonable resources, but the agent/institution responsible for explaining the AI system may not afford it [69]. In all mentioned situations, the AI system should be supplemented with external XAI techniques, or, if that is not possible, withdrawn from use and replaced with a model more amenable to explanation.

Otherwise, it would not be possible to meet the requirements of explainability under constitutional principles and the ECHR.

Such situations can be avoided from the onset if explainability becomes a mandatory feature that must be assessed before an AI system is deployed in a tax application. To this end, however, specific regulations would be needed, as the broad constitutional principles and the rules in the ECHR may not be enough to effectively impose the mentioned obligation on the deployers and users of tax AI systems.¹² Moreover, current XAI techniques were developed with technical requirements in mind and therefore are not necessarily on a par with legal justification standards such as those following from national constitutional principles and international human rights instruments such as the ECHR. While a machine learning method might exhibit high accuracy and detect the relevant features (explanation level), the legal rationale for a decision might still be unsound [70]. This disconnection between explanation and justification [71] has been well known by legal realists, and it is now being exposed as AI-based systems are implemented. Thus, there is a need for a relevant legal and technical investigation to assess how XAI techniques could eventually contribute to the discharge of these duties of *justification* by providing information about how an AI system arrives at its decision in each particular case [72].¹³ Only such AI systems will comply with the explainability requirements under the constitutional principles and the ECHR. Consequently, once an AI system operates in the tax domain, the aim is to identify and develop XAI methods capable of explaining the outcomes of that system. Keeping in mind that different explanations are likely to serve different purposes and, for this reason, are likely to be appropriate for different stakeholders,¹⁴ the search for suitable XAI methods should take into account the three groups of target stakeholders: taxpayers and tax advisors, tax officers and tax judges.

Taxpayers, as subjects/addressees of decisions rendered fully or partly by AI system, and tax advisors—in their role supporting taxpayers—are primarily concerned with *why* questions, for which a system's behaviour must be interpreted to let them know which information is represented and which factors contribute to a particular outcome [73]. For these stakeholders, therefore, local post-hoc explanation methods appear to be most suitable, because they help to clarify whether the provided AI decisions in particular cases regarding taxpayers are reliable and reasonable [74]. In terms of explainable AI research, the *why* questions are connected with local explanations, i.e. they are concerned with how a system works for a particular case, rather than giving a more general (global) view of how the model decides for every possible input. In case of deep

¹² See, however, the discussion of [55] above.

¹³ In most tax applications, AI systems deal with largely numerical data about relevant financial elements, which means that explanation approaches based on originally numerical features can play a crucial role. Nevertheless, some systems—such as those relying on text data or directly producing decisions that need to be grounded on legal arguments—might require the combination between explanation techniques and justification-based approaches for showing how the actions taken with basis on the explained outcomes can be sustained from the perspective of legal argumentation.

¹⁴ Depending on what a particular stakeholder is tasked with doing, they are likely to require a different kind of knowledge to do it and, thus, to seek a different kind of explanation: [73].

learning methods, these questions are usually analysed from the post-hoc perspective, i.e. the models are subject to analysis after the training. Thus, ICE plots show how—for a particular case—a prediction changes if alongside the change of a given feature (e.g. how the probability that a defendant is fraudulent changes as the amount of declared tax would change), while LIME and Shapley values can be used to determine how different features effected in a given prediction (e.g. those values may show that disparity in two tax declarations for the same year contributed greatly to a decision that a defendant was engaged in a fraudulent activity, whilst the fact that they used to duly pay his taxes in the previous years decreased that probability).¹⁵

Tax authorities are both operators and executors of AI systems for tax purposes. In such roles, they are responsible for making and justifying individual decisions based solely or partly on the outcomes of AI systems. They pursue mainly the issue of whether the provided AI decisions are reliable and reasonable. Accordingly, the main questions they seek to answer are: (i) *what* the AI system is doing, i.e., whether the system is transparent enough to describe inputs that must be entered and the outputs that are generated; and (ii) *why* the AI system is doing it. For instance, upon learning that the tax risk assessment AI system computes a RISK value of 0.853, a tax officer’s key responsibility is to interpret that value as an indicator of a significant risk of tax fraud. Similarly, it is a tax officer’s responsibility to determine whether a particular assessment has been generated legitimately or because the system discriminates by associating a foreign place of birth with a high level of tax risk.¹⁶ Likewise, in the case of taxpayers, local post-hoc explanation models mentioned above may work well in order to answer to why questions [74]. By contrast, for *what* questions, global post-hoc explanation models such as PDP, Shapley dependent plots, Shapley Summary Plots, and Accumulated Local Effects (ALE) Plots seem to be most suitable, as they allow the decision-makers to examine all decisions made by the AI system globally [74]. All those methods show how a given feature affects a system’s decision (e.g., that the disparity between two tax declarations generally has a large impact on the model’s decision).¹⁷

Finally, tax judges must solve disputes between taxpayers and tax authorities, including those triggered by the use of AI systems. In such disputes, the courts are interested in carefully identifying what and why AI systems are doing to determine whether or not their use by the tax authorities was in line with legal provisions, e.g. was fair and non-discriminatory as opposed to biased and arbitrary. Accordingly, the local and global XAI models mentioned in the previous paragraphs would suffice for these stakeholders.

5 Concluding remarks

This paper mapped various situations in which the protection of taxpayer rights requires some explanation of decisions produced with the involvement of an AI system. As Sections 2 and 3 show, current constitutional and human rights frameworks are strained by

¹⁵ For a deeper discussion on this point, consult [75].

¹⁶ By analogy to financial risk in loan risk assessment systems, as discussed in [73].

¹⁷ Again, [75] can be consulted for more in-depth description and analysis.

the use of inexplainable AI systems in tax matters, as the lack of explanation would erode the precision, transparency, and predictability expected tax law and its execution. Indeed, various judicial decisions within the framework of the ECHR provide grounds for sustaining that legislators are obliged by case law to ensure that the use of AI does not disrupt safeguards such as the rights to a fair trial, respect for private and family life, and non-discrimination. While the *Ferrazzini* ruling shows the ECtHR is reluctant to extend the fair trial provisions of the ECHR to tax matters that do not concern criminal law prosecution, the *SyRI* judgment by a Dutch court of first instance has shown an implicit connection between the violation of the right to respect for private and family life and the violation of the right to a fair trial because of the one and the same feature of the legislation governing the use of AI systems—their lack of explainability. In the case at hand, the use of inexplainable tax systems was deemed to impact the rights of taxpayers to effectively protect themselves from the adverse effects of tax authority decisions, and so the adoption of technical explanation measures appears as a requirement to ensure the effectiveness of the ECHR itself. Therefore, even the established reticence of the ECtHR in applying ECHR provisions to non-criminal matters in tax law is not enough to dispel the relevance of XAI for the lawful use of AI in the tax domain, especially in light of how national courts have been enforcing the ECHR within their jurisdictions. This suggests human rights frameworks can play a role in the construction of a minimum legal standard for XAI in tax.

In Section 4, we preliminary discussed the proposals to meet the explanation requirements under the constitutional principles and the ECHR. As of now, they are only for illustrative purposes. Tax XAI complying with the standards under constitutional principles and the ECHR requires further research, of an in-depth and empirical character, which would focus on the usefulness of XAI techniques as *explanation* methods *vis-à-vis* the mentioned legal background. Such research should also empirically test the usefulness of XAI method for taxpayers, tax authorities and judges by exposing the results of such methods to these three groups of stakeholders and ask them via questionnaires whether or not these methods meet their needs. Presumably, only their affirmative answer would mean that the tested XAI techniques can ensure the compatibility of tax AI systems with the constitutional principles and the rights set forth in the ECHR.

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References

1. Alm, J., Beebe, J., Kirsch, M.S., Marian, O., Soled, J.A.: New Technologies and the Evolution of Tax Compliance. *Va. Tax Rev.* 39, 287–356 (2020).
2. Di Puglia Pugliese, L., Guerriero, F., Macrina, G., Messina, E.: A Natural Language Processing Tool to Support the Electronic Invoicing Process in Italy. In: 2021 11th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS). pp. 397–402 (2021). <https://doi.org/10.1109/IDAACS53288.2021.9660987>.
3. Butler, J.: Analytical Challenges in Modern Tax Administration: A Brief History of Analytics at the IRS Symposium on Artificial Intelligence & the Future of Tax Law: AI in Tax Compliance and Enforcement. *Ohio St. Tech. L. J.* 16, 258–277 (2020).
4. Lismont, J., Cardinaels, E., Bruynseels, L., De Groote, S., Baesens, B., Lemahieu, W., Vanthienen, J.: Predicting tax avoidance by means of social network analytics. *Decision Support Systems*. 108, 13–24 (2018). <https://doi.org/10.1016/j.dss.2018.02.001>.
5. Antón, F.S.: Artificial Intelligence and Tax Administration: Strategy, Applications and Implications, with Special Reference to the Tax Inspection Procedure. *World Tax J.* 13, (2021).
6. Hadwick, D., Lan, S.: Lessons to Be Learned from the Dutch Childcare Allowance Scandal: A Comparative Review of Algorithmic Governance by Tax Administrations in the Netherlands, France and Germany. *World Tax Journal*. 13, (2021).
7. Calo, R., Citron, D.K.: The Automated Administrative State: A Crisis of Legitimacy. *Emory L.J.* 70, 797–846 (2021).
8. OECD: Tax Administration 3.0: The Digital Transformation of Tax Administration. OECD, Paris (2020).
9. Braun Binder, N.: Artificial Intelligence and Taxation: Risk Management in Fully Automated Taxation Procedures. In: Wischmeyer, T. and Rademacher, T. (eds.) *Regulating Artificial Intelligence*. pp. 295–306. Springer International Publishing, Cham (2020). https://doi.org/10.1007/978-3-030-32361-5_13.
10. Koops, B.-J.: The concept of function creep. *Law, Innovation and Technology*. 13, 29–56 (2021). <https://doi.org/10.1080/17579961.2021.1898299>.

11. Scarcella, L.: Tax compliance and privacy rights in profiling and automated decision making. *Internet Policy Review*. 8, (2019).
12. Sarra, C.: Put Dialectics into the Machine: Protection against Automatic-decision-making through a Deeper Understanding of Contestability by Design. *Global Jurist*. 20, (2020). <https://doi.org/10.1515/gj-2020-0003>.
13. Busuioc, M.: AI Algorithmic Oversight: New Frontiers in Regulation. In: Maggetti, M., Di Mascio, F., and Natalini, A. (eds.) *The Handbook on Regulatory Authorities*. Edward Elgar Publishing, Cheltenham; Northampton (2022).
14. Rekenkamer, A.: An Audit of 9 Algorithms used by the Dutch Government. Netherlands Court of Audit, The Hague (2022).
15. Barredo Arrieta, A., Díaz-Rodríguez, N., Del Ser, J., Bennetot, A., Tabik, S., Barabado, A., Garcia, S., Gil-Lopez, S., Molina, D., Benjamins, R., Chatila, R., Herrera, F.: Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI. *Information Fusion*. 58, 82–115 (2020). <https://doi.org/10.1016/j.inffus.2019.12.012>.
16. Hattingh, J.: The Multilateral Instrument from a Legal Perspective: What May Be the Challenges? *BFIT*. 71, (2017).
17. Huttner, L., Merigoux, D.: *Catala: Moving Towards the Future of Legal Expert Systems*. (2022).
18. ECJ: *Société d’investissement pour l’agriculture tropicale SA (SIAT) v État belge* (Case C-318/10). (2012).
19. ECJ: *Itelcar — Automóveis de Aluguer Lda v Fazenda Pública* (Case C-282/12). (2013).
20. Burrell, J.: How the machine ‘thinks’: Understanding opacity in machine learning algorithms. *Big Data & Society*. 3, 1–12 (2016). <https://doi.org/10.1177/2053951715622512>.
21. Wieringa, M.: What to account for when accounting for algorithms: a systematic literature review on algorithmic accountability. In: *Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency*. pp. 1–18. Association for Computing Machinery, Barcelona, Spain (2020). <https://doi.org/10.1145/3351095.3372833>.
22. McConnell, S.: *Code complete*. Microsoft Press, Redmond (2004).
23. Lawsky, S.B.: Formalizing the Code. *Tax L. Rev.* 70, 377–408 (2016).
24. Dijkstra, E.W.: The humble programmer. *Commun. ACM*. 15, 859–866 (1972). <https://doi.org/10.1145/355604.361591>.
25. Horner, J.K., Symons, J.: Understanding Error Rates in Software Engineering: Conceptual, Empirical, and Experimental Approaches. *Philos. Technol.* 32, 363–378 (2019). <https://doi.org/10.1007/s13347-019-00342-1>.
26. Richardson, R., Schultz, J.M., Southerland, V.M.: *Litigating Algorithms 2019 US Report: New Challenges to Government Use of Algorithmic Decision Systems*. AI Now Institute, New York (2019).
27. Slovenian Constitutional Court: *Ústavného súdu Slovenskej republiky PL. ÚS 25/2019-117 V mene Slovenskej republiky*. (2021).

28. Harris, D.J., O’Boyle, M., Bates, E., Buckley, C.: Harris, O’Boyle & Warbrick: Law of the European Convention on Human Rights. Oxford University Press, Oxford (2014).
29. ECtHR: Practical Guide on Admissibility Criteria. European Court of Human Rights, Strasbourg (2022).
30. Emberland, M.: The human rights of companies: exploring the structure of ECHR protection. Oxford University Press, Oxford (2006).
31. ECtHR: Case of Ferrazzini v. Italy (Application no. 44759/98). (2001).
32. Baker, P.: 60 Years of the European Convention on Human Rights and Taxation. *European Taxation*. 61, (2021).
33. ECtHR: Case of Jussila v. Finland (Application no. 73053/01). (2006).
34. ECtHR: Case of Steininger v. Austria case (Application no. 21539/07). (2012).
35. ECtHR: Case of Chap Ltd v. Armenia case (Application no. 15485/09). (2017).
36. ECtHR: Case of Matyjek v. Poland (Application no. 38184/03). (2007).
37. ECtHR: Case of Moiseyev v. Russia (Application no. 62936/00). (2008).
38. ECtHR: Case of Mattoccia v. Italy (Application no. 23969/94). (2000).
39. ECJ: WebMindLicenses kft v Nemzeti Adó- és Vámhivatal Kiemelt Adó- és Vám Főigazgatóság (Case C-419/14). (2015).
40. ECtHR: Case of Ruiz Torija v. Spain (Application no. 18390/91). (1994).
41. ECtHR: Case of Fomin v. Moldova (Application no. 36755/06). (2011).
42. ECtHR: Case of Suominen v. Finland (Application no. 37801/97). (2003).
43. Dymitruk, M.: The Right to a Fair Trial in Automated Civil Proceedings. *Masaryk University Journal of Law and Technology*. 13, 27–44 (2019).
44. ECtHR: Case of Schouten and Meldrum v. the Netherlands (Application no. 19005/91; 19006/91). (1994).
45. Wieringa, M., van Schie, G., van de Vinne, M.: De discussie omtrent SyRI moet over meer dan alleen privacy gaan, <https://ibestuur.nl/podium/de-discussie-omtrent-syri-moet-over-meer-dan-alleen-privacy-gaan>, last accessed 2022/03/03.
46. Henley, J., Booth, R.: Welfare surveillance system violates human rights, Dutch court rules, <https://www.theguardian.com/technology/2020/feb/05/welfare-surveillance-system-violates-human-rights-dutch-court-rules>, (2020).
47. Simonite, T.: Europe Limits Government by Algorithm. The US, Not So Much, <https://www.wired.com/story/europe-limits-government-algorithm-us-not-much/>, (2020).
48. Rechtbank den Haag: NJCM et al v. Netherlands. (2020).
49. van Bakkum, M., Borgesius, F.Z.: Digital welfare fraud detection and the Dutch SyRI judgment. *European Journal of Social Security*. (2021). <https://doi.org/10.1177/13882627211031257>.
50. ECtHR: Case of S. and Marper v. The United Kingdom (Applications nos. 30562/04 and 30566/04). (2008).
51. Gellert, R., van Bakkum, M., Zuiderveen Borgesius, F.: The Ola & Uber judgments: for the first time a court recognises a GDPR right to an explanation for algorithmic decision-making, <https://eulawanalysis.blogspot.com/2021/04/the-ola-uber-judgments-for-first-time.html>, last accessed 2021/04/30.
52. Rechtbank Amsterdam: “Uber employment” (HA20 — RK258). (2021).

53. Rechtbank Amsterdam: “Ola” (HA20 — RK207). (2021).
54. De Hert, P., Gutwirth, S.: Data Protection in the Case Law of Strasbourg and Luxembourg: Constitutionalisation in Action. In: Gutwirth, S., Pouillet, Y., De Hert, P., de Terwangne, C., and Nouwt, S. (eds.) *Reinventing Data Protection?* pp. 3–44. Springer Netherlands, Dordrecht (2009). https://doi.org/10.1007/978-1-4020-9498-9_1.
55. ECtHR: Case of I v. Finland (Application no. 20511/03). (2008).
56. Lagioia, F., Sartor, G.: Artificial intelligence in the big data era: risks and opportunities. In: Cannatacci, J., Falce, V., and Pollicino, O. (eds.) *Legal Challenges of Big Data*. pp. 280–307. Edward Elgar, Northampton (2020).
57. Lessig, L.: Law Regulating Code Regulating Law. *Loy. U. Chi. L.J.* 35, 1–14 (2003).
58. Artosi, A.: Technical Normativity. In: Chiodo, S. and Schiaffonati, V. (eds.) *Italian Philosophy of Technology: Socio-Cultural, Legal, Scientific and Aesthetic Perspectives on Technology*. pp. 149–160. Springer International Publishing, Cham (2021). https://doi.org/10.1007/978-3-030-54522-2_10.
59. Diver, L.: *Digisprudence: code as law rebooted*. Edinburgh University Press, Edinburgh (2021).
60. ECtHR: Guide on Article 14 of the European Convention on Human Rights and on Article 1 of Protocol No. 12 to the Convention: Prohibition of discrimination. European Court of Human Rights, Strasbourg (2021).
61. ECtHR: Case of Darby v. Sweden (Application no. 11581/85). (1990).
62. ECtHR: Case of Glor v. Switzerland (Application no. 13444/04). (2009).
63. ECtHR: Case of Guberina v. Croatia (Application no. 23682/13). (2016).
64. ECtHR: Taxation and the European Convention on Human Rights. European Court of Human Rights, Strasbourg (2021).
65. Goodman, B.W.: Economic Models of (Algorithmic) Discrimination. Presented at the 29th Conference on Neural Information Processing Systems (NIPS 2016) , Barcelona (2016).
66. Muller, C.: *The Impact of Artificial Intelligence on Human Rights, Democracy and the Rule of Law*. Council of Europe, Strasbourg (2020).
67. Kuźniacki, B., Tyliński, K.: Identifying the Potential and Risks of Integration of AI to Taxation: The Case of General Anti-Avoidance Rule. In: D’Agostino, G., Gaon, A., and Piovesan, C. (eds.) *Leading Legal Disruption: Artificial Intelligence and a Toolkit for Lawyers and the Law*. Carswell, Toronto (2021).
68. Humphreys, P.: The philosophical novelty of computer simulation methods. *Synthese*. 169, 615–626 (2009). <https://doi.org/10.1007/s11229-008-9435-2>.
69. Durán, J.M., Formanek, N.: Grounds for Trust: Essential Epistemic Opacity and Computational Reliabilism. *Minds & Machines*. 28, 645–666 (2018). <https://doi.org/10.1007/s11023-018-9481-6>.
70. Steging, C., Renooij, S., Verheij, B.: Rationale Discovery and Explainable AI. In: *Legal Knowledge and Information Systems*. pp. 225–234. IOS Press, Vilnius (2021). <https://doi.org/10.3233/FAIA210341>.

71. Mumford, J., Atkinson, K., Bench-Capon, T.: Machine Learning and Legal Argument. In: Schweighofer, E. (ed.) *Legal Knowledge and Information Systems*. pp. 191–196. IOS Press, Vilnius (2021).
72. Górski, Ł., Ramakrishna, S.: Explainable artificial intelligence, lawyer’s perspective. In: *Proceedings of the Eighteenth International Conference on Artificial Intelligence and Law*. pp. 60–68. Association for Computing Machinery, New York, NY, USA (2021). <https://doi.org/10.1145/3462757.3466145>.
73. Zednik, C.: Solving the Black Box Problem: A Normative Framework for Explainable Artificial Intelligence. *Philos. Technol.* 34, 265–288 (2021). <https://doi.org/10.1007/s13347-019-00382-7>.
74. Mehdiyev, N., Houy, C., Gutermuth, O., Mayer, L., Fettke, P.: Explainable Artificial Intelligence (XAI) Supporting Public Administration Processes – On the Potential of XAI in Tax Audit Processes. In: *Wirtschaftsinformatik 2021 Proceedings* (2021).
75. Molnar, C.: *Interpretable Machine Learning*. Lulu.com (2020).