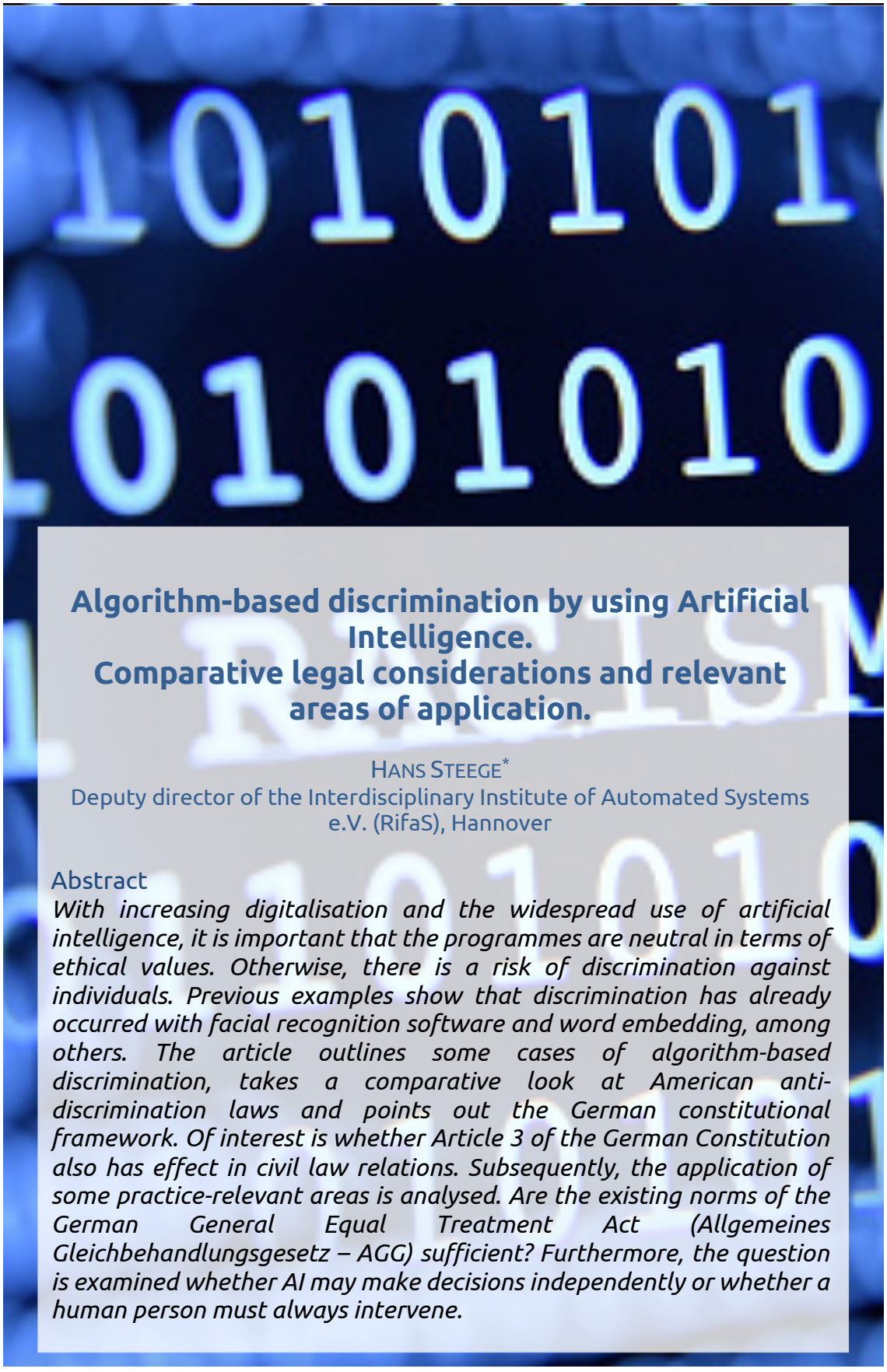
EJPLT

European Journal of Privacy Law & Technologies • 2021/1 • ISSN 2704-8012



Algorithm-based discrimination by using Artificial Intelligence. Comparative legal considerations and relevant areas of application.

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Abstract

With increasing digitalisation and the widespread use of artificial intelligence, it is important that the programmes are neutral in terms of ethical values. Otherwise, there is a risk of discrimination against individuals. Previous examples show that discrimination has already occurred with facial recognition software and word embedding, among others. The article outlines some cases of algorithm-based discrimination, takes a comparative look at American anti-discrimination laws and points out the German constitutional framework. Of interest is whether Article 3 of the German Constitution also has effect in civil law relations. Subsequently, the application of some practice-relevant areas is analysed. Are the existing norms of the German General Equal Treatment Act (Allgemeines Gleichbehandlungsgesetz – AGG) sufficient? Furthermore, the question is examined whether AI may make decisions independently or whether a human person must always intervene.

Keywords: Artificial intelligence; algorithm-based discrimination; constitutional law; GDPR; contract law.

Summary: Introduction. – 1. Algorithm-based discrimination. – 1.1 Google Photos. – 1.2 COMPAS. – 2. Description of AI. – 3. Discrimination in the USA. – 3.1 14th Amendment – 3.2. Different types of discrimination – 3.3. Affirmative Actions. – 4. (Anti)Discrimination in Germany. – 4.1 Constitutional protection. – 4.2. General Equal Treatment Act (AGG). – 5. Relevant areas of application. – 5.1 Employment law. – 5.2 Some further areas of application – 6. Regulation of algorithms. – Conclusions.

Introduction.

Digitalization is spreading to more and more areas, whether in everyday life or in industry. The interconnection of systems offers numerous new possibilities, first and foremost the exchange of information. In addition, automation promises to make processes simpler. Artificial intelligence (AI) differs significantly from conventional software, which follows an "if-then" scheme and is considered a key technology.

While the source code of rule-based programmes provides information about why a particular decision was made, this is fundamentally different with AI. This circumstance, in combination with autonomous learning, harbours dangers that concern discrimination, among other things. When AI is used on the capital market to act as an investment advisor, to grant loans and flats, to conclude insurance contracts or to make a prognosis about the recidivism of a criminal in court proceedings, sensitive areas of our everyday life and coexistence are affected.

The art of interpreting words and sentences, in short: the correct semantic understanding, poses challenges for AI. While the analogy "man is to king as woman is to x" was solved satisfactorily with “queen“ in one study, the combination "man is to computer programmer as woman is to homemaker" is discriminatory.[1] This reveals problems that do not only concern language and words, but also the understanding of the value of individual persons and groups of persons, as well as prejudices that finally affect everyone who comes into contact with AI.

In the following, after a comparative legal consideration, some areas of application of AI will be examined with regard to possible discrimination, whereby the focus is on labour law. In addition to equal treatment and data protection, competition and antitrust law are also affected, for example when it comes to pricing.[2] However, the latter will not be the subject of this article.

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[1] T Bolukbasi/K-W Chang/J Zou/V Saligrama/A Kalai, ‘Man is to Computer Programmer as Woman is to Homemaker? Debiasing Word Embeddings’, arXiv:1607.06520, 2016, Cornell University, 1 ff.

[2] B Paal, ‘Missbrauchstatbestand und Algorithmic Pricing’ [2019] GRUR, 43 ff.

1. Algorithm-based discrimination.

1.1 Google Photos.

Alongside Flickr,[3] Google Photos[4] in particular has a dominant position in the market. Google's software caused quite a stir when it classified black people as gorillas.[5] Previously, the software identified people, regardless of their skin colour, as dogs.[6] In order to make facial recognition possible, the algorithm has to be provided with a lot of information. The software learns on the basis of examples, whereby the composition of the information or example images has a decisive effect on the result.[7]

1.2 COMPAS.

Another example is the use of the software "Correctional Offender Management Profiling for Alternative Sanctions" (COMPAS). It is used in the United States to predict the probability that a person will commit a crime (again).[8] COMPAS calculates from answers to 137 questions how likely it is that the person in question will commit a crime again or will no longer be conspicuous in terms of criminal law. But why is the software so criticised[9] and should have been the subject of a case before the US Supreme Court in the past?[10] The following two cases and probabilities will illustrate this:

- Brisha Borden (18) tried to steal a bicycle when the opportunity arose. She was convicted of stealing the bicycle worth US-$ 80. COMPAS determined a high risk of recidivism (score 8/10).[11]
- Vernon Prater (41) robbed a shop (loot: US-$ 86.35). He had a previous conviction for armed robbery (score 3/10).
- Borden did not recidivate, Prater, on the other hand, robbed a shop and stole electronic items worth several thousand US dollars and is in prison. Prater is "white" - Borden "black".

The results of COMPAS are used both for the making of judgements, the sentence and for an application for early release. The Justice Department's National Institute of Corrections (NIC) even goes so far as to encourage all those involved in the process to use the software at every moment of the proceedings. [12] It is obvious that the software tends to classify African-Americans as criminals, but whites less often.

The COMPAS example shows that programmes are not neutral. From a constitutional and ethical point of view, it is incompatible with human dignity,

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[3] https://de.wikipedia.org/wiki/Flickr.
[4] https://de.wikipedia.org/wiki/Google_Fotos.
[5] https://arstechnica.com/information-technology/2015/06/google-dev-apologizes-after-photos-app-tags-black-people-as-gorillas/.
[6] https://twitter.com/yonatanzunger/status/615586630842236928.
[7] I Chen/FD Johansson/D Sontag, 'Why is my classifier discriminatory?', 2018, arXiv preprint.arXiv.
[8] BT – WD 8-3000-031/17, p. 6.
[9] https://www.nytimes.com/2017/06/13/opinion/how-computers-are-harming-criminal-justice.html.
[10] Loomis v. Wisconsin, 881 N.W.2d 749 (Wis. 2016), cert. denied, 137 S.Ct. 2290 (2017).
[11] *ProPublica*, available at: https://www.propublica.org/article/machine-biasrisk-assessments-in-criminal-sentencing.
[12] ibid.

the principle of the rule of law and the right to a fair trial that such software is used in proceedings in Germany.

2. Description of AI.

Algorithms that follow an "if-then" scheme make their decisions within the framework of what is given. Only what has been specified by the programmer can subsequently be processed by the programme. AI does not only learn on its own, but also uses neural networks and can further develop the previous algorithms. AI is characterised by the fact that information from the outside world can also be processed without prior programming and that corresponding feedback is given.[13] This triad of perception, thinking and acting is the advantage compared to conventional "if-then" codes.[14]

If AI is used in combination, e.g. in an autonomous vehicle, the integrated sensors are crucial for the input quality and have an effect on the process of thinking and the later acting.[15]

The advantage of a missing "if-then-scheme" is at the same time the weakness of AI. It remains open whether decisions can be traced ex post and which parameters were the basis for the decision.

3. Discrimination in the USA.

The debate around discrimination is much more pronounced in the United States, so it is worth looking at the understanding of discrimination there in addition to the legal framework of anti-discrimination laws.

3.1 14th Amendment.

In the USA, paragraph 1 of the 14th Amendment prohibits discrimination: *„All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the state wherein they reside. No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."*[16]

The statement "No state shall ... deny to any person within its jurisdiction the equal protection of the laws"[17] gives rise to the constitutional requirement of equal treatment of all persons. The 14th Amendment was particularly decisive in cases of discrimination against African-Americans and became significant in the debate on the constitutionality of affirmative actions.[18]

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[13] H Hexmoor, *Essential Principles for Autonomous Robotics* (Morgan & Claypool Publishers 2013) 25.
[14] H Steege, 'Autonomes Fahren und die staatliche Durchsetzung des Verbots der Rechtswidrigkeit' [2019] NZV, 459, 465; Hexmoor, *Essential Principles for Autonomous Robotics* (n 14) 25.
[15] On this and on possible sources of error in detail Steege, 'Autonomes Fahren und die staatliche Durchsetzung des Verbots der Rechtswidrigkeit' (n 15) 459, 461 f.
[16] https://www.law.cornell.edu/constitution/amendmentxiv.
[17] Known as the „Equal Protection Clause".
[18] Regents of Univ. of California v. Bakke, 438 U.S. 265 (1978).

Constitutionally disputed and from a dogmatic point of view interesting is the consideration whether the Equal Protection Clause can contain two competing protective purposes, namely the "any person line" and the "race line". Thus, the scope of protection of the "any person line" includes every human being. However, the Equal Protection Clause cannot be understood as a commandment of complete equal treatment, which would make any distinction in favour of minorities per se unconstitutional. It is therefore questionable whether the so-called "racial preference" is to be seen merely as a restrictive exception to the principle of "race-neutral equality", or whether an additional area of protection exists that encompasses persons belonging to a minority and which occurs alongside the right to full equal treatment. If one assumes such a scope of protection, the question arises whether both purposes of protection are equally weighted or whether the "race line" takes precedence.[19]

In addition to the constitutional protection, there exists with Title VI Sec. 601 of the Civil Rights Act of 1964 a non constitutional regulation that relates to public institutions: *„No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."*[20] In addition, there are further anti-discrimination laws in the USA.[21]

3.2. Different types of discrimination.

In the USA, a distinction is drawn between different forms of discrimination:

- (a) Intentional, direct discrimination: The booking software of a restaurant does not allow members of a minority group to reserve a table, regardless of whether the customers can pay or not.
- (b) Non-intentional, direct discrimination: The AI used in a job application process of a craft company does not hire women because they do not appear to be physically strong enough. This type of discrimination is called rational discrimination because it is assumed that there is a correlation between the criterion of belonging to a certain group and a characteristic. In this case, it would be the assumption that women are not physically fit to work in a craft profession.
- (c) Intentional, non-direct discrimination: The AI of a security company only hires people with a certain height, knowing that male applicants have an advantage.
- (d) Non-intentional, non-direct discrimination: A company's software performs special orthography tests during the hiring process because it is assumed that this is a prerequisite for the vacant position. This puts groups at a disadvantage who did not receive an equivalent school education due to external circumstances.

[19] In detail U Beyerlin, '"Umgekehrte Rassendiskriminierung" und Gleichbehandlungsgebot in der amerikanischen Verfassungsrechtsprechung. Zum Bakke-Urteil des U.S. Supreme Court vom 28. Juni 1978" '[1979] ZaöRV, 496 ff.

[20] Available at: https://www.justice.gov/crt/fcs/TitleVI-Overview.

[21] Cf. Title VII of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000E, 2003; Age Discrimination in Employment Act of 1967, 29 U.S.C. 621-34; Fair Housing Act und Fair Housing Amendments Act, 42 U.S.C. §§ 3601-19.

Having this in mind, what exactly now is discrimination?

A common view is that discrimination occurs when persons are disadvantaged on the basis of irrelevant characteristics (extraneous traits). Thus, anti-discrimination laws are supposed to give everyone the right to freely decide on his or her worth.[22] This is called "deliberative freedoms", according to which everyone can decide for him- or herself how to live without being prevented from doing so by irrelevant characteristics. [23] Irrelevant characteristics are said to be present, whether *chosen* or *given*. Based on a normative understanding, race and age are not self-selected, religion freely chosen and other factors may be due to a past choice.[24] This understanding of anti-discrimination laws - the holding of a number of rights in the form of deliberative freedoms - is unfamiliar in Germany. From a constitutional law dogmatic point of view, the approach of always countering discrimination with the creation of constitutional principles and rights appears difficult.[25]

3.3 Affirmative Actions.

Since unequal treatment by software cannot only occur due to discrimination, the legitimacy of the so-called "affirmative actions" shall be shown. In the past, mainly white people have filed lawsuits against affirmative actions, with the explanation that they have become victims of discrimination because the measures would favour members of minorities. Positive discrimination is mainly justified by the following triology: "correction of bias in standardised tests, compensation for past mistakes and promotion of diversity". [26] Diversity is seen as an argument for the common good. The compensation argument is highly controversial. Critics stress that the current beneficiaries did not necessarily have to suffer and that those at whose expense these measures are taken need not have committed the mistakes.[27] It is also crucial how moral obligations come about. Only then can be answered whether society has such a duty.

If AI is used in the future, e.g. to carry out admission procedures at universities instead of a human being, the same applies here as under the current law. However, it becomes problematic if the reasons for the decision and the underlying criteria are not transparent, i.e. the AI is no longer understandable in retrospect or during the process.

4. (Anti)Discrimination in Germany.

4.1 Constitutional protection.

In Germany, Article 3 (1) of the Constitutional Law (GG) postulates that all

[22] S Moreau, 'What is Discrimination?' (2010) 38 (2) Philosophy & Public Affairs, 143, 147.
[23] ibid 143, 150.
[24] In detail with regard to this concept of the *deliberative freedoms* see *Moreau,* ibid 143, 150.
[25] Other opinion D Hellman, 'Equality and Unconstitutional Discrimination', in D Hellman/S Moreau (eds.), *Philosophical Foundations of Discrimination Law,* (Oxford University Press 2013), 50, 60 ff.
[26] MJ Sandel, *Gerechtigkeit*, (Ullstein Verlag 2013), 230 ff.
[27] ibid, 232.

persons are equal before the law. Paragraph 3 standardises characteristics on the basis of which unequal treatment is prohibited. Although not explicitly mentioned, skin colour is covered by the differentiating characteristic of race due to historical understanding.[28]

a) Predictive policing

Of constitutional interest is the so-called predictive policing, where algorithms make predictions, for example for future crimes, criminals or crime scenes, both preventively and repressively. [29] By evaluating corresponding data, risk profiles are created for individual persons. [30] In addition, the probability of whether a person will recidivate is calculated.[31] Currently, no personal data is used in Germany, so there is no encroachment on fundamental rights.[32] The constitutional hurdles for predictive policing using personal data are very high in Germany.[33] Especially because of the serious infringement and the fundamental rights affected by it, the ultimate decision-making power cannot be shifted to such applications or to an AI. From a constitutional point of view, it follows that the decision-making power must necessarily remain with a human being as long as programmes are not value-neutral, as otherwise the individual is degraded to an object. In addition, it is open how the decision-making process of such an application is designed and how which aspects affect the calculation of probability. As long as this is not transparent, such an algorithm raises constitutional concerns.

b) Art. 3 Basic Law for the Federal Republic of Germany (GG) in civil law relations

Nowadays, programmes make more and more decisions that have a direct impact on individuals. Discrimination can be based on input of data, prejudices or unintended correlations.[34] Economic sectors affected include credit scoring, e-commerce pricing and automated job recruitment processes. [35] The information to be transmitted in each case can lead to different evaluations, whereby, for example, the place of residence can be decisive.[36] For example, a certain nationality can be inferred from a city district. Other data - possibly not queried - can also correlate with each other, resulting in intentional, non-direct discrimination that is impossible or difficult to prove. The respective source codes would have to be disclosed in a legal procedure, which, however, is not to be assumed.

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[28] EGMR, U. v. 13.12.2005, App.No. 55762/00 und 55974 (Timishev gegen Russland), Ziff. 55.
[29] I Härtel, 'Digitalisierung im Lichte des Verfassungsrechts – Algorithmen, Predictive Policing, autonomes Fahren' [2019] LKV, 49, 54; S Egbert, 'Siegeszug der Algorithmen? Predictive Policing im deutschsprachigen Raum' [2017] APuZ 32-33, 17, 19; T Knobloch, 'Vor die Lage kommen: Predictive Policing in Deutschland' [2018] Stiftung Neue Verantwortung/Bertelsmann Stiftung, 8.
[30] AG Ferguson, 'Policing Predictive Policing' [2017] Wash. U. L. Rev., 1112, 1142 ff.
[31] T Rademacher, 'Predictive Policing im deutschen Polizeirecht' [2017] AöR, 366, 370.
[32] Härtel, 'Digitalisierung im Lichte des Verfassungsrechts' (n 30) 49, 54; Knobloch, 'Predictive Policing in Deutschland' (n 30) 5.
[33] In this direction T Singelnstein, 'Predictive Policing: Algorithmenbasierte Straftatprognosen zur vorausschauenden Kriminalintervention' [2018] NStZ, 1, 8.
[34] So also T Wischmeyer, 'Regulierung intelligenter Systeme' [2018] AöR, 1, 26 ff.
[35] M Martini, 'Algorithmen als Herausforderung für die Rechtsordnung' [2017] JZ, 1017, 1018.
[36] ibid 1017, 1018; Härtel, 'Digitalisierung im Lichte des Verfassungsrechts' (n 30) 49, 56.

In order for those affected to be able to refer to Article 3 of the Constitutional Law, it would have to have indirect third-party effect. For a long time, however, the Bundesverfassungsgericht (German Federal Constitutional Court, short: BVerfG) rejected this in the case of Article 3 (1) and (3) of the GG (German Constitutional Law).[37] The BVerfG´s most recent judgment on Article 3 (1) GG recognises an indirect third-party effect in the relationship between private parties for special constellations: If a private party uses its monopoly or structural superiority to exclude persons from "participation in social life" without an objective reason, the necessary preconditions are met.[38] Whether the use of AI establishes structural superiority depends on the individual case.[39]

4.2 General Equal Treatment Act (AGG).

The non constitutional specification is found in the norms of the AGG, which are based on EU law.[40]

The General Part of the AGG specifies the objective of the law. § 1 contains the characteristics according to which no unequal treatment may take place. The prohibited grounds include race, ethnic origin, gender, religion, ideology, disability, age and sexual identity. § 2 standardizes the scope of application, § 3 the definitions. § 4 regulates the case of unequal treatment on several grounds. § 5 deals with affirmative actions.

Chapter 2 of the AGG determines the protection of employees against discrimination, chapter 3 the protection against discrimination in general civil law relations, whereby not all areas are covered. In further chapters the AGG deals among other things with the regulations for legal protection. The latter, however, will not be the focus of this paper.

a) Aim of the AGG

The aim of the Act is to prevent and eliminate discrimination.[41] This is to be taken into account in the interpretation of the norms of the AGG under the aspect of effective protection[42] and takes into account the "effet utile" of the European blueprint.[43]

b) Forms of discrimination

The AGG distinguishes in § 3 between direct discrimination (para. 1) and indirect discrimination (para. 2). Direct discrimination occurs when a person is treated disadvantageously in comparison to another person in a comparable situation on the basis of one of the grounds normed in § 1. Leaving aside Art. 22 of the GDPR, it can be assumed that in the case of a

[37] Härtel, 'Digitalisierung im Lichte des Verfassungsrechts' (n 30) 49, 57; M Jestaedt, 'Diskriminierungsschutz und Privatautonomie' (2005) 64 VVDStRL, 298, 340f.; G Britz, 'Diskriminierungsschutz und Privatautonomie' (2005) 64 VVDStRL, 355, 361f.

[38] BVerfG, B. v. 11.4.2018 – 1 BvR 3080/09, marg. no. 41; in detail BeckOK GG/*Kischel*, 47th edn, Status: 15.5.2021, Art. 3 marg. no. 93-93b.

[39] Examples can be found in Härtel, 'Digitalisierung im Lichte des Verfassungsrechts' (n 30) 49, 57.

[40] Compare RL 2000/43/EG; RL 2000/78/EG; RL 2002/73/EG; RL 2004/113/EG.

[41] On the individual characteristics of discrimination *Thüsing*, in: MüKoBGB, 8th edn 2018, § 1 AGG marg. no. 15 ff.

[42] Staudinger/*Serr*, BGB, Vol. 2, 17th edn, § 1 marg. no. 1.

[43] *EuGH* Slg. 1960, 683, 708; 1979, 1629.

decision by AI, without the intervention of a human being, the output of the AI is a treatment in the sense of § 3 (1) of the AGG, so that the requirement of a human act or omission [44] should be reconsidered legislatively. Otherwise, algorithm-based discrimination would not be a treatment in the sense of § 3 (1) AGG.[45] Discrimination can occur both by active doing and by omission.[46]

Indirect discrimination occurs when rules, criteria or procedures that appear neutral at first sight discriminate against persons on the basis of one of the grounds listed in § 1 AGG. However, this can be justified if there is a legitimate aim and the means are appropriate and necessary. However, justification must already be examined as a negative element of the offence. [47] If the discrimination is lawful, the element of the offence is already not fulfilled, so that it does not result in the element of the offence being given and the unlawfulness being lacking.[48] In practice, this has no effect.[49]

Indirect discrimination is more difficult to prove and dogmatically there are doubts about this form of discrimination in this country.[50]

It can be both intentional and accidental: An unintentional indirect bias occurs, for example, when an employer uses a criterion in the application process that is correctly or incorrectly considered relevant and correlates with an irrelevant group membership. However, such a correlation was not intended at any time. If the criterion is lawful, the indirect discrimination can be justified.

Indirect discrimination is intentional if a relevant or irrelevant criterion is used in the knowledge that it correlates with an irrelevant group membership, although it is precisely this group that should be covered.

c) Affirmative actions (positive discrimination)

In § 5, the AGG refers to positive discrimination, which must be appropriate and reasonable and prevent or compensate for existing disadvantages due to a reason mentioned in §1 AGG.

Positive discrimination differs from reverse discrimination in its objective and justification. It is not clear whether time is a factor in the legitimacy of positive discrimination.

Affirmative action disadvantages individuals in order to reverse or counteract the disadvantage of others; it is thus justice for one and injustice for the other.[51] Two views are held in Germany on the solution to this moral dilemma: On the one hand, there is already no discrimination terminologically, but a permissible positive action. [52] On the other hand, there is discrimination in fact, but this is justified because positive action is a

[44] BeckOK ArbR/*Roloff*, 60th edn, Status: 1.6.2021, AGG § 3 marg. no. 2.
[45] K v. Lewinski/R de Barros Fritz, 'Arbeitgeberhaftung nach dem AGG infolge des Einsatzes von Algorithmen bei Personalentscheidungen' [2018] NZA, 620, 621.
[46] BT-Drs. 17/1780, p. 29.
[47] BT-Drs. 16/1780, p. 33; *BAG* NZA 2010, 222; Roloff (n 45), marg. no. 18.
[48] BT-Drs. 16/1780, p. 32.
[49] Roloff (n 45), marg. no. 18.
[50] Thüsing (n 42), marg. no. 24.
[51] R Alexy, *Theorie der Grundrechte* (Suhrkamp Verlag 1994) 78 f.
[52] *Schiek/Schiek*, AGG, 2007, § 5 marg. no. 3; Erman/*Armbrüster*, BGB, Vol. I, 15th edn, AGG § 5 marg. no. 1.

corresponding justification.[53] The second view is to be followed for dogmatic and factual reasons; after all, there can be no positive discrimination that does not discriminate. Positive action can at most justify the disadvantage it creates, but it is ultimately discrimination.

5. Relevant areas of application.

Due to the particular practical importance, the following will deal with employment relationships, tenancy law, administrative law, court proceedings, lending and investment advice.

5.1 Employment law.

The use of AI generally promises an increase in objectivity, whether in the job application process or in preventive measures to prevent criminal offences in companies. For example, personality analyses are produced by AI.[54] At first glance, it seems that AI is free of bias.[55]

a) Recruitment

AI is increasingly used in job application processes.[56] Objectivity and the reduced time required are cited as positive factors.

The possibility of discrimination in these procedures by AI has hardly been considered so far.[57] In addition to erroneous or undetected correlations, prejudices make the software susceptible to discriminating against applicants, for example when words are linked to certain associations, as in the example above. Following the sentence "man is to computer programmer ...",[58] an algorithm would favour men and consider women unsuitable when hiring a programmer.

The use of personality tests in online applications increases the risk of discrimination on the grounds of disability and is also a violation of the AGG.[59] If personality profiles are created in the application process by using language analysis software, as is often the case in large companies,[60] there

[53] *Calliess/Ruffert/Krebber*, EUV/AEUV, 5th edn 2016, AEUV Art. 157 marg. no. 74; *EuGH* NZA 2010, 1281.
[54] B Dzida, 'Big Data im Arbeitsrecht' [2017] NZA, 541, 542; L Rudkowski, ' "Predictive policing" am Arbeitsplatz' [2019] NZA, 72; C Freyler, 'Robot-Recruiting, Künstliche Intelligenz und das Antidiskriminierungsrecht' [2020] NZA, 284, 287.
[55] See on cognitive biases TS Gendler, 'On the epistemic costs of implicit bias' [2011] Philosophical Studies, 33 ff.
[56] I Wildhaber, 'Die Roboter kommen – Konsequenzen für Arbeit und Arbeitsrecht' [2016] ZSR, 315, 337 ff.; B Dzida/N Groh, 'Diskriminierung nach dem AGG beim Einsatz von Algorithmen im Bewerbungsverfahren' [2018] NJW, 1917.
[57] Dzida/Groh, 'Diskriminierung nach dem AGG beim Einsatz von Algorithmen im Bewerbungsverfahren' (n 57) 1917; M Lützeler/D Kopp, 'Bewerbermanagement-Tools' [2015] ArbRAktuell, 491, 492; A Raif/M Swidersky, 'Typische Fehler in der digitalen Arbeitswelt vermeiden' [2017] GWR, 351, 352; S Mätzig, 'Erfolgsfaktor Anonymität? – Eine rechtliche Einordnung anonymisierter Personalauswahlverfahren' [2017] RdA, 185.
[58] Bolukbasi/Chang/Zou/Saligrama/Kalai, 'Man is to Computer Programmer as Woman is to Homemaker?' (n 2).
[59] Dzida/Groh, 'Diskriminierung nach dem AGG beim Einsatz von Algorithmen im Bewerbungsverfahren' (n 57) 1917, 1918.
[60] K Hummel, Deine Sprache verrät dich, in: FAZ v. 20.5.2015.

is an increased likelihood of being disadvantaged for non-native speakers or persons with a language disability.[61]

b) Predictive policing

In addition, employers may find it advantageous to carry out so-called predictive policing. Here it is particularly interesting whether this is compatible with the GDPR, whether the works council has to agree, whether it is scoring and whether § 31 of the German Federal Data Protection Act (BDSG) applies.

Predictive policing can be used to calculate the probability that an employee will commit a criminal offence against the employer's assets.[62] Predictive policing should not be inadmissible per se despite the not only insignificant encroachment on the general right of personality. Rather, it depends on the limits of data protection. [63] Whether this is the only fundamental right affected seems questionable; after all, the individual becomes a mere variable within a probability calculation, has no insight into the respective parameters and their weighting, and cannot be sure that he or she is not exposed to discrimination.[64]

- *Consent to predictive policing according to § 26 (2) BDSG*
  Predictive policing is lawful from a data protection perspective if the framework of § 26 BDSG is not exceeded.[65] When processing personal data[66] (Art. 4 No. 1 GDPR), the consent of the data subject is ruled out unless it is given voluntarily. However, § 26 (2) BDSG does not per se assume that voluntary consent of an employee never exists.[67] This view cannot be inferred from the wording either. Moreover, the fact that the element of voluntariness must be thoroughly checked is not arbitrary, but follows from the level of protection. If there are reasons to believe that there is a lack of voluntariness, the exact circumstances of the individual case must be considered. In terms of legal policy, there are efforts by the EU Commission and the Art. 29 Data Protection Working Group to negate the element of voluntariness in an employment relationship.[68] In addition, it cannot be assumed that employees will revoke their consent once it has been given without difficulty.

- *Predictive policing on the legal ground of § 26 (1) sentences 1 and 2 BDSG*
  If consent is not possible, § 26 (1) sentences 1 and 2 BDSG can be

[61] Dzida/Groh, 'Diskriminierung nach dem AGG beim Einsatz von Algorithmen im Bewerbungsverfahren' (n 57) 1917, 1918.
[62] W Hentrich/A Pyrcek, 'Compliance und Fraud Monitoring im Zeitalter von digitaler Transformation und Big Data' [2016] BB, 1451, 1452.
[63] Rudkowski, '"Predictive policing" am Arbeitsplatz' (n 55) 72, 73.
[64] Other opinion Rudkowski, '"Predictive policing" am Arbeitsplatz' (n 55) 72, 73.
[65] T Niklas/Thurn, 'Arbeitswelt 4.0 – Big Data im Betrieb' [2017] BB, 1589, 1590.
[66] H Steege, 'Ist die DS-GVO zeitgemäß für das autonome Fahren? Datenschutzrechtliche Aspekte der Entwicklung, Erprobung und Nutzung automatisierter und autonomer Fahrzeuge' [2019] MMR, 509.
[67] Other opinion Rudkowski, '"Predictive policing" am Arbeitsplatz' (n 55) 72, 73.
[68] Cf. BeckOK DatenschutzR/*Riesenhuber*, 36th edn, Status: 1.2.2021, BDSG § 26 marg. no. 43.1 with further references.

considered as an element of permission.Whether § 26 (1) sentence 1 or sentence 2 BDSG applies depends largely on the objective pursued: § 26 (1) sentence 2 BDSG is relevant if the measure serves repressive purposes. [69] This is not (yet) the case with predictive policing. However, only criminal offences are covered, not administrative offences and breaches of contract, no matter how serious they were.[70]

For preventive purposes and to clarify breaches of duty that are not possible under sentence 2, sentence 1 applies. In this respect, sentence 2 does not have any blocking effect.[71]

- *Limits of predictive policing (GDPR and the German Constitution)*

  Predictive policing finds its limits in the provisions of the BDSG, the GDPR and the GG. There is no limitation of the predictive decision by what is possible for a human mind of the superior in the respective situation of the individual case.[72]

  When such software is used, there must be no total monitoring of the employees, otherwise they will be degraded to an object. The thereby associated encroachment on the general right of personality under Art. 2 para. 1 in conjunction with Art. 1 para. 1 of the German Constitutional Law (GG) cannot be justified. [73] An atmosphere of constant surveillance pressure is inadmissible.[74]

  Article 22 (1) of the GDPR norms that people may not become mere objects based on decisions made by software.[75] Predictive policing does not violate this if a human intervenes between the process of assessment and decision or ultimately makes the decision and the AI merely takes over the assessment/prediction. In this respect, the human being is responsible for checking the correctness and plausibility. [76] It is necessary that the person has sufficient qualifications and media competence.[77] This includes, among other things, a detailed initial introduction to the programme and ongoing training.

  Whether turning away from the principle standardised in Article 22 (1) of the GDPR is constitutionally permissible appears doubtful. If one leaves employment law when considering this principle and takes a look at other areas, such as court proceedings or administrative law, and the question that arises there as to whether

[69] Erfurter Komm. zum Arbeitsrecht/*Franzen*, 21st edn 2021, BDSG § 26 marg. no. 36.
[70] *Franzen* (n 70) marg. no. 37.
[71] *BAG* NZA 2017, 1179 marg. no. 27 ff.; other opinion *LAG Baden-Würtemberg* ZD 2017, 88.
[72] Rudkowski, ' "Predictive policing" am Arbeitsplatz' (n 55) 72, 74; other opinion W Däubler, *Gläserne Belegschaften* (6th edn, Bund-Verlag 2015) marg. no. 120.
[73] Rudkowski, ' "Predictive policing" am Arbeitsplatz' (n 55) 72, 74.
[74] *BAG* NZA 2017, 1205, 1211; *BAG* NZA 2004, 1278, 1281.
[75] K v. Lewinski, 'Überwachung, Datenschutz und die Zukunft des Informationsrechts', in Telemedicus e.V. (ed.), *Überwachung und Recht*, 2014, 1, 16; BeckOK DatenschutzR/*v. Lewinski*, 36th edn, Status: 1.5.2021, DS-GVO Art. 22 marg. no. 2.
[76] BeckOK DatenschutzR/*v. Lewinski* (n 76), marg. no. 23.
[77] S J Golla, 'Abgenickt von Algorithmik – Aktuelles zum Verbot automatisierter Entscheidungen' [2014] PinG, 61, 64.

a decision is issued or not, central principles and fundamental rights speak in favour of not allowing the AI to have the final decision-making power over a human being.[78]

c) Termination

Ultimately, the question arises as to whether a termination of the employment relationship can be made by AI or whether it must be carried out by a human being. If the latter is the case, the termination cannot be based on predictive policing alone, as further preconditions for a termination must be there.[79] The same applies to a dismissal based on suspicion, as the decision of the programme is merely a calculated probability and the further requirements for such a decision must be fulfilled.[80]

In addition, the termination is the most serious interference on the basis of which the employment relationship is ended, so that it seems questionable that the AI may issue a termination without the involvement of a human being (regardless Art. 22 GDPR).

d) Considerations

The final decision must not be left to the software. In addition, the parameters on which the decision or prognosis is based, and their prioritization, must at least be obvious to the intervening human being. Otherwise, he cannot base his decision on the software. This can then at most be a vague point of reference. Moreover, the possibility of discrimination must be completely impossible. Besides, employees must receive extensive initial training and continuous education. Furthermore, the effectiveness and accuracy of the application must be checked at regular intervals.

5.2 Some further areas of application.

In terms of tenancy law, the main question is whether termination may be done by the AI. If a legal regulation such as Art. 22 of the GDPR does not exist, termination by the AI could be considered. However, a distinction must be made between commercial and residential tenancies. In particular, residential tenancies are in a state of tension with regard to the landlord's duty of tolerance towards the tenant.[81] In view of the particularly protected residential space, termination by AI appears problematic. It must be considered whether the use of AI in this area is covered by private autonomy or whether a human being has to decide on the termination of a tenancy agreement for residential space. The allocation of housing by AI, on the other hand, is not problematic, since this is the first step in establishing a contractual relationship. It remains

[78] Other opinion S Meyer, 'Künstliche Intelligenz und die Rolle des Rechts für Innovation' [2018] ZRP, 233, 237.
[79] Rudkowski, ' "Predictive policing" am Arbeitsplatz' (n 55) 72, 77.
[80] In detail ErfK/*Niemann* (n 70), BGB § 626 marg. no. 173-184.
[81] BH Oppermann/H Steege, 'Zur Duldungsproblematik bei der Ausstattung einer Wohnung mit Rauchwarnmeldern; zugleich eine Anmerkung zu BGH, VIII ZR 216/14, VIII ZR 290/14' [2016] WuM, 3 ff.; BH Oppermann/H Steege, 'Duldungspflichten des Mieters – eine zivilrechtliche Analyse' [2017] WuM, 361 ff.

to be seen to what extent the regulations on agency can be applied to AIs and whether the current legal framework is sufficient to answer these and other considerations, e.g. who is actually the contracting party.[82]

In the administration, the use of AI is imaginable in the area of communication with citizens, for example to provide information, as a basis for decisions or as a decision-maker in administrative acts. Whether and to what extent the use of AI is legally possible will not be discussed further here.[83]

AI does not stop at the advocacy sector either. The first judgements dealing with legal tech have already been made. Whether AI can replace a judge remains to be seen.[84] The associated fundamental rights dimension is also a matter for debate, even if it can be assumed that such use is not compatible with the GG for various reasons, there is also the danger here that discrimination can and will occur. Whether in criminal law or in the area of civil law, for example when it is a question of the credibility of a witness statement, prejudices against one gender, against nationalities would also have a massive effect here and thus leave the framework of the due process of law.

Algorithms are also finding their way into banking law, e.g. in so-called robo advisory, and are automating investment advice (§ 1 (1a) sentence 2 no. 1a Banking Act (Kreditwesengesetz – KWG), § 2 (8) no. 10 Securities Trading Act (Wertpapierhandelsgesetz – WpHG) and management (§ 1 (1a) sentence 2 no. 3 KWG, § 2 (8) no. 7 WpHG). It is not only possible to discriminate against consumers through robo advisory by means of algorithms, this also happens in the granting of loans. In individual cases, robo advisory can also be an investment brokerage (§ 1 (1a) sentence 2 no. 1 KWG, § 2 (8) no. 4 WpHG), so that a distinction must be made between civil and supervisory law.

Due to the high potential for disadvantage with regard to the interest and collateral accruing as well as the "whether" of concluding a loan, the use of algorithms should not take place unreflectively here either. Particularly in the case of creditworthiness checks according to §§ 505a, 505b German Civil Code (Bürgerliches Gesetzbuch – BGB), § 18a Banking Act (KWG), there is the possibility of correlation and a resulting disadvantage of certain groups. The limits of automation here are also § 31 Federal Data Protection Act (Bundesdatenschutzgesetz – BDSG) as well as Art. 22 GDPR and the special § 10 para. 2 sentence 1 no. 1 Banking Act (KWG).

Robo advisory has so far preoccupied the jurisprudence from the perspective of supervisory law.[85] However, little attention has been paid to the potential for discrimination.[86] Before a loan can be granted, the lending banks must

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[82] In detail L Specht/S Herold, 'Roboter als Vertragspartner?' [2018] MMR, 40 ff.

[83] To this M Martini/D Nink, 'Subsumtionsautomaten ante portas? – Zu den Grenzen der Automatisierung in verwaltungsrechtlichen (Rechtsbehelfs-)Verfahren' [2018] DVBl, 1128 ff.; L Guggenberger, 'Einsatz künstlicher Intelligenz in der Verwaltung' [2019] NVwZ, 844 ff.

[84] *LG Berlin* NJW 2018, 2901 = MMR 2018, 848 (Ls.); cf. furthermore on digitalisation of the justice A Paschke, 'Digitale Gerichtsöffentlichkeit und Determinierungsgesamtrechnung' [2019] MMR, 563.

[85] C Baumanns, 'FinTechs als Anlageberater? Die aufsichtsrechtliche Einordnung von Robo-Advisory' [2016] BKR, 366; S Scholz-Fröhling, 'FinTechs und die bankenaufsichtsrechtlichen Lizenzpflichten' [2017] BKR, 133; D Krimphove/K Rohwetter, 'Regulatory Sandbox – Sandkastenspiele auch für Deutschland? [2018] BKR, 494; F Möslein/A Lordt, 'Rechtsfragen des Robo-Advice' [2017] ZIP, 793; *Bitter*, in: Hoeren/Sieber/Holznagel (eds.), Hdb. Multimedia-Recht, 56. EL Februar 2021, marg. no. 59 ff.

[86] See on possible dangers the *BaFin* study, Big Data trifft auf künstliche Intelligenz, 2018, available at: https://www.bafin.de/SharedDocs/Downloads/DE/dl_bdai_studie.html; Martini, JZ 2017, 1017, 1018.

make a prognosis about the probability of contract fulfilment, and this prognosis must be positive, § 505a para. 1 BGB. § 505a (1) BGB contains a legal definition of the creditworthiness test, according to which it depends on the probability of whether "the borrower will fulfil his obligations in connection with the loan contract in accordance with the contract". § 2 (1) sentence 2 Regulation Establishing Guidelines on the Criteria and Methods of Creditworthiness Assessment for Real Estate Consumer Loan Agreements (Verordnung zur Festlegung von Leitlinien zu den Kriterien und Methoden der Kreditwürdigkeitsprüfung bei Immobiliar-Verbraucherdarlehensverträgen – ImmoKWPLV) also requires that it is a reasonably justifiable prognosis and § 3 (1) ImmoKWPLV adds that the borrower's future developments must be included.[87]

In practice, scoring in particular occupies a particularly important area of the creditworthiness check. In addition to possible correlations and effects of place of residence or gender, word embedding also causes problems here. Prejudices are not always easy to identify here, depend on the data that is initially available and primarily arise from biases in the data that is evaluated.[88] Banks and financial service providers must take all this into account when implementing algorithms and robo advisory.

6. Regulation of algorithms.

Due to the risk of discrimination in the use of algorithms and AI, it seems worthwhile to think about a regulation of algorithms that goes beyond the approach of the Article 22 of the GDPR and § 31 of the BDSG. In the jurisprudential discussion, more and more voices are in favour of regulating algorithms.[89] Regulation can start with the codes as well as with the use of AI.

So far, the source code is not public and is therefore not open to examination. The parameters used, their weighting and possible correlations remain hidden from the public. Sometimes, there is talk of a "black box algorithm".[90] This can be countered with transparency and traceability of algorithm-based decisions.

However, there should not be just one European law that regulates all algorithms and AI in all areas of application. Rather, each area should provide for individual regulations.[91] In fact, creating transparency appears to be the most difficult task, as neither data protection officers in companies nor the data protection authorities of the German federal states have the necessary

[87] C Feldhusen, 'Kreditwürdigkeitsprüfung: Wieviel Würdigung erlaubt die Prüfung nach Erlass der Immobiliar-Kreditwürdigkeitsprüfleitlinien-Verordnung?' [2019] WM , 97, 100.
[88] A Caliskan/JJ Bryson/A Narayanan, Semantics derived automatically from language corpora contain human-like biases, arXiv:1608.07187v4 [cs.AI], Cornell University, 2016, p. 1 ff.
[89] B Zypries, 'Digitalisierung erfordert Regulierung und Deregulierung' [2019] ZRP, 33; J Gerberding/GG Wagner, 'Qualitätssicherung für "Predictive Analytics" durch digitale Algorithmen' [2019] ZRP, 116; Martini, 'Algorithmen als Herausforderung für die Rechtsordnung' (n 36) 1017, 1020 f.
[90] Martini, 'Algorithmen als Herausforderung für die Rechtsordnung' (n 36) 1017, 1018; F Pasquale, *The Black Box Society* (Harvard University Press 2015) passim.
[91] So also Gerberding/Wagner, 'Qualitätssicherung für "Predictive Analytics" durch digitale Algorithmen' (n 90) 116.

knowledge or capacities to review millions of algorithms and AI.[92]

Further proposals for regulation can be found in Martini's work, e.g. a duty to justify algorithms and their decision or an independent review body.[93] A broad-based regulatory approach is to be endorsed.

Conclusions.

Already today, the use of algorithms is steadily increasing and it is foreseeable that AI will dominate more and more areas of life in the future. As has been shown, algorithms harbor the danger of discrimination and give reason for regulation. This is mainly due to the immanent lack of transparency. When considering and regulating algorithm-based AI, a clear distinction should be made between it and rule-based software. With regard to the latest proposal for an AI regulation of the European Commission, the broad definition of AI is subject for criticism.

In the USA, protection against discrimination by algorithms and AI follows in particular from the 14th Amendment and the Civil Rights Act. This covers various forms of discrimination. Affirmative actions are permissible, provided that certain conditions are met, in particular purpose and means.

In Germany, constitutional protection against discrimination is based on Article 3 of the German Constitution. The use of predictive policing with reference to personal data faces high constitutional hurdles. In the general civil law context, however, Art. 3 GG is only applicable under very strict conditions, as it otherwise has no third-party effect.

The AGG covers numerous prohibited forms of discrimination and grants comprehensive protection. Only the previous understanding of treatment in the sense of § 3 para. 1 AGG with the requirement of human action or omission leads to the fact that actions of algorithms are not covered.

Particularly in labour law, banking and capital market law, as well as insurance and tenancy law, attention must be paid to standards of the GG, the GDPR, the BDSG and the AGG when using algorithms and AI.

In order to prevent discrimination by software from increasing, the regulation of algorithms should be strengthened. Numerous, cumulative regulatory approaches are available for this purpose. In order to prevent discrimination, a regulation is necessary that obliges transparency in the making of a decision.

[92] But so Zypries, 'Digitalisierung erfordert Regulierung und Deregulierung' (n 90) 33.
[93] Martini, 'Algorithmen als Herausforderung für die Rechtsordnung' (n 36) 1017, 1020 f.