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A Crack in the Algorithm's Facade

A Fundamental Rights Perspective on "Efficiency" and "Neutrality" Narratives of Algorithms[1]

1 First ideas of this work were published in Guijarro Santos, 'Effiziente Ungleichheit', netzforma* e.V. (Ed.) Wenn KI—Dann feministisch (2020), p. 47; I would like to thank Eva Maria Bredler, Phillip Lücking, Fabian Endemann and Nazli Aghazadeh-Wegener for their time and comments as well as Johanna Schlingmann and André Bartsch for their editorial fine tuning.

Member States of the European Union (EU) increasingly implement Artificial Intelligence (AI) systems to assist or replace human decision-makers in more and more sensitive areas of life. AI systems are used to predict school grades, job prospects, or even crime.[1]

In Austria, for example, an AI system has been used since 2018 in a pilot phase to predict the prospects of job seekers to reintegrate into the Austrian job market. It calculates a "reintegration value" based on the data input of a job seeking person. Job seekers are classified into different groups according to the calculated reintegration value. The group defines the eligibility for support measures.[2] Unlike other AI systems deployed by welfare States, the methods paper of this so-called "AMS-algorithm"[3] is publicly available and debated widely in Austrian media and academia. The focus of concern is a table in the methods paper revealing that the AMS-algorithm categorical-

1 E.g. Algorithms in UK's schools: Katwala, Amit: An Algorithm Determined UK Students' Grades. Chaos Ensued, https://www.wired.com/story/an-algorithm-determined-uk-students-grades-chaos-ensued/ (October 12, 2021); prediction of job probabilities and the allocation of welfare in Austria: Wimmer, Barbara: Computer sagt nein: Algorithmus gibt Frauen weniger Chancen beim AMS, https://futurezone.at/netzpolitik/computer-sagt-nein-algorithmus-gibt-frauen-weniger-chancen-beim-ams/400345297 (October 12, 2021); for the welfare State in general: Alston, Philip: Report of the Special rapporteur on extreme poverty and human rights. UN Doc. A/74/48037, 2019; Prediction of crime in Germany: Singelnstein, Tobias: Hessen sucht mit Palantir-Software nach Gefährdern, https://netzpolitik.org/2019/big-data-bei-der-polizei-hessen-sucht-mit-palantir-software-nach-gefaehrdern/ (October 12, 2021), against which a constitutional complaint is pending: Mattes, Anna Livia: Polizeigesetz und Verfassungsschutzgesetz Hessen, https://freiheitsrechte.org/polizeigesetz-hessen/ (October 12, 2021); for further examples see Chiusi, Fabio et al.: Automating Society Report 2020, Algorithm Watch; for the intention to automate even more processes see representative for many: European Commission: White Paper On Artificial Intelligence. COM(2020) 65 final, 2020, p. 1: "Artificial intelligence […] will change our lives by improving healthcare […] increasing the security of Europeans, and in many other ways that we can only begin to imagine."

2 Holl, Jürgen et al.: Das AMS-Arbeitsmarktchancen-Modell. Dokumentation zur Methode, Wien 2018, p. 14; substantive socio-technical analyses by Lopez, Paola: Reinforcing Intersectional Inequality via the AMS Algorithm in Austria. In: Proceedings of the STS Conference Graz 2019, p. 289; Allhutter, Doris et al.: Der AMS-Algorithmus. Eine Soziotechnische Analyse des Arbeitsmarktchancen-Assistenz-Systems (AMAS). Institut für Technikfolgen-Abschätzung, Vienna 2020.

3 "AMS-algorithm" is the most common name, see for other circulating names Berner, Heiko/Schüll, Elmar: Bildung nach Maß. Die Auswirkungen des AMS-Algorithmus auf Chancengerechtigkeit, Bildungszugang und Weiterbildungsförderung. In: Magazin erwachsenenbildung.at (2020), p. 3.

ly attributes negative coefficients to job seekers which meet the data points "female gender", "over 50 years old", or "health impairment".[4] In contrast, a "male gender", "under 30 years old", or "able-bodied" is neither assigned a positive nor a negative coefficient. These coefficients are crucial for the calculation of the reintegration value: the more negative the coefficient, the lower the reintegration value and the higher the probability to be classified as a group "C"[5]-job seeker. Job seekers of this group "C" will be separated from the regular job center system and assigned to another institution where, amongst others, psychosocial counseling is offered.[6] Job seekers with a mediocre reintegration value are classified into group "B" and will receive the most expensive support. Researchers called the AMS-algorithm a "prime example for discrimination",[7] whereas the director of the Austrian job centers argued that the AMS-algorithm merely reflected reality. According to him, access to the Austrian job market is simply more difficult for women. The AMS-algorithm just represented this harsh reality for women on the Austrian job market and thus by no means discriminated.[8] Moreover, he indicated that expensive support measures were not profitable for group "C"-job seekers—hence the distribution of support measures by the AMS-algorithm was just efficient.[9]

The AMS algorithm vividly illustrates important aspects of the current debate about AI systems in decision making. On the one hand, researchers, civil society, and media keep referring to the discrimination risks inherent

4 Holl et al. 2018, p. 11.

5 Actually, the groups are named "H", "M", "N": Holl et al. 2018, p. 14. For simplicity the paper replicates the name used in media.

6 Berner; Schüll 2020, p. 4.

7 Wimmer, Barbara: Der AMS-Algorithmus ist ein "Paradebeispiel für Diskriminierung", https://futurezone.at/netzpolitik/der-ams-algorithmus-ist-ein-paradebeispiel-fuer-diskriminierung/400147421 (October 12, 2021).

8 Cf. Kopf, Johannes: Wie Ansicht zur Einsicht werden könnte, https://www.johanneskopf.at/2018/11/14/wie-ansicht-zur-einsicht-werden-koennte/ (October 12, 2021).

9 Szigetvari, András: AMS-Vorstand Kopf: "Was die EDV gar nicht abbilden kann, ist die Motivation", https://www.derstandard.at/consent/tcf/story/2000089096795/ams-vorstand-kopf-menschliche-komponente-wird-entscheidend-bleiben (October 12, 2021); Kopf, Johannes: Der Beipackzettel zum AMS-Algorithmus, https://futurezone.at/meinung/der-beipackzettel-zum-ams-algorithmus/400641347 (October 12, 2021).

in AI systems.[10] On the other hand, others (like the director of the Austrian job centers) justify its use by pointing to the statistical accuracy of a specific AI system—that is to the alleged neutrality of the system's epistemic foundation—and to a gain in efficiency.[11] Thereby it seems that on efficiency a facade of algorithmic neutrality and statistical unambiguousness is built behind which concerns about algorithmic discrimination are relegated. However, I argue in this paper that embedded in a fundamental and human rights framework, this facade cracks.

After specifying the technological terminology used in the following (I), I will situate the narrative of "efficient" and "neutral" AI systems within a fundamental and human rights framework and analyze the epistemic foundation of the AMS-algorithm through the lens of fundamental rights and science and technology studies (STS). Thereby I demonstrate that an increase in efficiency cannot serve as a catch-all-justification (II), and that even a statistically accurate result—indeed reflecting the "harsh reality" for a specific social group—breaches fundamental rights guaranteeing autonomy, equality, and non-discrimination (III). This shall not be a glass bead game but instead is meant to respond to the problem of regulating discrimination risks through AI systems.[12] For the sake of a responsive regulation it is pivotal how academia, civil society and policy imagine the potentials as well as the limits of AI systems and what they define as the harm in algorithmic discrimination.[13] Therefore, it is crucial that they look through the crack, that is, behind the narratives of "efficient" and "neutral" AI, instead of blindly obeying them.

10 Cf. Alston 2019; Achiume, E. Tendayi: Racial discrimination and emerging digital technologies. A human rights analysis. UN Doc. A/HCR/44/57, 2020; Barocas, Solon/Selbst, Andrew: Big Data's Disparate Impact. In: California Law Review 104(3) (2016), p. 671–732.

11 Kopf 2018; Kopf 2019; see also Kischel, Uwe: Art. 3. In: Epping, Volker/Hillgruber, Christian (Eds.): BeckOK Grundgesetz, München 2021, at § 218d 1.

12 As aspired inter alia by German Data Ethics Commission: Opinion of the Data Ethics Commission, 2020; German Parliament/Bundestag: Unterrichtung der Enquete-Kommission Künstliche Intelligenz. BT-Drs. 19/23700, 2020; European Commission: Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) And Amending Certain Union Legislative Acts. COM(2021)206 final, 2021.

13 Cave, Stephen et al.: Introduction. In: ibid: AI Narratives. A History of Imaginative Thinking about Intelligent Machines, Oxford 2020, p. 1–19; Seyfert, Robert: Algorithms as regulatory objects. In: Information, Communication & Society (2021), p. 1–17.

I. AI? What AI?

I called the AMS-algorithm an AI system because according to the proposed Artificial Intelligence Act of the EU Commission (that is not yet hard law) the AMS-algorithm would be classified as such.[14] However, the same AMS-algorithm could also be named otherwise as in the interdisciplinary discourse about AI many labels exist for the same system.

Terminology is important because it influences our imagination about technology, its potentials, and risks.[15] But terminology is not everything. More important than a label is what a specific system does, what for, and for whom. This is part of my argument which aims at acknowledging the potentials and limits of a specific system and deploying it accordingly.

The systems I am referring to in this paper evaluate training data, recognize patterns in this training data, generalize and apply these patterns to new data *(what)*. Its developers validate the results according to mathematical state of the art standards.[16] In this method "all is about data".[17] To better catch this I prefer to use the term data-based algorithmic system instead of AI system.[18] Furthermore, the data-based algorithmic systems referred to in this paper are deployed in (semi-)automated decision-making and shall predict human behavior and not the weather or energy consumption (what for). Their users are State actors and not private actors like companies (by whom). For all these systems, I use the AMS-algorithm as a representative example.

14 Article 3 (1) AIA in conjunction with Annex I: "'artificial intelligence system' (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with", Annex I lit. c compromises "statistical approaches".

15 Sommerer, Lucia M.: Personenbezogenes Predictive Policing, Baden-Baden 2020, p. 193 f.; especially in law according to Crooto, Rebecca: "Tech cases quickly turn into battles of analogies" cited in Thomson-DeVeaux, Amelia: The Supreme Court Is Stubbornly Analog. By Design, https://fivethirtyeight.com/features/the-supreme-court-is-stubbornly-analog-by-design/ (October 12, 2021).

16 For a summary cf. Bishop, Christopher M.: Pattern Recognition and Machine learning, New York 2006.

17 Ng, Annalyn; Soo, Kenneth: Numsense! Data Science for the Layman. No Math Added. 2017, p. 2.

18 Suggestion by Lopez, Paola: Artifical Intelligence und die normative Kraft des Faktischen. In: Merkur 75 (863) (2021), p. 45.

II. "Efficient" Algorithms

According to a report of the EU's Agency for Fundamental Rights (FRA), across the public sector "[t]he single most important reason for using AI is increased efficiency".[19] However, efficiency is just another unprecise term. As such it merely describes the relation between the aim and the means. For example, wood is chopped faster (aim) if a power saw is used instead of a nail file (means). But what exactly is making a specific data-based algorithmic system more efficient? What for and for whom?

The economically profitable distribution of State resources is an important reason for the State to implement algorithmic systems.[20] Research suggests that the economization of society affects government policies, as they "are frequently assessed against conceptions of efficiency based on financial cost-benefit analysis".[21] In this liberal paradigm it is fitting that, for example, predictive policing tools are "generally sold as a more efficient way to distribute police personnel and resources"[22] and that according to the FRA report respondents of the public sector placed "greater speed" and "cost reduction" as a motivation for deploying data-based algorithmic systems.[23]

Nonetheless, this narrative of cost-reducing and efficient algorithms is already questionable for economic reasons alone. This equation often neglects the financial, personal, and time resources spent on the development of data-based algorithmic systems.[24] This negligence might be because—as

19 European Union Agency for Fundamental Rights: Getting the Future Rights. Artificial Intelligence and Fundamental Rights. Vienna 2020, p. 29; see also Benjamin, Ruha: Race After Technology, Medford 2019, p. 7, 31, 72: "'efficiency' and 'progress' as lingua franca of innovation"; German Federal Government/Die Bundesregierung: Stellungnahme der Bundesregierung der Bundesrepublik Deutschland zum Weißbuch zur Künstlichen Intelligenz, 2020: "the deployment of AI will contribute to [...] a more efficient and citizen friendly public administration" (translation by the author); European Commission 2020, p. 30: "AI offers important efficiency and productivity gains".

20 Allhutter et al. 2020, p. 48

21 Birch, Kean: Techno-economic Assumptions. In: Science as Culture 26(4) (2017), p. 434; cf. Sommerer 2020, p. 289.

22 Katz, Yarden: Artificial Whiteness. Politics and Ideology in Artificial Intelligence, New York 2020, p. 138.

23 European Union Agency for Fundamental Rights 2020, p.29.

24 Likewise, climate change costs are often neglected cf. Hao, Karen: Training a Single AI model can emit as much carbon as five cars in their lifetimes,

Kean Birch put it—"capital-intensive technologies are frequently normalized as innovation".[25] The "innovation" AMS-algorithm cost 1,8 Million €.[26]

Further, within a fundamental and human rights framework "efficiency" is not a desirable value as such. It is not a maxim superior to fundamental and human rights. On the contrary: by opting for a fundamental and human rights framework, the State rejects a framework in which efficiency—more abstractly understood as the highest possible (economic or other) benefit for a majority[27]—determines if a person is protected by fundamental rights or not.[28] Fundamental and human rights are attributed to humans for being humans,[29] not because efficiency says so. The deployment of an algorithmic system in decision-making processes about humans must comply with fundamental and human rights law—always and regardless of any smartness, opacity, or economic efficiency of a system.[30]

That does not mean that fundamental and human rights are untouchable. They can be interfered with, but the interferences must be justified.[31]

https://www.technologyreview.com/2019/06/06/239031/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/ (October 12, 2021).

25 Birch 2017, p. 434.

26 Wimmer, Barbara: Der AMS-Algorithmus sollte ganz abgedreht werden', https://futurezone.at/netzpolitik/ams-algorithmus-sollte-ganz-abgedreht-werden/401009924 (October 12, 2021).

27 Cf. Bentham, Jeremy: A Fragment on Government, New York 1988, p. 3.

28 Cf. Eidenmüller, Horst: Effizienz als Rechtsprinzip, Tübingen 2015, p. 480 f.; Mathis, Klaus: Effizienz statt Gerechtigkeit? Auf der Suche nach den philosophischen Grundlagen der Ökonomischen Analyse des Rechts, Berlin 2019, p. 158 f.; similiar and illustrative Dworkin, Robert: Law's Empire, Cambridge/Massachusetts/London/England 1986, p. 290 f.; Posner, Richard A.:Wealth Maximization Revisted. In: Notre Dame Journal of Law, Ethics & Policy 2(1) (1985), p. 105.

29 Cf. Holzleithner, Elisabeth: Gerechtigkeit, Wien 2009, p. 92; Stern, Klaus: Idee der Menschenrechte und Positivität der Grundrechte. In: Isensee, Josef; Kirchhof, Paul (Eds.): Handbuch des Staatsrechts IX, München 2011, p. 5 f.

30 Cf. McGregor, Lorna et al.: International Human Rights Law as a Framework for Algorithmic Accountability. In: International and Comparative Law Quarterly 68(2) (2019), p. 341; District Court of the Hague, NJCM vs. De Staat der Nederlanden, ECLI:NL:RBDHA:2020:865; R (Bridges) vs. CC South Wales & ors, [2020] EWCA Civ 1958, Case Nº C1/2019/2670; German Federal Constitutional Court, 'Ausland-Ausland-Fernmeldeaufklärung' (May 19, 2020) BVerfGE 154, p. 152, at p. 260 § 192: algorithms must be reviewable.

31 Hillgruber, Christian: Schutzbereich, Ausgestaltung und Eingriff. In: Isensee/Kirchhof (Eds.): Handbuch des Staatsrechts IX, München 2011, p. 985 f., § 10 f.; Klatt, Matthias: Proportionality and Justification. In: Herlin-Karnell, Ester/Klatt, Matthias (Eds.): Constitu-

Fundamental and human rights law does not forbid to exert State power; it limits State power. The abstract standards of justification follow from different legal sources and wordings but are roughly the same: in principle, any fundamental and human rights breach must have a legal basis to ensure that the State exercises democratically legitimized power. Additionally, the intervention must be appropriate, necessary, and reasonable in pursuit of a specified and legitimate aim. In a nutshell, the intervention must be proportionate.[32] In this concept of justification, efficiency as such disaggregates. Since the State must specify the aim followed, efficiency decomposes into an aim like "cost reduction" and must be supported by explanations describing how the deployment of a data-based algorithmic system is necessary and appropriate to achieve this aim and whether its deployment is reasonable in view of the fundamental and human rights breach. This cannot be answered in the abstract but only on a case-by-case basis. It is, thus, evident that within a fundamental and human rights framework efficiency cannot serve as a catch-all justification argument.

And neither can the epistemic foundation of a data-based algorithmic system.

III. "Neutral" Algorithms

Since algorithmic systems are not led by their own subjective judgments, they are often portrayed as being neutral[33] and surrounded by an "aura of truth, objectivity, and accuracy".[34]

Yet, technology is a normative artifact formed by the values of its developers and the political system within which the technological artifact is de-

tionalism Justified, Oxford/New York 2020, p. 169: judicial review "as the institutionalization of a right to justification" referring to Rainer Forst.

32 Cf. e.g. Article 52(1) ECFR.

33 Cf. e.g. Smith, Mitch: In Wisconsin, a Backlash Against Using Data to Foretell Defendants' Futures, https://www.nytimes.com/2016/06/23/us/backlash-in-wisconsin-against-using-data-to-foretell-defendants-futures.html (October 12, 2021).

34 boyd, danah; Crawford, Kate: Critical Question For Big Data. In: Information, Communication and Society 15(5) (2012), p. 663.

veloped and deployed.[35] Algorithms do not just appear from the ether:[36] It is persons who decide to automate decision-making and to develop a data-based algorithmic system in the first place. It is persons who decide which output the algorithmic system shall generate. It is persons who choose the training data, who label it (regularly under bad working conditions)[37], who set the calculation parameters, who evaluate and verify the results. This whole process is not a straightforward one, but one of trial and error:[38] was the training data good enough? What does "good enough" mean to the developers? Must the parameters be adapted? In which way? The development of a data-based algorithmic system can be imagined as a dance with data,[39] and the data does not dance alone.

In this dance many steps can go wrong. Every (wrong) step impacts the knowledge the algorithmic system produces. In STS literature it is agreed that different "biases" can arise within technology.[40] In the context of data-based algorithmic systems, "biases" can be understood as a discrepancy between what the epistemic foundation of a data-based algorithmic system is supposed to represent and what it actually does represent.[41] For instance, it is likely that a data-based algorithmic result is biased because of errors like a data-entry error or because some parts of the training data were labeled falsely.[42] Then the training data is supposed to represent, for example, persons living in zip code "A", but the training data set contains persons actually living in zip code "C" falsely labeled as "A". Other biases can occur when a data-based algorithmic system is supposed to make a statement about "everyone", but the training data simply does not include "everyone". The AMS-al-

35 Cf. Winner, Langdon: Do Artifacts Have Politics? In: Daedalus 109(1) 1980, p. 121–136.

36 Lehr, David; Ohm, Paul: Playing with the Data: What Legal Scholars Should learn About Machine Learning. In: U.C. Davis Law Review 51(2) (2017), p. 667.

37 Hao, Karen: The AI gig economy is coming for you, https://www.technologyreview.com/2019/05/31/103015/the-ai-gig-economy-is-coming-for-you/ (October 12, 2021).

38 Ng/Soo 2017, p. 5.

39 Lehr; Ohm 2017, p. 655: "most machine learning dances back and forth".

40 Cf. Friedman, Batya; Nissenbaum, Helen: Bias in Computer Systems. In: ACM Transactions on Information Systems 14(3) (1996), p. 330–347; Suresh, Harini/Guttag, John V.: A Framework for Understanding Unintended Consequences of Machine Learning. In: arXiv:1901.1000 2020, p. 1–11.

41 Cf. Barocas, Solon et al.: Fairness and machine learning. Limitations and Opportunities, fairmlbook.org 2019 (work in progress), introduction.

42 Brodley, Carla E.; Friedl, Mark A.: Identifying Mislabeled Training Data. In: Journal of Artificial Intelligence Research 11 (1999), p. 131–167.

gorithm, for example, is deployed on all job seekers. However, "gender" was coded binarily (men/women) although non-binary persons are equally clients to the job centers.[43] This can lead to less accurate—biased—algorithmic results for non-binary persons.[44] Both kinds of biases are supposed to be technologically rectifiable, e.g. by correcting the false labels or integrating data about non-/underrepresented groups in the training data.[45]

The tech industry has been criticized for ignoring these technological shortcomings and instead promoting algorithmic systems as neutral and objective.[46] Amongst others, Evgeny Morozov stated: "Its founders prefer to treat technology as an autonomous and fully objective force rather than spending sleepless nights worrying about inherent biases in how their systems [...] operate".[47] Today, however, a growing international and interdisciplinary community of researchers is indeed worried and is actually trying to find technological solutions to fix the kind of biases just mentioned.[48]

Nonetheless, this research branch adds a new dimension to the neutrality narrative. Namely that once fixed, the algorithmic result could represent an objective truth on which decisions could be based without concern.[49] This is the direction in which such a statement like the one of the director of the Austrian job centers is heading: because the algorithmic result is statistically accurate regarding a specific social group like women—or in other words: because there is nothing to be technically rectified regarding this specific algorithmic result—the deployment of the algorithmic system is legiti-

43 Wagner, Ben et al.: Der AMS-Algorithmus. Transparenz, Verantwortung, Diskriminierung im Kontext von digitalem staatlichem Handeln. In: juridikum (2)2020, p. 195.

44 "Representation bias" Suresh/Guttag 2020, p. 5 ff.

45 Calders, Bart; Žliobaitė, Indre: Why Unbiased Computational Processes Can Lead to Discriminative Decision Procedures. In: Custers, Bart et al. (Eds.): Discrimination and Privacy in the Information Society, Berlin/Heidelberg 2013, p. 55 f.

46 E.g. Balkin, Jack M.: 2016 Sidley Austin Distinguished Lecture on Big Data Law and Policy. The Three Laws of Robotics in the Age of Big Data. In: Ohio State Law Journal 78(5) (2017), 1217–1241; Katz, Yarden: Manufacturing an Artificial Intelligence Revolution, https://ssrn.com/abstract=3078224 (October 13, 2021).

47 Morozov, Evgeny: Don't Be Evil, https://hci.stanford.edu/courses/cs047n/readings/morozov-google-evil.pdf (October 13, 2021).

48 Žliobaitė, Indre: Measuring discrimination in algorithmic decision making. In: Data Mining and Knowledge Discovery 31(4) (2017), p. 1060–1089; institutionalized e.g.. In: https://www.fatml.org/.

49 Cf. Prietl, Bianca: Das Versprechen von Big Data im Spiegel feministischer Rationalitätskritik. In: GENDER (3) 2019, p. 13.

mized. The numbers "speak for themselves" as Chris Anderson, the former editor-in-chief of the technology magazine Wired, once wrote.

I respond, however, that the deployment of statistically accurate algorithms in decision-making is not neutral in terms of fundamental and human rights and hence must be justified, that is, entails State accountability. More concretely, its deployment interferes with fundamental and human rights guaranteeing autonomy (1) and equality (2)—and can even amount to a legally prohibited discrimination (3). This is due to the inherent epistemic limitations of data-based algorithmic systems which I coin as the generalization effect and the effect of stabilizing social biases.

I will unfold this argument by using German fundamental rights as an example. Since I am more interested in the "idea behind these rights" than in its idiosyncrasies, the following analysis can be useful for fundamental and human rights of other jurisdictions, especially within the European multilevel fundamental and human rights framework.[50]

1. Do You See Me? Autonomy and the Generalization Effect

Fundamental and human rights protecting the personality, autonomy, and identity of a person are often subsumed under privacy rights[51] and inter alia enshrined in Articles 7 and 8 of the European Charter of Fundamen-

50 There are fundamental rights of EU member States, of the European Union itself and European human rights enshrined in the European Convention on Human Rights. They influence each other. For instance, EU's fundamental rights arose of the ECHR rights and are still guiding for interpretation (Article 53 ECFR). On the (contested) relation of German fundamental rights and EU fundamental rights see ECJ, Judgment of 23.2.2013, 'Melloni', C-399/11, EU:C:2013:107, § 60; German Federal Constitutional Court, 'Recht auf Vergessen I' (November 6, 2019) BVerfGE 152, p. 152, at p. 173 § 53 as translated by the German Federal Constitutional Court, Order of the First Senate of 6 November 2019, 'Right to be forgotten I', 1 BvR 16/13; German Federal Constitutional Court, 'Recht auf Vergessen II' (November 6, 2019) BVerfGE 152, p. 216, at p. 246 § 77 f. as translated by the German Federal Constitutional Court, Order of the First Senate of 6 November 2019, 'Right to be forgotten II', 1 BvR 276/17. Regarding the organization of the EU member States' social systems national fundamental rights are guiding—at least in principle and until the member States do not decide differently, cf. Art. 4(2) lit. b, Art. 152 f. TFEU.

51 Hildebrandt, Mirelle: Law for Computer Scientists and Other Folk, Oxford 2020, p. 99 f.

tal Rights (ECFR)[52] and in Article 8 of the European Convention on Human Rights.[53] In Germany, according to Article 2 (1) of the Basic Law "[e]very person shall have the right to the free development of his personality".[54]

The general right of personality (Allgemeines Persönlichkeitsrecht) contained therein does not protect against every possible influence or impairment of the autonomous evolvement of personality and identity.[55] Rather, external factors need to surpass a certain threshold. Indeed, identity develops only in interaction and communication with others.[56] It is evolved in a game[57] of private and public, of constructing and de-constructing one's own identity, of sending self- and receiving external images about oneself.[58] The right to self-presentation (Recht auf Selbstdarstellung), deduced from the general right to personality, guarantees that we can participate in this game.[59] It does not confer a right to be represented only in the way in which we want to, and even less so to be seen only in such a way.[60] The right to self-presentation merely guarantees that individuals are co-deciders, not the

52 On the relation of both Hildebrandt 2020, p. 130 f.; Gonzáles-Fuster, Gloria: The Emergence of Personal Data Protection as a Fundamental Right of the EU, Cham/Heidelberg/New York/Dordrecht/London 2014, p. 253 f.

53 ECtHR, 2.8.1984, App. № 8691/79, Malone vs. UK, Concurring opinion of Judge Pettiti; ECtHR, 16.12.1992, App. № 13710/88, Niemitz vs. Germany, § 42; ECtHR, 16.2.2000, App. № 27798/95, Amann vs. Switzerland, § 65 f.

54 Basic Law for the Federal Republic of Germany, Federal Law Gazette I, № 1, p. 1, as last amended by Article 2 of the Act of 29 September 2020 (Federal Law Gazette I, № 44, p. 2048), English translation according to Tomuschat et al.

55 German Federal Constitutional Court, 'Isolierte Vaterschaftsfeststellung' (April 19, 2016) BVerfGE 141, p. 186, at p. 202 § 32; German Federal Constitutional Court, 'Geschlechtsidentität' (October 10, 2017) BVerfGE 147, p. 1, at p. 19 § 38.

56 Ibid; cf. Altmann, Irwin: The Environment and Social Behavior. Privacy, personal space, territory, crowding, Monterey, California 1975, p. 23.

57 Similar figure by Cohen, Julie E.: Configuring the Networked Self, New Haven 2012, p. 127: "play of subjectivity".

58 Cf. Fried, Charles: An Anatomy of Values, Cambridge Massachusetts 1970, p. 143; Hildebrandt, Mireille: Smart Technologies and the End(s) of Law, Celtenham 2016, p. 80 f.; Rössler, Beate: Der Wert des Privaten, Berlin 2001, p. 260 f.; Rössler, Beate: Autonomie, Berlin 2019, p. 293.

59 Britz, Gabriele: Freie Entfaltung durch Selbstdarstellung, Tübingen 2007, p. 35.

60 German Federal Constitutional Court, 'Caroline von Monaco I' (January 14, 1998) BVerfGE 97, p. 125 at p. 149 § 86; Britz 2007, p. 47.

sole deciders, when the public creates an image of them.[61] From this right, the right to informational self-determination (Recht auf informationelle Selbstbestimmung) is deduced[62] which guarantees conditions for an autonomous evolvement of identity in a digitized context.[63]

This autonomous evolvement and one's own participation in the process of identity building is called into question when powerful external images of an individual prevent self-images to evolve and to arrive.[64] This is the case when data-based algorithmic systems are deployed in decision-making.[65] To better grasp this argument, we need to immerse into the algorithm's epistemic foundation, its limits, and—what I named—the effect of generalization.

Data-based algorithmic systems are designed to generalize.[66] By evaluating historical data and taking up patterns, they produce knowledge about a mass of people in the past and apply it to the individual case in the present.[67] To be more specific: The AMS-algorithm assigns a negative coefficient to women. This coefficient stands for a pattern found in the historical training data—it stands for the generic experience of women on the Austrian job market. The coefficient is negative because it reflects the negative deviation from the "ground truth" which was chosen by the developers to be young, male, and able-bodied Austrian job seekers without care duties.[68] It shows that women in general achieved the defined output, that is finding a job in a specific time frame less often than men. This generic knowledge about job

61 Britz, Gabriele: Verfassungsrechtlicher Schutz der freien Persönlichkeitsentfaltung. In: Bumke, Christian; Röthel, Anne (Eds.): Autonomie im Recht, Tübingen 2017, p. 357.

62 German Federal Constitutional Court, 'Volkszählung' (December 15, 1983) BVerfGE 65, p. 1, at p. 43 § 154 f.; English summary: Abstract of the German Federal Constitutional Court's Judgment of 15 December 1983, 1 BvR 209, 269, 362, 420, 440, 484/83 [CODICES].

63 German Federal Constitutional Court, 'Recht auf Vergessen I' (November 6, 2019) BVerfGE 152, p. 152, at p. 192 § 90 as translated by the German Federal Constitutional Court, Order of the First Senate of 6 November 2019, 'Right to be forgotten I', 1 BvR 16/13; Britz 2007, p. 52 f.; Kunig, Philip; Kämmerer, Jörn-Axel: Art. 2. In: Kämmerer, J.; Kotzur, M. (Eds.): v. Münch/Kunig Grundgesetz Kommentar, München 2021, at § 77.

64 Britz 2017, p. 360.

65 Cf. for credit-scoring Britz, Gabriele: Einzelfallgerechtigkeit versus Generalisierung, Tübingen 2008, p. 185.

66 Cf. Ng; Soo 2017, p. 12 f.; how generalization and "targeting" (which cannot be treated here) relate see Lopez 2021, p. 46.

67 Lopez 2021, p. 46.

68 Holl et al. 2018, p. 11.

seeking women in the past is applied to an individual job seeking woman in the present. Thus, the images that decide about her job prospects were fixed beforehand without her or her personal data being involved in this process. Even before she knew that she would be in search for a job, it had been designed, calculated, and determined how her female gender was going to be evaluated. Namely negatively. End. Naturally, generalizations are commonplace. But in contrast to an analogue, communicative process in which the person concerned has at least a chance to oppose generic assumptions about her person, the decision of a data-based algorithmic system is fixed. It no longer matters whether and how the woman concerned presents herself. Regardless of the individual capacities of a particular woman, the AMS-algorithm will assign each and every woman a negative coefficient. This generic assumption is simply imposed. What is more, this "error" in the individual case is a feature. Data-based algorithmic systems do not predict truths, but probabilities. The accuracy rate of the AMS-algorithm even varies across social groups: for some it lies at 95%, for others at 69%.[69]

Since the idea behind the right to informational self-determination and privacy rights is to guarantee the evolvement of identity in a digitalized world,[70] it is interfered with when predetermined, powerful digital profiles are imposed without the person concerned being able to effectively influence or control this process.[71]

But again, interferences with fundamental and human rights can be justified. They must be based on a legal basis and be proportionate (see II). Many requirements for a proportionate interference with the right to informational self-determination are by now specified in statutory data protection laws, especially in the Federal Data Protection Act (Bundesdatenschutzgesetz, BDSG), which refers broadly to the General Data Protection Regulation (GDPR) applicable in all EU member States.[72] These legal acts

69 Allhutter et al. 2020, p. 50.

70 See for the entanglement of data protection rights and identity protection: District Court of the Hague, 'NJCM vs. De Staat der Nederlanden', ECLI:NL:RBDHA:2020:865, § 6.24; Cohen 2012; Goldenfein, Jake: Monitoring Laws. Profiling and Identity in the World State, Cambridge 2020, p. 78 f.

71 Similar recently German Federal Constitutional Court, 'Recht auf Vergessen I' (November 6, 2019) BVerfGE 152, p. 152, at p. 192 § 90 as translated by the German Federal Constitutional Court, Order of the First Senate of 6 November 2019, 'Right to be forgotten I', 1 BvR 16/13.

72 Cf. requirements Eifert, Martin: Das Allgemeine Persönlichkeitsrecht des Art. 2 Abs. 1 GG. In: Juristische Ausbildung 37(11) (2015), p. 1186.

merely regulate fully automated decision-making (Article 39 BDSG; Article 22 GDPR) and not supported automated decision-making as is the case with the AMS-algorithm.

And indeed, if the decision-making process is only supported, the case workers could theoretically decide against the classification suggestion of the algorithmic system. But since the narrative of neutral and efficient algorithm is held high[73] and/or a case worker is not adequately trained to understand the algorithm's limit[74] and/or the case worker does not have much time per client (in some Austrian job centers the time per client is circa ten minutes),[75] it is unlikely that she decides against the algorithm. This psychological effect has been evidenced by research and is called automation bias.[76] Humans, in general, trust machines. In Polish job centers, for example, using a similar algorithmic system as in Austria, it was revealed that case workers decided only in 0,58% against the algorithmic result.[77] Thus, the threats for autonomy are similar in semi- as well as fully automated decision-making processes.[78] It remains open to discussion if the data protection rights at hand are sufficient to justify and cope with this threat for autonomy rights.[79]

73 Lopez 2019, p. 304.

74 E.g., Caseworker at the German Federal Office for Migration and Refugees, who use a speech recognition tool to verify the indicated origin of asylum seekers, are not sufficiently trained to do so: Keiner, Alexandra: Algorithmen als Rationalitätskontrolle. In: Leineweber, Christian/de Witt, Claudia (Eds.): Algorithmisierung und Autonomie im Diskurs, Hagen 2020, p. 47, 57 f.; Biselli, Anna: Eine Software des BAMF bringt Menschen in Gefahr, https://www.vice.com/de/article/a3q8wj/fluechtlinge-bamf-sprachanalyse-software-entscheidet-asyl (October 12, 2021).

75 Allhutter et al. 2020, p. 78.

76 Cf. Skitika, Linda J. et al.: Does automation bias decision-making? In: International Journal of Human-Computer Studies 51(5) (1999), p. 991–1006.

77 Allhutter et al. 2020, p. 90.

78 Fröhlich, Wiebke; Spiecker gen. Döhmann, Indra: Können Algorithmen diskriminieren? https://verfassungsblog.de/koennen-algorithmen-diskriminieren/ (October 12, 2021). The Austrian Data Protection Authority actually interpreted Article 22 GDPR to compromise also the AMS-algorithm as supported decision-making systems, Zavadil, Andreas: Datenschutzrechtliche Zulässigkeit des "AMS-Algorithmus". In: DSB Newsletter (4) (2020), p. 3–4.

79 Cf. Fröhlich; Spiecker 2021 / Wachter, Sandra; Mittelstadt, Brent: A Right to Reasonable Inferences. In: Columbia Business Law Review (2) (2019), p. 1–130; Martini, Mario: Fundamentals of a regulatory system for algorithmic-based processes, Verbraucherzentrale Bundesverband, Speyer 2019, p. 15 responding to Wachter/Mittelstadt 2019.

In any event, the reliance on the algorithmic result hides that already the mere automation of the decision-making process calls autonomy rights into question.

2. Are Calculated Likes Alike? The Right to Equal Treatment and the Generalization Effect

The generalization effect, moreover, is problematic from the standpoint of equality. Imagine a woman and a man register as unemployed with the job center. They are evaluated by the AMS-algorithm according to their data input. The woman is classified into the group with low reintegration chances, group "C", which will possibly be separated from the regular job center services to another institution. In comparison, the man is categorized into group "B". Just by assigning the woman and the man to different groups of social aid, they are treated unequally.

According to Article 3 (1) Basic Law and Article 20 ECFR all people are equal before the law. However, that does not mean that all persons shall be treated identically; the State is allowed to differentiate.[80] And in fact, differentiating is what the legislature and the executive do all the time: is matter A to be regulated, but not matter B? Should the police intervene in situation A, but not in situation B? Instead of an identical treatment, likes shall be treated alike, and unequals unequally. If the State deviates from this rule, it must justify this deviation.[81]

Hence, it must be analyzed if the generic rule on which the AMS-algorithm bases its classification decision can justify the unequal treatment. In this regard it must be acknowledged that the AMS-algorithm does not base its decision on any criteria but explicitly on social markers like gender which is a category protected under the non-discrimination clause. Thus, the epistemic foundation of the AMS-algorithm and the general rule deduced must be measured against the prohibition of discrimination, and not the right to equal treatment.

80 Gerhard, Ute: Gleichheit ohne Angleichung, München 1990.

81 German Federal Constitutional Court 'Erbschaftssteuer' (December 17, 2014) BVerfGE 138, p. 136, at p. 180 § 121; ECJ, Judgment of 16.9.2010, 'Chatzi', C-149/10, ECLI:EU:C:2010:534, § 64; ECtHR, 6.4.2000, App. № 34369/97, Thlimmenos vs. Greece, § 44 f.

3. The Effect of Stabilizing Social Biases and Non-Discrimination

The prohibition of discrimination is lex specialis to the right to equal treatment. It forbids a specific unequal treatment of persons on the grounds of legally enumerated categories.[82] Article 3 (3) Basic Law, for example, stipulates that no one shall be disadvantaged or privileged on the grounds of categories like gender or race. Similarly, Article 21 ECFR and Article 14 ECHR forbid discrimination on the grounds of the categories named therein.

What is "specific" about the "specific unequal treatment" depends crucially on the underlying understanding of equality and the view on society mediated by it.[83] A formal understanding of equality forbids the mere differentiation based on, for instance, (any) gender. Such an understanding (just) forbids to write laws that explicitly link one of the "taboo" criteria to different legal effects. From the viewpoint of substantive equality, however, the prohibition of discrimination does not forbid mere differentiation but to deepen social inequalities through the individual disadvantage of persons attributed to listed, socially marginalized groups.[84] Regarding gender-based discrimination in the EU and in Germany, a substantive understanding of equality is applied.[85] Since this understanding already acknowledges that individual discrimination can be the result of discriminatory social structures, it is in

82 Cf. Mangold, A. Katharina: Demokratische Inklusion durch Recht. Antidiskriminierungsrecht als Ermöglichungsbedingungen der demokratischen Begegnung von Freien und Gleichen, Tübingen 2021, p. 5 f.

83 For an overview and critiques of a formal understanding see Fredman, Sandra: Discrimination Law, Oxford 2011, p. 8 f.; for German Constitutional Law: Röhner, Cara: Ungleichheit und Verfassung. Vorschlag für eine relationale Rechtsanalyse, Weilerswist 2019, p. 169 f.

84 MacKinnon, Catharine: Toward a Feminist Understanding of the State, Cambridge Massachusetts 1991, p. 215 f.; MacKinnon, Catharine: Substantive Equality. A Perspective. In: Minnesota Law Review 96(1) 2011, p. 1, 12 f.; for German Constitutional Law: Baer, Susanne: Würde oder Gleichheit? Zur angemessenen Konzeption von Recht gegen Diskriminierung am Beispiel sexueller Belästigung am Arbeitsplatz in der Bundesrepublik Deutschland und den USA, Baden-Baden 1995, p. 235 f.

85 In German constitutional law, however, it is contested if a substantive understanding of equality applies also to other non-discrimination categories, cf. infra Fn. 92; in EU law, while applying to all non-discrimination categories, the nuances and details in legal doctrine are not yet fully elaborated cf., Wachter, Sandra et al.: Bias Preservation in Machine Learning. In: West Virginia Law Review 2021 (forthcoming), p. 17 f.

general better equipped to deal with the effect of stabilizing social biases as will be demonstrated in the following.[86]

a) What's Gender Got to Do With It?

In our example, the woman does not get the more expensive State aid which is reserved for persons categorized into group "B". Instead, she will be transferred from the regular job center system to an alternative institution. Thereby, she is treated unequally in comparison to persons in group "B" and individually disadvantaged. Is this on the grounds of gender? The classification into group "C" and the potential outsourcing from the job center service is directly based on the reintegration value, the calculation of which is based on a number of data points, not only on female gender. However, the German Federal Constitutional Court ruled that a disadvantaging decision is already discriminatory if it takes, amongst others, also gender negatively into account.[87] A female gender is always attributed a negative coefficient, while a male gender is neutral to the algorithm. The AMS-Algorithm, thus, takes a female gender negatively into account. However, some might argue that the unequal treatment is not gender-based because other women are indeed classified into group "B" and some men also classified into group "C". This argument is flawed because the negative assessment of a female gender in contrast to a male gender persists. If a female gender was not assigned a negative coefficient, probably even less women would be assigned to group "C".

Besides, the AMS-algorithm illustrates vividly that axes of inequality position persons differently in society. For example, a woman may be privileged compared to another woman because she is not burdened with care work (negative coefficient of -0,15) and/or is particularly young (neither a negative nor a positive coefficient). Kimberlé Crenshaw coined the term "intersectionality" to describe this complexity according to which not all axes of inequality always have the same effect on each person, but rather it is necessary to carefully examine which power relations intertwine and how.[88] Ac-

86 See also Xenidis, Raphaele: Tuning EU equality law to algorithmic discrimination. Three pathways to resilience. In: Maastricht Journal of European and Comparative Law 27(4) (2020), p. 736–758.

87 German Federal Constitutional Court, '§ 611a BGB' (November 16, 1993) BVerfGE 89, p. 276 at p. 289 § 50.

88 Crenshaw, Kimberlé: Demarginalizing the Intersection of Race and Sex. In: The University of Chicago Legal Forum (1) 1989, p. 139, 151 f.

cordingly, the AMS algorithm functions as an intersectional slide rule. The corresponding legal figure of intersectional discrimination is rarely acknowledged by Courts.[89] Nonetheless, legal scholars are polishing the doctrinal lenses to make intersectional discrimination visible to judges as well.[90] This is not decisive for our hypothetical and simplified example, but important for other cases of discrimination by the AMS-algorithm or any other data-based algorithmic system.[91]

Likewise, in this context it is important to be aware that with the legal concept of "indirect discrimination" EU and German[92] non-discrimination law can also handle masked forms of discrimination. Accordingly, by suppressing "taboo criteria" and using formally neutral criteria instead, the prohibition of non-discrimination cannot be circumvented, in case this criterion has a disadvantaging effect on a social group protected under non-discrimination law.[93] Legal discrimination does not need to be intentional; no bad faith must be proved.[94] Here again, the AMS-algorithm offers an example: The AMS-algorithm does not differentiate expressly because of the category of race. However, a study revealed that persons with fragmented data are twice as often classified into group "C" than those with no fragmented da-

89 ECJ, Judgment of 24.11.2016, 'Parris', C-443/15, ECLI:EU:C:2016:897; German Federal Constitutional Court, 'Kopftuch I' (September 24, 2003) BVerfGE 108, p. 281; but see ECJ, Judgment of 20.10.2011, 'Brachner', C-123/10, ECLI:EU:C:2011:675; German Federal Constitutional Court, 'Kopftuch II' (January 27, 2015) BVerfGE 138, p. 296.

90 Cf. Atrey, Shreya: Intersectional Discrimination, Oxford UK 2019; Mangold, A. Katharina: Mehrdimensionale Diskriminierung. In: Rechtsphilosophie 2(2) (2016), p. 152–168.

91 Cf. Xenidis 2020, p. 739 f.

92 In German Constitutional law as regards gender-discrimination it is agreed that indirect discrimination is covered by Article 3(3) Basic Law: Sacksofsky, Ute: Art. 3 (2–3). In: Umbach, Dieter C.; Clemens, Thomas (Eds.): Mitarbeiterkommentar und Handbuch 1, Karlsruhe 2002, at § 331 f.; for other categories confirming Baer, Susanne; Markard, Nora: Art. 3(2–3). In: Huber, Peter M.; Voßkuhle, Andreas (Eds.), v. Mangoldt/Klein/Starck Grundgesetz Kommentar, München 2018, at § 429; Nußberger, Angelika: Art. 3. In: Sachs, Michael (Ed.): Grundgesetz, München 2018, at § 255; dissenting Langenfeld, Christine: Art. 3(2–3). In: Herdegen, Matthias et al. (Eds.): Maunz/Dürig Grundgesetz-Kommentar, München 2020, at § 38; Kischel 2020, at § 215. In EU non-discrimination law indirect discrimination is deeply rooted in EU's legal doctrine regarding all forms of discrimination cf. ECJ, Judgment of 13.5.1986, 'Bilka Kaufhaus', C-170/84, ECLI:EU:C:1986:204.

93 Cf. Art. 2(2) lit. b, Council Directive 2000/43/EC, 29.6.2000.

94 Baer; Markard 2017, § 428.

ta.[95] Job seeking persons with fragmented data are inter alia persons with a third-country nationality or persons with an immigrated parent.[96] Thus, the formally neutral criterion of fragmented data is likely to have a disadvantaging effect on the protected group of racialized persons.

Compared to this case, our example is admittedly a rather obvious case of discrimination: a woman is individually disadvantaged because of expressly taking her gender negatively into account. More interestingly in that case is whether the discrimination can be justified.

b) Looking for Justification

The standard of justification for discrimination is higher than that of an "ordinary" unequal treatment.[97] Gender-based discrimination can only be justified in exceptional cases.[98] Because of the algorithm's epistemic limitation, that I name the effect of stabilizing social biases, this is not the case here.

A data-based algorithmic system merely reflects one possible relation between the input and the output and only the "what was" instead of the "why it was".[99] This is why a statement like that of the head of the Austrian job centers, arguing the AMS-algorithm just reflected the "harsh reality" for women, is shortsighted. It accepts the algorithmic result, the "what was", as

95 Allhutter et al. 2020, p. 30, 44.

96 Allhutter et al. 2020, p. 31; for a high correlation between a "migrant background" and racism see Gummich, Judy: Migrationshintergrund und Beeinträchtigung. In: Jacob, Jutta et al. (Eds.): Gendering Disability, Bielefeld 2010, p. 131, 132 f.

97 German Federal Constitutional Court, 'Kindererziehungszeiten' (April 5, 2005) BVerfGE 113, p. 1, at p. 20 § 69.

98 Ibid; ECtHR, 28.5.1985, App. № 9214/80, Abdulaziz et al. vs. UK, § 78.

99 Mayer-Schönberger, Viktor; Cukier, Kenneth: Big Data. A Revolution That Will transform How We Live, Work And Think, London 2013, p. 70 f.; Vigen, Tyler: Spurious correlations, https://tylervigen.com/spurious-correlations (October 12, 2021).

a definitive truth.[100] But algorithms do not exist in a neutral limbo.[101] The reasons for the algorithmic result, that is the "why", needs to be scrutinized. As Catherine D'Ignazio and Lauren F. Klein respond to Chris Anderson: "The numbers do not speak for themselves."[102]

Rather, only be embedding the negative coefficient into qualitative inequality research, it becomes clear that in the past women in Germany, Austria and other EU member States were assigned to the private sphere and excluded from the public job market by laws, court rulings, social conventions etc.[103] Today, these laws are mostly abolished, and the separation of private and public is more fluid. However, the exclusion persists in subtle ways in the shape of social structures and social biases;[104] patterns taken up by the algorithm and reflected in the negative coefficient.[105] Of course, social structures can change, and access to the job market is not always hampered for all women. However, in the world of the AMS-algorithm it is. It freezes social norms and biases. Thus, the AMS-algorithm does not base its decision on a random generic rule but on knowledge formed by sexist social structures. Its deployment stabilizes and even deepens these sexist structures by further disadvantaging women on its basis.

So, what then justifies the sexist discrimination through the AMS algorithm? Is the legitimate aim to avoid discrimination by deploying an allegedly "neutral" device? Then the AMS algorithm is evidently not appropriate for

100 Cf. Berry, David M.: Against Infrasomatization. Towards a Critical Theory of Algorithms. In: Bigo, Didier et al.: Data Politics. Worlds, Subjects, Rights, London 2019, p. 43, 45: "The cult of data-ism is a turn away from the project of seeking to understand society and culture through the application of critical reason in human affairs towards a data-deterministic world."; Hu, Lily; Kohler-Hausmann, Issa: What's Sex Got To Do With Fair Machine Learning? In: Proceedings of the 2020 Conference on Fairness, Accountability and Transparency, p. 513–524.

101 Cf. Wachter et al. 2021 (forthcoming), p. 31 f.

102 D'Ignazio, Catherine; Klein, Lauren F.: Data Feminism, Massachusetts 2020, Chapter 6.

103 E.g., in Germany according to § 1356 Civil Code in the version of 18.6.1957 wives were responsible for housekeeping. They were allowed to work for money if this was compatible with their care and housekeeping duties, Gesetz über die Gleichberechtigung von Mann und Frau auf dem Gebiete des bürgerlichen Rechts, 18.6.1957, Federal Law Gazette I, № 26, p. 609; seminal Fredman, Sandra: Women and the Law, Oxford 1997, p. 98 f.

104 Fröhlich, Laura et al.: Gender at Work Across Nations. In: Folberg, Abigail M. (Ed.) Social Issues' Special Issue: Global Perspectives on Women and Work 76(3) (2020), p. 484–511.

105 Lopez 2019, p. 302.

this purpose. Moreover, individual caseworkers certainly also discriminate. But they can consciously decide to act against a stereotype. Discriminatory social structures are powerful but not determinative. Algorithms, on the other hand, are exactly that. They take the same discriminatory decision again and again and again.[106]

Is the legitimate aim the profitable distribution of scarce State resources to spare the welfare State? The AMS-algorithm is not appropriate for that aim either. In what way is it profitable for the State to spend money on psychosocial counseling when the reason for the woman's poor reintegration value is not her individual need of psychosocial help but a sexist Austrian labor market? Mere sexist stereotypes cannot justify discrimination, as the German Federal Constitutional Court already ruled in 1992.[107] Moreover, the Basic Law stipulates that the State must promote actual equal rights for women and men by eliminating factually disadvantageous barriers (Article 3(2) Basic Law).[108] If—as with the AMS-algorithm—a discriminatory status quo is frozen and used as a justification for further disadvantages, this constitutional objective is missed.

In sum, the discrimination of the woman in the example cannot be justified and, thus, would be prohibited under German Constitutional law. This demonstrates that the accuracy of a data-based algorithmic system does not shield against the State's accountability for legal discrimination. It demonstrates that embedded in a fundamental and human rights framework, the algorithm's facade of neutrality and statistical unambiguousness cracks.

IV. From Disobedience to Justice

If we look through this crack and behind the narratives this facade is made of, we see a mathematical function. The conditions of its deployment[109] in decision-making must be politically negotiated.

106 O'Neil, Cathy: Weapons of Math Destruction, New York 2015: "scale".

107 German Federal Constitutional Court, 'Nachtarbeitsverbot', (January 28, 1992) BVerfGE 85, p. 191 at p. 207 § 56 f.

108 Ibid. Recital 3.

109 And not only its development Hoffmann, Anna L.: Where Fairness Fails. Data, Algorithms, and the Limits of Antidiscrimination Discourse. In: Information, Communication & Society 22(7) (2019), p. 910.

This paper is not about banning all data-based algorithmic systems. It rather adds another layer to the ongoing discussion about the regulation of algorithmic discrimination. Therefore, fundamental and human rights offer guidance. They inform us that a regulation of data-based algorithmic systems should not be driven by the narrative and liberal paradigm of economic efficiency but rather by the protection—or at least not the foreseeable violation—of fundamental and human rights. Moreover, they alert us to question the process of automation and the epistemic foundation of data-based algorithmic systems. They call for the informed identification of their potentials as well as their limits. If a data-based algorithmic system generates knowledge about a mass of people and the past, should it then be deployed to take a decision about the individual case in the present?

The response to this question must not lead to stalemate. Rather, a way out could be to use data-based algorithmic systems precisely for what they are good at: to identify past discriminatory structures. Instead of basing adverse individual decisions on data-based algorithmic systems, these systems could be used to identify discriminations and to justify affirmative action like diversity trainings for case workers or promotion programs for socially marginalized groups. In this way, past inequalities would be compensated instead of deepened.

Thus, if the narratives of efficient and neutral algorithms are not blindly obeyed, data-based algorithmic systems can lead us to a more just society.

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