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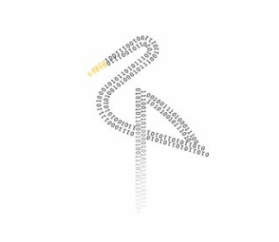

Virtual Borders – International Law and the Elusive Inequalities of Algorithmic Association

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1. Introduction

The use of algorithmic tools by international public authorities is changing the way in which norms are made and enacted.[1] This 'seismic shift' in global governance, as Benvenisti describes it, entails important distributive consequences: the digital turn not only empowers specific actors and corporate forms of expertise but also engenders new modes of social sorting based on algorithmic placements of people in patterns of data.[2] This contribution focuses on the emergent inequalities – on the newly actionable social divisions – that machine learning modules and data analysis thereby import in the domain of global governance.[3] The lines of discrimination and distribution drawn by such algorithmic practices of association and (risk-based) stratification, I argue, should be a matter of greater concern to international law(yers).[4] In line with the symposium's theme, I thereby conceptualize the salience of algorithmic decision-making processes from a distributional and not a procedural perspective – from a perspective of inequality and not privacy, data protection or transparency.[5] This intervention aims both to reveal the distributive effects of data-driven decision-

[1] As Rouvroy notes, '[t]he epistemic, epistemological and semiotic alterations due to the digital turn have had fundamental consequences on the normative metabolism … on the very making of norms'. A. Rouvroy and B. Stiegler, "The Digital Regime of Truth: From the Algorithmic Governmentality to a New Rule of Law", *La Deleuziana,* Vol. 3, 2016, 6.

[2] *Cf.* E. Benvenisti, "Toward Algorithmic Checks and Balances: A Rejoinder", *EJIL,* Vol. 29:4, 2018, 1087. See also L. Amoore, *The Politics of Possibility – Risk and Security Beyond Probability,* Duke University Press, 2013, 46ff (focusing on how 'commercial knowledge … is authorized … to act with the force of law'). For the claim that 'social sorting has become central to surveillance', see D. Lyon, "Surveillance as Social Sorting: Computer Codes and Mobile Bodies", in D. Lyon (ed.), *Surveillance as Social Sorting – Privacy, Risk, and Digital Discrimination,* London, Routledge, 2003, 13.

[3] M. Fourcade and F. Johns, "Loops, Ladders and Links: the Recursivity of Social and Machine Learning", *Theory and Society*, 2020, 9ff (revealing the 'production of digitally-based forms of social stratification and association').

[4] *Cf.* Amoore 2013, *supra* n. 2, 100. *Cf.* F. Johns, "Data, Detection, and the Redistribution of the Sensible in International Law", *AJIL,* Vol. 111:1, 2017, 100 (on the 'distributional implications' of technological change in global governance).

[5] For a good example of the liberal proceduralist path not taken here, see E. Benvenisti, "Upholding Democracy amid the Challenges of New Technology: What Role for the Law of Global Governance?", *EJIL,* Vol. 29:2, 2018. I am aware, of course, that many different tools, techniques and types of knowledge can be qualified as 'algorithmic decision-making processes'. As will become clear, this article primarily focuses on systems of predictive analytics based on sub-symbolic artificial intelligence. This refers to a mode of artificial intelligence that is not based on pre-programmed rules (where the human is per definition 'in the loop' as architect) but on predictive inferencing where rules are induced from data. See D. Abbott, *Applied Predictive*

making and to conceptualize the challenges posed by this algorithmic governmentality to the prospects and emancipatory promises of collectivity, solidarity and equality entertained in modernist imaginaries of international law.

The site selected for the empirical assessment of data-driven inequality is the 'virtual border': the ecology of interoperable databases, screening rules, triaging systems and algorithmic risk assessment tools 'aimed at visualising, registering, mapping, monitoring and profiling mobile (sub)populations'.[6] My analysis thereby intersects with accounts from critical security studies that have qualified borders not only as instruments for territorial division or delineation but also as sites of definition, distribution and discipline.[7] The proliferation of digital technologies in border security and migration management has destabilized traditional understandings of borders as 'rigid, immobile territorial frontiers',[8] and inspired heuristics—the 'shifting border',[9] 'mediated border'[10] or 'border mosaic'[11]—that map out the altered geographies, infrastructures and performative effects of bordering practices. The 'virtual border' analysed in this article is scattered across digital systems without fixed territorial coordinates and operates as a central site of data extraction and social sorting: it is a system of discrimination and division where the standards of hierarchy or inclusion, as I will show, are continuously kept in play.[12] This borderscape is a center of calculation where data

Analytics: Principles and Techniques for the Professional Data Analyst, Chichester, John Wiley & Sons, 2014, 3. For a useful account of the challenges posed by this form of data analytics from a legal perspective, see, for example, M. Zalnieriute, L. Bennett Moses and G. Williams, "The Rule of Law and Automation of Government Decision-Making", *Modern Law Review,* Vol. 82:3, 2019.

[6] D. Broeders and H. Dijstelbloem, "The Datafication of Mobility and Migration Management", in I. Van der Ploeg and J. Pridmore (eds.), *Digitizing Identities: Doing Identity in a Networked World,* London, Routledge, 2016, 243.

[7] *Cf.* A. Kesby, "The Shifting and Multiple Border and International Law"*, Oxford Journal of Legal Studies*, Vol. 27:1, 2007, 102 (on how borders 'construct the non-citizen'); M. Longo, *The Politics of Borders: Sovereignty, Security and the Citizen after 9/11,* CUP, 2017 (on borders as 'filtration sites', where 'identities are not just filtered, but created, modified and destroyed'; M. Leese, "Fixing State Vision: Interoperability, Biometrics, and Identity Management in the EU", *Geopolitics,* 2020, 1 (arguing that '[t]he border is a site of identity production').

[8] G. Glouftsios and S. Scheel, "An Inquiry into the Digitisation of Border and Migration Management: Performativity, Contestation and Heterogeneous Engineering", *Third World Quarterly,* 2020, 2.

[9] A. Shachar, *The Shifting Border: Legal Cartographies of Migration and Mobility*, Manchester University Press, 2020.

[10] S. Ellebrecht, *Mediated Bordering: Eurosur, the Refugee Boat, and the Construction of an External EU Border*, Columbia University Press, 2020.

[11] Amoore 2013, *supra* n. 2.

[12] *Cf.* Amoore 2013, *supra* n. 2, 82 ('the writing of the borderline' is a 'practice of discrimination and division' based on 'association, correlation and inference'); Longo 2017, *supra* n. 7, 195 ('new technologies of filtration used at ports of entry segment people [based on] risk scores'). The role of borders in identity-formation and social stratification has long been observed. Z. Bauman, *Globalization: The Human Consequences,* New York,

flows, bodies and scattered signatures of past passages or events are assembled as scores amenable to immediate institutional action.[13] This practice of conversion is politically performative: it is where identities are forged and where inscriptions of 'risk' circulate, opening or closing doors of opportunity and access.[14] It is where data doubles dwell.

The article focuses on the institutional and operational framework of 'virtual borders' that is currently under construction in the Schengen Area.[15] The material is tied to two case studies of 'smart border' pilot projects led by consultancy consortia and overseen by Frontex. Responding to the need for new technologies expressed in recent EU regulations on integrated border management, automated visa waiver systems (ETIAS) and the interoperability of data systems,[16] these recent pilot projects reveal the creation of an informational infrastructure and decision-making architecture of 'virtual borders' in Europe. In developing artificial intelligence tools for risk assessment and predictive analytics at the border, both pilot projects instantiate the EU's explicit strategic ambition to 'leverage' artificial intelligence for 'Border Control, Migration and Security'.[17] This ambition recently materialized in a 'roadmap' – drafted by Deloitte and published by DG Home – that identifies nine particular areas of opportunity for artificial intelligence, ranging from 'vulnerability assessment' in asylum applications or the use of data analytics to detect 'irregular travel patterns' to algorithmic screening and 'triaging' of visa applications.[18] My analysis of the two pilot projects, iBorderCtrl and Tresspass, is aimed at grasping how systems of algorithmic association and stratification are enacted and employed at the border. How is extracted data clustered into 'actionable' computational categories? How are subjects sorted and scored in specific systems of

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Columbia University Press, 1998 (on 'tourists and vagabonds'); E. Balibar, *Politics and the Other Scene*, London, Verso, 2002 (on 'collective identity').

[13] As noted by Europol's Executive Director: '[what we need] is an accessible interface with actionable information'. See eu-LISA, *Conference Report: The New Information Architecture as a Driver for Efficiency and Effectiveness in Internal Security,* 16 October 2019, Tallinn, 26. On how factual inscriptions circulate in 'centers of calculation', see B. Latour, "Drawing Things Together" in M. Lynch and S. Woolgar (eds.), *Representation in Scientific Practice*, MIT Press, 1990.

[14] *Cf.* Lyon 2003, *supra* n. 2, 27.

[15] For a policy statement that 'virtual' borders are needed (in addition to 'physical' borders), see EU-Lisa, *Strategy 2014-2020,* https://www.eulisa.europa.eu/Publications/Corporate/EL0114595ENC.pdf (last consulted 15 October 2020), 6.

[16] Regulation (EU) 2018/1240; Regulation (EU) 2019/816; Regulation (EU) 2019/817; Regulation (EU) 2019/1896.

[17] European Commission (DG for Migration and Home Affairs), *Opportunities and Challenges for the Use of Artificial Intelligence in Border Control, Migration and Security,* European Commission, Brussels, 2020, 1.

[18] *Ibid.* See also eu-LISA, *Artificial Intelligence in the Operational Management of Large-Scale IT Systems: Perspectives for eu-LISA,* eu-LISA, Tallinn, 2020.

surveillance? Focusing on both these 'nominal' and 'ordinal' aspects, on both grouping and grading, the article gives an account of the specific forms of inequality – of the novel 'social hierarchies' – that are engendered by practices of algorithmic association.[19]

Section 2 provides a detailed empirical exploration of the specific models and digital systems that are currently being tested, developed and piloted in the Schengen Area. The section has two central goals. First, it describes how the recourse to artificial intelligence in the domain of border control, migration and security is strategically rationalized, promoted and legally enshrined. In Section 2.1, I situate the institutional promotion and legal authorization of such algorithmic decision-making tools in a broader context of securitization in the domain of migration, the orientation towards anticipation or simulation in security governance and the perceived need for radical technological transformation within the EU. Secondly, in Section 2.2, I focus on the specific modalities of data extraction and social sorting that were developed in the iBorderCtrl and Tresspass pilot projects. This analysis illustrates how the use of artificial intelligence and predictive analytics – embedded in a proclaimed shift the 'from old and outdated rule based to a new risk based strategy' – are changing the nature and normative orientation of decision-making in border control, which raises particular concerns of inequality and exclusion.[20]

Section 3 develops the concept of 'associative inequality' to situate and problematize the distributive effects of algorithmic assignations of 'risk' and the practices of detection and dividuation these rely upon. These inequalities do not neatly unfold along familiar material, geographical or racial lines but emerge from patterns and anomalies detected in data.[21] This entails forms of disenfranchisement and distribution to which international law is insufficiently attuned. 'Pattern

[19] *Cf.* Fourcade and Johns 2020, *supra* n. 3, 12 and 17 (on new 'social hierarchies' and 'social groupings' emerging from 'ordinal' classification ('organized by judgments of positionality, priority, probability or value along one particular dimension') and 'nominal' classification ('organized by judgments of difference and similarity')).

[20] This shift the 'from old and outdated rule based to a new risk based strategy' is explicitly proclaimed in one of the pilot projects. See https://www.tresspass.eu/Technical-Framework (last accessed 15 October 2020).

[21] As will become clear, this does not entail a naive believe that pre-existing forms of inequality are not reproduced in machine learning modules. Yet, as Aradau and Blanke have observed, the correlational logic of predictive analytics also produces new relational ties that 'elude the structural categories of discrimination and exclusion'. Fourcade and Johns equally observe how machine learning 'produce[s] newly actionable social divisions', 'hierarchies' and 'groupings'. See C. Aradau and T. Blanke, "Politics of prediction: Security and the Time/Space of Governmentality in the Age of Big Data", *European Journal of Social Theory,* Vol. 20:3, 2017, 385; Fourcade and Johns 2020, *supra* n. 3, 11 and 17.

discrimination' is central to the operation of machine learning systems.[22] Inequality, understood as differential treatment based on the placement of people (or the bundle of vectors representing people) in clusters of data, is axiomatic to their functioning.[23] Yet, what emerges from these iterations of sorting and scoring are not the thick social groupings traditionally at work in international law but 'actionable' signs and symbols. A key challenge identified in this article is that forms of 'associative inequality' embedded in the rank orders of 'risk' thereby remain elusive, politically illegible and immune from legal regulation and critique.[24]

Section 4 signals several limitations of the current regulatory repertoire for counteracting this mode of social sorting by focusing specifically on efforts to instil procedures of transparency, accountability and non-discrimination (Section 4.1). Looking beyond such common tropes of regulatory reform, the article further reflects on the broader challenges posed by algorithmic governmentality for prospects of emancipation, equality and empowerment. I set out specifically on how its logic threatens notions of (collective) subjectivity, (collective) authorship and (collective) futurity (Section 4.2). Focused on the 'virtual border' as site where salient social divisions are enacted, the article thereby makes a dual contribution: it conceptualizes the forms of inequality engendered by algorithmic forms of risk-based grouping and grading – captured in the novel concept of 'associative inequality' – and highlights the difficulty of counteracting this form of distribution in the existing register of international law.

How can we prevent the potentiality of life, always only partially present in data patterns, from being folded and actualized in actionable algorithmic projections? How can we reclaim political spaces for recalcitrance where the 'common' may occur? In centring on these questions, the article concludes by claiming the 'right to opacity' – an intervention inspired by the Martinican philosopher

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[22] C. Apprich, "Introduction", in C. Apprich *et al*, *Pattern Discrimination,* Minneapolis, University of Minnesota Press, 2019, x. 'Pattern discrimination' is understood as the 'imposition of identity on input data, in order to filter' and derive 'information from it'. *Cf.* L. Amoore, *Cloud Ethics – Algorithms and the Attributes of Ourselves and Others,* Durham, Duke University Press, 2020, 8 ('an algorithm must necessarily discriminate in order to have any traction in the world').

[23] Fourcade and Johns 2020, *supra* n. 3, 16 ('[i]n a machine learning world, where each individual can be represented as a bundle of vectors, everyone is ultimately a unique combination, a category of one').

[24] On the fundamental problems posed by algorithmic governmentality for standards of non-discrimination, human rights and data protection, see M. Leese, "The New Profiling: Algorithms, Black Boxes, and the Failure of Anti-Discriminatory Safeguards in the European Union", *Security Dialogue,* Vol. 45:5, 2014; E. Kosta, "Algorithmic State Surveillance: Challenging the Notion of Agency in Human Rights", *Regulation and Governance,* 2020.

and poet Édouard Glissant, who described this right as the 'subsistence within an irreducible singularity'.[25]

2. 'Compressing all data into actionable risk scores' – The Construction of Virtual Borders

On 12 February 2020, Forensic Architecture Director Eyal Weizman was notified that his visa-waiver to enter the U.S. had been revoked.[26] At the U.S. embassy in London the next day, an officer informed Weizman that an 'algorithm' had identified him as a 'security threat'. Weizman was given the option, however, to assist the officer in reverse engineering and recrafting the risk score attached to his profile by providing information on his past travels and encounters, which he refused. 'This much we know', Weizman concluded: 'we are being electronically monitored for a set of connections – the network of associations, people, places, calls, and transactions – that make up our lives'.[27] At the U.S. border, fragments of Weizman's life were arrayed in such a manner that situated him on a specific spectrum of risk – a configuration determining degrees of mobility and surveillance. For every such mediatized example of algorithmic exclusion there are, of course, myriad other cases of people affected by their often unexplainable and unnegotiable placement in the risk-based orders of modern borders.[28]

While these assignations do not constitute international legal norms or decisions from the perspective of a positivist sources doctrine, they can be qualified as instantiations of global regulatory governance of the type that has long been under the purview of international legal labor and critique.[29] One salient way of thinking about the transnational, regulatory character of the decision-making tools described below is through the prism of the digital infrastructure it relies on

[25] E. Glissant, *Poetics of Relation (translated by B. Wing),* University of Michigan Press, 1997, 189-190 ('[t]he opaque is not the obscure … It is what cannot be reduced, which is the most perennial guarantee of participation and confluence').
[26] R. Mackey, "Homeland Security Algorithm Revokes U.S. Visa of War Crimes Investigator Eyal Weizman", *The Intercept,* 21 February 2020. Ironically, yet not coincidentally, Weizman would travel to the US to speak at an exhibition exploring the 'dark epistemology' and 'racialized violence' of contemporary 'security algorithms'.
[27] M. Shaw, "Eyal Weizman barred from US ahead of Forensic Architecture Retrospective", *Architect's Newspaper,* 2020.
[28] *Cf.* Longo 2017, *supra* n. 7.
[29] *EJIL* has been a particularly meaningful forum for bringing such informational, informal exercises of 'global regulatory governance' under the purview of international legal reflection. See, for example, Benvenisti 2018, *supra* n. 5.

and helps sustain.[30] A focus on the formal institutional character of the EU – and the web of decentralized agencies (such as Frontex and eu-LISA spun around it) – misses out on the ways in which data-driven practices of border control in the Schengen Area are tied to interoperable international infrastructures of data collection, processing and exchange in the domain of security.[31] Indicatively, UNSC Resolution 2396 obliges member states to employ 'evidence-based risk assessments, screening procedures, and the collection and analysis of travel data' at the border, to 'develop watch lists or databases … to screen travellers and conduct risk assessments', to 'share this information through bilateral and multilateral mechanisms' and 'develop and implement systems to collect biometric data'.[32] In this light, images of the border as a local site of sovereign control are deceptive: the databases, biometric identifiers and risk assessment routines that constitute contemporary borders are part of a global infrastructure of security governance.[33]

This section's empirical exploration unfolds in two parts. First, I elaborate on how salient changes in the informational infrastructure of border control are institutionally rationalized, legally enabled and legitimized through invocations of exception and emergency (2.1). I observe how systems of artificial intelligence are envisaged and enrolled as decision-making tools in the formation of 'virtual borders', oriented around the translation of (big) data into – general and individual – indicators of 'risk'. This is a timely inquiry, as Covid-19 related assessments of 'epidemic risk' are becoming part of the border control calculus. Second, I analyse two recent pilot projects that developed tools for surveillance and classification driven by machine learning modules and the

[30] This focus on infrastructure as regulation is central to two contemporary research projects: the InfraReg project at NYU and the Infra-Legalities project at Edinburgh Law School. On the former, see B. Kingsbury, "Infrastructure and InfraReg: on Rousing the International Law 'Wizards of Is'", *CILJ,* Vol. 8:2, 2019.
[31] *Cf.* G. Sullivan, *The Law of the List: UN Counterterrorism Sanctions and the Politics of Global Security Law*, CUP, 2020 (exploring this global, informational security assemblage). Indicative of this change is Regulation (EU) 2019/817 that establishes a framework for interoperability between EU information systems in the field of border control and visas.
[32] UNSC Res 2396 (2017), para. 4, 13 and 15. These obligations are concretized through initiatives such as the GCTF.
[33] UNSC Res 2396, para. 21 highlights the hybrid (public-private) nature of this infrastructure and the need for 'enhanc[ed] Member State cooperation with the private sector … especially with [ICT] companies, in gathering digital data'.

rationality of 'risk' (2.2).[34] My analysis of iBorderCtrl and Tresspass focuses specifically on practices of extraction, social sorting and erasure.[35]

2.1. Artificial Intelligence and the Informational Infrastructure of Security and Mobility

Automated decision-making systems such as those affecting Weizman in this particular example are at the heart of how the European borderscape is being reimagined and redesigned. Krum Garkov, the Executive Director of eu-LISA (the EU Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice), introduced his agency's strategy by claiming that 'the area of internal security is going through a major transformation, moving in part from the physical to the virtual world' – a world shaped by 'data and information'.[36] In a similar vein, Fabrice Leggeri, Director of Frontex, recently stated that 'the time for information driven border management is not tomorrow, it is today'.[37] Showing the reliance of these technological imaginaries on invocations of emergency, the EU Commission developed its influential strategic paper on *Stronger and Smarter Information Systems for Borders and Security* with the aim of 'address[ing] the *parallel challenges* of migration management and the fight against terrorism and organised crime'.[38] In line with supposed 'synergies' between both agendas, the strategy explores how 'existing and future information systems could enhance both external border management and internal security'.[39] In this merger between the juridical, institutional and operational domains of migration and security, technological enhancement provides the point of resonance: a 'transformative power' that can be wielded for the 'detection and identification of persons who *might* be a threat'.[40] If, as a recent EU

[34] These piloted systems respond to the call for automated decision-making tools in recent EU regulations. See, *inter alia,* Regulation (EU) 2018/1240; Regulation (EU) 2019/816; Regulation (EU) 2019/817; Regulation (EU) 2019/1896.
[35] *Cf.* A. Mbembe, *Critique of Black Reason,* Durham, Duke University Press, 2017, 18 (on 'bod[ies] of extraction'); C. Aradau and M. Tazzioli, "Biopolitics Multiple: Migration, Extraction, Subtraction", *Millennium: Journal of International Studies,* Vol. 48:2, 2019, 212 (on 'mechanisms of extraction that capitalise on refugees … by rendering them into data').
[36] K. Garkov, "Foreword", in eu-LISA, *eu-LISA Strategy 2014-2020,* Tallinn, 2014, 6.
[37] Leggeri made this statement at a joint conference organized by eu-LISA and Frontex. See eu-LISA, *Conference Report: EU Borders - Getting Smarter Through Technology,* 17 October 2018, Tallinn, 8.
[38] EU Commission, *Stronger and Smarter Information Systems for Borders and Security*, Communication from the EU Commission to the European Parliament and the Council, 2016, 2 (emphasis added).
[39] *Ibid.*
[40] eu-LISA 2018, *supra* n. 37, 8 (emphasis added). This signals the algorithmic orientation towards possible futures.

procurement call proclaims, 'the concept of borders has changed',[41] this change is sustained by a specific informational infrastructure.

In the past years, we have seen the construction of an enabling legal architecture for these changes to materialize, often with remarkable deference to the promise of technological possibilities, significant delegations of authority and problems of accountability. While the Schengen Borders Code sets out that 'border surveillance may also be carried out by technical means', the recently adopted regulation on the European Border and Coast Guard (Frontex) provides that border control 'shall consist of use of state-of-the-art technology including large-scale information systems'.[42] Not only have we seen a proliferation of new data-systems and agencies responsible for their construction and maintenance,[43] there is now also a legal framework in place for the interoperability of information processes through a 'common identity repository' and 'biometric matching service' that cut across the domains of border control and counter-terrorism.[44] The challenge, however, is to assemble these flows of data in a format that provides 'actionable' information to those involved in mundane practices of decision-making at the border. Indicatively, as Europol is 'under pressure due to increasing amounts of data', its Deputy Executive Director observed, the main challenge now is to 'transform *data* into *information* and to generate intelligence and knowledge based on this data'.[45] What the border control agent really needs, he expressed, is 'an accessible interface with actionable information'.[46] It is precisely in this necessary translation of the data deluge into such 'actionable information', he suggested, that 'AI can facilitate the work'.[47] In a similar vein, Olivier Onidi, EU Deputy Director-General of DG Migration and Home Affairs, claimed that 'data analytics' can make 'data more illustrative for border guards' and observed that 'there is tremendous work being done on artificial intelligence in the EU … to use, combine and spread data'.[48] Onidi specifically underlined that 'machine learning has potential' for 'vetting persons

[41] EC, *Horizon 2020 Funding and Tender Opportunities: Risk-based Screening at Border Crossing*, 2015 (on file).
[42] Regulation (EU) 2016/399, Art 13 and Regulation (EU) 2019/1896, Art 3, j.
[43] See, *inter alia*, Regulation (EU) 2017/2226 (EES); Regulation (EU) 2018/1240 (ETIAS); Regulation (EU) 2019/816 (ECRIS-TCN); Regulation (EU) 2018/1726 (eu-LISA) and Regulation (EU) 2019/1896 (Frontex and Eurosur).
[44] See Regulation (EU) 2019/817.
[45] eu-LISA 2019, *supra* n. 13, 26 (emphasis added).
[46] eu-LISA 2018, *supra* n. 37, 17. As discussed below, this focus on 'actionability' is of great epistemological significance.
[47] *Ibid.*
[48] *Ibid.*, 12.

who come to the EU', for 'screening their application files' and conducting 'virtual border checks'.[49] Thereby, he noted, 'borders' would become increasingly 'dematerialized'. Highlighting the growing use of AI systems for purposes of 'classification' and 'prediction', Maria Bouligaraki, the head of eu-LISA's Test Transition Unit, also stated that 'deep-learning systems' are essential 'to integrate large, unconnected silos of data'.[50] These AI-based systems of automated algorithmic 'vetting', 'screening', 'prediction' and 'classification' have already been endowed with legal authority in recently adopted EU regulations. While the ECRIS-TCN (European Criminal Records Information System for Third-Country Nationals) regulation allows for 'facial images to be used for automated biometric matching' once the 'required technology' has become available, the ETIAS (European Travel Information and Authorisation System) regulation notes that 'automated processing' of applications will be facilitated through the 'screening rules' of an 'algorithm enabling profiling' based on 'specific risk indicators'.[51]

This specific sociotechnical imaginary, which professes a dematerialization of the border and thereby privileges the combined use of big data and artificial intelligence as tools of public governance, is at the heart of two recent strategies developed by eu-LISA and the European Commission (DG Home).[52] Authored by Deloitte and following the 'Deloitte's AI Journey Framework',[53] the latter strategy sets out to explore how 'AI can be leveraged in the context of Border Control, Migration and Security'.[54] The strategy envisages AI to distil 'deeper insights from the increasing quantities of available data',[55] and notes that algorithmic 'risk assessment tools', despite their 'technical complexity', are scheduled early in the roadmap 'due to the perceived strategic importance for the European Commission'.[56] The document differentiates in this context

[49] *Ibid.*
[50] See eu-LISA 2019, *supra* n. 13, 40.
[51] Regulation (EU) 2019/816 (ECRIS-TCN), Recital 24 & Art. 6; Regulation (EU) 2018/1240 (ETIAS), Art. 4, 20 & 33.
[52] eu-LISA, 2020, *supra* n. 18; EC 2020, *supra* n. 17.
[53] See EC 2020, *supra* n. 17, 8. One could hardly find a better example of Amoore's observation that logic of consultancy has become dominant in security governance. *Cf.* Amoore 2013, *supra* n. 2, Chapter 1.
[54] EC 2020, *supra* n. 17, 1, 6 ('DG Home is excited to harness AI for the benefit of borders, migration and security').
[55] *Ibid.,* 5. While the strategy observes that 'there is much value to be captured through more effective use of the data that already exists', it adds that 'data capture … could adapt in order to enable some of the use cases that are currently deemed infeasible' and specifies that states 'will have to establish ways to capture, extract, transform and use the data in a proper manner to be ingested by the AI algorithms'. *Ibid.,* 78. The needs of the algorithm shapes the direction of data extraction.
[56] *Ibid.,* 3-4.

between '[g]eneral risk assessment … with the general aim to find patterns and cluster individuals' and '[i]ndividual risk assessment', which is used 'to determine eligibility or granting of a certain permit or right' and is therefore qualified as more 'sensitive'.[57] In addressing the framework within which this embrace of artificial intelligence unfolds, the strategy displays the limited purview of legal concerns: the two normative constraints identified in the strategy are data protection (the GDPR) and ethics (the EU's Ethics Guidelines for Trustworthy AI).[58] As final point of regulatory closure, the 'human in the loop' ideal plays a pivotal part throughout the strategy – promising an identifiable center of decision-making and accountability guaranteed by a promise of human judgment presumably unmediated by the socio-technical context in which it is embedded.[59]

While the concrete (legal) effects of the listed algorithmic systems differ – from the proposed tools of 'abscondment risk assessment' informing 'measures such as detention' in asylum procedures to the degrees of mobility afforded by 'triaging' at the border – the strategic agenda of the Commission explicitly explains that its 'risk assessment use cases share a common approach' and can be combined, sequenced and recycled.[60] Additionally, the strategy envisages that 'general risk assessment' modules aimed at 'identifying irregular patterns' that 'were not observed as strange before' could be 'plugged into' decision-making modules on an individual level as 'an additional piece of risk analysis'.[61] As a result, distinct domains of administrative practice and legal regulation become functionally integrated – not only through the 'interoperability' of data sources but also by means of sequenced systems and decision-making tools that allow for insights (on 'patterns' and 'risks') to be shared, modulated and cumulated. This is how, as the strategy indicates, the 'core functionality' of visa application triaging segues into risk assessment systems in asylum cases, while being informed by the 'adjacent modules' of border control analytics that can be 'plugged into' these various 'use cases'.[62] What comes to matter in these transfers of heterogeneous yet increasingly interoperable data and its translation into patterns 'not observed as strange before' cannot be

[57] *Ibid.,* 10 and 58.
[58] The invocation of ethics is a mantra in the strategy – perhaps most revealing in a proposal to delegate ethical evaluation to machine learning itself, expressed in use case of 'AI to monitor the ethicality of other AI systems'. See *ibid.,* 36.
[59] *Cf.* Amoore 2020, *supra* n. 22, 56ff (arguing why there is 'no meaningful outside to the algorithm').
[60] EC 2020, *supra* n. 17, 59 and Annex B, 96. The impact of such decision-making systems on concrete legal procedures (such as Article 10 of the EU Asylum Procedure Directive on the 'individual, objective and impartial' examination of asylum requests) is evident.
[61] *Ibid.,* 40 and Annex B.
[62] *Ibid.,* 59.

determined at the outset. With the use of big data analytics, Leese notes, 'every bit of information [can] become valuable in the future without revealing its utility in the present'.[63] This clearly complicates the application of regulatory principles as proportionality and purpose limitation, which are articulated in data protection regulations such as the GDPR.

Three discernible stages are thus visible in operationalising the 'virtual border': the construction and maintenance of large-scale information systems, the infrastructure of interoperability between these systems and, most essentially perhaps, the design of algorithmic models that reassemble disconnected data flows as actionable information. Importantly, the need for artificial intelligence and data mining techniques entails a strong reliance on private technology companies and risk consultancy consortia in the security sector.[64] While Europol 'scout[s] the market for available [AI] technologies',[65] Frontex institutionalized this scouting process in the 'tool' of 'technology foresight' through which 'industry representatives' are invited to pitch the 'technologies that may, in a medium or long-term perspective, impact the EU borders and the Border and Coast Guard community the most'.[66] Recent investigations specifically revealed how EU research pilots are an important source of corporate profit.[67] Such public procurement 'pilot

[63] Leese 2014, *supra* n. 24, 504.
[64] *Cf.* Amoore 2013, *supra* n. 2, 29-54.
[65] eu-LISA, *Conference Report: Going Digital for a Safe and Secure Europe,* 17-18 October 2017, Tallinn, 17.
[66] See D. Saunders, D. Voicu and M. Wojcikowska, "Technology Foresight - Building the Technological Future of the European Border and Coast Guard Agency", Frontex Research Project (on file). As observed by a consultant on smart border control solutions: '[b]order authorities are not developing technologies on their own. They buy from the market, usually in public procurement'. See Z. Szekely, "Technological Innovation and Borders", Contribution to Edinburgh workshop on Artificial Intelligence and Border Control, 2020 (on file). One particularly relevant call to industry by Frontex displayed an interest not only in 'hardware tools' for surveillance and data extraction, but particularly in products used for 'information sharing and interoperability' and 'data fusion'. It called for tools to deal with 'real time data mining for processing vast amounts of heterogeneous data', processing 'new sources of information (e.g. online news and social media)' and 'intelligence-based risk assessment, threat classification and vulnerability assessment models'. In Frontex, "Invitation to Industry/Researchers to Showcase During the European Day for Border Guards", 2013 (on file). On the ties between migration management and the private security industry more generally, see R. Andersson, *Illegality, Inc. Clandestine Migration and the Business of Bordering Europe,* Oakland, University of California Press, 2014.
[67] Z. Campbell, C. Chandler, C. Jones, "Sci-fi Surveillance: Europe's Secretive Push into Biometric Technology", *The Guardian,* 10 December 2020. This revealing piece of investigative journalism observes that 'billions of euros in public funding flow annually to research on controversial security technologies – at least 1.3 billion euros more will be released over the next seven years'. 'Horizon 2020 has been particularly beneficial for the private sector: since 2007, private companies have received 42% of the €2.7bn distributed by the security research programme – almost €1.15bn. Other participants, such as research institutes and public bodies, trail far behind'. The piece further reveals severe issues with ethical review and institutional oversight in the allocation of this budget.

projects' display how the infrastructure of 'virtual borders' is built – how private sector knowledge is enrolled in public decision-making processes, how distinct logics of 'prediction' or 'classification' emerge and how data is disaggregated, decluttered and reassembled in 'actionable' risk inscriptions. Pilot projects display the nature of 'virtual borders' as assemblages-in-the-making.[68]

2.2. iBorderCtrl and Tresspass – The Border as Site of Extraction and Social Sorting

This article specifically focuses on two EU-funded pilot projects: iBorderCtrl and Tresspass. These 'state of the art' border control systems, which claim to trade the 'subjective control of human agents' for 'objective control with automated means',[69] function to collect data that is subsequently rendered 'actionable' in the register of 'risk'. In the *first step*, both pilot projects respond to the call to develop innovative 'arrays of sensors, operational methods and improved data management techniques' for the collection and interconnection of data.[70] The life signatures thereby gathered range from traces on social media, credit card expenses and past travels to biometrics and biophysiological indications of intent. This is an essential corollary to forms of governance based on pattern detection and machine learning, which, Fourcade and Johns note, are 'fostering an ever-more-prevalent hunger for data'.[71] 'Data hunger' is associated with a specific form of artificial intelligence that operates not on the basis of pre-programmed rules (as with symbolic, expert-based AI), but based on accretive learning through data exposure.[72] In other words, the detection of 'actionable' associations for public decision-making processes hinges on the extraction and

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[68] This is explicit in how the EU Strategy on the Use of Artificial Intelligence in Border Control, Migration and Security refers to a number of Horizon 2020 projects (including iBorderCtrl) as the architecture for future 'use cases'.

[69] Unless otherwise indicated, the citations in this section are from the technical framework of both pilot projects. See https://www.iborderctrl.eu/Technical-Framework and https://www.tresspass.eu/Technical-Framework.

[70] EC 2015, *supra* n. 41.

[71] Fourcade and Johns 2020, *supra* n. 3, 3 and 6ff. Lyon observed in this context how the use of predictive analytics and big data would thereby inevitably 'justify unprecedented access to data'. D. Lyon, "Surveillance, Snowden and Big Data: Capacities, Consequences, Critique", *Big Data and Society,* Vol. 1:2, 2014, 6.

[72] In its report on the potential use of artificial intelligence in the operational management of large-scale IT systems, eu-LISA therefore differentiates between symbolic AI and data-driven AI, which is 'able to improve … performance without human supervision by relying solely on the analysis of training data'. eu-LISA 2020, *supra* n. 18, 10-11. As Aradau and Blanke note, big data is imagined here as 'reservoir of unexpected insights'. 'Data is king', which leads to ever-expanding regimes of 'extraction and capture … under the mantra 'collect it all". Aradau and Blanke 2017, *supra* n. 21, 379. 'Big data … is about an enhanced ability to … realise the promise of predictive analytics'. In C. McCue, *Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis,* Oxford, Butterworth-Heinnemann, 2015, 380.

processing of significant flows of (potentially heterogeneous) data.[73] It is precisely for this purpose of extraction that the 'virtual border' promises to be a privileged site.[74] While iBorderCtrl develops a 'face-matching tool' gathering images for facial recognition, a 'biometrics tool' collecting iris and palm vein scans and a 'document authentication tool', Tresspass provides the capacity for 'real-time behaviour analytics' that could detect 'hidden aspects' of 'intent' and 'attitude' through 'on-site observations' as well as 'open source web intelligence and mining'.[75] These systems further trade technologies of facial recognition (crossmatching images with databases) for forms of biophysiological reading: in 'analysing non-verbal micro-expressions' to 'quantif[y] the probability of deceit', iBorderCtrl claims to have moved 'beyond biometrics and onto biomarkers' – reading psychological states from uncontrollable physical features in a process described by Harari as 'biohacking'.[76] Aside from collecting information through 'sensors', open source data mining and 'on-site observation', iBorderCtrl and Tresspass also promise an architecture of interoperability: both systems are tied to an array of public databases (SIS II, VIS and EURODAC) and aspire to connect with data from social media platforms such as Twitter, Facebook, Instagram and Google+ as well as private credit card providers. In this process of extraction and aggregation, bodies are translated into information – rendered legible and comparable as decorporealized, virtual 'data doubles' that figure as governable fictions.[77] The act of 'doubling' individuals into digital data,

[73] eu-LISA refers in this context to Rogati's 'AI Hierarchy of Needs' (a spin on Maslow) that places 'data collection' at the pyramid's base. eu-LISA 2020, *supra* n. 18, 12. See M. Rogati, "The AI Hierarchy of Needs", *Medium*, 2017.

[74] Longo observes, in this sense, that not only do 'ports depend on [an infrastructure of] data-accumulation', but, also in reverse, 'data accumulation depends on [the infrastructure of] the ports' as 'contact points'. Longo 2017, *supra* n. 7, 155. See also Broeders and Dijstelbloem 2016, *supra* n. 6 (on borders as central sites of data gathering).

[75] D. M. Kyriazanos *et al,* "Automated Decision Making in Airport Checkpoints: Bias Detection Toward Smarter Security and Fairness", *IEEE Security and Privacy Magazine*, 2019.

[76] Similar to iBorderCtrl's process of 'adaptive psychological profiling' on the basis of 'non-verbal micro-expressions', Tresspass also works to reveal 'hidden aspects' of 'intent and attitude' by employing 'machine learning' tools that analyse 'data concerning … behavior and profile patterns'. Kyriazanos 2019, *ibid.* See also Y. N. Harari, "The Myth of Freedom", *The Guardian,* 2018. Both iBorderCtrl and Tresspass thereby draw on private technologies: the patented VicarVision face reader and SilentTalker psychological profiling system. Private actors are authorized as 'petty sovereigns', in line with J. Butler, *Precarious Life: The Powers of Mourning and Violence,* London, Verso, 2004.

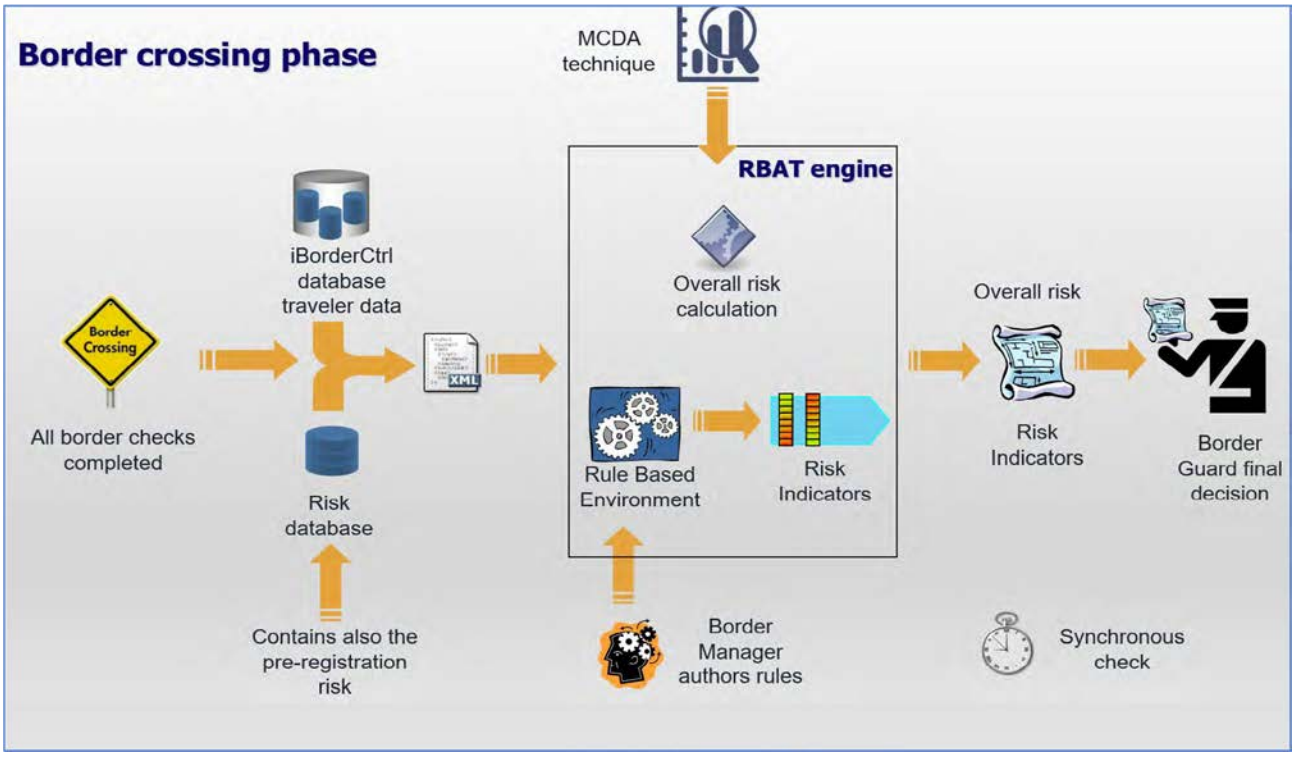
[77] *Cf.* K. Haggerty and R. Ericson, "The Surveillant Assemblage", *The British Journal of Sociology,* Vol 51:4, 2000, 611 (observing how the body is 'broken down by being abstracted from its territorial setting [and] reassembled in different settings through a series of data flows. The result is a decorporealized body, a data double of pure virtuality'); Lyon 2003, *supra* n. 2, 27 ('[data doubles are not] innocent … fictions'. 'They make a real difference. They have ethics, politics').

importantly, is not a form of representation but a performative process of subject-formation – a mode of 'ontological politics'.[78]

In addition to providing sensors and data extraction modules, iBorderCtrl and Tresspass also design decision-making systems that renders this data operational as 'risk scores' through forms of 'social sorting'.[79] It is precisely in this *second step* that the governmental rationality of the pilot projects is displayed. Oriented at reassembling disaggregated data in formats amenable to automated decision-making, Tresspass articulates a 'single cohesive risk based border management concept' that provides 'risk indicators' on the basis of collected data. In an explicit expression of governmental change, the project claims to move away from the 'old and outdated rule based to the new risk based strategy'. Similarly, iBorderCtrl states that 'risks are key to the performance of the system as they declutter the information by compressing all data into meaningful actionable risk scores'. This does not only entail a 'risk–assessment routine which aggregates and correlates the risks estimations [from] the processing of the travellers' data', but also an 'advanced post-hoc analytics that will help identify new patterns and knowledge allowing the iBorderCtrl system to adapt quickly to new situations'. The aggregated data is thereby rendered 'operable' through a technology of algorithmic and risk-oriented association with an immediate impact: 'risk scores' lead to 'targeted surveillance', 'risk mitigation measures' or 'denial of access'. This iBorderCtrl decision-making process is schematically represented in figure 1 below. In its shift from a 'rule based' to a 'risk based' order, the 'advanced risk modelling' tools used by iBorderCtrl and Tresspass provide decision-making tools based on techniques of association and social sorting that displace thicker forms of identification and social affiliation to which international legal thinking is more easily attuned (such as those linked to territory, population or formal status).

Figure 1 - iBorderCtrl: Intelligent Portable Control System[80]

[78] *Cf.* H. Dijstelbloem and D. Broeders, "Border Surveillance, Mobility Management and the Shaping of Non-Publics in Europe, *European Journal of Social Theory,* Vol. 18:1, 2015 (pointing to the ontological implications of datafied borders).
[79] For more context on the border as site of 'social sorting', see *supra* n. 2 and 12.
[80] iBorderCtrl, *Intelligent Portable Control System*, Presentation at FLYSEC Event, Brussels, 28 June 2018.



What are the core tenets of this shift from 'rules' to 'risk' that defines decision-making at the border? What are the defining features of this form of rating and ranking? First, it is essential to note that the translation of gathered data in risk scores does not follow a stable rule of assignment or association: iBorderCtrl's 'Border Control Analytics Tool' continuously seeks new patterns in the data that allows the algorithm to 'adapt'. New patterns between 'risk objects' and 'risk indicators' constantly emerge – ranging from Twitter data or gender to nationality or ethnicity – which feed back into the allocation of 'risk scores'. At every border crossing, iBorderCtrl's 'Risk-based Assessment Module' therefore performs a dual role: it 'calculates the overall risk of each traveller crossing the borders' while at the same time giving 'feedback' to the analytics module on 'potential risk patterns'.[81] The norms guiding the decision-making process, in other words, are continuously kept in play: as new 'patterns' emerge in practices of data mining, the assignations of risk alter – every passage has jurisgenerative potential. 'Risk', in this manifestation, displays itself as a 'mobile' norm determined by iterated, automated and autonomous alterations immanent to machine learning itself.[82] This is rendered explicit in the EU's strategy on artificial intelligence and border control

[81] *Ibid.*
[82] *Cf.* Amoore 2013, *supra* n. 2, 65 (observing how, in the context of algorithmic risk assessments, 'the norm is always in a process of becoming') and 66 (explaining how every individual risk assignation – however innocuous or momentary – is thereby folded into 'building and refining of the mobile boundaries between

regarding to the operationalisation (in 2022) of the ETIAS system. ETIAS-1 (the envisaged individual risk assessment routine), the strategy explains, cannot be scheduled before the start of 2023 as it 'will use the data from the first six months of 2022 for the creation of the AI model'.[83] Even after these risk assessment routines are operationalized, the strategy indicates, artificial intelligence could be employed to (re)define the risk indicators for ETIAS (as provided in Article 33(4) of EU Regulation 2018/1240) and assist in 'adapting them over time'.[84]

What comes to matter in the designations of 'risk' cannot fully be determined at the outset – not only because of the instability of the norm but also because of its inherently associative nature: 'risk scores' are not assigned only on the basis of predetermined causal presumptions underlying specific features (as with traditional profiling or 'rule based' systems) but also on the basis of the correlational patterns that emerge from tying heterogenous digital traces together.[85] This first tenet of the shift from 'rules' to 'risk' – the modular, mobile nature of the norm – thereby also signals a specific form of authorship (as problematized in Section 4.2): the parameters of possible deviance (or normalcy) are not inscribed in the code prior to its use – a moment of normative agency that could be identified and acted upon – but emerge from the exposure to new data extracted from ever-unfolding encounters and events. This process of 'spontaneous germination' leads only to provisional markers of deviance and normalcy – the norm always remains in flux.[86] Interestingly, however, this is not solely a process of automated algorithmic authorship, as human actors are enrolled within the learning process. As figure 2 displays, the iBorderCtrl platform provides a 'rule authoring environment' where 'border managers' can signal particular 'risk objects' (listed in figure 2

normal and risky behaviors'); Johns 2017, *supra* n. 4, 88 ('[in the context of unsupervised data mining] even the determination of what constitutes an "object" for purposes of analysis and change detection is automated').

[83] EC 2020, *supra* n. 17, 40. The EU strategy clarifies that classifications will therefore be based on a 'learned similarity': 'unsupervised' machine learning can 'uncover' correlations in data to be 'fed into the AI model' as 'predictive feature[s]'. AI could then be used both to select risk indicators and to 'adapt[] them over time'. EC 2020, *supra* n. 17, 89-92.

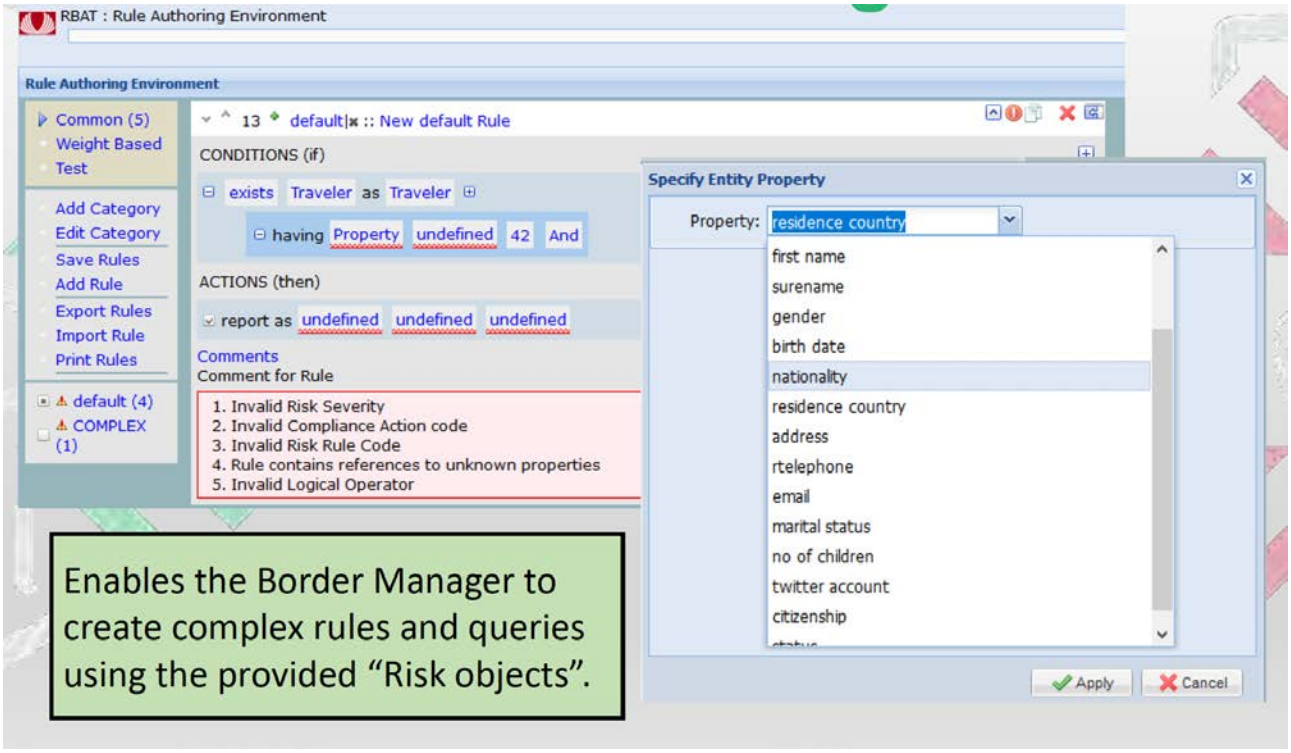
[84] *Ibid.,* Annex B, 91.

[85] *Cf.* C. Aradau and T. Blanke, "Governing others: Anomaly and the Algorithmic Subject of Security", *European Journal of International Security*, Vol. 3:1, 2017. This signals the 'ontology of association' at play in the risk calculus – its basis in correlational inference (relations between data elements) in addition to causal presumption (related to specific features).

[86] For the argument that, in the context of data mining, profiles appear as 'spontaneous germination', see A. Rouvroy, "The End(s) of Critique: Data-Behaviourism vs. Due-Process", in M. Hildebrandt and E. De Vries (eds.), *Privacy, Due Process and the Computational Turn. Philosophers of Law Meet Philosophers of Technology*, Abingdon, Routledge, 2012, 3. See also Leese 2014, *supra* n. 24, 503 ('data-driven profiles are [not] static categories but fluid phenomena').

below) and participate in crafting 'actionable' associations. The human is literally 'looped in' the conduits of data mining here – not as voice of normative reason residing outside the algorithm but as one more element in its adaptive and iterative learning process.[87]

Figure 2 - iBorderCtrl: RBAT – Rule Authoring Environment[88]



A second salient feature of the risk routines envisaged by iBorderCtrl and Tresspass – in addition to its modular, mobile character – is its explicit orientation towards 'actionability' as defining concern. The tools for 'compressing', 'aggregating' or 'correlating' data in adaptive risk routines, in this sense, are aimed at providing colour codes, flags or numerical ratings for immediate

[87] I am, of course, making a reference to the 'human in the loop' ideal, which is recurrent in legal scholarship and policy debates. *Cf.* Benvenisti 2018, *supra* n. 5. While a thorough analysis of this ideal is beyond this article's scope, I do want to highlight the problems involved in the juxtaposition between machine learning and the exercise of autonomous human judgment (presumably untouched by the material context in which it is embedded). The 'rule authoring environment' in the decision-making system of iBorderCtrl, contrarily, affirms Amoore's claim that '[i]n contemporary machine learning, humans are lodged within algorithms and algorithms within humans'. In Amoore 2020, *supra* n. 22, 58 (concluding that there is 'no … outside to the algorithm' and that the 'human in the loop' is an 'impossible figure').

[88] iBorderCtrl 2018, *supra* n. 80.

operational use.[89] This placement on scales of 'risk' does not imply direct correspondence to predefined normative criteria: the associative, anticipatory, unscripted, even unknowable rationality of risk modelling in iBorderCtrl or Tresspass explicitly dismisses the possibility of defining what is measured outside of the inferential process from which it is derived. This is machine learning as a performative, worldmaking enterprise – an exercise in enacting the world, not of rendering it visible. Yet, what results from this process – an 'actionable' indicator tying the assemblage of decision-making together (as displayed in figure 1) – has no representational or epistemological orientation.[90] Its aim is not to *produce* knowledge *about* the world (as in traditional registers of expertise), but to *capture* correlational patterns present *within* it.[91] This ideal to let the data 'speak for itself', Rouvroy has argued, signals a 'purely inductive' mode of reasoning that 'cancel[s] out all meaning' previously attached to extracted fragments or features.[92] The pretence to 'pure actuality' entertained by predictive analytics thereby erases the social meaning ascribed to attributes or events, acting only through the thin threads of the 'actionable' association.

In this 'actionable' signal, the associations drawn and choices made are no longer visible or traceable. As Keeley Crockett, one of the architects of iBorderCtrl, stated in this context: 'I cannot explain what a hundred neural networks are doing and how they are interlaced together. We are talking about 4900 rules from the final risk classifier alone. You can't explain it'.[93] What matters then is not the validity or representational merit of the 'final risk classifier', but its operational use: the 'reflex responses' it induces and the 'adaptive' abilities it displays in the conduits of human-machine

[89] Responding precisely to the demand, as expressed by Europol's Deputy Director General, for 'an accessible interface with actionable information'. eu-LISA 2018, *supra* n. 37, 17.
[90] In her analysis on the impact of artificial intelligence on global governance, Johns has also observed how 'accumulated human knowledge and experience' is displaced by '[t]he sorts of fleeting associations foregrounded in data mining' – by '[p]atterns appearing momentarily in data'. Johns 2017, *supra* n. 4, 98-99.
[91] As Rouvroy has noted, 'we feel that with Big Data we no longer have to produce knowledges about the world, but that we can discover knowledge directly in the world'. Rouvroy and Stiegler 2016, *supra* n. 1, 9. This aligns with Chandler's observations on the post-epistemological nature of sensing in the era of big data. See D. Chandler, *Ontopolitics in the Anthropocene: An Introduction to Mapping, Sensing and Hacking,* London, Routledge, 2018.
[92] Rouvroy and Stiegler 2016, *supra* n. 1, 7-8.
[93] K. Crockett, "Adapted Psychological Profiling Versus the Right to an Explainable Decision", 10th International Joint Conference on Computational Intelligence, Sevilla, 20 September 2018. While Crockett was specifically addressing the Automated Deception Detection System of iBorderCtrl in this citation, the reasoning can equally be applied to forms of machine learning involved in 'risk assessment'. The use of machine learning in both 'deception detection' as well as 'risk assessment' was underlined by Keeley Crockett and James O'Shea in their position paper for a forthcoming conference on artificial intelligence and border control. K. Crockett and J. O'Shea, "The Ambitions and Challenges of iBorderCtrl", Conference Paper, 2020 (on file with author).

decision-making.[94] Once again, this places the 'human in the loop' ideal into perspective, as the standards of evaluation that are supposed to be central to human review are no longer knowable.[95] As figure 1 indicates, the 'human' is 'looped in' at the end of the decision-making chain, where any form of judgment is already mediated by the indicative intervention of a 'risk score' and its computational account of a world that is inherently inaccessible to human representation or review. How to judge what one 'can't explain'?

A third and final aspect of these risk routines that I want to underline is their temporal orientation. What is enacted in the associative lines of risk is not a judgment on past transgressions but a projection and simulation of possible futures.[96] As a senior data analyst from Frontex stated in an interview, this reflects a more general desire to use artificial intelligence 'not only as descriptive but especially as a predictive and prescriptive tool'.[97] Instead of only applying present rules to past events, the temporal space of interest for risk modelling systems such as iBorderCtrl and Tresspass is doubled up: while data on past transgressions remains, of course, crucial in the calculus of risk, projections of possible future threats are also drawn from nodes between data points that are innocuous in isolation.[98] What is captured in the artefact of 'risk', in short, is not a stable legal status but a potentiality of deviation – not a crystalized past but a speculated futurity.[99] It is precisely by 'inferring across the gaps' of the unknown that the 'risk based' model of decision-making differs from its purportedly outdated 'rule based' antecedent.[100] In the shift from 'rules' to 'risk', the aim is

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[94] Rouvroy 2012, *supra* n. 86, 4.

[95] Leese has argued in this context that 'human reviewers lose true agency' and that 'inductive knowledge generation is not 'assistance' in decision-making but rather a prescription of human-reviewer conduct'. Leese 2014, *supra* n. 24, 505.

[96] *Cf.* Kingsbury 2019, *supra* n. 30, 184 (on AI as a technology through which the 'future [is] brought into the present').

[97] Interview with Frontex Data Analyst, April 2020 (transcripts on file). The EU strategy lists various of modules aimed at predicting the 'risk level of individuals', the 'flow of travellers' or the 'risk of abscondment' during asylum applications – predictions based on 'patterns/trends' 'not … immediately obvious to a human reviewer'. EC 2020, *supra* n. 51, 89, 91, 96. This aspiration is situated in a longer lineage of 'audio-visual protocols' oriented towards 'prospection', as already indicated in P. Virilio, *War and Cinema: The Logics of Perception,* London, Verso, 1989.

[98] This is described in the EU strategy as the difference between pre-defined 'risk thresholds' and 'learned similarities' or 'patterns not observed as strange before'. EC 2020, *supra* n. 17, 89ff.

[99] We observe a resonance with speculative (rather than prophylactic) risk formats in the world of finance. *Cf.* D. Wigan, "Financialization and Derivatives: Constructing an Artifice of Indifference", *Competition and Change,* Vol. 13:2, 2009.

[100] *Cf.* Amoore 2013, *supra* n. 2, 59. The shift from 'rules' to 'risks' thereby corresponds to the computational shift from symbolic (supervised) to sub-symbolic (unsupervised) forms of machine learning, as noted in EC 2020, *supra* n. 17, 89ff.

to fold the future into the present by targeting contingency as such – foreclosing the virtual, possible and unactualized aspects of life.[101]

At the 'virtual border', this section showed, lines of cleavage and discrimination are not drawn along recognizable boundaries of international legal ordering but through a translation of extracted data into 'actionable' associations – the 'vibrant matters' of risk flags, scores and modular scales that mediate the placement of people at the border.[102] I have focused on the forms of extraction, social sorting and the erasure of meaning that this technology of bordering entails. The next section conceptualizes the configurations of inequality emerging from these 'predictive and prescriptive' assignations of 'risk'.

3. Rank Orders of Risk – The Elusive Inequalities of Algorithmic Association

This section analyses the inequalities engendered by algorithmic risk calculi – the particular ways in which they rate and rank – and signals what is at stake for international law(yers) in confronting this increasingly prevalent mode of 'social sorting'.[103] While these reflections are based on the empirical inquiry of the preceding section, they extend to the use of machine learning tools in public decision-making processes also beyond the 'virtual border'. My aim here is to explore, on a general level, the difficulty of registering and counteracting the inequalities induced by increasingly prevalent forms of algorithmic governmentality in a language of structural discrimination.[104] The section signals the key tenets of what I describe as 'associative inequality' and situates its emergence in a broader analysis of bordering as an inherently distributive practice. I focus on how the use of computational tools both reproduces existing divisions enacted at the border and induces new forms of associative inequality.

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[101] *Cf.* Rouvroy 2012, *supra* n. 86, 10 and 13 (noting the focus in algorithmic governmentality on the 'inactual, potential dimensions of human existence'); Amoore 2013, *supra* n. 2, 62 and 157 (describing this as a form of governing that can 'only act on a potential future that is already actualized as a possibility'); B. Massumi, "The Future Birth of the Affective Fact", in B. Massumi, *Ontopower: War, Powers, and the State of Perception,* Durham, Duke University Press, 2015. The focus on the 'virtual' (the realm of human potentiality) in Massumi's work intersects with accounts that placed spontaneity at the heart of human dignity. *Cf.* H. Arendt, *The Origins of Totalitarianism,* New York, Penguin, 2017 (1951), 574.

[102] *Cf.* J. Bennett, *Vibrant Matter: A Political Ecology of Things,* Duke University Press, 2010, 6 (on 'thing-power': the mediating ability of objects to 'animate, to act, to produce effects dramatic and subtle').

[103] On machine learning as technology of 'stratification and association' – of 'ladders and links' – see Fourcade and Johns 2020, *supra* n. 3. On surveillance as 'social sorting', see Lyon 2003, *supra* n. 2.

[104] I have described the general tenets of this algorithmic governmentality in Section 2.

As scholars such as Bauman and Balibar have long observed,[105] practices of bordering engender and encode social inequality, particularly in a context of accelerated globalization where the frictionless and smooth mobility of some is safeguarded at the expense of the enhanced surveillance and exclusion of others.[106] This differential 'experience of bordering' – associated with varying degrees of inclusion and access – entails multiple overlapping manifestations of inequality: unequal treatment in terms of data extraction at the border intersects with more general social, political and economic inequalities that the drawing of borderlines exacerbates and sustains.[107] The 'socially discriminatory function' of borders,[108] in this sense, expresses itself into diverging degrees of state violence, arbitrary allocations of 'life chances',[109] and an entrenchment of the exploitative conditions of neoliberal capitalism.[110]

The new technical tools of 'virtual bordering' are grafted onto these already existing asymmetries, as exemplified by both iBorderCtrl's aim to separate 'bona fide' travellers from those to be subjected to further scrutiny or refusal as well as the general ambition of the EU strategy on artificial intelligence and border control to safeguard 'smooth' mobility through intensified

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[105] Bauman 1998, *supra* n. 12; Balibar 2002, *supra* n. 12. Both situate the performativity of borders in the context of social and economic inequality and neoliberal globalization. While Bauman identifies the distinction at the border between 'tourists' and 'vagabonds' as a reproduction of global inequality, Balibar focuses on the 'multiplication' and 'polysemic' nature of the border: the 'dual regime of the circulation of individuals' along social, economic or racial lines (82).

[106] Throughout the EU Commission's strategy on artificial intelligence and border control, we can observe this dual goal of both 'smoothness' and 'security' – of safeguarding movement and allowing 'circulations to take place'. See EC 2020, *supra* n. 17, 2ff. In the specific context of the EU, Bigo has identified this inequality between those who benefit from the 'time-space compression of the world' and those 'who are prisoners of the local'. In D. Bigo, "Frontier Controls in the European Union", in E. Guild*, Controlling Frontiers Free Movement Into and Within Europe,* London, Routledge, 2005, 56. *Cf.* M. Foucault, *Security, Territory, Population,* London, Palgrave MacMillan, 2007 (making the argument that the governmental apparatus of security is less aimed at limitation than at productive, managed 'circulation').

[107] N. Yuval-Davis, G. Wemyss and K. Cassidy, *Bordering,* Cambridge, Polity Press, 2019, 165; Balibar 2002, *supra* n. 12, 81-82 ('[t]oday's borders [are designed] not merely to give individuals from different social classes different experiences of the law … but actively to *differentiate* between individuals in terms of social class').

[108] E. Balibar, *We, The People of Europe: Reflections on Transnational Citizenship*, Princeton: Princeton University Press, 2004, 113. For an analysis of Balibar's position from an international legal perspective, see Kesby 2007, *supra* n. 7.

[109] This refers to Weber's take on how socio-economic inequality segues into inequality of opportunity – of 'life chances'. In M. Weber, *Economy and Society* (ed. by G. Roth and C. Wittich), Berkeley, University of California Press, 1978, 302.

[110] Focusing specifically on this latter dimension, see also M. Sparke, "A Neoliberal Nexus: Economy, Security and the Biopolitics of Citizenship on the Border", *Political Geography,* Vol. 25, 2006 (referring to 'business class citizenship').

surveillance.[111] It has also been widely observed how existing forms of structural inequality – along socio-economic or racial lines – are folded into presumably neutral systems of algorithmic learning.[112] In the case of iBorderCtrl and Tresspass, for example, one can point to the use of artificial intelligence for biophysiological reading and emotion analysis, both of which have raised serious ethical concerns in terms of racial (and other) forms of 'bias'.[113] Yet, it would be a mistake to perceive the distributive effects of data analytics and machine learning only in terms of pre-existing forms of inequality that are – presumably involuntarily – coded into their operations (either through implicit 'bias' in software design or as a result of skewed training data). Framed as error and exception, the problem of 'bias' appears here as deviation to the prevalent norm of neutrality, objectivity and equality – a crack through which the noise of 'real world' social stratification enters into the system, polluting the algorithm's clean correlational mathematics.

This prevailing perspective, which subsequently aims to counter algorithmic 'bias' through '*ex ante* ethics-by-design initiatives or *ex post* audits',[114] cannot account, however, for the 'newly actionable social divisions' that lie at the heart of algorithmic decision-making processes. As Fourcade and Johns convincingly argued: 'it would be an error to think that machine learning only reinforces patterns that exist otherwise in the social world'.[115] The fluid and modular risk classifications discussed above, in this sense, do not merely import, reproduce or reinforce inequalities already present in the interstices of society. The 'actionable' associations performed at the 'virtual border' are not 'representative' of groupings existing prior to their algorithmic

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[111] See iBorderCtrl 2018, *supra* n. 80; EC 2020, *supra* n. 17, 2ff.

[112] Several important accounts of this reproduction were published in recent years. See, *inter alia,* V. Eubanks, *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor,* New York, St. Martin's Press, 2018; R. Benjamin, *Race After Technology: Abolitionist Tools for the New Jim Code,* Boston, Polity Press, 2019.

[113] See, *inter alia,* H. Devlin, "AI Systems Claiming to 'Read' Emotions Pose Discrimination Risks", *The Guardian,* 16 February 2020; L. Rhue, "Emotion-Reading Tech Fails the Racial Bias Test", *The Conversation,* 2 January 2019.

[114] For a critique of such 'incremental, technical fixes', see Fourcade and Johns 2020, *supra* n. 3, 18, 25. Amoore, referring Eubanks and Noble, has also proposed an account on the distributive nature of algorithms beyond the mere 'inscription of racialized or other prejudicial profiles in the design of the algorithm'. The 'regimes of recognition' she focuses on, she argues, 'exceed profiles written into the rules by a human'. Machine learning algorithms, therefore, are 'calculative spaces where prejudice and racial injustices can lodge and intensify, though not in a form that could be easily resolved with a politics of ethical design or the rewriting of the rules'. Amoore 2020, *supra* n. 22, 69. The ethical design projects referred to by Johns and Amoore are precisely those that are put forward as a mantra in EC 2020, *supra* n. 17.

[115] Fourcade and Johns 2020, *ibid.*, 16 and 24 ('preexisting social divisions and inequalities are still very much part of its operations. But the forces of ordinality and nominality have also been materialized and formatted in new ways').

assemblage, but appear only as the emergent effects of (temporary and modular) patterns and correlations. This is precisely what the focus in the EU strategy on 'learned similarities' expresses. The shift from a register of representationalism to the language of performativity is pivotal here: the distributive power exerted by algorithmic modules results from the novel objects, relations and artefacts they engender – the scores and classifications that are rendered 'actionable' through its risk routines. To work only towards uncovering the ways in which algorithms thereby reproduce forms of inequality already hidden underneath the surface of society (the forces or biases 'behind' its operations) implies missing out on the ways in which machine learning and data mining produce their own forms of sociality – their own attributes, explanations and accounts.[116] This entails a distinct practice of division and discrimination that does not result from (un)intended bias, dirty data or system error but from the functional logic of data analysis as 'pattern discrimination'.[117] As Aradau and Blanke note, this 'pattern discrimination' follows a logic of 'pure relationality' – the 'shortest path between data points' within a selected 'feature space' – that trades the social meaning of behavioural features, past passages and practices for classification categories based on probabilistic proximities between data points in function of a target output.[118] In this foundational, technical sense, inequality is 'constitutive of the field [of machine learning] itself': without the clusters, weights and thresholds through which attributes are sorted and scored, the learning process would simply cease to function. The forms of grouping (association) and grading (stratification) that come into being, as iBorderCtrl states, from 'compressing all data into actionable risk scores', in sum, entail hierarchies and collectives not previously present: 'new social entities [and] categories of undesirables'.[119] In this sense, Dijstelbloem and Broeders point to the ever-more 'fine-grained

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[116] *Cf.* B. Latour, "Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern", *Critical Inquiry,* Vol. 30, 2004 (on how the 'social' is assembled (rather than reflected) in mundane material processes); *Cf.* A. Mol, *The Body Multiple,* Durham, Duke University Press, 2003 (on ontological enactments); K. Barad, *Meeting the Universe Halfway,* Durham, Duke University Press, 2007, 87 and 175 (on the 'mutual constitution of the social and the scientific').

[117] *Cf.* Apprich 2019, *supra* n. 22. Leese 2014, *supra* n. 24, 504 ('in the case of data-driven profiling, the occurrence of discrimination will be based not on a system error, but on the functional logic of correlative pattern discovery').

[118] Aradau and Blanke note how data-driven prediction entails a non-representational logic of 'between-ness' – a practice that 'eludes the structural categories of discrimination and exclusion deployed in critical thought'. Aradau and Blanke 2017, *supra* n. 21, 385. The tools described by Aradau and Blanke are those envisaged in EC 2020, *supra* n. 17, 89ff.

[119] Fourcade and Johns 2020, *supra* n. 3*,* 14ff; Dijstelbloem and Broeders 2015, *supra* n. 78, 32 (on the 'technologically mediated statuses' produced at the border). While Amoore observes that lines of discrimination 'are not drawn according to fixed criteria that could be mapped one to one on racial

techno-legal characterizations' and 'categories' dividing people at the border – these are 'not already existing groups of people', they argue, but 'come into being' through the mediation of border control technologies.[120] These constantly (re)enacted computational classifications thereby produce configurations of inequality – coined here as 'associative inequality' – with significant real-life effects: they determine who moves 'smoothly' on the landscape of the global, who is subjected to extractive forms of scrutiny and surveillance, and who is categorized as a potential threat and therefore destined to remain a 'prisoner of the local'.[121]

The practice of ranking and rating people for governance purposes is, of course, not new. Yet, the use of algorithmic tools for patterning and prediction raises particular challenges for legal regulation and socio-political critique. As the preceding empirical analysis showed, the key feature of the associative orders enacted at the 'virtual border' is the fact that people are not (solely and primarily) grouped on the basis of fixed criteria but through shifting lines of 'association, correlation and inference'.[122] As a result, I have demonstrated, the standards of evaluation (the 'ordinal' norms) and forms of affiliation (the 'nominal' orders) engendered by machine learning systems are fluid and mobile: they adapt and alter through their exposure to ever-unfolding passages and events. This problematizes, I will discuss below, the use of legal non-discrimination standards, which protect only against decision-making on the basis of specific and identifiable features qualified as illegal and unjust. Attempts at aligning the distributive outcome of algorithmic association with these structural categories of discrimination and exclusion, however valuable, are inescapably confronted with an excess that remains elusive – with emergent patterns and relations not registered as meaningful or 'strange' before.[123] The relational rank orders of risk, in short, cannot be reduced to representations

characteristics or ethnic origin', Longo asserts that the 'data-driven filtration mechanism … cannot be reduced to class'. Longo 2017, *supra* n. 7, 197. Amoore 2013, *supra* n. 2, 100.

[120] Dijstelbloem and Broeders 2015, *supra* n. 78, 28ff. These observations resonate in literature on data-driven forms of subject-making. *Cf.* J. Cheney-Lippold, *We Are Data – Algorithms and the Making of our Digital Selves,* New York, NYU Press, 2017; D. Lupton, *Data Selves – More-than-Human Perspectives,* Cambridge, Polity Press, 2020, A. Pelizza, "Identification as translation: The Art of Choosing the Right Spokespersons at the Securitized Border", *Social Studies of Science,* 2021 (tracking 'how always partial forms of identification are materially processed').

[121] *Cf.* Bigo 2005, *supra* n. 106.

[122] *Cf.* Amoore 2013, *supra* n. 2, 82 (on how 'practice[s] of discrimination and division' are enacted at the virtual border).

[123] *Cf.* Aradau and Blanke 2017, *supra* n. 21, 385 (on how associations of 'between-ness' reconfigur and exceed structural categories of inequality); Amoore 2013, *supra* n. 2, 100 (on how 'lines of discrimination and partition are concealed').

of inequality preceding their enactment – such representations provide only an incomplete picture of how we are partitioned algorithmically.

Associative inequality then does not display itself in hierarchies based on embodied and recognizable features – such as structural polarities of racialized or gendered othering – but through classifications based on statistical abstractions: inferential risk rankings and tentative colour codes. These entail a hierarchical relationality, yet a mode of relationality that cannot be captured in conventional socio-political categories of exclusion: the 'clusters' between attributes in a vector space of artificial neural networks merely display an abstract relational propensity aimed at 'actionability' – as reflected in the claim by Europol's Executive Director that '[what we need] is an accessible interface with actionable information'.[124] The 'learned similarities' and 'correlational' categories or risk enacted by iBorderCtrl and envisaged in the EU strategy produce subject positions in which new configurations of inequality are embedded – they entail, as Cheney-Lippold observed, 'pattern-based abstractions that become the new, actionable indices for identity itself'.[125] Rather than attempting to frame these associative orders in terms of non-discrimination, it is precisely their unscripted, illusive, relational nature that demands attention and critical interrogation. We therefore need to find strategies, Aradau and Blanke argue, to 'reconnect techniques of producing dots, spikes, and nodes with vocabularies of inequality'.[126] In this project of reconnection, it is essential to start from the material practices of algorithmic division and how they trade representational categories for probabilistic and radically behaviorist gradients.[127] Our analysis of the inequalities immanent in risk scores and rankings should therefore not focus on trying to find the structural forces hiding 'behind' or 'underneath' these allocations – as non-discrimination standards inevitably demand – but to start from the elusiveness of their compositional character. This calls for a problematization of inequality where what is at stake is not the consistency of distributive schemes but the modular, temporary, illegible nature of correlational categories and their resulting extraction from political sites of

[124] As the EU strategy on the use of AI in border control explains: 'classification categories could be defined' in a manner that is 'less pre-defined', where 'applications are grouped based on some 'learned' similarity'. With this aim, it envisages 'unsupervised' machine learning, using 'vector space models' to 'partition data into clusters'. EC 2020, *supra* n. 17, 89.
[125] Cheney-Lippold 2017, *supra* n. 120, 9.
[126] *Cf.* Aradau and Blanke 2017, *supra* n. 85, 20.
[127] *Cf.* J. Cohen, *Between Truth and Power – The Legal Constructions of Informational Capitalism,* OUP, 2019, 67.

contestation.[128] The associative configurations of inequality that this article foregrounds do not engender a (potentially biased) representation of the subject as such but a performative enactment of actionable classifications only provisionally and tentatively held together.

Yet, this elusiveness – the difficulty of defining 'associative inequalities' in a representational register – should not be seen as an impediment to critical engagement but as its very object. Which relations are produced and precluded in the computational 'compression' of data into risk scores?[129] How does the fluidity of algorithmic ordering impact prospects of legal regulation or possibilities of collectivity, solidarity and resistance? Who is crafting the codes of this 'compression' and what type of authorship does this imply or inhibit? What are the political and legal repercussions, in short, of the elusiveness and illegibility that mark machine learning as a mode of normative ordering and social sorting? These questions on the containment or contestability of associative inequality are central in the next section.

4. A New Normative Metabolism – Algorithmic Governmentality and International Law

International lawyers, particularly those versed in constitutional and administrative law,[130] of course do not confront these potentially problematic practices of digital sorting and surveillance with empty hands.[131] There are strategically salient options available to contest such algorithmic decision-making systems on the basis of legal rules governing cross-border mobility, data protection or refugee status determination in international and EU law.[132] A range of concerns can be raised on the legal problems arising at the 'virtual border'. How could the use of automated deception detection, algorithmic risk scoring and expansive extraction of biophysiological data in current EU pilot projects be rhymed with the provisions on human dignity and fundamental rights enshrined in the

[128] *Ibid.,* 247 (on how algorithmic governance thereby works against sustainable Polanyian countermovements).
[129] *Cf.* Aradau and Blanke 2017, *supra* n. 21, 386 (articulating a need to 'revisit relationality in social theory and develop critical vocabularies of relationality that grapple with big data governmentality').
[130] See, for example, C. Harlow, "Global Administrative Law: The Quest for Principles and Values", *EJIL,* Vol. 17:1, 2006; A. Von Bogdandy, M. Goldmann, I. Venzke, "From Public International to International Public Law: Translating World Public Opinion into International Public Authority", *EJIL,* Vol. 28:1, 2017.
[131] See, for example, Benvenisti 2018, *supra* n. 5 (proposing an international legal right of 'access to data').
[132] The EU Fundamental Rights Agency has analyzed a number of these questions. See EU FRA, *Under Watchful Eyes: Biometrics, EU IT systems and Fundamental Rights*, 2018, https://fra.europa.eu/sites/default/files/fra_uploads/fra-2018-biometrics-fundamental-rights-eu_en.pdf (last accessed on 15 March 2021); EU FRA, *Fundamental Rights of Refugees, Asylum Applicants and Migrants at the European Borders*, 2018, https://fra.europa.eu/sites/default/files/fra_uploads/fra-coe-2020-european-law-land-borders_en.pdf (last accessed on 15 March 2021).

Schengen Borders Code?[133] What are the points of friction between the EU's recent agenda for AI-driven 'emotion analysis' and 'individual risk assessment' in asylum decisions – framed as a 'data-driven approach for applications regarding international protection' – and its legal asylum acquis?[134] Could we qualify the algorithmic placements and assignments at the border as decisions with 'significant effect' under article 22 of the GDPR, and what would the importance be of such qualification in terms of demands for transparency, reason-giving and redress?[135] These are without doubt valuable avenues of future engagement.

In these efforts to extend existing international legal rules to new technical processes, however, there is a risk that the safeguards of the former can no longer be 'afforded' by the environment built around the latter. This concept of 'affordances' is at the heart of recent arguments by Hildebrandt and Cohen on how the informational infrastructure of data-driven decision-making has altered and eroded the 'material conditions of possibility for the exercise of fundamental rights'.[136] Efforts at extrapolating, extending and enforcing existing legal rights, Cohen observes, too often 'take materiality for granted' and fail to account for how, in Hildebrandt's terms, 'law-as-we-know-it is an affordance of a specific ICI [information and communication infrastructure]'.[137] In line with these observations, I trace how the socio-technical environment of the 'virtual border' might

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[133] See, in particular, Regulation (EU) 2016/399 Articles 3, 4 and 7.

[134] This strategic vision of the European Commission – as drafted by Deloitte – elaborates in great detail on the potential of artificial intelligence in decision-making processes on asylum (the granting of international protection). Different 'use cases' are suggested, including the recourse to artificial intelligence for 'vulnerability assessments' ('real-time analysis of an applicant's facial movements, spoken language and body language to detect signals which can … inform decision-making') and 'abscondment risk assessment' ('presenting data-driven information which may not be immediately obvious to a human reviewer'). The stated goal of these envisaged systems is to 'limit[] the risk of granting international protection to individuals who are ineligible or have bad intentions'. While the strategy recognizes that 'emotion AI' is marked by a high 'technical complexity', its 'high potential' is recognized also beyond 'vulnerability assessment': '[b]ringing visual analytics into the asylum assessment process also allows for additional AI models to be efficiently leveraged at this point in the modified process [of individual risk assessments] (e.g. age discernment via facial image analysis)'. EC 2020, *supra* n. 17, Annex B. In referring to the asylum acquis of the EU, I specifically envisage the provisions on the procedural and substantive standards in the Qualification Direction (2011/95/EU) and the Asylum Procedures Directive (2013/32/EU).

[135] The GDPR, indeed, sets out specific requirements not only for automated processing systems that have 'legal effects' but also when these 'similarly significantly affect[]' a natural person. Regulation (EU) 2016/679 (GDPR), Recital 71.

[136] Cohen 2019, *supra* n. 127, 246; M. Hildebrandt, *Smart Technologies and the End(s) of Law – Novel Entanglements of Law and Technology,* Cheltenham, Edward Elgar, 2016; J. Cohen, "Affording Fundamental Rights", *Critical Analysis of Law*, Vol. 4:1, 2017, 78 ('rights discourse requires extension into the register of affordances'); M. Hildebrandt, "Law *as* Affordance – The Devil is in the Vanishing Points", *Critical Analysis of Law*, Vol. 4:1, 2017.

[137] Hildebrandt 2017, *supra* n. 136, 119; Cohen 2019, *supra* n. 136*,* 246.

disable a meaningful invocation of non-discrimination, transparency and accountability standards – three recurrent regulatory tropes.

If section 4.1 hints at possible limits of the liberal proceduralist frame, section 4.2 explores emergent forms of normative ordering that are enabled by the use of interoperable data systems and data mining modules. I analyse the properties of this algorithmic governmentality by contrasting its workings with three tenets of modern law – the notions of (collective) subjectivity, authorship and planned futurity.

4.1. Algorithmic Affordances and the Limits of Liberal Proceduralism

On the first page of the EU strategy on the use of artificial intelligence in border control, it is stated that 'increasingly advanced AI' raises questions of 'bias', 'transparency, privacy and accountability' and should be 'properly designed'.[138] In a familiar format for policy interventions of this kind – and attuned to Deloitte's AI Journey Framework – these legal concerns are framed as 'ethical principles' to be addressed through technical fixes in the training data and ways to keep a 'human in the loop'.[139] While the dilution and displacement of legal standards into vague ethical commitments and questions of design could be criticized or contested as a matter of strategic choice, I believe this reflects a more structural problem: it shows the constitutive dependency of legal safeguards and regulatory standards on a material environment of decision-making that is now being quite radically reconfigured.[140]

The 'risk' routines envisaged by iBorderCtrl or Tresspass differ from traditional forms of intervention that seek to pre-empt or manage future threats on the basis of prophylactic profiling techniques, which draw on scientific and professional expertise to single out particular characteristics presumed to entail higher chances of danger and deviance. Projections about possible 'risk' produced by these EU pilot projects are not exclusively made on the basis of these statistical probabilities that can be assigned to personal attributes on the basis of historic data, but also, more importantly, on the basis of relational associations between data elements that do not necessarily

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[138] EC 2020, *supra* n. 17, 1.

[139] *Ibid.,* 15 ('there should be considerations from an ethics perspective around the … impact of moving to a technology-driven process'), 77 ('[t]he ethics dimension focuses on the mechanisms needed to understand and prevent AI bias and ensure values and integrity are embedded in AI-driven initiatives'). 'Human rights' appear only once in the strategy and are framed as 'ethical principles'.

[140] *Cf.* Hildebrandt 2017, *supra* n. 136, 116 (on the 'dependencies between law and its technological embodiment').

have any independent causal importance. This is precisely the promise of classifications based not on 'set rules' but on 'learned similarities'.[141] In line with the prior observations on algorithmic governmentality, this data-driven calculus of 'risk' works with the fleeting relations and temporary hypotheses of algorithmic correlations – an 'ontology of association' that enables governance on the basis of pattern and inference.[142] These calculi are not based on causal properties of specific features but on their position in relation to other elements – the profiles drawn algorithmically from the mining of data are not rationally constructed but induced and extracted from unscripted learning.[143] The 'risk' categories thereby emerging are then both fluid (open to modification as data is processed) and non-representational (defying correspondence with visible, stable and meaningful social attributes or affiliations). This technique of 'tying things together' – of producing 'actionable' indicators – differs from forms of profiling presupposed in non-discrimination law.[144] As a member of the Frontex Research and Innovation Unit explains: 'with these new tools [of machine learning] you are not really profiling. In fact, it would be impossible to do profiling. These systems are in a sense blind to those features. It's looking for relations. That is really very different'.[145] With forms of data-driven division based on 'momentary groupings that might be disappearing back into the white noise of the database', Leese therefore argues, we have 'a diminishing effectiveness of the anti-discrimination toolbox'.[146] The shift from profiling based on representational criteria towards fluid, non-representational forms of classification based on correlative pattern discovery, in short, has reconfigured the material conditions of possibility for the application of non-discrimination law.[147]

In addition to non-discrimination standards, enhanced 'transparency' is an often repeated procedural demand in contexts of automated decision-making.[148] While the algorithmic systems

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[141] EC 2020, *supra* n. 17, 89. *Cf.* Amoore 2013, *supra* n. 2, 61ff (the 'risk calculus … infer[s] possible futures on the basis of underlying fragmented elements of data toward which they are for the most part indifferent'. 'What matters is that [a] correlation can be drawn … that is nonetheless indifferent to the specificity of persons, places and events').

[142] *Cf.* T. Bucher, *If … Then – Algorithmic Power and Politics,* OUP, 2018 (on algorithmic 'ontologies of association').

[143] *Cf.* Leese 2014, *supra* n. 24, 495. *Cf.* Amoore 2013, *supra* n. 2, 92.

[144] The 'regulatory power' of non-discrimination law, for Leese, only appears 'when applied to discrimination that arises from traditional practices of profiling [based on] predefined individual characteristics'. Leese 2014, *supra* n. 24, 500.

[145] Interview with Frontex Data Analyst, April 2020 (transcripts on file). This limits the promise of non-discrimination safeguards, such as those included in Regulation (EU) 2018/1240 (ETIAS), Art. 14.

[146] Leese 2014, *supra* n. 24, 503.

[147] *Cf.* Cohen 2019, *supra* n. 127, 246-247.

[148] We also saw it being invoked in the EU strategy on artificial intelligence and border control. EC 2020, *supra* n. 17, 1.

discussed above seek to enact 'absolute transparency' on the level of subjects of surveillance,[149] their decision-making architecture is marked by obscurity.[150] In response, the language of transparency is invoked by those calling to open the black box or to convert the black box into a 'white box'. Those regulatory projects demand insight in algorithmic systems by accessing the formula or source code of their functioning.[151] Such attempts to situate the agency of the algorithm in a unified, identifiable computational source, however, have little traction when confronted with unsupervised machine learning systems – such as those envisaged in the EU strategy – that do not work with pre-defined 'risk thresholds' or 'specific indicators' but that 'partition the data into clusters' through continuously 'uncovered correlations'.[152] When Keeley Crockett laments that she 'can't explain … what a hundred neural networks are doing and how they are interlaced together',[153] she is not pointing to a problem of unwillingness or technical difficulty but to the fact that the contingencies or learned similarities from which 'actionable' patterns emerge cannot be expressed in a sequential logic or code that is amenable to legibility and regulation. While symbolic, rule-based algorithms work through a series of programmed steps that can be traced, nonlinear learning algorithms entail a 'new kind of model' and 'different mode of knowing': in acting and adapting through 'infinite combinatorial possibilities', their logic is inherently indeterminate.[154]

In analogy to Judith Butler's remarks on the impossibility of giving an unmediated account of oneself, these algorithms have no true transparent selves to show – their threads can only be traced in the dark. Transparency, as Keeley Crockett explains, is simply not an 'affordance' of deep neural networks.

The difficulty of identifying a single source code or site of authorship also complicates the consistent attempts at holding algorithms 'accountable'.[155] Who would we be holding accountable for wrongful assignations of 'risk' at the border and what would the criteria of such an evaluation be

[149] *Cf.* S. Zuboff, *The Age of Surveillance Capitalism,* New York, Public Affairs, 2019 (on 'absolute transparency').
[150] This obscurity is inevitable in certain machine learning tools. C. Rudin, "Stop Explaining Black Box Machine Learning Models for High Stakes Decisions and Use Interpretable Models Instead", *Nature Machine Intelligence*, Vol. 1:5, 2019.
[151] See, for example, F. Pasquale, *The Black Box Society – The Secret Algorithms That Control Money and Information,* Cambridge (Ma), Harvard University Press, 2016.
[152] EC 2020, *supra* n. 17, 89-90.
[153] See *supra* n. 93.
[154] *Cf.* Amoore 2020, *supra* n. 22, 11-14.
[155] A promise articulated throughout the EU strategy on artificial intelligence and border control. EC 2020, *supra* n. 17, 1

if the standards of decision-making (the 'risk levels') are themselves algorithmically determined? Throughout the EU strategy, the fictive figure mobilized to fill this accountability gap is the 'human in the loop'.[156] Yet, the issue is not only that these human agents have no means to meaningfully review the computational indicators through which action and (re)cognition are mediated (as the iBorderCtrl project illustrated), but also, more fundamentally, that attempts to situate accountability in a single decision-making site mask the distributed and composite forms of authorship that draw divisions at the 'virtual border'.[157] The correlational patterns that shape the ever-shifting thresholds between norm and anomaly contain traces of past passages and practices by an infinite and indeterminate collective. In this sense, Amoore argues, attempts to assign accountability to the 'human in the loop' might be chasing an 'impossible figure' and miss out on the 'multiple and distributed selves' that 'dwell within the calculus'.[158] In the limitless feedback loops of the learning machine, a single site of accountability might be unavailable.

These observations are not meant as a repudiation of attempts to proceduralise algorithmic decision-making practices. Yet, in line with the invitation by Hildebrandt and Cohen to pay closer attention to the socio-technical conditions of possibility for legal regulation,[159] an analysis of recent pilot projects displays that non-discrimination law, transparency standards or accountability frameworks might not be available as emancipatory 'affordances' in increasingly data-driven governance infrastructures.

4.2. Algorithmic Immanence and the Modernist Tenets of International Law

Having hinted at the limits of liberal proceduralism, this section provides an account of algorithmic governmentality as a distinct practice of normative ordering: a particular way of distributing, dividing and drawing things together – of 'reassembling the social'.[160] I explore the properties of algorithmic governmentality in contrast to three tenets of modern law – its notions of subjectivity, authorship

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[156] *Ibid.,* 18 (on how the 'significant impact' of new technologies can be 'mitigated by having a 'human-in-the-loop'").

[157] For similar concerns on the 'human in the loop' ideal, see I. Kalpouzos, Double Elevation: Autonomous Weapons and the Search for an Irreducible Law of War", *LJIL,* Vol. 33:2, 2020, 293 (observing how 'the loop itself is changing').

[158] Amoore 2020, *supra* n. 22, 58-66 and 123.

[159] See *supra* n. 136.

[160] *Cf.* B. Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory,* OUP, 2005. There is no 'social' force 'behind' the operations of artificial intelligence. Machine learning entails and engenders its own 'sociality'.

and planned futurity. This contrast is not meant to construct an image of international law to be idealised or implemented but to signal a general shift in governance co-produced by data-driven techniques of simulation, subject-making and future-telling. While this account is based on the preceding analysis of the 'virtual border', we observe these changes in various policy domains: from the field of security and counterterrorism to new practices of development planning and environmental governance.[161]

4.2.1. 'Lost in categorization'[162] – The Erosion of (Collective) Subjectivity

The algorithmic systems described above work against prospects of legal subjectivity and collectivity. First, data-driven and correlational risk assignments entail a particular form of subject formation that operates outside the relatively stable parameters of legal identification (tied, for example, to notions of citizenship or migration status). In the construction of 'actionable' risk scores, I noted, citizenship – as made explicit in figure 2 – appears only as one of many in the 'bundle of vectors' assembled for decision-making purposes.[163] At the 'virtual border', in this sense, one does not appear as the unitary subject of disciplinary power, as a Foucauldian reading might suggest, but as a temporary aggregation of data into pattern and profile.[164] This process of algorithmic inference and assemblage cancels out possibilities of self-identification – of ascribing meaning to specific traces or events (except perhaps, as in Weizman's case, in efforts to decode or reengineer the inductive reasoning of risk assignments). Representational categories that enable durable forms of subjectivity, and often emanate from legal modes of social ordering,[165] are displaced by a logic of decision-making oriented towards presumably unmediated signatures of past conduct or communication. In the workings of this 'data behaviorism', Rouvroy observes, there are no 'resilient objects' – no meaningful juridical

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[161] See, *inter alia*, G. Sullivan, *The Law of the List: UN Counterterrorism Sanctions and the Politics of Global Security Law*, CUP, 2020; M. Arvidsson, "The Swarm that we already are: Artificially Intelligent (AI) Swarming 'Insect Drones', Targeting and International Humanitarian Law in a Posthuman Ecology", *JHRE,* Vol. 11:1, 2020; D. Van Den Meerssche and G. Gordon, "'A New Normative Architecture': Risk and Resilience as Routines of Un-Governance", *TLT*, 2020.

[162] Dijstelbloem and Broeders 2015, *supra* n. 78, 32.

[163] Fourcade and Johns 2020, *supra* n. 3, 16. This differs from Longo's observation that risk-scoring is 'citizenship-blind' but it does signal how such stable legal identities are decentred in the calculus of risk. *Cf.* Longo 2017, *supra* n. 7*,* 195.

[164] For a Foucauldian take on the disciplinary, normalizing nature of border control, see Longo 2017, *supra* n. 7*,* 160ff. On how these disciplinary formations are algorithmically reconfigured, see J. Cheney-Lippold, "A New Algorithmic Identity: Soft Biopolitics and the Modulation of Control", *Theory, Culture & Society,* Vol. 28:6, 2011.

[165] *Cf.* J. Derrida, "Force of Law: the 'Mystical Foundation of Authority'*", Cardozo Law Review*, Vol. 11, 1990.

inscriptions: 'actionable' ratings capture only the 'unique, supra-individual, constantly reconfigured 'statistical body' made of the infra-individual digital traces of impersonal, disparate, heterogeneous, dividualized facets of daily life and interactions'.[166] There is an inevitable gap, in other words, between the legal subject and the 'data doubles' temporarily and tentatively tied to it.[167] This disjunction has salient consequences, as human rights protection hinges on forms of identification and agency alien to the associative pattern. The probabilistic and radically behaviorist risk assignations through which iBorderCtrl and Tresspass render scattered data 'actionable' displace more stable and agential forms of legal subjectivity.[168]

Recourse to 'actionable' algorithmic associations, secondly, threatens our prospects of collectivity. While tainted by imperial legacies and 'fault lines' of exclusion,[169] the language of international law entertains promises of equality and collectivity: a cosmopolitan image of the 'liberation of individuals enjoying human rights in a global federation under the rule of law'.[170] In this register of emancipation, a global citizenry is tied together in the invocation of a collective 'we' and the constitutive ideal that international law is a project 'about all, by all and for all'.[171] International law figures here as bonding device: a productive logic of (dis)similarity that draws together what is scattered in projections of the common world we inhabit and our placement within

[166] Rouvroy 2012, *supra* n. 86; Rouvroy and Stiegler 2016, *supra* n. 1. *Cf.* Amoore 2013, *supra* n. 2, 90ff (noting how algorithmic 'border control ceases to be interested in individuals as such'); Johns 2017, *supra* n. 3, 96.
[167] *Cf.* L. Amoore, "Risk Before Justice: When the Law Contests its Own Suspension", *LJIL,* Vol. 21:4, 2008, 850 ('the legal category of citizen is broken down and denuded'). See also Cheney-Lippold 2017, *supra* n. 120, 145-6 ('algorithmic identifications locate us in novel subject positions … that can never truly square with our own, individual perspectives').
[168] *Cf.* Kosta 2020, *supra* n. 24, 10 ('the use of algorithms [challenges] the notion of agency in human rights protection'). See also Arendt 1951, *supra* n. 101, 578-601 (on how behaviorism entails the 'death of the juridical person').
[169] One meaningful way to conceptualize these 'fault lines' in line with this article's key contribution is from a perspective of phenomenology and its attentiveness to experiences of collective self-identification and othering. For a useful account along these lines, see H. Lindahl, *Fault Lines of Globalization – Legal Order and the Politics of A-Legality,* OUP, 2013.
[170] *Cf.* M. Koskenniemi, "The Fate of Public International Law: Between Technique and Politics", *MLR,* Vol. 70:1, 2007, 2-3 (describing this ideal as part of a Victorian tradition in international law). This promise of equality and empowerment resonates in key sources in international law such as the UN Charter or the Universal Declaration on Human Rights.
[171] *Cf.* F. Johns, "Data, Detection, and the Redistribution of the Sensible in International Law", *AJIL,* Vol. 111:1, 2017, 100, 59. This projection of the 'collective we' resonates in accounts that qualify 'humanity' as the α and Ω of international law. See R. Teitel, *Humanity's Law,* OUP, 2011; A. Peters, "Humanity as the α and Ω of Sovereignty", *EJIL,* Vol. 20:3, 2009. I do not aim to endorse these perspectives but merely refer to them as projections of a collective 'we' in international law. On 'collective consciousness' as pillar of international legal order, see P. Allott, *Eunomia,* OUP, 2001.

it.[172] There are, of course, different architectures of association at play in international legal practice and reflection,[173] not all of which are grounded in cosmopolitan or universalist aspiration. Territory, population, collective self-identification, common currencies or shared suffering provide coordinates of affiliation that are invested with legal meaning in various (and often conflicting) regimes of international law. It is along these fault lines of inclusion and exclusion that a particular politics of distribution materializes in international legal discourse and practice: international law divides and distributes through the relations its recognizes, the categories of social life it formalizes and the political associations it thereby enables or performs.[174] An important dimension of international law's relationship to inequality, in this sense, relates to the collectivities it fosters and the durable forms of social relationality it engenders, relies upon or works against.

To the extent that international law entails promises of empowerment and contestations of inequality, in other words, this is premised on the phenomenology of a collective 'we' – on a capacity to sustain shared experiences of suffering and disenfranchisement.[175] Yet, at the 'virtual border', this orientation towards collective agency breaks down. Data mining tools and machine learning modules engender only temporary, fleeting groupings (clustered around risk scores or colour codes) without meaningful representational equivalent to be found in the social sphere.[176] As Dijstelbloem and Broeders observe, the associations drawn in data-driven border surveillance 'become so fragmented and shattered' that those affected become 'lost in categorization".[177] What emerges are 'non-publics' – pulsing patterns emerging and dissolving in the ebb and flow of data

[172] This is why, some have observed, the salience of international legal ordering hinges on a particular phenomenology of commonality. *Cf.* Johns 2017, *supra* n. 3 (referring to international law's 'sensorium'). For the argument that this phenomenological 'first-person plural' is central to the formation of any legal order, see Lindahl 2013, *supra* n. 169. For a related observation that law's 'mode of existence' relates to its capacity to 'tie together' what is socially scattered, see B. Latour, *An Inquiry into Modes of Existence,* HUP, 2013. There is clearly a Luhmannian ring to these accounts.

[173] *Cf.* F. Johns, "Data Territories: Changing Architectures of Association in International Law", *NYIL,* Vol. 47, 2016 (for the elaboration of the concept 'architectures of association' and how these have altered with technological developments).

[174] For a wonderful account of how such legal assignations become sites of political imagination and strategic struggle in everyday bordering experiences, see I. Mann, "Border Masquerades", *Berkeley Journal of International Law,* 2020.

[175] *Cf.* Johns 2017, *supra* n. 3. On a more general, jurisprudential level, Lindahl has argued how (international) legal order hinges on such collectivity. Lindahl 2013, *supra* n. 169, 77 (developing a 'first-person plural concept of legal order').

[176] *Cf.* Leese 2014, *supra* n. 24, 503-504 (on how data-driven profiling only creates 'momentary groupings': 'artificial and non-representational categories rather than actual real-life social groups').

[177] Dijstelbloem and Broeders 2015, *supra* n. 78, 32.

streams.[178] These ephemeral bonds of association, which increasingly displace the (much thicker) relational ties and affiliations enacted in international law, cannot sustain durable political projects of recalcitrance or solidarity.[179] This threatens to leave the inequalities immanent in 'surveillance-driven social sorting' largely unintelligible and untouched: it is precisely the experience and durable representation of collectivity – a crucial lever in any struggle against inequality – that are eroded by the obscure, momentary and fluid 'compressions' of scattered data into 'actionable risk scores'.[180] The workings of the 'virtual border', in this sense, erode the 'first person plural' perspective on which the possibility of both legal order and political action hinges.[181] International legal imaginaries of collectivity – or the possibility thereof – are disrupted and displaced as decision-making is delegated to practices of data analysis and pattern detection. What is needed in this context are not privacy enhancing technologies but re-enchanted forms of commonality that can counteract the fleeting, phenomenologically void modes of automated social sorting.[182]

4.2.2. 'Spontaneous germination'[183] – The Erosion of (Collective) Authorship

Associated with this erosion of human subjectivity and the prospect for collective agency, algorithmic governance also challenges ideals of collective authorship, understood as the dual notion that people live under rules of their own making and that those to whom the task of making or applying rules is delegated can be held to account.[184] Kingsbury, in this vein, locates the 'endowment

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[178] *Ibid.* This aligns with Stiegler's observation that 'virtual machines' have altered and unravelled the 'experience of the social'. B. Stiegler, *What Makes Life Worth Living: On Pharmacology* (trans. D. Ross), Cambridge, Polity, 2013, 116.

[179] *Cf.* K. Yeung, "A Study of the Implications of Advanced Digital Technologies (Including AI Systems) for the Concept of Responsibility within a Human Rights Framework", *Council of Europe*, 2018, 29 (on how data-driven profiling 'may seriously undermine social solidarity and cohesion'); Fourcade and Johns 2020, *supra* n. 3, 22 (on the 'dire prospects for collective action' in a context of machine learning, where 'social recognition and commonality' are 'difficult to sustain').

[180] Echoing the concerns surrounding the 'human in the loop' ideal expressed above (text following *supra* n. 87), one is left to wonder 'how to politically mobilize around what one 'can't explain'? *Cf.* K. Yeung, "Algorithmic Regulation: A Critical Interrogation", *Regulation & Governance,* Vol. 12:4, 2018, 515 (on how people are 'oblivious' to the categories of which they form part); K. De Vries, "Identity, Profiling Algorithms and a World of Ambient Intelligence", *Ethics and Information Technology,* Vol. 12:1, 2010, 81 ('what do *I* have to do with the[se] hypothetically similar people').

[181] This is a reference to Lindahl who identifies durability and collective self-identification as core tenets of legal ordering. This is problematized in the context of algorithmic governmentality, where boundaries of (il)legality are temporary and impossible to register in collective representations. *Cf.* Lindahl 2013, *supra* n. 169, 84ff.

[182] Rouvroy 2012, *supra* n. 86, 13; Amoore 2020, *supra* n. 22, 158 (on the need for new forms of 'fabulation').

[183] Rouvroy 2012, *supra* n. 86, 3.

[184] *Cf.* M. Hildebrandt, "Law as Information in the Era of Data-Driven Agency", *Modern Law Review,* Vol. 79, 2016.

of international law' precisely in its modernist commitment to 'far-sighted', 'collective planning' – promises of public deliberation and law-making.[185] While the material legacy of this endowment is surely open to debate (as feminist, postcolonial and Marxist histories have extensively illustrated and as Kingsbury himself acknowledges), it is clear that the emancipatory potential invoked here stands at odds with the nature of decision-making sketched throughout this article. The process of 'spontaneous germination' from which the algorithmic norm appears – the distillation of 'flocks, swarms, rhythms, and constellations within the deafening noise of intercepted data' – is one in which decisions inevitably dissipate.[186] This implies an inversion of Kingsbury's ideal of collective authorship: it signals a promise of immanence where rules are not deliberated but discovered, not made but induced through adaptive data analytics.

Who is the author of the 'risk score' that groups and grades at the border? Who can we call to account? Which space should we occupy to rewrite the ever-evolving codes of inclusion and exclusion? Having discounted the 'human in the loop' as 'unified locus' of authorship and accountability,[187] it might be tempting to move further upstream in the decision-making chain and focus on the agency of the code designers and software engineers.[188] Yet, such an attempt to fix the algorithm's normative orientation at its incipient state cannot account for the ways in which (machine learning) algorithms continuously learn and compose with humans, data, and other algorithms.[189] As the 'analytics' of pattern detection segue into the 'individual risk assessment' routines piloted by iBorderCtrl or Tresspass (and soon to be operationalized in systems such as ETIAS), we can see a decentralized form of authorship. What will come to matter in the 'risk' classification is not determined at the outset in the code. Instead, the norm is co-composed by a vast and incalculable collective – we are writing it together, not as authors but as scattered signs and signals.[190] This distillation of thresholds for normalcy and deviance from knowledge discovered

[185] Kingsbury 2019, *supra* n. 30, 185-186.
[186] H. Steyerl, "A Sea of Data: Pattern Recognition and Corporate Animism (Forked Version)", in Apprich *et al.* 2019, *supra* n. 22, 2. *Cf.* Amoore 2013, *supra* n. 2, 169 ('the politics of possibility annuls all decisions'); M. Fourcade and J. Gordon, "Learning Like a State: Statecraft in the Digital Age", *Journal of Law and Political Economy,* Vol. 1:1, 2020, 80 (on how algorithmic 'categories emerge organically from regularities observed in the data').
[187] See *supra* n. 87 and 95 with the associated text. See also Amoore 2020, *supra* n. 22, 66ff.
[188] This is the path taken by Eubanks, for example. Eubanks 2018, *supra* n. 112, 212-213.
[189] Amoore 2020, *supra* n. 22, 18-20 and 67.
[190] Gillespie argues that 'algorithms are made and remade in every instance of their use because every click, every query, changes the tool incrementally'. T. Gillespie, "The Relevance of Algorithms", in T. Gillespie, P.

directly in the world – a 'world without causation'[191] – narrows the space for law as the scene where subjects perform their authorship.[192] The 'collective' invoked by Kingsbury, in this sense, no longer decides or deliberates but speaks only through the digital traces that it leaves. This raises concerns beyond the accountability for direct harms: how can we set collective standards or make political claims in a world written through endless cybernetic feedback loops? The problem here is not merely that 'the world is no longer expressed in terms we can understand',[193] as Cheney-Lippold laments, but that the passive and purely behaviorist ways in which people and their patterns are folded into emergent norms erode the potentiality for collectivities to emerge and act politically. The temporary clusters assembled at the 'virtual border' are not capable of making common claims.

4.2.3. The 'actualisation of the virtual'[194] – The Erosion of (Collective) Futurity

The final disjunction between algorithmic governance and the fundamental tenets of international law relates to a different pillar of the endowment idealized by Kingsbury: the 'organized futurity' that the 'mindsets' of international lawyers can help foster and sustain.[195] It is in the articulation of long-term plans for pressing social problems, he argues, that the modernist foundation and political contribution of international law(yers) is most prominently pronounced. As an implicit corollary to this modernist framing of international law as an expression of 'collective' imaginaries, we can also see its potential (specifically in relation to matters of inequality and exclusion) as a mode of disruption – an enactment of commonality against the grain of settled schemes of distribution. A social site of future-making.

Also in this more subversive form, the language of international law therefore relies on the possibility of an 'organized futurity' envisaged by Kingsbury – on shared projections and plans for political life. As instruments of data mining and risk classification divide and dividuate us amongst each other and within ourselves, the central challenge for international law is to sustain a language

Boczkowski and K. Foot (eds.), *Media Technologies: Essays on Communication, Materiality, and Society,* Cambridge (Ma), MIT Press, 2014, 173.

[191] D. Chandler, "A World without Causation: Big Data and the Coming of Age of Posthumanism", *Millennium: Journal of International Studies*, Vol. 43:3, 2015.

[192] *Cf.* Rouvroy 2012, *supra* n. 86, 15.

[193] Cheney-Lippold 2017, *supra* n. 120, 252.

[194] Rouvroy and Stiegler 2016, *supra* n. 1, 10. This subsection, as those above, uses the empirical analysis in Section 3.2.

[195] Kingsbury 2019, *supra* n. 30, 186.

that both provides forms of individual and collective consistence and safeguards spaces outside computational rule. If the emancipatory promise of international law resides in multiplying the range of possible trajectories – to anticipate and nurture incipient, virtual manifestations of solidarity and collectivity – the machine learning algorithms on which I focused are aimed towards exactly the inverse: to reduce multiplicities to 'real-time' and 'actionable' outputs, thereby foreclosing alternative ways to narrate the relations it reveals.[196] The concept of 'virtuality' refers to its invocation by Deleuze and Massumi as a realm of potentiality – an element of 'immanent life' – that can never be entirely computed or diagrammed.[197] The relationship of algorithmic governance towards the future is, in this sense, an attempt to 'actualise the virtual': to act on the conditional mode of what people could become – on the immanent, potential dimensions of human existence'.[198] This entails that the associative rule of 'risk' has no tolerance for what remains incomplete, emergent and contingent – it labours to close the gap between actuality and capacity, between the correlational pattern and all that it could (come to) mean.[199] Yet, it is precisely in these gaps of potentiality and virtuality that the political promise of international law resides.

It has not been my aim in these three subsections to criticize the rise of algorithmic governmentality by calling for a return to (or celebration of) modernist ideals of subjectivity, imaginaries of collective authorship or linear teleologies of time and futurity. What I see threatened,

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196 *Cf.* Fourcade and Gordon 2020, *supra* n. 186, 87 (underscoring Kingsbury's concerns that the 'emergent [algorithmic] governmentality eschews … long-term plans in favor of a constant state of real-time experimentation and reactivity').

197 G. Deleuze, *Pure Immanence: Essays on a Life,* New York, Zone Books, 2001; B. Massumi, *Parables for the Virtual: Movement, Affect, Sensation*, Durham, Duke University Press, 2002. The relation with 'anticipation' refers to Benjamin's ideal of radical politics as a state of readiness towards the unexpected. See W. Benjamin, *Oeuvres* (III), Paris, Gallimard, 2000. For Amoore, this reduction of potentiality to 'already actualized … possibility' is key to the violence of algorithmic governmentality. Amoore 2013, *supra* n. 2, 157 ('[t]he question for critique becomes how to sustain … the unexpected place and the unknowable subject'. From the perspective of 'human dignity', see Hildebrandt 2016, *supra* n. 184.

198 Rouvroy 2012, *supra* n. 86, 13. Massumi 2002, *supra* n. 197*,* 137ff (as digital technologies work to a 'systematization of the possible', he notes, '[n]othing is more destructive for … imaging … the virtual' 'than equating it with the digital').

199 As Neyrat wonderfully observes, '[n]ous ne parlerions pas parce que tout serait non pas dit mais pré-dit, toujours déjà écrit ou édit, édité, mais dans une écriture qui serait celle des choses mêmes'. F. Neyrat, "Désajointement", *Variations,* Vol. 15, 2011. This, as Ertzscheid notes, precludes the possibility of making political claims: 'c'est peut-être précisément parce que les gouvernements sont noyés par les (en partie) fausses capacitations à prévoir "le" futur qu'ils se retrouvent aussi incapables de dessiner "un" futur'. In H. Guillaud, "Dégouverner", *Internetactu,* 2020.

and in need of care, is not an absolute ideal of liberal autonomy but the potentiality of being and becoming political.

5. Conclusion – Towards a 'Right to Opacity' in International Law

This article observed how the practice of 'compressing' data and rendering it 'actionable' in registers of risk are gradually reshaped by algorithmic systems and machine learning modules aimed at finding patterns in scattered signatures of past behaviour. Through these evanescent, digitally assembled and modular bonds of association, 'risk' appears as a highly adaptive norm that facilitates projections of people in immanent, emergent and simulated futurities. This is an inherently distributive practice of world-making: the essence of risk technologies is to fracture, divide and rank subjects in associative orders crafted for governmental purposes. If, as Duncan Kennedy argued, the relationship of law to inequality is indeed manifested in its foreclosure of possible pathways and its definition of bargaining powers, it is essential to trace how these boundaries of possibility and 'crosscutting lines of cleavage' are being redrawn along fault lines of associative risk calculi.[200] It is in the projection and pre-emption of possibilities based on algorithmic forms of authorship and hierarchical placements of people within clusters of data that new configurations of inequality materialize in the allocation of access, resources and capacities of self-definition – configurations marked by a politically disempowering elusiveness.

If this article problematized our available legal repertoire, this is primarily out of concern that existing standard-setting projects are folded into regimes of algorithmic governance, leaving more salient and troubling features of its normative metabolism untouched. Prevalent concerns for transparency, non-discrimination and accountability, I argued, have limited purchase against forms of decision-making that do not exclusively work with accumulated data, predetermined features and causal reasoning – such are the properties of the presumably outdated 'rule based' systems – but through mobile relations between data points only tentatively and temporarily held together.[201]

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[200] The reference to Kennedy might, at first sight, not appear intuitive when thinking about algorithmic practices. Yet, as I argued, these practices entail a shift in the 'valuation process' described by Kennedy, through which 'individuals and groups [are] organized along crosscutting lines of cleavage' and from which specific '[k]nowledge conditions emerge[]'. If the relationship of law to inequality is manifested in its formalization of such 'valuations processes', the reconfiguration of how 'lines of cleavage' are redrawn should be a matter of concern for counteracting international law's distributive politics. See D. Kennedy, "The Stakes of Law, or Hale and Foucault!", *Legal Studies Forum,* Vol. 15:4, 1991.

[201] *Cf.* Amoore 2013, *supra* n. 2, 68 ('because the [risk] derivative is produced via mobile norms that screen out much of the data, the political space of response that says 'protect', 'limit', 'make private' is problematized').

Drawing on the work of Cohen and Hildebrandt, I pointed out that the protective proceduralist standards at the heart of modern public law are 'affordances' of a material environment of decision-making that is being reconfigured at the 'virtual border'. Yet, if it does not suffice to extend the reach of normative prescripts and rules already at our disposal, nor can the elusive inequalities of algorithmic association be rendered contestable by adopting a posture of 'critical sanctimony' that portrays them as only reproducing hierarchies already latent in the social fabric.[202] As the mode of social sorting at the 'virtual border' instantiates, it is in the midst of mundane socio-technical work and through the mediation of informational infrastructures that lines of discrimination – of inclusion and exclusion – are being redrawn. In conclusion, I want to hint at a potential political orientation that could inspire and orient tactical engagement in this space.

Inspired by Édouard Glissant, I believe the essence of recalcitrance and resistance to algorithmic rule can be captured in the 'right to opacity'.[203] In contrast to the 'right to privacy', this is not about setting standards to which data can be gathered (and under which conditions) but about contesting the depth of inference that renders this data 'actionable'. It is not a 'right to be forgotten', but a right not to be foretold – not to be perceived as projection. It is the 'possibility of not being assimilated to the totality of one's own potentiality'[204] – an insistence on ambiguity and, with Glissant, on the inherent violence of pure 'transparency'.[205] The 'right to opacity' reclaims the gap between reality and representation that algorithmic governmentality constantly seeks to close – staking out spaces where subjectivation and commonality can occur. If modernist ideals of autonomy entailed bringing the subject into light, the project of opacity retreats into the dark.[206] Yet, as Glissant argued, opacity is not obscurity – it is not a recognition of what cannot be experienced but of what 'cannot be reduced', which, he believed, 'is the most perennial guarantee of participation

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[202] *Cf.* F. Johns, "From Planning to Prototypes: New Ways of Seeing Like A State", *Modern Law Review,* Vol 82:5, 2019.
[203] Glissant 1997, *supra* n. 25.
[204] Rouvroy and Stiegler 2016, *supra* n. 1, 11 and 7 (arguing that algorithmic governmentality threatens 'the capability to 'author' one's actions, to have the 'authority' to give account of one's actions meanings').
[205] As Glissant notes, writing in a postcolonial context, the 'requirement of transparency' entails that 'in order to accept you, I have to measure your solidity with the ideal scale providing me to make comparisons and, perhaps, judgments … I relate it to my norm. I admit you to existence, within my system. I create you afresh'. Glissant 1997, *supra* n. 25, 190. This resonates, in a context of data-driven governance with Hildebrandt's plea to 'safeguard the fundamental uncertainty and indeterminacy' associated with human autonomy. Hildebrandt 2016, *supra* n. 184, 30.
[206] Rouvroy 2012, *supra* n. 86, 5 (on how algorithmic governmentality promises 'an esthetics of full light and intemporal or a-chronological transparency').

and confluence'.[207] The 'right to opacity' is resistance against 'social sorting' through data extraction and correlational future-telling. Opacity is virtuality – a precondition for commonality, for the collective representations preceding possibilities of law.[208] The 'right to opacity' inverts the shift from 'rules' to 'risks' – reappropriating authorship. Only within opacity – outside algorithmic pre-emption where events are yet to unfold and to be given meaning – can we practice politics. For solidarity to be possible in the face of emerging 'associative inequalities', in other words, we need to reintroduce opacity in the technical settings of the self-learning machine. 'We have ethical and political relationships with other beings in the world', Amoore indeed remarks, 'precisely because the meaning of those relations, their mediation through every scene of life, cannot be condensed. They are precisely irreducible'.[209] It is only from such an 'irreducible singularity' that commonality can grow – a commonality defiant of the debilitating algorithmic divisions that we face.

[207] Glissant 1997, *supra* n. 25, 191.
[208] This draws on Lindahl's claim that the phenomenological 'first-person plural' is central to the formation of any legal order. See Lindahl 2013, *supra* n. 169. On 'virtuality', see *supra* n. 197.
[209] Amoore, 2020, *supra* n. 22, 156.