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

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Abstract

The use of algorithmic tools by international public authorities is changing how norms are made and enacted. This seismic shift in global governance has important distributive consequences: the digital turn not only empowers specific corporate actors and forms of expertise but also entails new modes of social sorting based on the placement of people in patterns of data. This article focuses on the emergent inequalities that machine learning and data analytics thereby import in the domain of global governance. In line with the symposium's theme, I thereby frame the importance of computational decision-making processes from a distributional, and not a procedural, perspective – from a perspective of inequality and not privacy, data protection or transparency. The empirical site for the assessment of these emergent inequalities is the 'virtual border'. By focusing on the technological tools of data extraction and algorithmic risk assessment that are reshaping practices of border control, the article makes a dual contribution: it reveals the social hierarchies engendered by these data-driven forms of grouping and grading – captured in the novel concept of 'associative inequality' – and highlights the difficulty of registering or counteracting this mode of subject-making in existing legal terms. This intervention both traces the particular distributive effects of data-driven governance and signals the challenges it poses to the prospects and emancipatory promises of collectivity, solidarity and equality entertained in modernist ideals of international law. In resisting the logic of algorithmic governance, I suggest, we should strive not for transparency but for opacity, not inclusion but incomparability, not privacy but open-ended and defiant commonality.

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Ce que nous avons en commun, c'est l'incomparable.
– Jean-Luc Nancy, *Le Monde*, 2008

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 Eyal 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, not privacy, data protection or transparency.[5] This intervention aims both to reveal the distributive effects of data-driven decision-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

1 *Cf.* Rouvroy and Stiegler, 'The Digital Regime of Truth: From the Algorithmic Governmentality to a New Rule of Law', 3 *La Deleuziana* (2016) 6.

2 Benvenisti, 'Toward Algorithmic Checks and Balances: A Rejoinder', 29 *European Journal of International Law* (*EJIL*) (2018) 1087, at 1087; *cf.* L. Amoore, *The Politics of Possibility: Risk and Security beyond Probability* (2013), at 46ff; Lyon, 'Surveillance as Social Sorting: Computer Codes and Mobile Bodies', in D. Lyon (ed.), *Surveillance as Social Sorting: Privacy, Risk and Digital Discrimination* (2003) 13, at 13 (on how 'social sorting' is central to surveillance).

3 Fourcade and Johns, 'Loops, Ladders and Links: The Recursivity of Social and Machine Learning', 49 *Theory and Society* (2020) 803, at 811ff (revealing the 'production of digitally-based forms of social stratification and association').

4 *Cf.* Amoore, *supra* note 2, at 100; *cf.* Johns, 'Data, Detection, and the Redistribution of the Sensible in International Law', 111 *American Journal of International Law* (*AJIL*) (2017) 57, at 100.

5 For an example of the proceduralist path not taken here, see Benvenisti, 'Upholding Democracy amid the Challenges of New Technology: What Role for the Law of Global Governance?', 29 *EJIL* (2018) 9. Many different techniques, of course, could be qualified as 'algorithmic decision-making processes'. This article primarily focuses on predictive analytics based on sub-symbolic artificial intelligence (AI). This refers to a mode of AI 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.

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* (2016) 242, at 243.

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 socio-political 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 centre of calculation where data 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 European Union (EU) regulations on integrated border management, automated visa waiver systems (the European Travel Information and Authorization

7 *Cf.* Kesby, 'The Shifting and Multiple Border and International Law', 27 *Oxford Journal of Legal Studies* (2007) 101, at 102 (on how borders 'construct the non-citizen'); M. Longo, *The Politics of Borders: Sovereignty, Security and the Citizen after 9/11* (2017) (on borders as 'filtration sites', where 'identities are not just filtered but created, modified and destroyed'); Leese, 'Fixing State Vision: Interoperability, Biometrics, and Identity Management in the EU', 27 *Geopolitics* (2022) 113, at 113 (arguing that '[t]he border is a site of identity production').

8 Glouftsios and Scheel, 'An Inquiry into the Digitisation of Border and Migration Management: Performativity, Contestation and Heterogeneous Engineering', 42 *Third World Quarterly* (2021) 123, at 124.

9 A. Shachar, *The Shifting Border: Legal Cartographies of Migration and Mobility* (2020).

10 S. Ellebrecht, *Mediated Bordering: Eurosur, the Refugee Boat, and the Construction of an External EU Border* (2020).

11 Amoore, *supra* note 2.

12 *Cf.* Amoore, *supra* note 2; Longo, *supra* note 7. The role of borders in identity formation and social stratification has long been observed. Z. Bauman, *Globalization: The Human Consequences* (1998); E. Balibar, *Politics and the Other Scene* (2002).

13 As noted by Europol's executive director, '[what we need] is an accessible interface with actionable information'. See European Union Agency for the Operational Management of Large-Scale Information Technology Systems in the Area of Freedom, Security and Justice (EU-LISA), Conference Report: The New Information Architecture as a Driver for Efficiency and Effectiveness in Internal Security, 16 October 2019, at 26. On how factual inscriptions circulate in 'centres of calculation', see Latour, 'Drawing Things Together', in M. Lynch and S. Woolgar (eds), *Representation in Scientific Practice* (1990) 19.

14 *Cf.* Lyon, *supra* note 2, at 27.

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

System [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 (AI) tools for risk assessment and predictive analytics at the border, both pilot projects instantiate the EU's explicit strategic ambition to 'leverage' AI 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 AI, 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 surveillance? Focusing on both of these 'nominal' and 'ordinal' aspects – on both grouping and grading – the article gives an account of the specific forms of inequality – of the new 'social hierarchies' – that are produced by practices of algorithmic association.[19]

I develop the concept of 'associative inequality' to trace and problematize the distributive effects of algorithmic assignations of 'risk' and the practices of detection and dividuation upon which these rely. What emerges from these iterations of sorting and scoring are not the thick social groupings traditionally at work in international law but, rather, fluid and 'actionable' social classifications. This differential placement of people (or the bundle of vectors re-enacting people) in clusters of data does not neatly unfold along familiar material, geographical or racial lines but emerges from patterns and anomalies detected in data.[20] This entails forms of disenfranchisement to which legal thinking is insufficiently attuned. A key challenge identified in this article is that the 'associative inequalities' embedded in the rank orders of 'risk' thereby remain elusive, politically illegible and immune from legal regulation and critique.[21]

[16] Council Regulation 2018/1240, OJ L 236/1; Council Regulation 2019/816, OJ L 135/1; Council Regulation 2019/817, OJ L 135/27; Council Regulation 2019/1896, OJ L 295/1.

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

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

[19] *Cf.* Fourcade and Johns, *supra* note 3, at 814 (on how hierarchies emerge from 'ordinal' classification ['organized by judgments of … value'] and 'nominal' classification ['organized by judgments of difference and similarity']).

[20] As will become clear, this does not entail the naïve belief that pre-existing forms of inequality are absent from machine-learning modules. Yet, as Aradau and Blanke also observed, it signals that 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 Aradau and Blanke, 'Politics of prediction: Security and the Time/Space of Governmentality in the Age of Big Data', 20 *European Journal of Social Theory* (2017) 373, at 385; Fourcade and Johns, *supra* note 3, at 813, 819.

[21] On the problems posed by algorithmic governmentality for standards of non-discrimination, human rights and data protection, see Leese, 'The New Profiling: Algorithms, Black Boxes, and the Failure of Anti-Discriminatory Safeguards in the European Union', 45 *Security Dialogue* (2014) 494; Kosta,

After canvassing and questioning 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. Focused on the 'virtual border' as a 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 new concept of 'associative inequality') and highlights the difficulty of counteracting this distributive practice in the existing register of international law. This provides new pathways for critical inquiry. How can we prevent the potentialities of life, which are always only partially present in data patterns, from being reduced to actionable algorithmic predictions? How can we leave space for the unexpected and unforeseen – a space where politics remains possible? In focusing on these questions, the article concludes by claiming the 'right to opacity' – an intervention inspired by Martinican philosopher and poet Édouard Glissant, who described the right as the 'subsistence within an irreducible singularity'.[22]

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 USA had been revoked.[23] At the US 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'.[24] At the US 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.[25]

'Algorithmic State Surveillance: Challenging the Notion of Agency in Human Rights', 16 *Regulation and Governance* (2022) 212.

22 E. Glissant, *Poetics of Relation*, translated by B. Wing (1997), at 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').

23 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 USA to speak at an exhibition exploring the 'dark epistemology' and 'racialized violence' of contemporary 'security algorithms'.

24 Shaw, 'Eyal Weizman Barred from US ahead of Forensic Architecture Retrospective', *Architect's Newspaper* (2020).

25 *Cf.* Longo, *supra* note 7.

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 labour and critique. 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 and helps sustain.[26] A focus on the formal institutional character of the EU – and the web of decentralized agencies (such as Frontex and the EU Agency for the Operational Management of Large-Scale Information Technology Systems in the Area of Freedom, Security and Justice [EU-LISA] that is 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.[27] Indicatively, United Nations Security Council 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 to 'develop and implement systems to collect biometric data'.[28]

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.[29] Aside from this infrastructural dimension, the virtual bordering practices explored below are also shaped by broader changes in the logic of global governance that are fuelled by the possibilities (or promises) of (big) data and AI.[30] This article's description of how subjects are divided in fluid, relational and actionable clusters of data signals a style of governance (based on algorithmic anomaly detection, correlational inference and sensory power) that significantly differs from prior practices of bordering and the sociotechnical imaginaries underlying them.[31] The article thereby reveals changes in

[26] This infrastructural perspective is central to two ongoing research projects: the InfraReg project at New York University and the *infra*-Legalities project at Edinburgh Law School. On the former, see Kingsbury, 'Infrastructure and InfraReg: On Rousing the International Law "Wizards of Is"', 8 *Cambridge International Law Journal* (2019). On the latter, see Sullivan, 'Infra-Legalities: Global Security Infrastructures, Artificial Intelligence and International Law' (2021) (on file with author).

[27] *Cf.* G. Sullivan, *The Law of the List: UN Counterterrorism Sanctions and the Politics of Global Security Law* (2020) (exploring this global, informational security assemblage). Indicative of this change is Council Regulation 2019/817, *supra* note 16, that establishes a framework for interoperability between European Union (EU) information systems in the field of border control and visas.

[28] SC Res. 2396 (2017), para. 4, 13, 15. These obligations are concretized through initiatives such as the Global Counterterrorism Forum (GCTF).

[29] *Ibid.*, 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'.

[30] *Cf.* Johns, 'Governance by Data', 17 *Annual Review of Law and Social Science* (2021) 53, at 63–65 (on the 'shift in the logics, techniques, and objects of governance' engendered by the 'profusion of digital data').

[31] Aradau and Blanke, 'Governing Others: Anomaly and the Algorithmic Subject of Security', 3 *European Journal of International Security* (2017) 1; Isin and Ruppert, 'The Birth of Sensory Power', *Big Data and Society* (2020) https://doi.org/10.1177/2053951720969208, 1.

both the infrastructural foundations and governmental rationalities of global security governance.

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. I observe how systems of AI 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 rationality of 'risk'.[32] My analysis of iBorderCtrl and Tresspass focuses specifically on practices of extraction, social sorting and erasure.[33]

A *AI 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, 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'.[34] 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'.[35] 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'.[36] In line with the supposed 'synergies' between both agendas, the strategy explores how 'existing and future information systems could enhance both external border management and internal security'.[37] 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

[32] These piloted systems respond to the call for automated decision-making tools in recent EU regulations. See, *inter alia*, Council Regulation 2018/1240, *supra* note 16; Council Regulation 2019/816, *supra* note 16; Council Regulation 2019/817, *supra* note 16; Council Regulation 2019/1896, *supra* note 16.

[33] *Cf.* A. Mbembe, *Critique of Black Reason* (2017), at 18 (on the black body as a 'body of extraction'); Aradau and Tazzioli, 'Biopolitics Multiple: Migration, Extraction, Subtraction', 48 *Millennium: Journal of International Studies* (*MJIL*) (2019) 198, at 212 (on 'mechanisms of extraction that capitalise on refugees … by rendering them into data').

[34] Garkov, 'Foreword', in EU-LISA, *EU-LISA Strategy 2014–2020* (2014), at 6.

[35] 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, at 8.

[36] EU Commission, Stronger and Smarter Information Systems for Borders and Security, Communication from the EU Commission to the European Parliament and the Council (2016), at 2 (emphasis added).

[37] *Ibid.*

threat'.[38] If, as a recent EU procurement call proclaims, 'the concept of borders has changed', this change is sustained by a specific informational infrastructure.[39]

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'.[40] Not only have we seen a proliferation of new data systems and agencies responsible for their construction and maintenance,[41] 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 can cut across the domains of border control and counter-terrorism.[42] 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'.[43] What the border control agent really needs, he expressed, is 'an accessible interface with actionable information'.[44] It is precisely in this necessary translation of the data deluge into such 'actionable information', he suggested, that 'AI can facilitate the work'.[45]

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 he observed that 'there is tremendous work being done on artificial intelligence in the EU … to use, combine and spread data'.[46] Onidi specifically underlined that 'machine learning has potential' for 'vetting persons who come to the EU', for 'screening their application files' and for conducting 'virtual border checks'.[47] 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

[38] EU-LISA, *supra* note 35, at 8 (emphasis added). This signals the algorithmic orientation towards possible futures.

[39] European Commission, Horizon 2020 Funding and Tender Opportunities: Risk-based Screening at Border Crossing (2015) (on file with author).

[40] Council Regulation 2016/399, OJ L 77/1, Art. 13; Council Regulation 2019/1896, *supra* note 16, Art. 3(j).

[41] See, *inter alia*, Council Regulation 2017/2226, OJ L 327/20; Council Regulation 2018/1240, *supra* note 16; Council Regulation 2019/816, *supra* note 16; Council Regulation 2018/1726, OJ L 295/99; Council Regulation 2019/1896, *supra* note 16.

[42] See Council Regulation 2019/817, *supra* note 16.

[43] EU-LISA, *supra* note 13, at 26 (emphasis added).

[44] EU-LISA, *supra* note 35, at 17. This focus on 'actionability' is of great epistemological significance.

[45] *Ibid.*

[46] *Ibid.*, at 12.

[47] *Ibid.*

systems' are essential 'to integrate large, unconnected silos of data'.[48] 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 regulation on a European Criminal Records Information System for Third-Country Nationals allows for 'facial images to be used for automated biometric matching' once the 'required technology' has become available, the ETIAS regulation notes that 'automated processing' of applications will be facilitated through the 'screening rules' of an 'algorithm enabling profiling' based on 'specific risk indicators'.[49]

This specific sociotechnical imaginary, which professes a dematerialization of the border and thereby privileges the combined use of big data and AI as tools of public governance, is at the heart of two recent strategies developed by EU-LISA and the European Commission (DG Home).[50] Authored by Deloitte and following 'Deloitte's AI Journey Framework',[51] the latter strategy sets out to explore how 'AI can be leveraged in the context of Border Control, Migration and Security'.[52] The strategy envisages AI to distil 'deeper insights from the increasing quantities of available data'[53] 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'.[54] The document differentiates in this context 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'.[55] In setting out the rules that should guide the strategic use of AI, the strategy displays the limited importance of legal concerns: the two normative constraints identified in the strategy are data protection (the General Data Protection Regulation [GDPR]) and ethics (the EU's Ethics Guidelines for Trustworthy Artificial Intelligence).[56] As a final point of regulatory closure, the 'human in the loop' ideal plays a pivotal part throughout the strategy – promising an identifiable centre of decision-making and accountability guaranteed by

[48] See EU-LISA, *supra* note 13, at 40.

[49] Council Regulation 2019/816, *supra* note 16, Recital 24, Art. 6; Council Regulation 2018/1240, *supra* note 16, Arts 4, 20, 33.

[50] EU-LISA, *supra* note 18; European Commission, *supra* note 17.

[51] See European Commission, *supra* note 17, at 8; *cf.* Amoore, *supra* note 2 (on how the logic of consultancy pervades global governance).

[52] European Commission, *supra* note 17, at 1, 6 ('DG Home is excited to harness AI for the benefit of borders, migration and security').

[53] *Ibid.*, at 5 (while the strategy observes that 'there is much value to be captured [from] 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 that states 'will have to … capture, extract, transform and use the data [t]o be ingested by the AI algorithms'). *Ibid.*, at 78.

[54] *Ibid.*, at 3–4.

[55] *Ibid.*, at 10, 58.

[56] 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 the use of 'AI to monitor the ethicality of other AI systems'. See *ibid.*, at 36. See also Council Regulation 2016/679, OJ L 119/1, which is also known as the General Data Protection Regulation (GDPR); EU Commission - High-Level Expert Group on Artificial Intelligence, Ethics Guidelines for Trustworthy AI (2019).

a promise of human judgment presumably unmediated by the sociotechnical context in which it is embedded.

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.[57] 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'.[58] 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'.[59] What comes to matter in these transfers of heterogeneous, yet increasingly interoperable, data and their translation into patterns 'not observed as strange before' cannot be determined at the outset. With the use of big data analytics, Matthias Leese notes, 'every bit of information [can] become valuable in the future without revealing its utility in the present'.[60] 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 operationalizing 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 AI and data-mining techniques entails a strong reliance on private technology companies and risk consultancy consortia in the security sector.[61] While Europol 'scout[s] the market for available [AI] technologies',[62] 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'.[63] Recent investigations specifically revealed

[57] European Commission, *supra* note 17, at 59, 96, Annex B. The impact of such systems on concrete legal procedures (such as Commission Directive 2013/32, OJ L 180/60 Art. 10 on the 'individual, objective and impartial' examination of requests) is evident.

[58] European Commission, *supra* note 17, at 40, Annex B.

[59] *Ibid.*, at 59.

[60] Leese, *supra* note 21, at 504.

[61] *Cf.* Amoore, *supra* note 2, at 29–54.

[62] EU-LISA, Conference Report: Going Digital for a Safe and Secure Europe, 17–18 October 2017, at 17.

[63] See Saunders, Voicu and Wojcikowska, 'Technology Foresight: Building the Technological Future of the European Border and Coast Guard Agency', Frontex Research Project (on file with author). One relevant

how EU research pilots are an important source of corporate profit.[64] Such public procurement 'pilot 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.[65]

B *iBorderCtrl and Tresspass: Border Experiments 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',[66] 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.[67] 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, Marion Fourcade and Fleur Johns note, are 'fostering an ever-more-prevalent hunger for data'.[68] 'Data hunger' is inherent to those specific forms of AI that operate not on the basis of preprogrammed rules (as with symbolic, expert-based AI) but, rather, on accretive learning through data exposure.[69] In other words, the detection of 'actionable' associations

call to industry by Frontex displayed an interest not only in 'hardware tools' for surveillance and data extraction but also particularly in products for 'information sharing and interoperability' and 'data fusion'. It called for tools to deal with 'real time data mining [of] vast amounts of heterogeneous data', processing 'new sources of information' 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 with author). 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* (2014).

64 Campbell, Chandler and Jones, 'Sci-fi Surveillance: Europe's Secretive Push into Biometric Technology', *The Guardian* (10 December 2020) ('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'). The piece also reveals severe issues with ethical review and oversight in the allocation of this budget.

65 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'.

66 Unless otherwise indicated, the citations in this section are from the technical framework of both pilot projects. See 'iBorderCtrl Technical Framework', available at www.iborderctrl.eu/Technical-Framework; 'Tresspass Technical Framework', www.tresspass.eu/Technical-Framework.

67 European Commission, *supra* note 39.

68 Fourcade and Johns, *supra* note 3, at 805, 808ff; *cf.* Lyon, 'Surveillance, Snowden and Big Data: Capacities, Consequences, Critique', 1 *Big Data and Society* (2014) 1, at 6.

69 As Aradau and Blanke note, the view on big data as a 'reservoir of unexpected insights' leads to ever-expanding regimes of 'extraction and capture … under the mantra "collect it all"'. Aradau and Blanke, *supra* note 20, at 379; *cf.* C. McCue, *Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis* (2015), at 380 ('[b]ig data … is about an enhanced ability to … realise the promise of predictive analytics').

for public decision-making processes hinges on the extraction and processing of significant flows of (potentially heterogeneous) data.[70] The 'virtual border' is a crucial site for these processes of data extraction and interconnection.[71]

While iBorderCtrl promises to develop a 'face-matching tool' that gathers images for facial recognition, a 'biometrics tool' that collects 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'.[72] These systems further trade technologies of facial recognition (cross-matching 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 Yuval Harari as 'biohacking'.[73] 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.[74] The act of 'doubling' individuals into digital data, importantly, is not a form of representation but, rather, a performative process of subject formation – a mode of ontological politics.[75]

[70] The 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, *supra* note 18, 12. See Rogati, 'The AI Hierarchy of Needs', *Medium* 12 June 2017).

[71] *Cf.* Longo, *supra* note 7, at 155; Broeders and Dijstelbloem, *supra* note 6.

[72] Kyriazanos *et al.*, 'Automated Decision Making in Airport Checkpoints: Bias Detection toward Smarter Security and Fairness', *Institute of Electrical and Electronics Engineers Security and Privacy Magazine* (2019).

[73] Harari, 'The Myth of Freedom', *The Guardian* 14 September 2018). Similar to iBorderCtrl's 'adaptive psychological profiling' based on 'non-verbal micro-expressions', Tresspass aims to reveal 'hidden aspects' of 'intent and attitude' by employing 'machine-learning' tools that analyse 'data' on 'behavior and profile patterns'. Kyriazanos *et al.*, *supra* note 72. iBorderCtrl and Tresspass use the private (and patented) SilentTalker psychological profiling technology and the VicarVision face reader.

[74] *Cf.* Haggerty and Ericson, 'The Surveillant Assemblage', 51 *British Journal of Sociology* (2000) 605, at 611 (observing how the body is 'broken down' and 'reassembled' through 'data flows'. 'The result is a decorporealized body, a data double of pure virtuality'); Lyon, *supra* note 2, at 27 ('[data doubles are not] innocent … fictions'. 'They make a real difference. They have ethics, politics').

[75] The shift from representationalist to performative thought is central to this article and requires a clarificatory note. As Barad argued, this shift moves the 'focus from questions of correspondence between descriptions and reality (e.g. do they mirror nature or culture?) to matters of practices, doings, and actions', which 'allows matter its due as an active participant in the world's becoming'. The crucial question on 'risk scores', in this sense, is not if these succeed in capturing real risks 'out there' (this presumes a correspondence between the world and its representation) but which effects these 'risk scores' have in enacting subjects and relations. It is not about evaluating (potentially flawed) portrayals of reality (this would be a representationalist analysis) but about paying attention to the performative enactments that shape reality. *Cf.* K. Barad, *Meeting the Universe Halfway* (2007), at 135–136. This entails a new mode of social inquiry and critique, which traces back to governmentality studies, science and technology studies

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'.[76] 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'.[77] 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. 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).

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

and feminist theory. Lang also signalled the importance of this shift for international lawyers. A. Lang, 'International Lawyers and the Study of Expertise: Representationalism and Performativity', in M. Hirsch and A. Lang (eds), *Research Handbook on the Sociology of International Law* (2018) 122. Performativity theory has been very productively employed in the field of border studies. Dijstelbloem and Broeders, 'Border Surveillance, Mobility Management and the Shaping of Non-Publics in Europe', 18 *European Journal of Social Theory* (2015) 21; J. Cheney-Lippold, *We Are Data – Algorithms and the Making of Our Digital Selves* (2017); D. Lupton, *Data Selves: More-than-Human Perspectives* (2020).

[76] For more context on the border as site of 'social sorting', see notes 2 and 12 above.

[77] Importantly, this shift from the 'old and outdated rule-based', to a 'risk-based', logic does not signal the introduction of risk assessment routines (which far predate this project) but indicate a shift in these routines and the computational logic underpinning them. While 'rule-based' systems are based on pre-determined procedures and stable normative criteria, the 'risk-based' systems built around the promise of AI and sub-symbolic computational code entail different procedures that variously apply to people as they are grouped in fluid correlational clusters. This shift, as I will explore, has important repercussions for the nature of public decision-making and the possibilities for legal regulation and political contestation.

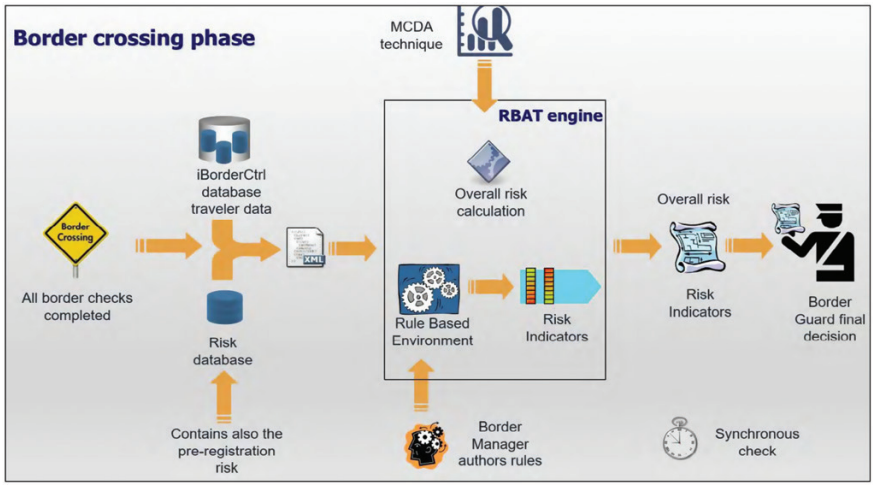

Figure 1: *iBorderCtrl: Intelligent Portable Control System. Source: iBorderCtrl, Intelligent Portable Control System, Presentation at FLYSEC Event, Brussels, 28 June 2018*

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'.[78] 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' thereby displays itself as a 'mobile' norm shaped by iterated alterations immanent to machine learning itself.[79] This is made explicit in the EU's strategy on AI and border control regarding the operationalization (in 2022) of the ETIAS system. ETIAS-1 (the individual risk assessment routine), the strategy notes, 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'.[80] Even after these risk assessment routines are operationalized, the strategy indicates, AI could be used 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'.[81]

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

78 *Ibid.*

79 *Cf.* Amoore, *supra* note 2, at 65ff ('the norm is always … becoming').

80 European Commission, *supra* note 17, at 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'. European Commission, *supra* note 17, at 89–92.

81 *Ibid.*, at 91, Annex B.

from tying heterogenous digital traces together.[82] 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.B of this article): the parameters of 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 instead 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 or normalcy – the norm always remains in flux.[83] 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) and participate in crafting actionable associations. The human is literally 'looped in' the conduits of data mining here – not as the voice of normative reason residing outside the algorithm but, rather, as one more element in its adaptive and iterative learning process.[84]

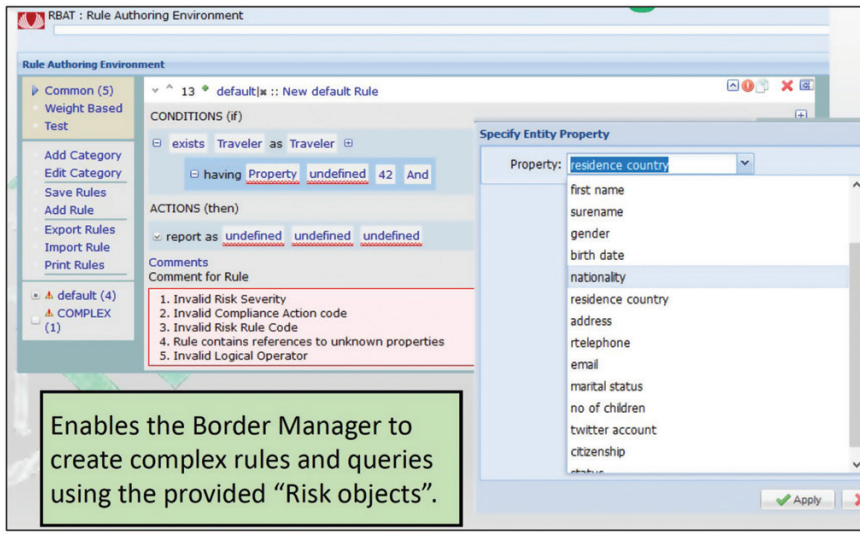

Figure 2: *iBorderCtrl: RBAT – Rule Authoring Environment. Source: iBorderCtrl, Intelligent Portable Control System, Presentation at FLYSEC Event, Brussels, 28 June 2018*

[82] *Cf.* Aradau and Blanke, *supra* note 31. 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).

[83] *Cf.* 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* (2012) 143, at 146 (on 'spontaneous germination'); Leese, *supra* note 21, at 503.

[84] The iBorderCtrl design thereby problematizes the 'human in the loop' – the ideal of unmediated human judgment. This 'rule-authoring environment' affirms Amoore's claim that 'humans are lodged within algorithms and algorithms within humans'. L. Amoore, *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others* (2020), at 58 (arguing there is 'no … outside to the algorithm' and that the 'human in the loop' is an 'impossible figure').

A second salient feature of the risk routines envisaged by iBorderCtrl and Tresspass – in addition to their modular, mobile character – is their 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 operational use.[85] 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, world-making 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.[86] Its aim is not to produce knowledge about the world (as in traditional registers of expertise) but, rather, to capture correlational patterns present within it.[87] This ideal to let the data 'speak for itself', Antoinette Rouvroy and Bernard Stiegler have argued, signals a 'purely inductive' mode of reasoning that 'cancel[s] out all meaning' previously attached to extracted fragments or features.[88] 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 become hard to trace or visualize. 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'.[89] What matters then is not the validity or representational merit of the 'final risk classifier', but its operational use: the 'reflex responses' that it induces and the 'adaptive' abilities that it displays in the processes of human-machine decision-making.[90] This further complicates the 'human-in-the-loop' ideal. As Figure 1 shows, the 'human' is 'looped in' only at the end of the decision-making chain, where judgment is inevitably mediated (and prescribed) by the signal of the risk score.[91] While border guards can tinker with 'risk objects' in a 'rule-authoring

[85] EU-LISA, *supra* note 35, at 17.

[86] *Cf.* Johns, *supra* note 4, at 98ff.

[87] *Cf.* Rouvroy and Stiegler, *supra* note 1, at 9; *cf.* D. Chandler, *Ontopolitics in the Anthropocene: An Introduction to Mapping, Sensing and Hacking* (2018), at 87ff (on the post-epistemological nature of big data 'sensing').

[88] Rouvroy and Stiegler, *supra* note 1, at 7–8.

[89] Crockett, 'Adapted Psychological Profiling versus the Right to an Explainable Decision', 10th International Joint Conference on Computational Intelligence, Seville, 20 September 2018. While Crockett was specifically addressing the iBorderCtrl's Automated Deception Detection System (ADDS) in this citation, the use of deep neural networks is also envisaged for 'risk assessment'. See Crockett and O'Shea, 'The Ambitions and Challenges of iBorderCtrl', Paper for Conference on AI and the International Rule of Law, Edinburgh University, 2020 (on file with author).

[90] *Cf.* Rouvroy, supra note 83, at 148; Gordon and Van Den Meerssche, 'Regimes of Operadiction – Values of Algorithmic Law-making', in I. Feichtner and G. Gordon (eds), *Law and the Global Constitution of Value: Ecology, Governance and Political Economy* (forthcoming 2022).

[91] *Cf.* Leese, *supra* note 21, at 505 (on how 'human reviewers lose true agency').

environment', there is no possibility to evaluate the weights and thresholds of the computational risk scores on the basis of a pre-existing notion of 'risk' – the concept is constituted through the adaptive translation of 'learned similarities' in 'actionable' signals. The relation between the human and the algorithm is not one of externality and control but, rather, of mutual learning and composite becoming.[92]

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. As a senior data analyst from Frontex stated in an interview, this reflects a more general desire to use AI 'not only as descriptive but especially as a predictive and prescriptive tool'.[93] Instead of applying present rules to past events, the temporal space of interest for such risk-modelling systems is doubled up: while data on past transgressions remains crucial, of course, in the calculus of risk, projections of possible future threats are also drawn from nodes between data points that are innocuous in isolation.[94] What is captured in the artefact of 'risk', in short, is not a stable legal status but a potentiality of deviation – not a crystallized past but a speculated futurity.[95] 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.[96] In the shift from 'rules' to 'risk', the aim is to fold the future into the present by targeting and governing contingency as such, acting on and through the virtual, possible and unactualized aspects of life.[97]

At the 'virtual border', this section has shown, 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.[98] 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'.

[92] *Cf.* Amoore, *supra* note 84; see also section 4.A.

[93] Interview with Frontex Data Analyst, April 2020 (transcripts on file with author). The EU strategy aspires to predict the 'risk level of individuals', the 'flow of travellers' or the 'risk of abscondment' during asylum applications based on 'patterns/trends' 'not … immediately obvious to a human reviewer'. European Commission, *supra* note 17, at 89, 91ff.

[94] *Cf.* European Commission, *supra* note 17, at 89ff (signalling a difference between decision-making that is based on pre-defined 'risk thresholds' and 'learned similarities' or 'patterns not observed as strange before').

[95] We observe a resonance with speculative (rather than prophylactic) risk formats in the world of finance. *Cf.* Wigan, 'Financialization and Derivatives: Constructing an Artifice of Indifference', 13 *Competition and Change* (2009) 157.

[96] *Cf.* Amoore, *supra* note 2, at 59. The shift from 'rules' to 'risks' thereby corresponds to the computational shift from symbolic (supervised) to sub-symbolic (unsupervised) forms of machine learning. *Cf.* European Commission, *supra* note 17, at 89ff.

[97] *Cf.* Rouvroy, *supra* note 83; Amoore, *supra* note 2, at 62, 157; Massumi, 'The Future Birth of the Affective Fact', in B. Massumi (ed.), *Ontopower: War, Powers, and the State of Perception* (2015) 189. The focus on the 'virtual' (the realm of human potentiality) in Massumi's work intersects with accounts that place spontaneity at the heart of human dignity. *Cf.* H. Arendt, *The Origins of Totalitarianism* (2017 [1951]), at 574.

[98] *Cf.* J. Bennett, *Vibrant Matter: A Political Ecology of Things* (2010), at 6.

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.[99] While these reflections are based on the empirical inquiry of the preceding section, they also extend to the use of machine-learning tools in public decision-making processes beyond the 'virtual border'. My aim here is to explore, on a general level, how the inequalities induced by algorithmic association both amplify and elude familiar forms of structural discrimination. The section signals the key tenets of what I describe as 'associative inequality' and places its emergence in a broader context of bordering as an inherently distributive practice. I also focus on how the use of algorithmic tools troubles prevailing modes of legal protection and political critique.

As scholars such as Zygmunt Bauman and Étienne Balibar have long observed,[100] 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.[101] 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.[102] The 'socially discriminatory function' of borders,[103] in this sense, expresses itself into diverging degrees of state violence, arbitrary allocations of 'life chances'[104] and an entrenchment of the exploitative conditions of neoliberal capitalism.[105]

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 AI and border control to safeguard 'smooth' mobility through intensified surveillance.[106] It has also been widely observed how existing forms of structural inequality – along socio-economic or racial lines – are folded into

[99] On AI as a mode of 'stratification and association' – of 'ladders and links' – see Fourcade and Johns, *supra* note 3.

[100] Bauman, *supra* note 12 (on 'tourists' and 'vagabonds'); Balibar, *supra* note 12 (on borders as 'polysemic').

[101] In the EU strategy, we observe this dual goal of 'smoothness' and 'security' – of safeguarding movement and allowing 'circulations to take place'. European Commission, *supra* note 17, at 2ff. *Cf.* M. Foucault, *Security, Territory, Population*, edited by A.I. Davidson, translated by G. Burchell (2007) (on how governmentality is less aimed at limitation than at productive, managed 'circulation').

[102] N. Yuval-Davis *et al.*, *Bordering* (2019), at 165; Balibar, *supra* note 12, at 81–82.

[103] E. Balibar, *We, The People of Europe* (2004), at 113.

[104] *Cf.* M. Weber, *Economy and Society*, edited by G. Roth and C. Wittich (1978), at 302.

[105] *Cf.* Sparke, 'A Neoliberal Nexus: Economy, Security and the Biopolitics of Citizenship on the Border', 25 *Political Geography* (2006) 151 (referring to 'business-class citizenship').

[106] See iBorderCtrl, *supra* note 78; European Commission, *supra* note 17, at 2ff.

presumably neutral systems of algorithmic learning.[107] In the case of iBorderCtrl and Tresspass, for example, one can point to the use of AI for biophysiological reading and emotion analysis, both of which have raised serious ethical concerns in terms of racial (and other) forms of 'bias'.[108] 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 as fixable deviation to a 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', cannot account, however, for the 'newly actionable social divisions' that are enacted through algorithmic decision-making processes.[109] As Fourcade and Johns have observed, 'it would be an error to think that machine learning only reinforces patterns that exist otherwise in the social world'.[110] The fluid and modular risk classifications discussed above, in this sense, do not only import, reproduce or reinforce inequalities that are 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 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 that 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 sociality – their own attributes, explanations and accounts.[111] Rather than focusing only on computational 'bias' as an error that can be corrected, I therefore want to signal how practices of sensing and algorithmic association redraw the lines of discrimination and division in the border control calculus. This is not an

[107] 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* (2018); R. Benjamin, *Race after Technology: Abolitionist Tools for the New Jim Code* (2019).

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

[109] Fourcade and Johns, *supra* note 3, at 813, 820; *cf.* Amoore, *supra* note 84, at 69.

[110] Fourcade and Johns, *supra* note 3, at 818, 826–827.

[111] *Cf.* Latour, 'Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern', 30 *Critical Inquiry* (2004) 225; A. Mol, *The Body Multiple* (2003), at 225; see also note 75 above.

indictment of flawed data or corrupt code but, rather, an inquiry into the new forms of subjectivity and social ordering that are enacted in these decision-making practices.

The practices of division and discrimination that I explore do not result then from (un)intended bias, dirty data or system error but from the functional logic of data analysis as 'pattern discrimination'.[112] As Claudia Aradau and Tobias 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.[113] In this foundational, technical sense, inequality is constitutive of the practice 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.[114] 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 that are not previously present: 'new social entities [and] categories of undesirables'.[115] In this sense, Huub Dijstelbloem and Dennis Broeders point to the ever-more 'fine-grained 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.[116] 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'.[117]

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 has shown, 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, rather, through shifting lines of 'association, correlation and inference'.[118] As a result, I have demonstrated, the standards of evaluation (the 'ordinal'

[112] C. Apprich *et al.*, *Pattern Discrimination* (2019); Leese, *supra* note 21, at 504 (arguing that, with machine learning, 'discrimination' will be based not on a 'system error' but on 'correlative pattern discovery').

[113] Aradau and Blanke, *supra* note 20, at 385 (on how this relational logic of 'between-ness' eludes 'structural categories of discrimination and exclusion'). These are the tools described in European Commission, *supra* note 17, at 89ff.

[114] *Cf.* Amoore, *supra* note 84, at 75.

[115] Fourcade and Johns, *supra* note 3, at 816; *cf.* Amoore, *supra* note 2.

[116] Dijstelbloem and Broeders, *supra* note 75, at 28ff. These observations resonate in literature on data-driven forms of subject making. Cheney-Lippold, *supra* note 75; Lupton, *supra* note 75; Pelizza, 'Identification as Translation: The Art of Choosing the Right Spokespersons at the Securitized Border', 51 *Social Studies of Science* (2021) 487.

[117] *Cf.* Bigo, 'Frontier Controls in the European Union', in E. Guild (ed.), *Controlling Frontiers Free Movement into and within Europe* (2005) 49.

[118] *Cf.* Amoore, *supra* note 2, at 82.

norms) and the 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. As I will discuss below, this problematizes 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. The relational rank orders of risk, in short, cannot be reduced to representations of inequality preceding their enactment – such representations provide only an incomplete picture of how we are partitioned algorithmically. At the same time, evidently, as I argued above, these practices of sensing and sorting emerge from a longer lineage of (colonial) technologies to render subjects visible, manageable and classifiable.[119]

Associative inequality then does not display itself in hierarchies based on embodied and recognizable features (such as structural polarities of racialized and 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'.[120] 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 enacted – they entail, as John Cheney-Lippold has noted, 'pattern-based abstractions that become the new, actionable indices for identity itself'.[121]

Rather than trying to frame these associative orders in terms of non-discrimination (or through the juxtaposition with 'human bias'), it is precisely their unscripted, illusive, relational nature that demands attention and critical interrogation. We therefore need to find strategies, as Aradau and Blanke have argued, to 'reconnect techniques of producing dots, spikes, and nodes with vocabularies of inequality'.[122] In this reconnection, it is key to start from the material practices of algorithmic division and how they trade representational categories for probabilistic and radically behaviourist gradients.[123] Our analysis of the inequalities immanent in risk scores and rankings should therefore not focus on trying to find structural forces hiding 'behind' or 'underneath'

[119] *Cf.* Isin and Ruppert, *supra* note 31.

[120] 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'. European Commission, *supra* note 17, at 89.

[121] Cheney-Lippold, *supra* note 75, at 9.

[122] *Cf.* Aradau and Blanke, *supra* note 31, at 20.

[123] *Cf.* J. Cohen, *Between Truth and Power: The Legal Constructions of Informational Capitalism* (2019), at 67.

these allocations – as non-discrimination standards demand – but to start from the elusiveness of their compositional character. This problematization of inequality focuses not merely on the consistency of distributive schemes but on the modular, temporary, illegible nature of correlational categories and their resulting extraction from political sites of contestation.[124] This entails a different mode of critique that focuses not (only) on the 'biased' representation of the subject and its classification according to pre-existing schemes but also on its performative enactment based on shifting and contingent relational criteria.[125]

This elusiveness – the difficulty of defining 'associative inequalities' in a representational register – should therefore not be seen as an impediment to critical engagement but, instead, as its object. Which relations are produced and precluded in the computational 'compression' of data into risk scores?[126] How does the fluidity of algorithmic ordering impact prospects of legal regulation and possibilities of solidarity, collectivity or 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 are particularly urgent questions in light of the inherent structural violence of bordering practices and the risk that this violence is both amplified and sanitized with the introduction of new technologies.[127]

4 A New Normative Metabolism: Algorithmic Governmentality and International Law

International lawyers, of course, do not confront these practices of digital sorting and surveillance with empty hands.[128] There are strategically salient options available to contest such algorithmic decision-making systems on the basis of rules governing cross-border mobility, data protection or refugee status determination in international and EU law.[129] A range of concerns arise at the 'virtual border'. How can the use of automated deception detection, algorithmic risk scoring and expansive extraction of

[124] *Ibid.*, at 247 (on how algorithmic governance thereby works against sustainable Polanyian counter-movements).

[125] *Cf.* Johns, *supra* note 30, at 66.

[126] *Cf.* Aradau and Blanke, *supra* note 20, at 386 (on the need to 'revisit relationality in social theory').

[127] This violence is surveyed in a highly illuminating report by United Nations (UN) Special Rapporteur Tendayi Achiume. See UN Secretary-General, Report of the Special Rapporteur on Contemporary Forms of Racism, Racial Discrimination, Xenophobia and Related Intolerance, Doc. A/75/590 (2020); *cf.* Molnar, 'Technological Testing Grounds: Migration Management Experiments and Reflections from the Ground Up', EDRi and the Refugee Law Lab (2020); Achiume, 'Digital Racial Borders', 115 *AJIL Unbound* (2021) 333. On the proliferation of borders and the subjectivities, differential inclusion and violence that this entails, see also S. Mezzadra and B. Neilson, *Border as Method, or, the Multiplication of Labor* (2013).

[128] See, e.g., Benvenisti, *supra* note 5; Sullivan, *supra* note 27.

[129] See EU Agency for Fundamental Rights, *Under Watchful Eyes: Biometrics, EU IT Systems and Fundamental Rights* (2018); EU Agency for Fundamental Rights, *Fundamental Rights of Refugees, Asylum Applicants and Migrants at the European Borders* (2018).

biophysiological data be rhymed with the provisions on human dignity and fundamental rights in the Schengen Borders Code?[130] What are the points of friction between the EU's agenda for AI-driven 'emotion analysis' or 'individual risk assessment' in asylum cases (framed as a 'data-driven approach for applications regarding international protection') and its legal asylum acquis?[131] Could we qualify the algorithmic 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?[132] 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 Mireille Hildebrandt and Julie 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'.[133] 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]'.[134] In line with these observations, I trace how the sociotechnical environment of the 'virtual border' might disable a meaningful invocation of non-discrimination, transparency and accountability standards – three recurrent regulatory tropes.

If section 4.A of this article shows possible limits of the liberal proceduralist frame, section 4.B signals emergent forms of normative ordering that are enabled by the use of interoperable data systems and data-mining modules. I analyse this algorithmic governmentality by contrasting its workings with three immanent tenets of modern politics – the notions of (collective) subjectivity, authorship and planned futurity.

[130] See, in particular, Council Regulation 2016/399, *supra* note 40, Arts 3, 4, 7.

[131] The EU strategy expands in detail on the potential of AI in asylum procedures, including for 'vulnerability assessments' ('real-time analysis of an applicant's facial movements, spoken language and body language') and 'abscondment risk assessment'. The goal is to 'limit[] the risk of granting international protection to individuals who are ineligible or have bad intentions'. European Commission, *supra* note 17, at 94–95. In referring to the EU's asylum *acquis*, I envisage the procedural and substantive standards in Commission Directive 2011/95, OJ L 337/9, and Commission Directive 2013/32, *supra* note 57.

[132] The GDPR sets out specific requirements not only for automated processing systems that have 'legal effects' but also when these 'similarly significantly affect[]' a natural person. Council Regulation 2016/679, *supra* note 56, Recital 71.

[133] The concept of affordances was coined by environmental psychologist James Gibson to signal the 'enabling properties of physical environments'. It has been developed in social theory to highlight how human thought and action is both enabled and conditioned by the properties of sociotechnical environments. This inspired legal scholars to highlight how also the exercise of (fundamental) rights hinges on particular material configurations. *Cf.* Cohen, *supra* note 125, at 246; M. Hildebrandt, *Smart Technologies and the End(s) of Law: Novel Entanglements of Law and Technology* (2016); Cohen, 'Affording Fundamental Rights', 4 *Critical Analysis of Law* (2017) 78; Hildebrandt, 'Law as Affordance: The Devil Is in the Vanishing Points', 4 *Critical Analysis of Law* (2017) 116.

[134] Hildebrandt, *Affordance*, *supra* note 133, at 119; Cohen, *supra* note 123, at 246.

A *Algorithmic Affordances and the Limits of Liberal Proceduralism*

On the first page of the EU strategy on the use of AI in border control, it is stated that 'increasingly advanced AI' raises questions of 'bias', 'transparency, privacy and accountability' and should be 'properly designed'.[135] 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'.[136] 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.[137]

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 have any independent causal importance. This is precisely the promise of classifications based not on 'set rules' but on 'learned similarities'.[138]

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.[139] 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. 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 profiling based on fixed individual characteristics, as presupposed in non-discrimination law.[140] 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 so. These systems are in a way blind to those features.

[135] European Commission, *supra* note 17, at 1.

[136] *Ibid.*, at 15, 77 ('[t]he ethics dimension [is needed] to understand and prevent AI bias and ensure values and integrity are embedded in AI-driven initiatives'). 'Human rights' appear once (as 'ethical principles').

[137] *Cf.* Hildebrandt, *Affordance*, *supra* note 133, at 116.

[138] European Commission, *supra* note 17, at 89.

[139] T. Bucher, *If … Then: Algorithmic Power and Politics* (2018) (on 'ontologies of association').

[140] *Cf.* Leese, *supra* note 21, at 495; Amoore, *supra* note 2, at 61ff, 92.

It's looking for relations. That is really very different'.[141] With data-driven divisions based on 'momentary groupings that might be disappearing back into the white noise of the database', Leese has observed that we have 'a diminishing effectiveness of the anti-discrimination toolbox'.[142] The shift from profiling based on representational criteria towards fluid forms of classification based on correlative pattern discovery, in other words, is reconfiguring the material conditions of possibility for the application of non-discrimination law.[143]

In addition to non-discrimination standards, enhanced 'transparency' is an often-repeated procedural demand in contexts of automated decision-making.[144] While the algorithmic systems discussed above seek to enact 'absolute transparency' on the level of subjects of surveillance,[145] their decision-making architecture is marked by obscurity.[146] 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.[147]

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 predefined 'risk thresholds' or 'specific indicators' but that 'partition the data into clusters' through continuously 'uncovered correlations'.[148] When Crockett laments that she 'can't explain … what a hundred neural networks are doing and how they are interlaced together', she is not pointing to a problem of unwillingness or technical difficulty but, rather, 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.[149] While symbolic, rule-based algorithms work through a series of programmed steps that can be traced, non-linear 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.[150] 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 Crockett laments, might not be an 'affordance' of deep neural networks.

[141] Interview with Frontex Data Analyst, April 2020 (transcripts on file with author). This limits the promise of non-discrimination safeguards, such as those included in Council Regulation 2018/1240, *supra* note 16, Art. 14.

[142] Leese, *supra* note 21, at 503.

[143] *Cf.* Cohen, *supra* note 123, at 246–247.

[144] We also saw it being invoked in the EU strategy. European Commission, *supra* note 17, at 1.

[145] *Cf.* S. Zuboff, *The Age of Surveillance Capitalism* (2019).

[146] Rudin, 'Stop Explaining Black Box Machine Learning Models for High Stakes Decisions and Use Interpretable Models Instead', 1 *Nature Machine Intelligence* (2019) 206.

[147] See, e.g., F. Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (2016).

[148] European Commission, *supra* note 17, at 89–90.

[149] See note 89 above and associated text.

[150] *Cf.* Amoore, *supra* note 84, at 11–14.

The difficulty of identifying a single source code or site of authorship also complicates the consistent attempts at holding algorithms 'accountable'.[151] Who would we be holding accountable for wrongful assignations of 'risk' at the border and what would the criteria of such an evaluation be 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'.[152] 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'.[153] 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, Louise 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'.[154] In the limitless feedback loops of the learning machine, a single site of accountability might be unavailable.

These observations are not meant to repudiate attempts to regulate algorithmic decision-making. Yet, in line with Hildebrandt's invitation to pay attention to the material conditions of possibility for legal regulation,[155] they display why non-discrimination law, transparency standards and accountability frameworks might not be available as emancipatory 'affordances' at the virtual border. The toolbox of liberal proceduralism appears (at least partly) premised on a decision-making chain of sequential causal steps shaped by predefined rules and demarcated moments of human agency and discretion (in contrast to 'unsupervised uncovering of correlations' or 'learned similarities').[156] In signalling this problem, I do not aim at a cynical rebuttal of regulatory projects but at trading the formal transposition of procedural principles for a critical engagement with matters of sociotechnical design.[157]

[151] A promise articulated throughout the EU strategy. European Commission, *supra* note 17, at 1.

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

[153] *Cf.* Kalpouzos, 'Double Elevation: Autonomous Weapons and the Search for an Irreducible Law of War', 33 *Leiden Journal of International Law* (*LJIL*) (2020) 289, at 293 (how 'the loop itself is changing'); Johns, *supra* note 30, at 3.

[154] Amoore, *supra* note 84, at 58–66, 123.

[155] See note 133 above.

[156] European Commission, *supra* note 17, at 89–90.

[157] This is what Hildebrandt's CoHuBiCol project is also oriented towards. See 'CoHuBiCol', available at www.cohubicol.com/. This will be important, I believe, in the implementation and evaluation of the recently proposed EU Regulation on AI (which explicitly defined migration and border control as high-risk use cases). European Commission, Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act), Doc. 2021/0106 (COD), 21 April 2021.

B *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'.[158] I explore the properties of algorithmic governmentality in contrast to three tenets of modern politics on which the emancipatory promise of public (international) law hinges – its notions of subjectivity, authorship and planned futurity. This contrast is not meant to construct an image of international law to be idealized or implemented but to signal a general shift in the prevailing political technology 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.[159]

1 'Lost in Categorization': 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 have noted, citizenship – as made explicit in Figure 2 – appears only as one of many in the 'bundle of vectors' assembled for decision-making purposes.[160] 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.[161] 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 re-engineer the inductive reasoning of risk assignments). Representational categories that enable durable forms of subjectivity, and often emanate from legal modes of social ordering,[162] 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

[158] *Cf.* B. Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (2005).

[159] See, *inter alia*, Sullivan, *supra* note 27; Arvidsson, 'The Swarm That We Already Are: Artificially Intelligent (AI) Swarming Insect Drones, Targeting and International Humanitarian Law in a Posthuman Ecology', 11 *Journal of Human Rights and the Environment* (*JHRE*) (2020) 114; Van Den Meerssche and Gordon, '"A New Normative Architecture": Risk and Resilience as Routines of Un-Governance', 11 *Transnational Legal Theory* (2020) 267.

[160] Fourcade and Johns, *supra* note 3, at 818. This differs from Longo's claim that risk scoring is 'citizenship-blind', but it does signal how such stable legal identities are decentred in the calculus of risk. *Cf.* Longo, *supra* note 7, at 195.

[161] *Cf.* Cheney-Lippold, 'A New Algorithmic Identity: Soft Biopolitics and the Modulation of Control', 28 *Theory, Culture and Society* (2011) 164.

[162] *Cf.* Derrida, 'Force of Law: The "Mystical Foundation of Authority"', 11 *Cardozo Law Review* (1990) 920.

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'.[163] There is an inevitable gap, in other words, between the legal subject and the 'data doubles' temporarily and tentatively tied to it.[164] 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 behaviourist risk assignations through which iBorderCtrl and Tresspass render scattered data 'actionable' displace more stable and agential forms of legal subjectivity.[165]

Second, recourse to 'actionable' algorithmic associations threatens our prospects of collectivity. While tainted by imperial legacies and 'fault lines' of exclusion,[166] 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'.[167] 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'.[168] 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 that we inhabit and our placement within it.[169] There are, of course, different architectures of association at play in international legal practice and reflection,[170] 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 that it recognizes, the categories of social life that it formalizes and the political associations that it thereby enables or performs.[171] 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.

[163] Rouvroy, *supra* note 83, at 157; *cf.* Amoore, *supra* note 2, at 90ff; Johns, *supra* note 4, at 96.

[164] *Cf.* Cheney-Lippold, *supra* note 75, at 145–146.

[165] *Cf.* Kosta, *supra* note 21, at 10.

[166] *Cf.* H. Lindahl, *Fault Lines of Globalization: Legal Order and the Politics of A-Legality* (2013).

[167] Koskenniemi, 'The Fate of Public International Law: Between Technique and Politics', 70 *Modern Law Review* (*MLR*) (2007) 1, at 2–3. These promises, of course, resonate in key documents such as the UN Charter or the Universal Declaration of Human Rights, GA Res. 217A (III), 10 December 1948.

[168] Johns, *supra* note 4, at 59, 100; see also R. Teitel, *Humanity's Law* (2011); Peters, 'Humanity as the α and Ω of Sovereignty', 20 *EJIL* (2009) 513. I do not intend here to endorse these perspectives but refer to them as projections of a collective 'we' in international law.

[169] For the claim that this phenomenological 'first-person plural' – the assertion of commonality and practice of othering – is central to the formation of any legal order, see Lindahl, *supra* note 166.

[170] *Cf.* Johns, 'Data Territories: Changing Architectures of Association in International Law', 47 *Netherlands Yearbook of International Law* (2016) 107.

[171] For a wonderful account of how such assignations become sites of imagination and struggle in bordering experiences, see, e.g., Mann, 'Border Masquerades', *Berkeley Journal of International Law* (forthcoming).

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.[172] Yet, at the 'virtual border', this orientation towards collective agency breaks down.[173] 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.[174] 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'.[175] What emerges are 'non-publics' – pulsing patterns emerging and dissolving in the ebb and flow of data streams.[176]

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.[177] 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'.[178] 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.[179] 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.[180]

2 *'Spontaneous Germination': 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

[172] *Cf.* Johns, *supra* note 4; Lindahl, *supra* note 166, at 77.

[173] *Cf.* Fourcade and Johns, *supra* note 3, at 818 (noting how '[i]n a machine learning world … everyone is ultimately a unique combination, a category of one').

[174] *Cf.* Leese, *supra* note 21, at 503–504.

[175] Dijstelbloem and Broeders, *supra* note 75, at 32.

[176] *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*, translated by D. Ross (2013), at 116.

[177] See, e.g., Yeung, *A Study of the Implications of Advanced Digital Technologies (Including AI Systems) for the Concept of Responsibility within a Human Rights Framework* (2018), at 29.

[178] *Cf.* De Vries, 'Identity, Profiling Algorithms and a World of Ambient Intelligence', 12 *Ethics and Information Technology* (2010) 71, at 81 ('what do *I* have to do with the[se] hypothetically similar people').

[179] *Cf.* Lindahl, *supra* note 166, at 84ff.

[180] Rouvroy, *supra* note 83, at 158–160; Amoore, *supra* note 84, at 158 (on the need for new forms of 'fabulation').

to whom the task of making or applying rules is delegated can be held to account.[181] Benedict Kingsbury, in this vein, locates the 'endowment of international law' precisely in its modernist commitment to 'far-sighted', 'collective planning' – promises of public deliberation and law-making.[182] While the material legacy of this endowment is surely open to debate (as feminist, post-colonial 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[183] – the distillation of 'flocks, swarms, rhythms, and constellations within the deafening noise of intercepted data' – is one in which decisions inevitably dissipate.[184] 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 the 'unified locus' of authorship and accountability,[185] 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.[186] 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.[187] 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, rather, as scattered signs and signals.[188] This distillation of thresholds for normalcy and deviance from knowledge discovered directly in the world – a 'world without causation'[189] – narrows the space for law as the scene where subjects perform their authorship.[190] The 'collective' invoked by Kingsbury, in this sense, no longer decides or deliberates but speaks only through the digital traces that it leaves.

[181] *Cf.* Hildebrandt, 'Law as Information in the Era of Data-Driven Agency', 79 *MLR* (2016) 1.

[182] Kingsbury, *supra* note 26, at 185–186.

[183] Rouvroy, *supra* note 83, at 146.

[184] Steyerl, 'A Sea of Data: Pattern Recognition and Corporate Animism (Forked Version)', in Apprich *et al.*, *supra* note 112, at 2.

[185] See section 4.A in this article and notes 84 and 91 above with the associated text.

[186] See, e.g., Eubanks, *supra* note 107, at 212–213.

[187] Amoore, *supra* note 84, at 18–20, 67.

[188] *Cf.* Gillespie, 'The Relevance of Algorithms', in T. Gillespie *et al.* (eds), *Media Technologies: Essays on Communication, Materiality, and Society* (2014) 167, at 173.

[189] Chandler, 'A World without Causation: Big Data and the Coming of Age of Posthumanism', 43 *MJIL* (2015) 833.

[190] *Cf.* Rouvroy, *supra* note 83, at 161–162.

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',[191] as Cheney-Lippold laments, but that the passive and purely behaviourist 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.[192]

3 *The 'Actualisation of the Virtual': 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.[193] 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 and lawyers 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 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 have focused are aimed towards exactly the inverse: to reduce multiplicities to 'real-time' and 'actionable' outputs, thereby foreclosing alternative ways to narrate the relations they reveal. The concept of 'virtuality' refers to its invocation by Gilles Deleuze and Brian Massumi as a realm of potentiality – an element of 'immanent life' – that can never be entirely computed or diagrammed.[194] 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'.[195] This entails that the associative rule of 'risk' has no

[191] Cheney-Lippold, *supra* note 75, at 252.

[192] *Cf.* Mezzadra and Neilson, *supra* note 127, at 273ff (on the 'translation of the common' as precondition for politics).

[193] Kingsbury, *supra* note 26, at 186.

[194] G. Deleuze, *Pure Immanence: Essays on a Life* (2001); B. Massumi, *Parables for the Virtual: Movement, Affect, Sensation* (2002).

[195] Rouvroy and Stiegler, *supra* note 1, at 10; Rouvroy, *supra* note 83, at 13. *Cf.* Massumi, *supra* note 196, at 137ff.

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.[196] Yet it is precisely in these gaps of potentiality and virtuality that the political promise of international law resides.

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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, and in need of care, is not an absolute ideal of liberal autonomy but the potentiality of being and becoming political – not the capitalized universal subject, which is invoked in certain strands of (legal) scholarship but, rather, a space for practices of commoning and subjectivation.[197] For Jacques Rancière, politics is indeed perceived precisely as emanating from the social subjectivation of the 'part with no part' in existing distributive schemes: a subversive and emancipatory expression of 'the contingency of equality'.[198] In tune with Glissant's *Poetics of Relation*, Sandro Mezzadra and Brett Neilson perceive the political as a 'social practice of translation', which 'creates a collective subject that must continually keep open … and reopen the processes of its own constitution'.[199] Mezzadra and Neilson thereby trace 'the power of a common that is not given by nature, history, or culture but must be politically invented and reinvented'.[200] Such a relational, open-ended 'translation of the common' hinges on a phenomenology of mutual recognition and a set of social and material practices through which experiences of shared suffering or displacement can be sensed and channelled into collective political action.[201] As the previous sections have shown, not only does the behaviourist code of the 'virtual border' express the 'death of the juridical person',[202] but its division of 'data doubles' in fluid correlational clusters also inhibits the formation of such common projects or perspectives. In foreclosing

[196] *Cf.* Neyrat, 'Désajointement', 15 *Variations* (2011) 35, at 37 ('[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').

[197] This difference between the capitalized universal Subject (perceived as 'psychotic') and practices of subjectivation is drawn out wonderfully by Donna Haraway in 'Cyborg Revolution with Donna Haraway', *The Dig Radio* (2 May 2019), available at www.thedigradio.com/podcast/cyborg-revolution-with-donna-haraway/. On such iterative, symbiotic forms of subjectivation and the 'response-abilities' of care they foster and sustain, see M. Petersmann, 'Response-abilities of Care in More-than-Human Worlds', 12 *JHRE* (2021) 102.

[198] J. Rancière, *Dis-Agreement: Politics and Philosophy*, translated by J. Rose (1998), at 28. *Cf.* Mezzadra and Neilson, *supra* note 127, at 254ff.

[199] Mezzadra and Neilson, *supra* note 127, at 273–274. Their argument draws on M. Hardt and A. Negri, *Multitude: War and Democracy in the Age of Empire* (2004); Glissant, *supra* note 22.

[200] Mezzadra and Neilson, *supra* note 127, at 274.

[201] *Ibid.*, at 274–276. Mezzadra and Neilson trace the formation of such 'collective subject[s] in the making' from the factory to the 'motley crew' of maritime workers and describe the workings of power as docility through difference. In this 'labor of translation', they refer to 'affective exchanges … and the sharing of pain, sufferance, and joy'.

[202] *Cf.* Arendt, *supra* note 97, at 578–601 (on behaviourism as the 'death of the juridical person').

spaces of subjectivation, conditions for collectivity and open-ended futurity, this mode of governmentality erodes the terrain of law's empancipatory possibilities.

5 Conclusion: Opacity as Resistance

Thinking with Duncan Kennedy's observation that law's relationship to inequality is manifested in its foreclosure of possible pathways and its definition of bargaining powers, this article traces how these boundaries of possibility and 'crosscutting lines of cleavage' are being redrawn through algorithmic practices of association and computational calculi of risk.[203] It is in the projection and pre-emption of possibilities based on the hierarchical placement of people in clusters of data that new configurations of inequality materialize – configurations marked by a disempowering fluidity and elusiveness.

If I have problematized existing legal responses to manifestations of algorithmic violence and injustice,[204] this is out of concern that such responses tend to be folded quite easily in existing governance regimes, leaving salient and troubling features of their normative metabolism intact. Prevalent concerns for transparency, non-discrimination and accountability, I have argued, have limited purchase against forms of decision-making that do not exclusively work with accumulated data, predetermined norms and causal criteria – such are the properties of the presumably outdated 'rule-based' systems – but through mobile relations between data points only tentatively and temporarily held together.[205] What would it mean for international lawyers not to frame algorithmic systems as objects of regulation – to be fixed and made transparent with tools already at our disposal – but to reflect on the social imaginaries they entail, the inequalities they produce and the worlds they engender?[206] In conclusion, I want to signal a possible orientation that can inspire and orient further critical and political engagement in this space.

Inspired by Glissant, one possible pathway for recalcitrance or resistance to algorithmic rule can be provided by the 'right to opacity'.[207] In contrast to the 'right to privacy', this is not about setting standards to which data can be gathered (and under which conditions) but, rather, 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'[208] – an insistence on ambiguity and, with Glissant, on the inherent violence of total 'transparency'.[209] The 'right to opacity' reclaims the gap between reality and representation that algorithmic governmentality constantly

[203] Kennedy, 'The Stakes of Law, or Hale and Foucault!', 15 *Legal Studies Forum* (1991) 327, at 361.

[204] Bellanova *et al.*, 'Toward a Critique of Algorithmic Violence', 15 *International Political Sociology* (2021) 121.

[205] *Cf.* Amoore, *supra* note 2, at 68.

[206] *Cf.* Johns, *supra* note 30. I am grateful to Ben Hurlbut and Itty Abraham for highlighting these questions.

[207] Glissant, *supra* note 22.

[208] Rouvroy and Stiegler, *supra* note 1, at 7, 11.

[209] Glissant, *supra* note 22, at 190. *Cf.* Hildebrandt, *supra* note 182, at 30 (associating the value of human autonomy with 'fundamental uncertainty'); Amoore, *supra* note 84, at 166.

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.[210] Yet, as Glissant argued, opacity is not obscurity – it is not a recognition of what cannot be experienced but, instead, of what 'cannot be reduced', which, he argued, 'is the most perennial guarantee of participation and confluence'.[211]

Opacity is virtuality – a precondition for commonality – for the collective representations that precede possibilities of law.[212] Only within opacity – outside algorithmic pre-emption where events are yet to unfold and to be given meaning – can we practise politics. For solidarity to be possible in the face of emerging 'associative inequalities', in short, 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 powerfully argues, 'precisely because the meaning of those relations, their mediation through every scene of life, cannot be condensed. They are precisely irreducible'.[213] It is only from such an 'irreducible singularity' that commonality can grow – a commonality defiant of the debilitating algorithmic divisions that we face.

[210] Rouvroy, *supra* note 83, at 148; *cf.* F. Moten and S. Harney, *The Undercommons: Fugitive Planning and Black Study* (2013).

[211] Glissant, *supra* note 22, at 191.

[212] *Cf.* Lindahl, *supra* note 166. On 'virtuality', see notes 97 and 176 above.

[213] Amoore, *supra* note 84, at 156.