



THERESA GRUBER

Artificial Intelligence in Border and Migration Management

Assessing the Human Rights Implications of Artificial Intelligence
for Migrants and Refugees

Dissertation to obtain a Master's Degree
in Law, in the specialty of International
and European Law

Supervisor:

Dr. Jeremy Sarkin, Professor of the NOVA School of Law

2024, September

Anti Plagiarism Statement

I, Theresa Gruber, hereby declare that the work I present, is my own work and that all my sources have been properly cited and acknowledged. I am aware that the use of unacknowledged extraneous materials and sources, constitutes a serious ethical and disciplinary offence.

26th September 2024, Austria

A handwritten signature in black ink, reading "Theresa Gruber". The signature is written in a cursive style with a large initial 'T' and a long horizontal stroke extending to the right.

Acknowledgements

This thesis is the final product of a comprehensive study abroad and most importantly, the conclusion of my Master's Degree in International and European Law at Nova Law School Lisbon. The new nature of the legal context in which the subject falls contributes to an interesting analysis of the current framework of artificial intelligence technology at the EU's external borders, the current EU legislation concerning these technologies and their impacts on migrants and refugees.

By writing this thesis, I have become well-educated on the linkage between technology and human rights and the importance to uphold a world where the dignity of migrants and refugees is not compromised by the digitalisation of borders. It is an interesting and contemporary topic that needs much more attention in the future.

Hereby, I would like to thank and express my sincere gratitude to my supervisor, Dr. Jeremy Sarkin, for his guidance and very prompt feedback over the past year. In addition, I would like to thank my family and partner for their everlasting encouragement and belief in me, as well as their support for whatever dream I have set in my life.

Abstract

In an era where Artificial Intelligence (AI) is reshaping social structures, border governance is similarly undergoing a radical transformation. The European Union (EU) and its Member States have recognised the great potential of AI and are digitalising its external borders, by deploying these advanced technologies which range from algorithmic profiling, biometric identification, emotion recognition, to advanced data analysis. These new innovations are frequently justified under the guise of enhancing migration management and ensuring security. However, what is often overlooked is that these technologies can present measures to curb migration and thereby present serious human rights implications and real impacts on the lives of migrants and refugees.

Therefore, this thesis aims to question and reflect on the impacts of these AI technologies on migrants and refugees. By analysing both existing and upcoming AI technologies in border governance, the research reveals that these AI technologies often raise issues which manifest in human rights violations. These include issues of accountability, transparency, as well as the potential for both direct and indirect discrimination. Moreover, the inherent opacity surrounding these technologies compromises procedural fairness standards and fails to uphold democratic principles, ultimately exacerbating the vulnerability and marginalisation of migrants.

The thesis contributes to the existing literature in five ways. First, it maps out current and forthcoming AI technologies employed at borders. Second, it explores the human rights challenges posed by these technologies. Third, it offers an overview of the legal safeguards available to protect the rights of affected migrants. The findings indicate that the deployment of these AI technologies occur within a largely unregulated environment, prompting a call for enhanced oversight and governance mechanisms rooted in fundamental human rights. While the new AI Act attempts to address these challenges by categorising AI technologies according to their human rights risks, it remains uncertain how effective this regulation will be in safeguarding these rights. The Chapter on the AI Act highlights these shortcomings, which are especially apparent in migration management. Lastly, recommendations are given on how to uphold fundamental human rights of migrants and refugees.

Keywords: Artificial Intelligence, big data, human rights, migration, management, EU border controls, AI Act

Resumo

Numa era em que a Inteligência Artificial (IA) está a remodelar as estruturas sociais, a governação das fronteiras está a passar por uma transformação radical. A União Europeia (UE) e os seus Estados-Membros reconheceram o potencial da IA e estão a digitalizar as suas fronteiras externas, recorrendo a tecnologias avançadas que vão desde a criação de perfis algorítmicos, identificação biométrica, reconhecimento de emoções, até à análise avançada de dados. Estas inovações são frequentemente justificadas sob o pretexto de melhorar a gestão migratória e garantir a segurança. No entanto, o que muitas vezes é ignorado é que estas tecnologias podem ser utilizadas para restringir a migração e, assim, representar sérias repercussões em termos de direitos humanos e impactos reais na vida dos migrantes e refugiados.

Assim, esta dissertação procura questionar e refletir sobre os impactos destas tecnologias de IA nos migrantes e refugiados. Ao analisar as tecnologias de IA já existentes e as que estão prestes a ser implementadas na governação das fronteiras, a pesquisa revela que estas tecnologias frequentemente levantam questões que se manifestam em violações dos direitos humanos. Estas incluem problemas de responsabilidade, transparência, bem como a potencial discriminação direta e indireta. Além disso, a opacidade inerente a estas tecnologias compromete os padrões de equidade processual e falha em sustentar princípios democráticos, exacerbando, em última análise, a vulnerabilidade e marginalização dos migrantes.

A dissertação contribui para a literatura existente de cinco maneiras. Em primeiro lugar, mapeia as tecnologias de IA atuais e futuras empregues nas fronteiras. Em segundo lugar, explora os desafios em termos de direitos humanos que estas tecnologias colocam. Em terceiro lugar, oferece uma visão geral das salvaguardas jurídicas disponíveis para proteger os direitos dos migrantes afetados. Os resultados indicam que a implementação destas tecnologias de IA ocorre num ambiente amplamente não regulamentado, o que leva a uma chamada para o reforço dos mecanismos de supervisão e governação baseados nos direitos humanos fundamentais. Embora o novo Regulamento de IA procure abordar estes desafios ao categorizar as tecnologias de IA de acordo com os seus riscos para os direitos humanos, permanece incerto quão eficaz será esta regulamentação na proteção destes direitos.

O capítulo sobre o Regulamento de IA destaca as suas lacunas na gestão migratória. Por fim, são apresentadas recomendações sobre como garantir o respeito pelos direitos humanos fundamentais dos migrantes e refugiados.

Palavras-chave: Inteligência Artificial, big data, direitos humanos, migração, gestão, controlo de fronteiras da UE, Regulamento de IA

Table of Contents

I.	<i>Introduction</i>	1
1.	<i>Methodology</i>	7
2.	<i>Research Questions and Overview</i>	8
3.	<i>Definitions</i>	10
3.1.	Artificial intelligence	10
3.2.	Biometric data and systems	13
3.3.	Definition of Human Rights	14
3.4.	Definition of migrants	15
4.	<i>The evolution of AI in Migration Management</i>	16
II.	<i>AI systems in border and migration management</i>	19
5.	<i>Predictive analytic systems</i>	19
5.1.	The impacts of predictive AI tools on Human Rights	20
5.2.	Regulation of these systems	23
6.	<i>Identity verification technologies</i>	23
6.1.	Facial recognition	24
6.2.	The impacts on Human Rights	25
7.	<i>Automated Decision-Making techniques</i>	26
7.1.	The Human Element	28
8.	<i>Algorithmic profiling</i>	30
8.1.	Human Rights implications of algorithmic profiling	31
8.2.	Algorithmic profiling within the AI Act	32
9.	<i>Emotion recognition technology</i>	32
10.	<i>Frontex and AI</i>	35
III.	<i>AI and its impacts on Human Rights</i>	36
11.	<i>Respect to the right to life and liberty</i>	39
12.	<i>Respect to the principle of non-refoulement and pushbacks</i>	41
13.	<i>Privacy Rights</i>	43
IV.	<i>Challenges within AI Systems</i>	44
13.1.	Lack of Transparency surrounding AI technology	45
14.	<i>Lack of algorithmic transparency</i>	45
15.	<i>The Lack of accountability</i>	48
15.1.	Who to hold accountable?	48
15.2.	Agency Laundering	50

15.3.	The Global North and South divide	51
15.4.	Counteracting gaps in accountability	52
16.	<i>Unfair, biased and discriminatory AI</i>	54
16.1.	How can AI be discriminatory?	56
16.2.	Automation bias and discriminatory human decision-making	57
16.3.	Counteracting discrimination	59
17.	<i>The lack of privacy and data protection</i>	59
18.	<i>The lack of respect of human dignity</i>	61
19.	<i>Lack of procedural fairness</i>	61
19.1.	Right to an effective remedy	62
20.	<i>Migration as a testing ground for new technologies</i>	63
21.	<i>The Criminalisation of Migration</i>	66
V.	<i>The inherent power of Data collection</i>	67
22.	<i>Big Data</i>	67
23.	<i>Biometrics</i>	71
24.	<i>EU databases and their future interoperability</i>	72
VI.	<i>Legislative Framework</i>	76
25.	<i>Human Rights Legislation</i>	76
25.1.	Non-discrimination law	77
26.	<i>The Artificial Intelligence Act</i>	78
26.1.	Prohibition of the Article 5	80
26.2.	High-risk AI systems	81
26.3.	Shortcomings of the AI Act	81
27.	<i>Final thoughts and recommendation</i>	84
28.	<i>Conclusion</i>	87
29.	<i>Bibliography</i>	90
29.1.	Articles	90
29.2.	Books	95
29.3.	Case Law	97
29.4.	Legislation	97
29.5.	Publications	97
29.6.	Webpages	99
29.7.	Statements	101
29.8.	Table References	102

List of Abbreviations

ADM – Automated Decision-Making

AI – Artificial Intelligence

AIA – Artificial Intelligence Act

AVATAR – Automated Virtual Agent for Real Time Truth Assessment

CAT – Convention against Torture

CCTV – Closed-Circuit Television

CJEU – Court of Justice of the European Union

DPIA – Data Protection Impact Assessment

ECHR – European Convention on Human Rights

ECRIS-TCN – European Travel Information and Authorisation System Database

EES – Entry/Exit System Database

EU-Lisa – EU Agency for the Operational Management for Large-Scale Information Systems in the Area of Freedom, Security, and Justice

Eurodac – European Dactyloscopy Database

EWPS - Early Warning and Preparation System

FRA – European Union Agency for Fundamental Human Rights

Frontex – European Border and Coast Guard Agency

FRT – Facial Recognition Technology

GDPR – General Data Protection Regulation

ICCPR – International Covenant on Civil and Political Rights

ICESCR – International Covenant on Economic, Social and Cultural Rights

ICERD – Convention on the Elimination of All Forms of Racial Discrimination

IND – Immigration and Naturalisation Service (Netherlands)

IT – Information Technology

NLP - Natural Language Processing

NGO – Non-Governmental Organisation

OHCHR – Office of the United Nations High Commissioner for Human Rights

PNR – Passenger Name Records Data

SIS II – Schengen Information System

SBMS – Shared Biometric Matching System (EU)

TEU – Treaty of the European Union

UDHR – Universal Declaration of Human Rights

UNCCT – United Nations Counter-Terrorism Centre

UNHCR – United Nations High Commissioner for Refugees

VIS – Visa Information System

I. Introduction

A young girl from Syria has made her way to the Greek border, hopeful for a safe and brighter future. Upon arrival, she encounters Greek officials who employ advanced AI technologies to verify her identity, assess whether she poses a security 'risk,' and ultimately allow algorithms to influence the outcome of her asylum application and the administrative procedures necessary for a positive claim. Despite having no criminal record, she is flagged as a 'risk' by one of the systems and is consequently denied entry into the EU. The ramifications of this decision are profound. She now faces the risk of being forcibly repatriated to Turkey or being detained as an 'irregular' migrant in a Greek detention centre, both outcomes far from the safety and future she had hoped for.¹ This hypothetical, yet alarmingly plausible, scenario raises important questions concerning the nexus of technology and human rights at external borders: What criteria guide these AI-driven decisions? Will she be informed about the reasons behind the decision? What recourse does she have to challenge it, and how accessible are these mechanisms? Most importantly, how are her fundamental human rights protected in the context of these automated assessments, especially given her vulnerable status as a refugee fleeing war and unrest? These questions must be at the centre of any analysis of AI border technologies.

In recent years, migration management has become a central pillar of the EU's external governance, especially after the 2015 'refugee crisis'. In the face of an unprecedented influx of migrants and refugees, the EU was confronted with significant dysfunctions within the European asylum system, which in turn led to a crisis in the management of migration.² The initial EU response was to tighten the external borders and facilitate pushbacks at sea, which resulted in a high death toll.³ Subsequently, the EU has introduced several security measures aimed at intercepting migratory flows before they reach European territory.⁴ A key strategy therein has been to digitise its borders and transform them into so-called 'smart borders'. This initiative was pushed forward by the "Smart Borders" package, initially proposed by the European

¹ Blasi Casagran, Cristina. "Fundamental Rights Implications of Interconnecting Migration and Policing Databases in the EU", *Human Rights Law Review* 21 (2021): 433-457, DOI: 10.1093/hrlr/ngaa057.

² Carammia, Marcello, Iacus, Stefano Maria & Wilkin, Teddy. "Forecasting asylum-related migration flows with machine learning and data at scale", *Sci Rep* 12, 1457 (2022): 1-2, <https://doi.org/10.1038/s41598-022-05241-8>.

³ Panebianco, Stefania, Fontana, Iole. "When responsibility to protect 'hits home': the refugee crisis and the EU response", *Third World Quarterly* 39, 1 (2018): 1-17, <https://doi.org/10.1080/01436597.2017.1369035>.

⁴ *Ibid*, 2.

Commission in 2013.⁵ A recent EPRS paper identified the primary applications of AI in border control, highlighting its use in biometric identification, emotion detection, algorithmic risk assessments, and AI tools for migration monitoring, analysis, and forecasting.⁶ Yet, there are many more uses where AI can change border governance in a virtual and physical way.

However, the increased AI surveillance raises many questions, such as to what extent do AI in-driven technologies reshape the borders and how does this development affect the fundamental human rights of migrants? The effects of these new technologies are twofold: On the one hand, AI serves as a catalyst for enhancing efficiency and fostering innovation⁷, particularly within border management, where automation has the potential to augment administrative processes, improve legal certainty, and reduce waiting times. On the other hand, the wide-ranging implementation of AI-enabled technologies raises ethical and societal concerns. AI technologies increase the surveillance towards migrants and refugees. They facilitate profiling techniques, enable automated 'risk assessment' and pose the risk 'militarising' the border regime, without appropriate legal remedies and accountability frameworks or oversight mechanisms.⁸ This intensified surveillance landscape is being promoted by governments and private entities, with many states building physical infrastructure to prevent migration, while private actors are being funded by them to develop new technologies.⁹ Several states are also experimenting with automated decision-making (ADM) in their asylum systems. Not only are the ramifications of using such ADM systems in migration management extremely high, but there are little to no legal mechanisms in place to protect people's procedural rights.¹⁰

⁵ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre, University of Oxford* (2023): 11, DOI:10.13140/RG.2.2.24295.46248.

⁶ Dumbrava, Costica. „Artificial intelligence at EU borders: Overview of applications and key issues”, EPRS: European Parliamentary Research Service (2021): 1-2. DOI:10.2861/91831.

⁷ Andonovski, Jovan. "Artificial Intelligence and Human Rights – Legal Challenge for the European Union", *St. Kliment Ohridski University Press* (May, 2019), https://www.academia.edu/90813153/Artificial_intelligence_and_human_rights_legal_challenge_for_the_European_Union.

⁸ Csernaton, Raluca. "Constructing the EU's High-Tech-Borders: FRONTEX and Dual-Use Drones for Border Management", *European Security* 27, 2 (2018): 178, DOI: <https://doi.org/10.1080/09662839.2018.1481396>.

⁹ McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCHR, University of Essex* (September 2023): 8, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

¹⁰ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 315.

Challenges raised by the deployment of AI

Effectively, automated decision-making is susceptible to the same issues that plague human decision-making¹¹, including lack of accountability, lack of transparency, discrimination, bias, and error.¹² In addition, inaccuracies in the underlying data exacerbate these problems, leading to erroneous decisions in high-stakes situations, such as determining entry into the EU or granting protection status. When such decisions are flawed due to inaccurate data, they not only endanger the personal integrity and safety of migrants but also increase the risks of stigmatisation and discrimination based on race, colour, or religion.¹³

Moreover, the technologies require an examination whether they uphold principles of natural justice and the rule of law. This is because research has shown that processes based on new technologies often neglect procedural fairness principles, such as granting victims the right to be heard, a guarantee to have an impartial decision-making process, and the right to appeal a wrongful decision.¹⁴ These principles often falter at the initial stage, as refugees struggle to access the necessary information for taking any legal steps. This is further hindered by language and cultural barriers which show in limited or non-existent translation services regarding key information and a lack of willingness to ensure that information is presented in a manner the individual concerned can understand.¹⁵ In addition to the deficiencies in providing migrants with accessible information about their situation, there is a general opacity surrounding the new technologies, even on the part of the authorities, which is also reflected in the legal framework due to ongoing legal uncertainty.¹⁶

¹¹ Tufekci, Zeynep. "Algorithmic Harms Beyond Facebook and Google: Emergent Challenges of Computational Agency" *Colorado Technology Law Journal* 13 (2): 217, <https://ctlj.colorado.edu/wp-content/uploads/2015/08/Tufekci-final.pdf>.

¹² Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

¹³ Sadik, Giray and Kaya, Ceren. "The Role of Surveillance Technologies in the Securitization of EU Migration Policies and Border Management", *International Relations* 17, No. 68 (2020): 145-160, <https://www.jstor.org/stable/10.2307/26980741>.

¹⁴ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 26.

¹⁵ Amelung, Nina. "Crimmigration Control across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases", *Historical Social Research* 46, Nr. 3 (2021): 151-177.

¹⁶ Forti, Mirko. "AI-Driven Migration Management Procedures: Fundamental Rights Issues and Regulatory Answers", *BioLaw Journal*, no. 2 (2021): 449, <https://ssrn.com/abstract=3877083>.

Even if refugees manage to access the necessary information, they may lack the financial and legal means to challenge their decisions.¹⁷ The combined challenges of limited information and resources not only present logistical obstacles but also fundamentally impede their ability to exercise their rights.¹⁸ This raises questions such as how AI technologies affect the standards of procedural justice and the right to an effective remedy and how can these fundamental principles be protected? What obstacles are there for refugees in accessing justice?

Moreover, the increasing reliance on AI technologies raises concerns, as the efficiency of these tools makes it often seem unnecessary for human border guards to verify their 'automated' outcomes.¹⁹ An example of this heightened reliance is seen in the use of automated passenger screening at airports, where the system makes immediate decisions about passengers without human oversight. Given the extensive deployment of these systems, it is understandable that humans rely heavily on them. The rationale is that if the system is correct 99 times out of 100, why doubt its accuracy on the hundredth time? This logic is also applied in border management, where the same reliance in technology prevails, even when the life of the refugee is at risk. These circumstances highlight that human involvement is still needed, especially in cases which are more critically and ethically nuanced.²⁰ The question arises as to what extent humans can correct the results of the AI systems and whether they can intervene in wrong outcomes? Is the human being an appropriate safeguard in relation to AI decisions?

Criminalisation and Discrimination in Migration Management

AI technologies used in migration management are primarily designed to track, identify, and control individuals crossing borders.²¹ Although their development and deployment leads to stricter measures and heightened surveillance, they also reinforce the broader

¹⁷ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 26.

¹⁸ Bor, Sherry and Chepto Koech, Nicole. "Balancing Human Rights and the Use of Artificial Intelligence in Border Security in Africa", *Journal of Intellectual Property and Information Technology Law* 3 (2023): 77-122, <https://doi.org/10.52907/jipit.v3i1.260>.

¹⁹ Beduschi, Ana. „International migration management in the age of artificial intelligence", *Oxford University Press* 9, no. 3 (2021): 576-596. DOI:10.1093/migration/mnaa003.

²⁰ Ibid, 18.

²¹ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 2.

Introduction

objective of keeping migrants away from the so-called 'Fortress Europe'²², while simultaneously criminalising them. This can be seen either in the use of 'military-grade drones' aimed at the interception of migrants in the Mediterranean sea or the 'ROBORDER' project, which deploys unmanned mobile robots across aerial, water, and land border spaces. The use of 'quasi-military technology' directly criminalises migration and makes it more challenging for migrants to reach European territory.²³

Nevertheless, these measures do not necessarily reduce the number of migrants in Europe, but rather forces them to find alternative ways to reach safe countries without being detected by drones, robots or other unmanned surveillance devices.²⁴ The technologies led to an extension of borders beyond their traditional physical confines, with control mechanisms now enforced in the air, on land, at sea and within the countries of origin, and in the countries of refuge.²⁵ This constant surveillance is exemplified by using drones, facial recognition cameras, and the monitoring of migrants' smartphones or web-searches.²⁶ This has transformed borders from mere demarcation lines between sovereign states into instruments of exclusion wielded by those in power to restrict access to certain areas, prevent specific groups from reaching Europe, or even deport them when residing in the EU.²⁷ This evolution not only perpetuates but also deepens social divides.²⁸ Thus technological developments at borders do not unfold independently, instead, they often mirror and perpetuate existing power structures and disparities.²⁹

²² Chander, Sarah. „Regulating Migration Tech: How the EU’s AI Act can better protect people on the move”, *EDRI* (May 2022), <https://edri.org/our-work/regulating-migration-tech-how-the-eus-ai-act-can-better-protect-people-on-the-move/>.

²³ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 314, see also: Csernaton, Raluca. "Constructing the EU’s High-Tech-Borders: FRONTEX and Dual-Use Drones for Border Management", *European Security* 27, 2 (2018): 178, DOI: <https://doi.org/10.1080/09662839.2018.1481396>.

²⁴ Bergh, Sylvia L., et al., "Marocco’s Governance of Cities and Borders: AI Enhanced Surveillance Facial Recognition, and Human Rights", in: "*The Cambridge Handbook of Facial Recognition in the Modern State*" Cambridge Law Handbooks, Cambridge University Press (2024): 267-284, DOI: <https://doi.org/10.1017/9781009321211>.

²⁵ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab* online (2020): 34.

²⁶ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab* online (2020): 16.

²⁷ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

²⁸ Amelung, Nina. "Crimmigration Control across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases", *Historical Social Research* 46, Nr. 3 (2021): 151-177, DOI: [10.12759/hsr.46.2021.3.151-177](https://doi.org/10.12759/hsr.46.2021.3.151-177).

²⁹ Amelung, Nina. "Crimmigration Control across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases", *Historical Social Research* 46, Nr. 3 (2021): 151-177.

What is more, is that the rapid development of AI is outpacing legal regulation. This leaves migrants and refugees with few legal safeguards and legal mechanisms to address their violated human right.³⁰ Despite this regulatory gap, the EU continues to develop and deploy new technologies at its borders, resulting in an opaque situation with little to no oversight or accountability for those responsible.³¹ Thus, a key research question of this thesis will be if this *regulatory gap is intentional and whether the EU is purposefully using migrants as a testing ground for new technologies?* This question merits analysis because technological development has always been intertwined with political stances and power dynamics.³² The use of technology only serves as a revealing lens which illuminates these political stances, practices and attitudes towards migrants.³³ Therefore, the analysis must incorporate political considerations, as migration management is inherently political. Also, the correlating migration data has long been used to justify hard-line responses toward migrants. Even if these hard-line and intrusive responses have appeared under the guise of protecting national sovereignty, they also support xenophobic and anti-migrant agendas.³⁴ All of this has led to a culture of mistrust and disbelief in the migration regime.³⁵ The advent of new AI technologies seems to further strengthen the power of states and the EU, as they control the underlying technologies that shape these immigration decisions and measures.³⁶ The challenge lies in balancing security with respect for human rights, as authorities must navigate between protecting EU citizens and safeguarding the rights of migrants and refugees.³⁷

In addition, the difference between the existing rights of EU citizens and non-EU citizens must be analysed, as new technologies often reinforce this disparity.³⁸ What

³⁰ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 8, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

³¹ Ibid, 30.

³² Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

³³ Ibid, 32.

³⁴ UN Special Rapporteur on contemporary forms of racism. "Report of the Special Rapporteur on contemporary forms of racism, racial discrimination, xenophobia and related intolerance" A/77/549 (2022): para 22, <https://documents.un.org/doc/undoc/gen/n22/651/88/pdf/n2265188.pdf>.

³⁵ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 2.

³⁶ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 1-5.

³⁷ Bor, Sherry and Chepto Koech, Nicole. "Balancing Human Rights and the Use of Artificial Intelligence in Border Security in Africa", *Journal of Intellectual Property and Information Technology Law* 3 (2023): 77-122, <https://doi.org/10.52907/jipit.v3i1.260>.

³⁸ Beduschi, Ana. „International migration management in the age of artificial intelligence”, *Oxford University Press* 9, no. 3 (2021): 576-596. DOI:10.1093/migration/mnaa003.

Methodology

is more is that AI can challenge the foundational principles of fairness and equality that should underpin the use of technology in society. For example, when biases are coded into technological systems they can perpetuate and even exacerbate existing societal inequalities, leading to discriminatory outcomes that disproportionately affect marginalised groups.³⁹

The new AI Act and its Inadequacy

The introduction of the new AI Act has redefined the regulatory framework for AI technologies once again. The Regulation classifies AI systems based on their potential human rights risks they pose. It brings clarity with definitions and classifications, such as the one for AI systems in general. The Act broadly defines an AI system as a “*machine-based system that operates with varying levels of autonomy*”⁴⁰ and further distinguishes between those with high-risk to human rights and those with only minimal human rights risks.⁴¹

While the Act provides a useful framework for the regulation of AI technologies, it falls short in addressing the specific issues in migration management. This thesis argues that the Act inadequately considers the human rights implications of AI in this context, particularly for vulnerable migrants.⁴²

1. Methodology

This thesis aims to bridge the gap between technological advancements and human rights considerations. It argues that the integration of new technologies in border and migration management is not just a matter of technological implementation, but also a challenge regarding upholding human rights, especially in an era dominated by AI.

In other words, it seeks to weigh the benefits of these advanced technologies against the risks they pose to human rights. Indeed, the new technologies and human

³⁹ Beduschi, Ana. „International migration management in the age of artificial intelligence”, *Oxford University Press* 9, no. 3 (2021): 576-596.

⁴⁰ European Union. “Artificial Intelligence Act (AI Act), Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts”, COM(2021) 206 final (2021), Article 3(1).

⁴¹ European Union, AI Act, COM(2021) 206 final, Article 6.

⁴² Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab* online (2020): 2.

rights of migrants have been studied separately, as there is limited understanding about their effects on migrant's rights.⁴³ This highlights a gap in the existing literature that this thesis aims to address. It seeks to fill this void by exploring the relationship of the two fields by integrating their analyses and then critically assesses the implications for migrant's rights.

The methodology used for each chapter involves gathering legal materials, laws, jurisprudence and international scholarly articles on the subject, supplemented by reports and materials from international organisations recognised as experts, as for instance the European Agency for Fundamental Rights (FRA). These resources have been systematically arranged to provide a thorough overview of each chapter's topic and to summarise the principal findings of the existing literature. The thesis aims to set the stage for subsequent research in this area. The current legal frameworks, which safeguard the human rights of migrants, will be examined with a focus on European legislation. Further, the new AI Act which sets requirements for high-risk systems including those in migration management, will be analysed.⁴⁴

2. Research Questions and Overview

At heart lies the research question: *What are the human rights implications of new AI-technologies in EU border and migration management, and how can these systems be developed and deployed to protect these rights?* Answering this question requires a multidisciplinary approach that integrates the technological, legal, and human rights aspects of AI within the migration context. The thesis is structured as follows: First, the current and emerging technologies are mapped out. Second, the human rights impacts are analysed and the inherent challenges within AI systems. Lastly, the issues are analysed from a legal perspective.

Returning to the content of the individual chapters, the first section of this thesis lays the foundations by examining the evolution of AI in migration management (Chapter 6) and defining AI and some important terms (Chapter 7). In the following

⁴³ Sadik, Giray and Kaya, Ceren. "The Role of Surveillance Technologies in the Securitization of EU Migration Policies and Border Management", *International Relations* 17, No. 68 (2020): 145-160, <https://www.jstor.org/stable/10.2307/26980741>

⁴⁴ Fuster González, Gloria. "Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence." *EPRS, Scientific Foresight Unit* (2021): 1-22.

section (Section II) each application is analysed individually, with a focus on its specific human rights implications.

The third section analyses the impacts of these technologies on specific human rights (Section III). The subsequent Section (Section IV) names the underlying AI issues that potentially lead to these human rights risks, such as lack of accountability and transparency (Section III.) This chapter sets a focus on the potential for discriminatory practices facilitated by AI technologies. It analyses how algorithmic bias and automation bias can result in an unequal treatment of migrants and refugees. Also, it is analysed whether migrants have access to effective remedies and what recourse is available to them after a human rights abuse enabled by AI systems. Can they claim a violation of their rights, and if so, to whom and where can such claims be made? Finding answers to these questions is challenging due to the situational and procedural differences at the EU's external borders. Yet, these questions significantly impact the ability of victims to seek access to an effective remedy.⁴⁵

Furthermore, the section considers the broader societal implications of these technologies, such as export the technologies to repressive countries and the Global South and North divide. The research adopts a more critical approach on the deployment of AI technologies in border governance, whilst it does not deny potential benefits they may offer. The central research question in this chapters is: *Does the use of AI technologies in migration management contribute to the marginalisation of vulnerable migrants?*

Section V. analyses the role of big data and data collection in migration management. The section provides a brief overview of the EU's large IT databases and their planned interoperability. The underlying research question of this section is: *What are the risks associated with the trend towards datafication in migration management, in particular with regard to the collection and use of migrants' data by AI systems, and how can these risks be mitigated to protect individuals' data protection rights?* This chapter examines the extensive data collection that accompanies the use of AI and the significant power dynamics created by the possession of such data. This

⁴⁵ Lane, Lottie. "Clarifying Human Rights Standards through Artificial Intelligence", *Cambridge University Press, International and Comparative Law Quarterly* 71 (2022): 919, DOI: 10.1017/S0020589322000380.

analysis is crucial as the increased use of AI will inevitably be accompanied by increased data collection.

The sixth section examines the current legal framework and outlines possible legal guarantees for migrants and asylum seekers. This part of the thesis examines the sub-question: *How is the use of AI in migration management addressed by current legislation, including human rights law, the AI Act and data protection regulations?* This question is important when considering the recent enactment of the AI Act, which has once again shifted the legal framework for AI systems in border control. By outlining these laws, this thesis also examines the basis on which individuals can seek redress when AI systems violate their human rights.

The aim of this work is twofold. First, it seeks to contribute to the existing literature by mapping out the current technologies used in migration management and identifying the inherent issues within these technologies. Second, it advocates for a stronger human rights protection for migrants and refugees, who are particularly vulnerable due to fewer legal safeguards and the tendency to use them as a "testing ground for new technologies".⁴⁶ The overarching goal is to offer recommendations for enhancing the regulatory environment in the EU to ensure that the advancement of AI supports, rather than undermines, the rights of migrants and refugees. The concluding reflections provide a roadmap for policymakers, academics, and human rights advocates to address the challenges and opportunities of AI-enabled border management, aiming to ensure a future where technology upholds the highest values and norms of humanity⁴⁷.

3. Definitions

3.1. Artificial intelligence

The term 'Artificial Intelligence', though frequently encountered in our daily life, lacks a precise definition. Broadly speaking, AI refers to the ability of computer systems to analyse data and produce results that are like human cognitive processes, such as

⁴⁶ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

⁴⁷ Samson Ayinla, Benjamin, et. al. „Ethical AI in practice: Balancing technological advancements with human values“, *International Journal of Science and Research Archive* 11, 1 (2024): 1311-1326, DOI: <http://dx.doi.org/10.30574/ijrsra.2024.11.1.0218>.

Definitions

learning, decision-making and problem-solving abilities.⁴⁸ Thus, AI refers to systems that are designed to achieve human-defined goals by generating results such as content, predictions or decisions using various techniques and approaches. In a broad sense, AI is the science of making machines smart. According to Mainzer's definition, AI involves systems that can autonomously solve tasks. The degree of intelligence in these systems can be measured by how independently and efficiently they operate and the complexity of the tasks they manage⁴⁹.

Today, computer science treats AI as an independent field, focusing primarily on machine learning and artificial neural networks. The term "artificial intelligence" was first introduced by McCarthy, Minsky, Rochester, and Shannon. They proposed that every aspect of learning or intelligence could be so precisely defined that a machine could be designed to simulate it. Their goal was to develop machines capable of using language, form concepts and solves problems, similar to how humans learn and improve themselves over time.⁵⁰

According to the new AI Act, an AI-systems is any "*machine-based system designed to operate with varying degrees of autonomy*". Furthermore, it is stipulated by the Act, that AI systems, once deployed, may exhibit adaptability, which refers to machine learning and continuous learning techniques within the system. The definition also specifies that AI systems generate outputs such as predictions, content, recommendations or decisions and declares that the systems influence the environment, or the decisions made with their help.⁵¹

AI includes various systems that can be categorised into weak and strong AI. According to Searle, strong AI is not merely a tool for studying the mind but has the capability to understand and possess cognitive abilities when appropriately programmed. In contrast, weak AI only simulates human intelligence without truly

⁴⁸ S.Rao, Anand and Verweij, Gerard. „Sizing the prize – What's the real value of AI for your business and how can you capitalise?“, PWC (2017), <https://www.pwc.com/gx/en/news-room/docs/report-pwc-ai-analysis-sizing-the-prize.pdf>.

⁴⁹ Mainzer, Klaus. "*Künstliche Intelligenz – Wann übernehmen die Maschinen?*", Springer. 1st eds (2016): 2-3, <https://link.springer.com/book/10.1007/978-3-662-58046-2>.

⁵⁰ McCarthy, John, et al., "A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence", *AI Magazine* 4, 2006 (2006): 13. DOI: <https://doi.org/10.1609/aimag.v27i4.1904>.

⁵¹ European Union, AI Act, COM(2021) 206 final, Article 3.

possessing it.⁵² Moreover, AI includes numerous subfields like machine learning, deep learning or natural language processing:

Machine learning is a key advancement in modern AI technology and involves feeding vast amounts of data into a computer. The algorithm then autonomously learns from this data and makes decisions in a way that mirrors the human learning processes⁵³. Essentially, machine learning processes can be described as making predictions based on data.⁵⁴ Lehr and Ohm describe it as an automated method for uncovering correlations between variables within a dataset to predict certain results.⁵⁵

Deep learning is an evolution of machine learning and is used to solve complex problems⁵⁶. It works by processing data through neural networks, that mimic the functions of human brain cells.⁵⁷

Data mining is a subset of machine learning and refers to the process of identifying patterns from big amounts of data through the application of statistical, mathematical and computational methods.⁵⁸

Natural Language Processing (NLP), on the other hand, describes all AI technologies which focus on analysing, interpreting and generating natural language. It is commonly used by Google, ChatGPT, Apple's Siri and Amazon's Alexa. Advances within NLP have been achieved by expanding the datasets on which they are based. However, these NLP are only as reliable as the underlying data set. If an underlying data set is biased, so are the results. At present NLP systems are not able to autonomously exclude irrelevant and socially or culturally harmful data.⁵⁹

⁵² Searle, John. "Minds, brains, and programs", *Behavioural and Brain Sciences* 3 (1980): 418. home.csulb.edu/~cwallis/382/readings/482/searle.minds.brains.programs.bbs.1980.pdf.

⁵³ Elliott, Anthony. "The complex systems of AI: Recent trajectories of social theory", in: *The Routledge Social Science Handbook of AI*, Routledge, 1st Edition (2023): 3-14. <https://doi.org/10.4324/9780429198533>.

⁵⁴ Alarie, Benjamin. "The path of the law: towards legal singularity." *The University of Toronto Law Journal* 66, no. 4 (2016): 443–55. <https://www.jstor.org/stable/univtorolawj.66.4.443>.

⁵⁵ Lehr, David and Ohm, Paul. "Playing with the Data: What Legal Scholars should learn about Machine Learning", *U.C. Davis Law Review* 653, no. 51 (2017): 671, https://lawreview.sf.ucdavis.edu/sites/g/files/dgvnsk15026/files/media/documents/51-2_Lehr_Ohm.pdf.

⁵⁶ Cataleta, Maria Stefania. "Humane Artificial Intelligence: The Fragility of Human Rights Facing AI", *East-West Center, Working Paper* No. 2 (2020), <http://www.jstor.org/stable/resrep25514>.

⁵⁷ Forti, Mirko. "AI-Driven Migration Management Procedures: Fundamental Rights Issues and Regulatory Answers", *BioLaw Journal*, no. 2 (2021): 433-451, <https://ssrn.com/abstract=3877083>.

⁵⁸ Zuiderveen Borgesius, Frederik. "Discrimination, Artificial Intelligence, and Algorithmic Decision-Making", Council of Europe (2018), <https://rm.coe.int/discrimination-artificial-intelligence-and-algorithmic-decision-making/1680925d73>.

⁵⁹ Elliott, Anthony, ed. *The Routledge Social Science Handbook of AI*, Routledge, 1st eds (2023): 6, <https://doi.org/10.4324/9780429198533>.

Definitions

Sometimes the term "algorithm" is used to describe AI, but there is a clear difference between a mere algorithm and AI. An algorithm is an "abstract, formalized description of a computational procedure"⁶⁰. Essentially, an algorithm can be a computer program. In some cases, algorithms make decisions completely independently. For example, a spam filter in an email service automatically determines which messages are classified as spam and which are delivered to the user's inbox. AI, on the other hand, refers to systems that mimic human cognitive functions such as learning and problem solving. While algorithms are often a component of AI systems, AI encompasses a far broader range of technologies.⁶¹

3.2. Biometric data and systems

Biometric data is defined as personal data derived from physical, physiological, and behavioural characteristics and allows a person to be identified or verified based on these attributes. These characteristics can include fingerprints, iris scans, facial recognition, voice patterns, blood samples, hand geometry among others.⁶²

Biometric technology is used to measure, analyse and process an individual's characteristics. This is done either when a person's identity is not yet known, then constitutes the so-called "biometric identification" and is defined as the "*process of automatically recognising human characteristics, whether physical, physiological, behavioural or psychological, to establish a person's identity by comparing their biometric data with records stored in a database*".⁶³

When a person is already known or claims to be a certain person, then the biometric technology is used to verify the identity of this person. This process is the so-called "biometric verification" process. It works by comparing the biometric characteristics of a person with a specific dataset that is already linked to that person. For example, the ID holder's fingerprint is scanned to confirm that they are indeed the person they claim to be. According to Article 3 paragraph 36 of the AI Act, biometric verification means "*automated one-to-one verification*" or, in other words, the

⁶⁰ Zuiderveen Borgesius, Frederik. "Discrimination, Artificial Intelligence and algorithmic decision-making", *Council of Europe/Directorate General of Democracy* (2018): 11.

⁶¹ Ibid, 60.

⁶² European Parliament, Regulation (EU) 2016/679: Legislative Resolution of 27 April 2016, OJ L 119, Article 4, paragraph 14.

⁶³ European Union, AI Act, COM(2021) 206 final, Article 3 paragraph 35.

comparison of one's own biometric data with the biometric data previously provided.⁶⁴ In addition, there is a type of AI system that classifies migrants based on their biometric data. The AI Act defines these systems as “biometric categorisation systems”⁶⁵.

The Act also defines “remote biometric recognition systems”. These systems are a type of AI system that can identify people remotely and compare the person's biometric data with the data in the database. This can be done, for example, with installed cameras that are combined with software that identifies people and uses the facial and body features as biometric data. This data is then compared with data in databases.⁶⁶

Profiling is the analysis of large data sources against predetermined risk profiles to help make decisions about individuals.⁶⁷ According to the UN Counter-Terrorism Centre (UNCCT) handbook, profiling entails using information about a person to assess the likelihood that they pose a security or other risk. Factors such as the individual's origin and travel history play a crucial role in this context.⁶⁸

Finally, it is important to recognise that “digital border technologies” encompass a wide range of technologies, some of them incorporate AI, while others do not. Indeed, not all digital technologies used in border management involve AI. A relevant example is the use of drones for surveillance purposes. These drones are often equipped with various digital technologies, such as infrared cameras and night vision devices, which in themselves do not constitute AI. However, they can also be enhanced with AI capabilities, such as the ability to distinguish between humans and animals⁶⁹.

3.3. Definition of Human Rights

Human rights serve as legal safeguards primarily designed to protect individuals, although they can also offer protection to groups or legal entities. These rights are characterised by their inviolability, meaning they cannot be violated or circumvented.

⁶⁴ European Union, AI Act, COM(2021) 206 final, Article 3 paragraph 36.

⁶⁵ European Union, AI Act, COM(2021) 206 final, Article 3 paragraph 40.

⁶⁶ European Union, AI Act, COM(2021) 206 final, Article 3 paragraph 41.

⁶⁷ Zuiderveen Borgesius, Frederik. “Discrimination, Artificial Intelligence, and Algorithmic Decision-Making”, *Council of Europe/ Directorate General of Democracy* (2018): 14.

⁶⁸ UN Counter-Terrorism Centre. “Human Rights and Screening in Border Security”, UN Office of Counter-Terrorism (2018), <https://www.un.org/sites/www.un.org.counterterrorism/files/1806953-en-ctitf-handbookhrscreeningatborders-for-web2.pdf>.

⁶⁹ McGregor, Lorna. “Digital Border Governance: A Human Rights Based Approach”, *OHCHR, University of Essex* (September 2023): 8, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

Definitions

Consequently, human rights hold a superior position in the legal order, reinforced by their recognition in constitutions or international treaties. On the EU level, the most significant legal frameworks include the European Convention on Human Rights and the European Charter of Human Rights. In addition to their inviolability, human rights are also marked by their universality, inalienability, and the principle of egalitarianism. As such, every individual, including refugees and migrants, inherently possesses the same rights simply by virtue of being human.⁷⁰

3.4. Definition of migrants

In this thesis, the term "migrant" is used to describe all persons crossing the external borders of the EU for the ease of reference. This approach aligns with the definitions provided by the IOM and the UN Migration Agency, which categorise migrants as individuals crossing an international border, irrespective of their legal status, whether their movement is voluntary or involuntary, and regardless of the reasons behind it. This broad definition encompasses refugees within the category of migrants.⁷¹ In contrast, the UNHCR adopts a different perspective, excluding refugees from this broad definition due to their heightened vulnerability and the specific protection needs they require.⁷²

Additionally, the distinction between regular and irregular migrants has emerged as a result of the criminalisation of migrants. These definitions are fundamentally state imposed, reflecting governmental decisions on who is permitted to enter or remain within a country. As a result, irregular migration is not an inherent social phenomenon but rather a social and legal construct shaped by state policies.⁷³

The term "refugee" is a more precisely defined term and refers to persons in need of protection who flee their home countries. The refugees may be granted asylum status or subsidiary protection status. "Asylum seeker", on the other hand, refers to

⁷⁰ Brander, Patricia, et. al., "Compass – Manual for Human Rights Education with Young People", *Council of Europe 2* (2023); 390-426. <https://rm.coe.int/compass-2023-eng-final-web/1680af992c>.

⁷¹ IOM. "Who is a migrant?", *IOM* (2019) available at: <https://www.iom.int/about-migration>, in: Wolf, Sarah. "The Security Sector Governance-Migration Nexus: Rethinking how Security Sector Governance matters for migrants' rights", *Ubiquity Press*, SSR Paper 19 (2021), DOI: 10.5334/bcl.

⁷² Carling, Jorgen. "The end of migrants as we know them?", *UNU-Merit United Nations University* (2016), available at: <https://www.merit.unu.edu/the-end-of-migrants-as-we-know-them/>, in: Wolf, Sarah. "The Security Sector Governance-Migration Nexus: Rethinking how Security Sector Governance matters for migrants' rights", *Ubiquity Press*, SSR Paper 19 (2021).

⁷³ Düvell, Frank. "Transit migration: A blurred and politicised concept", *Population Space and Place* 18 (2012): 415–427, in: Wolf, Sarah. "The Security Sector Governance-Migration Nexus: Rethinking how Security Sector Governance matters for migrants' rights", *Ubiquity Press*, SSR Paper 19 (2021): 5-6.

those whose applications for asylum are still under review. Despite the clear definitions of these terms, they often fail to capture the full complexity of individual migration experiences. For instance, a person initially recognised as a refugee may be reclassified as an irregular migrant by the host country and subsequently deported to their country of origin.⁷⁴ This example demonstrates that the difference between irregular migrants and refugees is complex and cannot be easily determined by applying textbook definitions. In principle, any black-and-white classification should be avoided. Such categorisations not only dehumanise individuals by oversimplifying their complex situations, but also risk being internalised by the migrants themselves. Tsagarousianou's social study revealed that migrants often engage in discussions about who should be labelled as "illegal" and who is deemed a "deserving" migrant, highlighting the profound impact these classifications have on their self-perception and community dynamics.⁷⁵

4. The evolution of AI in Migration Management

The borders of a state serve to demarcate national territory and are understood as the limits of a state's sovereignty and jurisdiction. Therefore, fixed physical borders, such as walls or wire fences, are a strong expression of sovereign control over a territory. However, with the development and deployment of AI systems, borders are extending beyond their traditional physical confines, namely to the interior of countries. This is facilitated by tools such as remote surveillance, pre-departure registration, remote checks, and digital monitoring.⁷⁶ In other words, the focus has shifted from dividing territories to dividing people, particularly between 'insiders' and 'outsiders'⁷⁷. This division is reinforced by biometric technologies and, more recently, AI systems that generate risk profiles to assess the likelihood of migrants being permitted through border controls (cf. the VISIT programme in the US).⁷⁸ In Europe, borders are increasingly extend in the interior of the countries, leading to exclusion even before

⁷⁴ Wolf, Sarah. "The Security Sector Governance-Migration Nexus: Rethinking how Security Sector Governance matters for migrants' rights", *Ubiquity Press*, SSR Paper 19 (2021): 5-6. DOI: 10.5334/bcl.

⁷⁵ Tsagarousianou, Roza. "The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe", *Media, Culture & Society* 0, 0 (2023): 12-15.

⁷⁶ *Ibid*, 75.

⁷⁷ Everuss, Louis. "Mobile Sovereignty: The case of 'boat people' in Australia", *Political Geography* 79, 102162 (2020), cited in: Elliott, Anthony, ed. "*The Routledge Social Science Handbook of AI*", Routledge, 1st eds (2023): 345, <https://doi.org/10.4324/9780429198533>.

⁷⁸ Amore, L. "Biometric borders: Governing mobilities in the war on terror", *Political Geography* 25, 3 (2006): 340, cited in: Elliott, Anthony, ed. "*The Routledge Social Science Handbook of AI*", Routledge, 1st eds (2023): 345, <https://doi.org/10.4324/9780429198533>.

reaching the border (cf. Germany). Amoore highlights in this context, that it is the migrants' body which becomes the "carrier of the border", as multiple access barriers are assigned to it⁷⁹

Looking back, the transformation of borders stemmed from the growing necessity for states to identify individuals within their sovereign territories, driven by factors such as increasing population mobility and security concerns. Techniques were developed over time to uniquely identify individuals. One of the first of such techniques was the selective passport issuance. Thereby, passports were primarily granted to specific groups like merchants and envoys. In fact, a system emerged that categorized individuals based on their eligibility to enter a country, delineating between those with permission, those requiring permits, and those denied entry. Conversely, the absence of passports among marginalised groups facilitated precise control over their movements, thereby limiting their mobility. Consequently, the advent of national passports initially regulated internal movement, leading to more effective border control measures.⁸⁰

However, the simplicity of passports and other identity documents made them susceptible to misuse, including forgery or unauthorised transfer to others. Therefore, the first effective identification system was the system of storing fingerprints, which was introduced at the turn of the 20th century, serving both law enforcement and migration control purposes. The advent of photography further enhanced identification measures, with traveller portraits utilised for identification purposes.⁸¹ Moreover, AI traces back in history more than we think. In 1943, Warren McCulloch and Walter Pitts developed a model of synthetic neurons, laying the foundation for what we know today as AI.⁸² This model demonstrated the basic principle of artificial neural networks, which mimics the biological processes of the brain. Even today, modern models of artificial neural networks build on this foundation and offer immense potential,

⁷⁹ I Amoore, L. "Biometric borders: Governing mobilities in the war on terror", *Political Geography* 25, 3 (2006): 340, cited in: Elliott, Anthony, ed. "*The Routledge Social Science Handbook of AI*", Routledge, 1st eds (2023): 345.

⁸⁰ Tsagarousianou, Roza. "The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe", *Media, Culture & Society* 0, 0 (2023): 12-15.

⁸¹ Shyamasundar, R.K. "The computing legacy of Alan M. Turing (1912-1954)", *Current Science* 12 (2014): 1678.

https://www.researchgate.net/publication/297349135_The_computing_legacy_of_Alan_M_Turing_1912-1954.

⁸² Weber, Jutta and Prietl, Bianca. "AI in the age of technoscience", in "*Routledge Social Science Handbook of Artificial Intelligence*", Routledge 1st Edition (2021): 58-59, ISBN: 9780429198533.

particularly in areas such as speech and image recognition.⁸³ In 1950, Alan Turing laid the foundations for machine learning. He investigated the possibility of computers being able to think and developed the Turing-test, to determine whether a computer has human-like intelligence. However, it is still being determined whether a computer will ever be able to think like a human, also because no computer has ever passed the Turing test.⁸⁴

In recent decades, the concept of "border security" has increasingly become an important pillar of EU policy. Initially, the focus was on basic control measures at external borders, but the terrorist attacks of September 2001 prompted a shift toward a more security-oriented approach, aimed at protecting the EU from potential terrorist threats. Consequently, border governance has increasingly been aligned with internal security objectives.⁸⁵ Alongside these efforts, states have increasingly turned to innovative technologies, such as biometric systems, AI technology and Big Data, to implement their migration management policies and programs. Whether motivated by pro- or anti-immigration objectives, the governments intentions drive the introduction of AI tools to manage migration.⁸⁶

AI technologies aimed at enhancing security include automated border checks, algorithmic recognition and classification of objects, unmanned surveillance capabilities, maritime domain awareness, predictive analytic tools and geospatial data analytics.⁸⁷ What they all have in common is that they increase the surveillance over migrants and refugees. The deployment of such technologies impacts not only the processes but also the outcomes of decisions, which are traditionally made by administrative tribunals, immigration officers, border agents, and other officials involved in immigration systems, border enforcement and refugee management.⁸⁸

⁸³ Tewari, Jolly and Bose, Malobika. "History of Artificial Intelligence", *Indian Journal of Law and Legal Research* 2 (2023), 1-9. <https://www.ijllr.com/post/history-of-artificial-intelligence>.

⁸⁴ Shyamasundar, R.K. "The computing legacy of Alan M. Turing (1912-1954)", *Current Science* 12 (2014): 1678.

⁸⁵ Baldaccini, Anneliese. "Counter-Terrorism and the EU-Strategy for Border Security: Framing Suspects with Biometric Documents and Databases", *European Journal of Migration and Law* 10 (2008): 31-49, DOI: <https://doi.org/10.1163/138836407X261308>.

⁸⁶ Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23, DOI: <https://doi.org/10.1186/s40878-022-00305>.

⁸⁷ Szwed, Agata. "The use of artificial intelligence in migration-related procedures in the European Union - opportunities and threats", *Procedia Computer Science* 207, Issue C (2022): 3639–3645.

⁸⁸ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 16.

II. AI systems in border and migration management

In the EU, AI technologies are or will be used at every stage of the migration process. This starts in the phase before entering the EU territory. In this phase, AI-supported chatbots provide information and automated decision-making systems decide on visa applications. During entry, AI facilitates identity verification and security checks using biometric data and monitors borders using unmanned surveillance towers, AI-powered sea vessels, and drones. Hungary, Greece and Estonia, for example, integrate AI into unpiloted vehicles, such as drones, to expand their aerial surveillance.⁸⁹ After entry, AI systems check applications for legal residence and makes repatriation decisions. In addition, AI can predict future migration movements and potential crises, and so provide insights into migration management that were previously beyond reach.⁹⁰ It is important that each technology is assessed on its own merits. Consequently, the following chapters will individually examine each technology, considering both its legal and social implications.

5. Predictive analytic systems

Predictive analytical AI systems can forecast future migration movements with an unprecedented level of accuracy. By using techniques such as data mining, predictive modelling and machine learning, these systems can predict the number of people attempting to cross international borders.⁹¹ The EU has recognised the potential of these technologies and is gradually integrating them. One example of such a system is the Early Warning and Preparation System (EWPS), which has been developed by the European Asylum Agency (EUAA). The tool would, in principle, predict future population movements and future pressures on Member States' asylum systems.⁹² The input data for the system mainly includes historical data on past migration trends, data on social media activity, information from the EU's external borders and data on

⁸⁹ Catelli, Chiara. "Beyond walls and fences: EU funding used for a complex and digitalised border surveillance system", *PICUM* (2024): 27, <https://picum.org/blog/thematique/eu-migration-policies/>.

⁹⁰ Szwed, Agata. "The use of artificial intelligence in migration-related procedures in the European Union - opportunities and threats", *Procedia Computer Science* 207, Issue C (2022): 3639–3645.

⁹¹ European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19, <https://www.accessnow.org/wp-content/uploads/2022/05/Uses-of-AI-in-migration-and-border-control.pdf>.

⁹² European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

the outcome of asylum applications.⁹³ This data is then analysed by an algorithm based on machine learning. In principle, the system attempts to predict the events that will lead to a large movement of refugees. Based on this information, the system can estimate the number of asylum applications in the EU up to four weeks in advance.⁹⁴

5.1. The impacts of predictive AI tools on Human Rights

The predictive tools have a dual impact. On one hand, their increased predictability can improve the asylum application process by allowing authorities to schedule additional staff, which may help in speeding up administrative processes for migrants and reduce the burden on refugee camps. Additionally, predictive tools can enhance the provision of humanitarian aid, such as food, shelter, and medical care.⁹⁵

On the other hand, predictive tools risk projecting biases and power imbalances of the past into future.⁹⁶ This issue stems not only from potential biases in algorithms, but from the fundamental nature of prediction itself. Predictive AI tools, or rather their underlying algorithms, rely on historical data to forecast future events, such as migration flows. In a world marked by racial stratification, this approach tends to project past inequalities into future scenarios.⁹⁷ Consequently, this can lead to reinforcing border controls or implementing measures to exclude certain migrants from Europe. Scholars have stressed in this context that it is necessary to ensure that data which is correlated with race must be excluded from the dataset of the underlying predictive analytic tool to prevent discriminatory outcomes.⁹⁸ This is in line with the opinion of the UNHCR, which has also warned that predictive tools inherent the risk of perpetuating discrimination, as the data they use often reflects entrenched racial and ethnic

⁹³ Carammia, Marcello, Iacus, Stefano Maria & Wilkin, Teddy. "Forecasting asylum-related migration flows with machine learning and data at scale", *Sci Rep* 12, 1457 (2022).
<https://doi.org/10.1038/s41598-022-05241-8>.

⁹⁴ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre, University of Oxford* (2023): 1-30, DOI:10.13140/RG.2.2.24295.46248.

⁹⁵ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

⁹⁶ Mayson, Sandra G. "Bias In, Bias Out", *Yale Law Journal* 128, 2218 (2018)
https://scholarship.law.upenn.edu/faculty_scholarship/2393.

⁹⁷ Ibid, 96.

⁹⁸ Ibid, 96.

biases⁹⁹. (See Chapter 20) In line with several academics¹⁰⁰, this thesis contends, that predictive analytic tools can lead to biased assumptions about certain groups and classifies them as a higher risk for being an irregular migrant. This in turn can prompt preventive measures that intercept and restrict the movement of these groups, jeopardising their right to equal treatment and non-discrimination.¹⁰¹

Second, it must be questioned what is happening with all this data?¹⁰² Even when states and international organisations collect data with the primary aim of predicting large population movements, there is no guarantee that this data will be used solely for that purpose. As will be explored in greater detail in the forthcoming Section on Data Collection (See Section V.), the act of gathering and holding data is inherently political, particularly when conducted by powerful entities such as states and international organisations.¹⁰³ Furthermore, the data can be misused for political ends, such as affecting the distribution of aid and resources and to supporting hardline anti-immigration policies.¹⁰⁴ In other words, predictive tools can contribute to pushbacks and the immobilisation of migrants, thereby undermining the right to asylum and the principle of non-refoulement.¹⁰⁵

In addition, predictive analytics systems often require the use of extensive personal data, which in turn raises concerns about data protection principles and the protection of privacy. In particular, the systems may call into question the principle of purpose limitation, as the data collected for a specific purpose could be used for predictive analyses without proper authorisation. Furthermore, it is difficult to almost impossible to obtain the explicit consent of data subjects for their data to be analysed for these systems. Moreover, the data protection principle of data minimisation is also

⁹⁹ OHCHR. "The right to privacy in the digital age: Report of the United Nations High Commissioner for Human Rights", A/HRC/48/31 (2021): §24, <https://www.ohchr.org/en/calls-for-input/2021/right-privacy-digital-age-report-2021>.

¹⁰⁰ See cf: Beduschi, Ana. „International migration management in the age of artificial intelligence”, *Oxford University Press* 9, no. 3 (2021): 576-596. DOI:10.1093/migration/mnaa003, and Forti, Mirko. "AI-Driven Migration Management Procedures: Fundamental Rights Issues and Regulatory Answers", *BioLaw Journal*, no. 2 (2021): 433, <https://ssrn.com/abstract=3877083>, and Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 310.

¹⁰¹ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre, University of Oxford* (2023), DOI:10.13140/RG.2.2.24295.46248.

¹⁰² Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 17.

¹⁰³ Ibid, 102.

¹⁰⁴ Ibid, 102.

¹⁰⁵ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 7, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

at risk, as these systems usually require large amounts of data to function effectively, leading to disproportionate data processing.¹⁰⁶

The EDPS has also voiced these concerns, particularly in relation to the latter mentioned EUAA tool. In his opinion, the EDPS criticised the monitoring of social media activities of migrants and refugees and emphasized that such monitoring violates fundamental principles of personal data protection and endangers the rights and freedoms of these vulnerable groups. He underscored the importance of adhering to the principles of purpose limitation and data minimization, by arguing that this personal data should only be collected for very specific and legitimate purposes. Moreover, he stressed that these risks are especially acute when the data pertains to vulnerable populations or includes information that could be associated with criminal allegations. The EDPS also warned that these surveillance techniques are likely to be used to restrict migratory movements.¹⁰⁷

In summary, predictive analytics systems contribute to a framework for heightened surveillance towards migrants and refugees by analysing data and revealing how many people are willing to migrate to Europe.¹⁰⁸ The research showed that predictive analytics systems, by their very nature, can easily be leveraged to justify more stringent border controls and restrictive policies. This approach not only prioritises security concerns over humanitarian considerations but also risks perpetuating a „Fortress Europe“ mentality that undermines the fundamental rights of migrants and asylum seekers. The deployment of such technologies should therefore be scrutinised to ensure they do not solely serve to entrench exclusionary practices¹⁰⁹. Moreover, the data-driven nature of these systems can lead to an over-reliance on quantitative metrics, potentially overlooking the complex and nuanced realities of individual migration experiences¹¹⁰. This reductionist view can result in policies that are

¹⁰⁶ European Digital Rights (EDRi). “Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act”, *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

¹⁰⁷ European Data Protection Supervisor (EDPS). “Statement by the Data Protection Officer on the European Asylum Support Office (EASO) Social Media Monitoring Reports (case 2018-1083)”, *Data Protection Officer, European Asylum Support Office* (2019), https://edps.europa.eu/sites/default/files/publication/19-11-12_reply_easo_ssm_final_reply_en.pdf.

¹⁰⁸ Ibid, 106.

¹⁰⁹ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 17-22.

¹¹⁰ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 20.

Identity verification technologies

ill-suited to addressing the root causes of migration and fail to provide adequate protection to those in need¹¹¹.

5.2. Regulation of these systems

At present predictive analytics systems do not fall within the scope of the AI Act, therefore they are exempted from its requirements and protective measures. Given the significant risks they pose to human rights, this thesis argues that these systems should be classified as “high-risk systems” under the AI Act. If their primary purpose, however, is to interdict, restrict or prevent movement, they pose an unacceptable risk to fundamental rights and should be entirely prohibited by including them in Article 5 of the AI Act, which addresses prohibited AI practices.¹¹²

6. Identity verification technologies

AI-driven technology is used to verify the authenticity of migrants' identities and their accompanying documents. In the Netherlands, for example, the Immigration and Naturalisation Service (IND) uses algorithms to detect potential fraud in documents such as residence permits, birth certificates and marriage certificates. The program works by using pattern recognition tools. It categorises documents into different risk levels, which are intended to support the human agent in their decision-making process. In addition, there is an EU-funded research project called Horizon 2020, which aims to recognise document fraud. This project aims to develop new technologies for identity and document verification, with a focus on developing hardware that can recognise forged documents based on biometric data.¹¹³

Furthermore, AI technologies are used to verify the identity of individuals by dialect recognition, as for example in Germany¹¹⁴, and facial recognition technologies.

¹¹¹ Catelli, Chiara. “Beyond walls and fences: EU funding used for a complex and digitalised border surveillance system”, *PICUM* (2024): 27, <https://picum.org/blog/thematique/eu-migration-policies/>.

¹¹² European Digital Rights (EDRi). “Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act”, *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

¹¹³ Ozkul, Derya. “Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe”, *Oxford: Refugee Studies Centre, University of Oxford* (2023): 6-8.

¹¹⁴ Ozkul, Derya. “Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe”, *Oxford: Refugee Studies Centre, University of Oxford* (2023): 43.

6.1. Facial recognition

At present, facial recognition technology (FRT) is employed for identity verification purposes in several EU Member States. The technology relies on facial biometrics or, in other words, features of the face. It is commonly used in electronic passports, where a photograph of the passport holder is matched with a live image when the passport is presented. Such a process is known as "one-to-one" matching. A second example is FRT technology, which is used to match live images of individuals with watch-lists of persons of interest or 'risk'. This process, is known as "one-to-many matching" and uses machine learning techniques to assess the likelihood that the two images belong to the same person.¹¹⁵ FRT can also be used to monitor large numbers of people by simply installing the cameras in border spaces. Such advanced cameras are able to scan multiple people simultaneously, often without their consent. Compared to traditional closed-circuit television (CCTV), which has been used to monitor people for more than 25 years, FRT cameras, often combined with AI technology, are much more invasive towards the privacy of people on the move.¹¹⁶

To illustrate the use of FRT for surveillance purposes, one can consider the Spanish-Moroccan border. At the entry and exit points of Ceuta and Melilla, more than thirty-five cameras equipped with FRT technology have been installed. These cameras are integrated into a 'Live Face Identification System', implemented by Gunnebo Iberia and Thales Spain, with the objective of strengthening border control and security. In essence, they serve to monitor individuals crossing into European Union territory.¹¹⁷

Furthermore, advanced technology now enables flexible mobile facial scanning, capable of detecting faces inside vehicles such as cars, trucks, and buses. The cameras capture facial images and match them to a database that instantly provides personal information about the identified individuals. This technology also facilitates the use of 'blacklists,' allowing authorities to deny entry to individuals flagged on these

¹¹⁵ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022): 8-10.

¹¹⁶ Feldstein, Steven. "The global expansion of AI surveillance", *Carnegie Endowment for International Peace* (2019), <https://carnegieendowment.org/research/2019/09/the-global-expansion-of-ai-surveillance?lang=en>.

¹¹⁷ Bergh, Sylvia I., et al., "Marocco's Governance of Cities and Borders: AI Enhanced Surveillance Facial Recognition, and Human Rights", in: "*The Cambridge Handbook of Facial Recognition in the Modern State*" Cambridge Law Handbooks, Cambridge University Press (2024): 267-284, DOI: <https://doi.org/10.1017/9781009321211>.

lists. It is anticipated that the Ceuta border will record approximately 40,000 facial scans per day, while Melilla is expected to process twice that number.¹¹⁸

6.2. The impacts on Human Rights

FRT has already prompted concerns under the GDPR, the EU Charter, and the Law Enforcement Directive.¹¹⁹ However, its specific implications for migrants, particularly considering recent AI advancements integrated into FRT, have not been thoroughly examined, even though they are likely similar to the issues already identified.

An important issue is the lack of access to the repositories in which the images captured by facial recognition cameras are stored. This issue is exacerbated by the lack of regulation in this context.¹²⁰ It simply remains unclear, how the biometric data is used, how long it is stored and by whom it could be used. This is compounded by a general lack of consent, especially in contexts involving migrants who are not asked for permission to be scanned at border crossings. FRT cameras, which are used to monitor people remotely, lead to a paradoxical situation in which the monitoring takes place before the person even has the opportunity to give their consent to the monitoring.¹²¹

In addition, the accuracy of FRT varies considerably, in fact several studies have shown unacceptably high error rates. For example, FRT for surveillance purposes only works well under ideal conditions, but its effectiveness decreases when faced with variables such as bad weather or blurred images. Interestingly, this shortcomings within the FRT cameras are also known among refugees. With this knowledge on the part of the migrants' new methods emerge, such as swimming across the border only while foggy weather to evade camera detection. It is obvious that these developments have severe human rights implications, as they lead to the creation of new deadly

¹¹⁸ Bergh, Sylvia I., et al., "Marocco's Governance of Cities and Borders: AI Enhanced Surveillance Facial Recognition, and Human Rights", in: *The Cambridge Handbook of Facial Recognition in the Modern State* Cambridge Law Handbooks, Cambridge University Press (2024): 267-284, DOI: <https://doi.org/10.1017/9781009321211>.

¹¹⁹ Raposo cited in: Neuwirth, Rostam J. "Prohibited artificial intelligence practices in the proposed EU artificial intelligence act (AIA)", *Computer Law & Security Review* 48, 105798 (2023): 1-14. <https://doi.org/10.1016/j.clsr.2023.105798>.

¹²⁰ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 8, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

¹²¹ Ibid, 118.

migration routes.¹²² Furthermore, the FRT technologies also have a deterrence effect on border crossings, because migrants are unsure whether they could be detected by AI surveillance systems, even if there is no physical force or border walls.¹²³ Moreover, FRT has been shown to exhibit gender and racial biases, resulting in higher false positive rates for minorities and women. As Steve Lohr noted in the *New York Times*, "the darker the skin, the more errors arise"¹²⁴. Thus, FRT can also bring risks to the right of non-discrimination.

7. Automated Decision-Making techniques

Automated decision-making (ADM) is designed to either assist humans in making decisions or to independently make decisions without human input.¹²⁵ The AI takes decisions by mimicking human intelligence and the more closely it resembles "human likeliness" (anthropomorphism), the more willing people are to trust it to make autonomous decisions.¹²⁶ In the context of migration management ADM systems can decide on visa and asylum applications and assess whether someone poses a 'risk' to security, thus calling for refusal of entry to EU territory. What these decisions have in common is that they are highly discretionary and often depend on the assessment of a migrants' life story and whether it is truthful and credible or not.¹²⁷

Apart from the technological reliability of these systems, it remains unclear what the criteria for constituting a „risk“, a „fraud“ or a „red flag“. These definitional issues are exacerbated by the inherent opacity of these technologies and their decision-making process.¹²⁸ Thus, as this thesis argues, that relying solely on AI to decide a refugee status or the need for protection from deportation would be a serious violation of human rights. This is because such decisions require a thorough consideration of the potential future risks faced by individuals and the assessments are always nuanced

¹²² Bergh, Sylvia I., et al., "Marocco's Governance of Cities and Borders: AI Enhanced Surveillance Facial Recognition, and Human Rights", in: *The Cambridge Handbook of Facial Recognition in the Modern State* Cambridge Law Handbooks, Cambridge University Press (2024): 267-284.

¹²³ Feldstein, Steven. "The global expansion of AI surveillance", *Carnegie Endowment for International Peace* (2019): 5-24.

¹²⁴ Ibid, 123.

¹²⁵ Skaug Sætra, Henrik. „A typology of AI applications in politics“, in: A. Visvizi, M. Bodziany (Eds.) *Artificial Intelligence and its Contexts: Advanced Sciences and Technologies for Security Applications*, Springer (2021): 27-43, DOI: 10.1007/978-3-030-88972-2_3.

¹²⁶ Ivanov, Stanislav and Webster, Craig. "Automated decision-making: Hoteliers' perceptions", *Technology in Society* 76 (2024): 1-2, <https://doi.org/10.1016/j.techsoc.2023.102430>.

¹²⁷ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 25.

¹²⁸ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 25-26.

Automated Decision-Making techniques

and complex, which in turn demands a level of human judgement that current AI systems are not yet capable of providing.¹²⁹ In other words, the complexity of migratory movements and the human experiences that come with it, cannot be reduced in such a way that algorithm grasp all the factors relevant to the decision.¹³⁰ Therefore, the use of these ADM technologies in migration management fosters an environment that is „ripe for algorithmic discrimination“¹³¹.

Furthermore, the degree of the decision being automated varies as well. ADM systems can range from fully automated processes, such as e-gates that verify passports and permit passage, to systems that incorporate a human element. For example, an immigration officer may review a decision prepared by a computer. With the latter, the ultimate decision rests with the human officer and therefore the decision is not fully automated. However, as Wagner et al. note, "*the human being may often be led to rubber stamp*"¹³². This is when the human agent does not have the time nor the abilities to make an adequate decision in each individual case and therefore follows the algorithmically prepared decision blindly¹³³. This phenomenon is also called "automation bias" and describes the tendency to believe in the infallibility of computers and to rely too much on the results of algorithmic systems, even if this contradicts personal convictions. A bias towards automation can also be observed in migration management, as civil servants, being human, often tend to trust the outcomes generated by machines. Automation bias stems from cognitive laziness, the insufficient ability to question the results and the perception of the superiority of the computer.¹³⁴ As a result, the line between human decision making and ADM is unclear and sometimes blurred.¹³⁵

¹²⁹ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 316.

¹³⁰ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 25.

¹³¹ Ibid, 130.

¹³² Wagner, Ben, et. al. „Algorithms and Human Rights: Study on the human rights dimensions of automated data processing techniques and possible regulatory implications“, prepared by the Committee of Experts on internet intermediaries (MSI-NET), *Council of Europe* (2018), <https://edoc.coe.int/en/internet/7589-algorithms-and-human-rights-study-on-the-human-rights-dimensions-of-automated-data-processing-techniques-and-possible-regulatory-implications.html>.

¹³³ Ibid, 132.

¹³⁴ Huggins, Anna. "Addressing Disconnection: Automated Decision-Making, Administrative Law and Regulatory Reform," *University of New South Wales Law Journal* 44 (2021): 1067, <https://doi.org/10.53637/WCGG2401>.

¹³⁵ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

7.1. The Human Element

At this stage, it is necessary to analyse the “human element”, which found has been prominently featured in legal frameworks, adjudication and literature. In principle, there are three approaches to AI involvement in decision-making: The “human-in-the-loop” concept allows AI to suggest decisions, with humans retaining full control over the final choice. The “human-on-the-loop” model, where AI makes and implements decisions, though humans have the authority to override them. Lastly, the “humans-out-of-the-loop” approach, where AI autonomously makes decisions without human intervention.¹³⁶

Regardless of the level of human intervention, scholars, policymakers, and even the Court agreed on the importance of retaining the “human element” in decision-making processes.¹³⁷ This was further affirmed by the Commission, which emphasised that human oversight is essential in ensuring that AI systems must not produce adverse effects.¹³⁸ Furthermore, the new AI Act states that human oversight shall aim at preventing or minimising the risks to health, safety or fundamental rights by including it into the decision-making processes.¹³⁹ Apart from the new AI Act, the concept of the human intervention has long been integrated into the established GDPR. In its Article 22 GDPR, the Regulation provides for the right not to be subjected to a decision solely based on automated processing, including profiling, if the decision has legal effects on the individual.¹⁴⁰ Thereby, the GDPR even provides a prohibition of ADM and a right to the human element in the decision-making process.¹⁴¹ Despite the overlapping objectives of the AI Act and the GDPR, a difference in scope exists. Namely, the AI Act imposes stricter human oversight requirements specifically for high-risk AI systems, as

¹³⁶ Ivanov, Stanislav and Webster, Craig. “Automated decision-making: Hoteliers’ perceptions”, *Technology in Society* 76 (2024): 1-2, <https://doi.org/10.1016/j.techsoc.2023.102430>.

¹³⁷ Foster, Madeleine. “Refugee Protection in the artificial intelligence era: A test case for rights”, *Royal Institute of International Affairs* (September 2022): 21-22.

¹³⁸ Lazcoz, Guillermo & De Hert, Paul. „Humans in the GDPR and AIA governance of automated and algorithmic systems: Essential pre-requisites against abdicating responsibilities”, *Computer Law & Security Review* 50, 105833 (2023): 1-20, <https://doi.org/10.1016/j.clsr.2023.105833>.

¹³⁹ European Union, AI Act, COM(2021) 206 final, Article 14 paragraph 2.

¹⁴⁰ European Union, *GDPR*, Regulation (EU) 2016/679, Article 22.

¹⁴¹ Zuiderveen Borgesius, Frederik. “Discrimination, Artificial Intelligence and algorithmic decision-making”, *Council of Europe/Directorate General of Democracy* (2018).

Automated Decision-Making techniques

stipulated in Article 8 (1) and Article 14. Conversely, the GDPR mandates human oversight for all automated decision-making processes.¹⁴²

Furthermore, the approach of retaining a human in the process has also been reinforced through judicial rulings. The most important case is the Court of Justice decision in 2022, which outlined a non-exhaustive set of guidelines regarding ADM processes. Even if the case concerned “automated processing of Passenger Name Records (PNR) data” and its corresponding Directive¹⁴³, the findings are also relevant in the context of ADM decisions in the migration management context. In its ruling, the Court highlighted that algorithmic profiling must be supplemented by human review to eliminate false positives and prevent discriminatory outcomes. Further, the Court mandated that any risk assessment must be subjected to an “individual re-examination” by a human before any adverse action is taken against a traveller.¹⁴⁴ Furthermore, the Court held that pre-established criteria must be specific and non-discriminatory.¹⁴⁵ However, by prescribing a human review as the primary solution to discriminatory results, the CJEU overlooked huge challenges in ADM processes, such as automation bias and data quality issues. Furthermore, the judges failed to develop a consistent and effective method for implementing non-discrimination measures.¹⁴⁶

In general, the “human element” is widely recognised as a safeguard mechanism against discriminatory outcomes of the ADM systems. Yet, relying solely on a human reviewer is not as easy and involves many more considerations, such as automation bias. Therefore, this thesis advocates for a slightly different approach: Namely, that it is the ‘human judgement’ which should not be replaced but augmented by technology. Unlike the approach of a “human element” as a safeguard against adverse effects from ADM processes, this perspective asserts that human judgement should remain central and not be overridden by AI outcomes. Essentially, this means that AI should support human decision-making rather than merely being reviewed by humans. This concept is already evident in some border control practices, where immigration authorities maintain that a human should make the final decision on security risks, with AI

¹⁴² Lazcoz, Guillermo & De Hert, Paul. „Humans in the GDPR and AIA governance of automated and algorithmic systems: Essential pre-requisites against abdicating responsibilities”, *Computer Law & Security Review* 50, 105833 (2023): 1-20.

¹⁴³ Haitzma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

¹⁴⁴ Court of Justice of the European Union, *Case C-817*, 2022, paras. 123, 203.

¹⁴⁵ *Ibid*, 144.

¹⁴⁶ *Ibid*, 143.

technology serving only as an advisory tool.¹⁴⁷ In addition, projects such as the iBorderCtrl project are developed with the intention of leaving the final decision in human hands, with AI technology serving as a tool to assist, not replace, human judgement. However, the specific terms and conditions for the inclusion of the human element are still being worked out, including by adjudication.¹⁴⁸

8. Algorithmic profiling

AI technology is also used for automated risk assessment and profiling techniques. In principle, risk assessment, profiling and automated processing all relate to the same thing, namely, to determine whether a person poses a "risk" to public safety and should therefore be detained. For the sake of clarity, the term "algorithmic profiling" is used in this thesis to refer to all techniques that relate to the AI-driven behavioural analysis of the individuals.¹⁴⁹ Algorithmic profiling involves analysing data collected from migrants or asylum seekers and automatically matching it against databases and predefined risk categories to identify individuals who may be involved in terrorism or serious crime.¹⁵⁰ The risk categories used are based on predetermined characteristics that are often opaque and not publicly disclosed.¹⁵¹ The characteristics are also mainly predictive in nature, i.e. the person has not yet committed a crime and is not yet known to law enforcement authorities. However, they should be indicative in determining that individuals assessed might commit a criminal offence in the future, or in short, pose a "risk" to national security. Nowadays, predictive characteristics are based on patterns found in data sets using data mining techniques. However, not every characteristic used is predictive in nature, some are also based on existing knowledge of criminal

¹⁴⁷ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022): 21-22.

¹⁴⁸ Ibid, 147.

¹⁴⁹ Custers, Bart. "Data Dilemmas in the Information Society: Introduction and Overview," in *Discrimination and Privacy in the Information Society, Studies in Applied Philosophy, Epistemology and Rational Ethics*, Springer 3 (2013), found in: Haitzma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

¹⁵⁰ Haitzma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

¹⁵¹ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre, University of Oxford* (2023).

Algorithmic profiling

behaviour.¹⁵² The databases used to compare the individuals can be national, European or international. The Schengen Information System (SIS II) is primarily used in Europe to check alerts on persons or objects, while Interpol databases are used internationally. Based on the alerts generated, authorities decide the necessary actions, such as detention or further investigation.¹⁵³

8.1. Human Rights implications of algorithmic profiling

Algorithmic profiling technology pose a risk to the right to non-discrimination, both in a direct and indirect way, due to its lack of transparency and possible bias in the assessment criteria (the latter mentioned predetermined characteristics).¹⁵⁴ Direct discrimination occurs, when protected characteristics, such as race and ethnicity is used as selection criteria. Indirect discrimination occurs when seemingly neutral characteristics reveal protected characteristics. For example, the neutral characteristic of a zipo code is used to disadvantage migrants fleeing from a specific region.¹⁵⁵

In addition, the algorithms are trained to use existing data and previous decisions, which may be biased. Machine learning technology takes existing data sets, which are often biased, and applies these biases to future decisions. For example, the UK Home Secretary found that an automated visa application system was learning from an already biased datasets and was racially discriminatory, because earlier decisions were. This system processed the information provided by applicants and assigned each person a colour code (green, amber or red) based on a traffic light system and lead to biased results.¹⁵⁶

¹⁵² Custers, Bart. "Data Dilemmas in the Information Society: Introduction and Overview," in *Discrimination and Privacy in the Information Society, Studies in Applied Philosophy, Epistemology and Rational Ethics*, Springer 3 (2013), found in: Haitsma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

¹⁵³ Haitsma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

¹⁵⁴ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre*, University of Oxford (2023).

¹⁵⁵ De Schutter, Olivier. "*International Human Rights Law*", Cambridge University press 3rd eds. (2019): 722, DOI: 10.1017/9781108564588.

¹⁵⁶ Vavoula, Niovi. "Unpacking the EU Proposal for an AI Act: Implications for AI systems used in the context of migration, asylum and border control management", *TPQ* 20, no. 4 (2022): 119-127, <http://turkishpolicy.com/article/1100/unpacking-the-eu-proposal-for-an-ai-act-implications-for-ai-systems-used-in-the-context-of-migration-asylum-and-border-control-management>.

Apart from the right not to be discriminated against, automated algorithmic profiling also interferes with privacy and data protection rights. While most AI systems require big data, it is the algorithmic profiling techniques that are specifically built on this data. In fact, data is collected from various sources, including official government data, biometric data, records from private companies and even from individuals' phones.¹⁵⁷

8.2. Algorithmic profiling within the AI Act

The AI Act classifies algorithmic profiling of individuals as "high-risk" AI systems. However, Article 83 of the AI Act exempts large-scale EU IT systems from its scope if they were implemented or are to be implemented within 12 months of the Act's application date. Consequently, algorithmic profiling by systems such as the European Travel Information and Authorisation System (ETIAS)¹⁵⁸ and the Visa Information System (VIS) which were implemented in 2023, are exempted from the scope of the Act and are not obliged to fulfil the safeguards therein.¹⁵⁹ The problematic nature of this exclusion clause will be analysed in a later chapter.

9. Emotion recognition technology

AI polygraphs such as lie detectors and emotion recognition technologies are systems that can infer a person's emotional state or intentions based on biometric data or other physical, physiological or behavioural characteristics. These systems could be used during the migration process to detect terrorist intentions and people's emotions.¹⁶⁰ The aim of the developers of this technology is to check migrants for their trustworthiness in order to ensure security in EU territory. Emotion detection is a practise that dates back to centuries-old efforts to use lie detectors for law enforcement to convict criminals. Despite this long history, scientific knowledge is limited, and it is not yet clear with certainty whether and how there is a connection between physiological and physical data and a person's true intentions. For example, there is

¹⁵⁷ Vavoula, Niovi. "Unpacking the EU Proposal for an AI Act: Implications for AI systems used in the context of migration, asylum and border control management", *TPQ* 20, no. 4 (2022): 119-127.

¹⁵⁸ ETIAS requires visa-free nationals to register with personal data, which is then cross-checked against EU and Interpol databases.

¹⁵⁹ *Ibid*, 157.

¹⁶⁰ European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

Emotion recognition technology

neither a common set of facial movements when someone is lying, nor a set of micro-gestures when someone is a risk to society.¹⁶¹

Emotion recognition technologies are not yet used at EU borders. Yet, some EU-funded projects have been tested and are under development. One such example is the iBorderCtrl project, which seeks to improve the speed and thoroughness of border controls of third-country nationals entering the EU.¹⁶² It was funded under the EU's Horizon 2020 programme and the Secure Societies programme and combines a range of advanced technologies, including biometric verification, emotion recognition, document authentication and risk assessment, into a single system. Three European countries, namely Hungary, Latvia and Greece, took part in the project.¹⁶³ The technology works as follows: First, people are asked personalised questions by an "avatar agent". Their answers are recorded via webcam and their micro-gestures are analysed to determine the probability of truthfulness. In the subsequent phase, when migrants arrive at EU borders, their facial expressions recorded during the pre-screening process are matched with images from earlier border crossings. Those flagged as a potentially "higher risk" are then subject to more detailed examination by border officials.

The project has been widely criticised, primarily because the technology's efficiency in accurately assessing human behaviour lacks scientific validation.¹⁶⁴ For example, a team of scientists from the UK-based firm, Silent Talker, have pointed out that there is insufficient scientific evidence to support the accuracy of the technology in assessing individual behaviour by looking at micro gestures¹⁶⁵. Furthermore, they highlighted that such emotion detection tools lead to bias against people based on their skin colour, gender, age and cultural background. In fact, Silent Talker found in its

¹⁶¹ Vavoula, Niovi. "Unpacking the EU Proposal for an AI Act: Implications for AI systems used in the context of migration, asylum and border control management", *TPQ* 20, no. 4 (2022): 119-127.

¹⁶² European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

¹⁶³ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre, University of Oxford* (2023): 26-27

¹⁶⁴ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 20.

¹⁶⁵ Rothwell, Janet, et. al. „Silent talker: a new computer-based system for the analysis of facial cues to deception", *Applied Cognitive Psychology* 20, 6 (2006): 757-777, DOI: <https://doi.org/10.1002/ACP.1204>.

research that the technology has a higher accuracy with men than women and higher accuracy with European individuals than non-European individuals.¹⁶⁶

Another example of these developments is an automated virtual agent for real-time truth assessment (AVATAR). This project is nothing more than a "lie detector" for evaluating the credibility of individuals crossing international borders. The system was developed by the BORDERS Research Centre at the University of Arizona with support from the EU Agency Frontex. The AVATAR works by measuring "changes in eye movements, pupil dilation and the voice"¹⁶⁷. With the captured measurements, it is then assessed if the migrant poses a risk.¹⁶⁸ Compared to the iBorderCtrl project (73-75% accuracy rate), the AVATAR project has an even lower accuracy rate, ranging from 60 to 80 percent¹⁶⁹. According to FRONTEX, there is a serious risk of algorithmic bias that can affect the reliability and performance of these systems.¹⁷⁰

To summarise, emotion detection is a scientific unproven and unreliable technology. This is because facial expressions and facial movements vary according to culture and situation. Furthermore, factors such as stress and trauma can distort the results as well. Moreover, facial expressions cannot simply be classified into emotion categories, which would then determine whether someone is lying or poses a risk. It is even questionable whether emotion recognition works at all. Assuming that it does work, reading people's emotions has serious implications for human rights.¹⁷¹ From this perspective, and in anticipation of a later chapter, it is almost a shame that emotion recognition tools were only classified as 'high-risk' AI systems in the AI Act and not banned completely.¹⁷²

¹⁶⁶ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre*, University of Oxford (2023): 26-27.

¹⁶⁷ Vavoula, Niovi. "Unpacking the EU Proposal for an AI Act: Implications for AI systems used in the context of migration, asylum and border control management", *TPQ* 20, no. 4 (2022): 119-122.

¹⁶⁸ European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

¹⁶⁹ Ibid, 167.

¹⁷⁰ Ibid, 167.

¹⁷¹ Fuster González, Gloria. "Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence." *EPRS, Scientific Foresight Unit* (2021): 1-22.

¹⁷² Ibid, 171.

10. Frontex and AI

Frontex, the European border control agency, is also showing increasing interest in AI technology as a tool to improve its border control activities and has published several reports describing potential use cases for AI. At present, Frontex carries out its activities using vessels, aeroplanes and fixed installations such as surveillance towers.

AI technology is or will strengthen all these activities profoundly.¹⁷³ For example, AI systems can improve maritime awareness by enabling the detection and monitoring of more vessels at sea. AI can also be integrated into unmanned surveillance towers to detect irregular border crossings. In addition, aircraft could be equipped with AI systems to detect irregular border crossings and ships at sea. Furthermore, there is the possibility of integrating AI into the identification process to gain on 3D images of the individuals. AI could even be used to analyse geospatial data to gain insights into migration patterns from a space perspective.¹⁷⁴ Another way to strengthen surveillance is by deploying AI-enabled drones. The agency has tested “military-grade drones in the Mediterranean and Aegean seas for the surveillance” and interception of migrants vessels.¹⁷⁵

The deployment of AI technology by Frontex in its border governance illustrates a clear trend towards a decentralisation of the EU borders.¹⁷⁶ By integrating the AI technologies, surveillance is no longer confined to traditional border checkpoints. Instead, the deployment creates multiple layers of monitoring that extend in both ways, physically and virtually. This thesis argues that these advanced surveillance capabilities not only act as a deterrent for migrants seeking to reach Europe but also facilitate Frontex’s maritime pushbacks.¹⁷⁷ Widely documented tragedies at sea, along with the agency's involvement, underscore this argument.¹⁷⁸ Moreover, anti-

¹⁷³ Frontex, “Artificial Intelligence-based capabilities for the European Border and Coast Guard”, *Frontex Executive Summary* 1810 (March, 2021): 9-23, <https://www.frontex.europa.eu/publications/artificial-intelligence-based-capabilities-for-the-european-border-and-coast-guard-final-report-CYyjoie>.

¹⁷⁴ Csernaton, Raluca. “Constructing the EU’s High-Tech-Borders: FRONTEX and Dual-Use Drones for Border Management”, *European Security* 27, 2 (2018): 183, DOI: <https://doi.org/10.1080/09662839.2018.1481396>.

¹⁷⁵ Ibid, 174.

¹⁷⁶ Ibid, 174.

¹⁷⁷ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 19.

¹⁷⁸ Waters, Nick, Freudenthal, Emmanuel, Williams, Logan. “Frontex at Fault: European Border Force Complicit in ‘illegal’ pushbacks”, *Bellingcat, Lighthouse Reports* (2020), <https://www.bellingcat.com/news/2020/10/23/frontex-at-fault-european-border-force-complicit-in-illegal-pushbacks/>.

immigration policies in countries such as Italy, Spain, and Greece¹⁷⁹ further exacerbate this issue and push towards the criminalisation of migration.¹⁸⁰

The specifics of what has been implemented versus what is still in development are not entirely clear. Yet, it is certain that Frontex can pursue its AI development with the financial support of the research fund from the EU's Horizon 2020 programme. This fund enables Frontex to develop several research projects. For example, the TRESPASS project, which uses algorithms to assess the 'risk' of third country nationals crossing the borders.¹⁸¹ Additionally, the ROBORDER project introduces a fully automated surveillance system with unmanned robotic vehicles¹⁸², while the FOLDOUT project¹⁸³ enables real-time monitoring of border areas through sensors to detect illegal cross-border movements.¹⁸⁴

III. AI and its impacts on Human Rights

Following a critical examination of existing and emerging AI technologies used at borders, it becomes clear that the AI technologies harbour several risks to human rights for migrants, which makes their already vulnerable position even more vulnerable. Moreover, it becomes clear that assessing real-world impact of the tools remains a challenge, particularly for technologies not yet fully implemented. The subsequent chapters aim to scrutinise the effects of these AI systems on human rights, while acknowledging that such an analysis may not entirely capture all impacts on individuals within the migration context.

Research, along with insights from refugee-led organisations, civil societies, academics, and NGOs, highlights that AI technologies can indeed adversely affect the human rights of migrants. Yet, the specific risks depend on various factors, including

¹⁷⁹ Statewatch. "EU-Spain: New report provides an "x-ray" of the public funding and private companies in Spain's "migration control industry", (2017), <https://www.statewatch.org/news/2017/november/eu-spain-new-report-provides-an-x-ray-of-the-public-funding-and-private-companies-in-spain-s-migration-control-industry/>.

¹⁸⁰ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 19.

¹⁸¹ Tresspass.eu. "Matched Betting: How profitable can it be?", <https://www.tresspass.eu/>.

¹⁸² Roborder.eu. "Project structure", <https://roborder.eu/the-project/project-structure/>.

¹⁸³ Foldout Solution. "Foldout Border Surveillance Technology: Through foliage detection of illegal cross-border activities", <https://foldout.eu/>.

¹⁸⁴ Forti, Mirko. "AI-Driven Migration Management Procedures: Fundamental Rights Issues and Regulatory Answers", *BioLaw Journal*, no. 2 (2021): 433-451, <https://ssrn.com/abstract=3877083>.

AI and its impacts on Human Rights

the type of technology, its intended use, the context of deployment, and the relevant legal and procedural safeguards.¹⁸⁵

What is clear however is that several internationally protected rights are directly impacted. These include the right to equality, freedom from discrimination, the right to life and security, protection from torture, freedom of expression, the right to privacy, and the right not to be deported to countries where one's life is at risk (non-refoulement). Additionally, rights related to due process in administrative decisions are at stake, such as the right to effective remedies, an impartial decision-maker, the right to appeal a decision, and the right to be informed of the case against oneself.¹⁸⁶

Moreover, the use of AI in migration management can create a chilling effect on the exercise of rights such as freedom of expression, association, and religion, as well as access to essential services like education, housing, and healthcare. These risks are further intensified by the intersecting vulnerabilities individuals face, shaped by factors such as “race, ethnicity, gender identity, sex, age, disability, nationality, migration status”, and other social determinants¹⁸⁷.

In high-risk situations, where the stakes are incredibly high, the potential for AI to make mistakes can lead to severe consequences, such as discrimination, family separation, or even the loss of life and liberty¹⁸⁸. It is crucial to remember that migrants and asylum seekers are already in fragile situations, heavily reliant on the decisions made by public authorities. This makes them particularly vulnerable to any errors or biases in AI systems, which can have irreversible and devastating impacts.¹⁸⁹

Research on AI systems has also highlighted their potential for misuse in political contexts, including the control, repression, intimidation, coercion, and harassment of individuals. Although AI is not an autonomous tool of repression, it can complement and amplify existing repressive measures.¹⁹⁰ Additionally, these technologies may reinforce policies that discourage the reception of migrants and

¹⁸⁵ McGregor, Lorna. “Digital Border Governance: A Human Rights Based Approach”, *OHCR, University of Essex* (September 2023): 4, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

¹⁸⁶ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 25.

¹⁸⁷ Ibid, 185.

¹⁸⁸ Ibid, 186.

¹⁸⁹ Szwed, Agata. “The use of artificial intelligence in migration-related procedures in the European Union - opportunities and threats”, *Procedia Computer Science* 207, Issue C (2022): 3639–3645.

¹⁹⁰ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 21.

asylum seekers, known as 'non-entrée policies'. Finally, this thesis advocates for a use of AI technology in migration management, where the human rights protection is not exchanged for efficiency.¹⁹¹ Even if the EU keeps a pro-migration stance and aims to balance security with human rights, the inherent shortcomings of AI, such as biased facial recognition tools and algorithmic discrimination, pose major human rights risks. Therefore, it is necessary that AI deployment in migration management is guided by a genuine intention to uphold human rights, as the effectiveness of this balance will ultimately depend on the ethical priorities and objectives of the implementing state or organisation.¹⁹²

The following table provides an overview of how specific AI issues can adversely affect human rights:

Table 1. Human Rights affected by AI

AI issue	Human Rights affected
1. Lack of algorithmic transparency	<ul style="list-style-type: none"> - Right to a fair trial and effective remedy - Right to respect for private and family life - Right to privacy and data protection - Right to access public services
2. Lack of privacy and data protection	<ul style="list-style-type: none"> - Right to privacy and data protection - Respect for private and family life
3. Lack of accountability, liability and contestability	<ul style="list-style-type: none"> - The right to life and the right not to be tortured - The right to an effective remedy and a fair trial
4. Unfairness, bias and discrimination	<ul style="list-style-type: none"> - Prohibition of discrimination, - Right to liberty and security, - Prohibition of torture and inhuman or degrading treatment or punishment, - Right to a fair trial, right to an effective remedy,

¹⁹¹ Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23, DOI: <https://doi.org/10.1186/s40878-022-00305>.

¹⁹² Cf. Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23.

Respect to the right to life and liberty

	<ul style="list-style-type: none"> - Equality before the law and non-discrimination, - Equality between men and women, - Rights of the child
5. Lack of respect of human dignity	<ul style="list-style-type: none"> - Principle of non-refoulement, - Prohibition of torture and inhuman or degrading treatment or punishment, - And all the above

Source: Cf. Rodrigues, Rowena. “Legal and human rights issues of AI: Gaps, challenges and vulnerabilities”, *Journal of Responsible Technology* 4 (2020): 8.

11. Respect to the right to life and liberty

One of the most serious risks within the use of AI systems in migration management is the infringement on the right to life and the right to liberty¹⁹³ Violations of these rights can manifest in several forms. As already shown in the above table, the lack of algorithmic transparency and the general opacity surrounding the use of AI technologies risks the right to life by rendering it nearly impossible to challenge or rectify decisions made by these systems¹⁹⁴. Moreover, AI systems can be inherently discriminatory, biased and unjust (see Chapter 17) and they showcased fundamental inability to respect human dignity by neglecting the nuances and complexities in individuals' migration experiences (see Chapter 19). In anticipation to the following chapters, it can be said, that biases in the training data of algorithms can result in systems interpreting irrelevant or misleading patterns as significant, leading to unjust, arbitrary, or discriminatory outcomes.¹⁹⁵

In addition, and probably the starkest example of violations of the right to life are the pushbacks facilitated by AI technology in the maritime context, to authoritarian countries where human rights are violated systematically (i.e. Libya). Additionally, deportation decisions can be influenced by AI technologies or even made by ADM. Any minor inaccuracies in the data or errors in the algorithm therein lead to infringements on the right to life or liberty.¹⁹⁶

¹⁹³ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 24-25.

¹⁹⁴ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 11.

¹⁹⁵ Ibid, 194.

¹⁹⁶ Ibid, 193.

An example of a violation of the right to liberty becomes apparent when individuals are placed in detention centres without clear explanations for the decisions made or the ability to contest those decisions, which are often influenced by AI systems. The use of AI technology to justify unlawful detention or incarceration highlights the extent to which the EU is prepared to compromise fundamental human rights under the pretext of national security and border enforcement.¹⁹⁷

In some cases, the increased use of technology at borders has already led to more deaths. Unfortunately, exact numbers are difficult to obtain, as it is nearly impossible to determine how many refugees take more dangerous migratory routes to avoid detection by surveillance systems at sea or on land. Additionally, the number of deportations and the extent to which these decisions are influenced by AI technology remain unclear. The U.S. has promoted a similar "smart border technology" and "virtual wall of surveillance," including AI-enabled technologies, as a more „humane“ strategy opposing Trump Administration's call for a physical wall.¹⁹⁸ However, this virtual wall has driven migrants into more dangerous terrains, such as the Arizona desert, leading to a "land of open graves"¹⁹⁹ and actually doubled the number of migrant deaths.²⁰⁰ Interpreting this example from the U.S. in the European context, it is highly likely that the increased pushbacks at sea²⁰¹, facilitated by similar surveillance technology, similarly escalates the number of deaths in the Mediterranean sea²⁰² and turns it into a „sea of open graves“.²⁰³

¹⁹⁷ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 24-25.

¹⁹⁸ Fang, Lee and Biddle, Sam. "Google Ai Tech Will Be Used For Virtual Border Wall, Cbp Contract Shows", *The Intercept* (2020), <https://theintercept.com/2020/10/21/google-cbp-border-contract-anduril/>.

¹⁹⁹ De Leon, Jason and Wells, Michael. "The Land of Open Graves, Living and Dying on the Migrant Trail", *University of California Press* 36, 1st eds (2015): 1-20, <https://www.ucpress.edu/book/9780520282759/the-land-of-open-graves>.

²⁰⁰ Allan Boyce, Geoffrey, N. Chambers, Samuel and Launis, Sarah. "Democrats' 'smart border' technology is not a 'humane' alternative to Trump's wall", *The Hill* (2019) <https://thehill.com/opinion/immigration/429454-democrats-smart-border-technology-is-not-a-humane-alternative-to-trumps>.

²⁰¹ Charles Heller and Chris Jones, "*Eurosur: saving lives or reinforcing deadly borders?*", *Statewatch* (2014), <https://www.statewatch.org/statewatch-database/eurosur-saving-lives-or-reinforcing-deadly-borders-by-charles-heller-and-chris-jones/>; See also Niamh, Keady-Tabbal, Itamar and Mann, "Tents at Sea: How Greek Officials Use Rescue Equipment for Illegal Deportations", *Just Security* (2020), <https://www.justsecurity.org/70309/tents-at-sea-how-greek-officials-use-rescue-equipment-for-illegal-deportations/>.

²⁰² Border Violence Monitoring Network, <https://www.borderviolence.eu/>

²⁰³ *Ibid*, 197.

Given the many shipwrecks and deaths in the Mediterranean in the last decades, it is not farfetched to argue that the technology deployment will worsen this situation.²⁰⁴ Moreover, the growing dependence on border security technologies, as also illustrated by the EU's New Migration Pact²⁰⁵, sends a clear message, namely the prioritisation of protection of Europe's external borders, even if it costs human lives.²⁰⁶ Despite this, states and the EU have a positive obligation to uphold the right to life. This means they must ensure that any AI system deployed in border and migration management is designed to operate in a manner that fully respects and protects this fundamental rights.²⁰⁷

12. Respect to the principle of non-refoulement and pushbacks

The core research question of this thesis, namely how and to what the extent the AI technologies adversely affect human rights, cannot be comprehensively addressed without considering the issue of pushbacks and non-entrée measures. The term "pushbacks" refers to various actions taken by states that result in migrants being forcibly returned to the country from which they came.²⁰⁸

These actions can be directly facilitated by AI technology, or AI may reinforce and exacerbate such measures. In fact, AI systems can be used to detect, monitor, and intercept migrants before they can even claim asylum, effectively pre-empting their right to seek refuge or protection status. Furthermore, states with advanced AI capabilities may be more inclined to implement stringent measures aimed at preventing the arrival of migrants and asylum seekers.²⁰⁹ In this context, AI risks becoming another political tool used to reinforce traditional state practices aimed at

²⁰⁴ Julia Black, "Shipwreck Off coast of Libya Pushes Migrant Deaths on the Mediterranean Past 20,000 Mark", *International Organization for Migration, UN Migration* (2020) <https://www.iom.int/news/shipwreck-coast-libya-pushes-migrant-deaths-mediterranean-past-20000-mark>.

²⁰⁵ FRONTEX, "New Frontex Regulation comes into force", Frontex (2019) <https://frontex.europa.eu/media-centre/news-release/new-frontex-regulation-comes-into-force-S0luwe>.

²⁰⁶ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 24-25.

²⁰⁷ Carrera, Sergio and Stefan, Marco. „*Fundamental Rights Challenges in Border Controls and Expulsion of Irregular Immigrants in the European Union: Complaint Mechanisms and Access to Justice*”, Routledge, 1st eds (2020): 261, ISBN 9781032174877.

²⁰⁸ The United Nations Office of the High Commissioner for Human Rights defines pushbacks as "various measures taken by States which result in migrants, including asylum-seekers, being summarily forced back to the country where they [...] have crossed an international border without access to international protection or asylum procedures or denied of any individual assessment of their protection needs which may lead to a violation of the principle of non-refoulement" in: Luyten, Katrien. "Addressing pushbacks at the EU's external borders", *EPRS* (2022):2, [https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/738191/EPRS_BRI\(2022\)738191_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/738191/EPRS_BRI(2022)738191_EN.pdf)

²⁰⁹ Beduschi, Ana. „International migration management in the age of artificial intelligence”, *Oxford University Press* 9, no. 3 (2021): 576-596.

curbing international migration and preventing asylum seekers from reaching their territories.²¹⁰

Given that sea borders are more challenging to patrol than land borders, it is likely that the EU will focus on patrolling the sea with advanced AI technology²¹¹. As discussed in the chapter on Frontex, the agency has identified several use cases for AI in its operations. For example, AI could assist Frontex in conducting targeted maritime interventions aimed at intercepting and returning migrants and refugees to countries where they fear for their lives or freedom.²¹²

These concerns were echoed by the UN Special Rapporteur on the Human Rights of Migrants, who pointed out that pushback practices are not only reinforced by physical barriers, but also by digital surveillance tools, including AI technologies. The use of these technologies improves surveillance capabilities and thereby reinforces deterrence measures, making it increasingly dangerous for migrants attempting to cross borders.²¹³

As mentioned earlier in this thesis, research in border regions has shown that migrants are well aware of the advanced technologies used on them, and as a deterrent against them. This awareness often forces them to seek less visible but more dangerous migration routes to avoid detection.²¹⁴ Consequently, the use of AI in border surveillance not only increases the risks faced by migrants, but also contributes directly to human rights violations that can even result in the loss of human life.²¹⁵

Consequently, AI technologies have the potential to bolster unlawful non-refoulement practices, violating Article 33 of the Refugee Convention, which prohibits

²¹⁰ Beduschi, Ana. „International migration management in the age of artificial intelligence”, *Oxford University Press* 9, no. 3 (2021): 576-596.

²¹¹ Tyler, Hannah. “The Increasing Use of Artificial Intelligence in Border Zones Prompts Privacy Questions”, *Migration Policy Institute* (2022), available at: <https://www.migrationpolicy.org/article/artificial-intelligence-border-zones-privacy>.

²¹² Beduschi, Ana. „International migration management in the age of artificial intelligence”, *Oxford University Press* 9, no. 3 (2021): 581.

²¹² Ibid, 211.

²¹³ UN Special Rapporteur on the human rights of migrants. “Report on means to address the human rights impact of pushbacks of migrants on land and at sea: Report of the Special Rapporteur on the human rights of migrants, Felipe González Morales”, A/HRC/47/30 (12 May 2021), § 54, <https://documents.un.org/doc/undoc/gen/g21/106/33/pdf/g2110633.pdf>.

²¹⁴ Report of the Working Group on the use of mercenaries (n8), at §45, in: McGregor, Lorna. “Digital Border Governance: A Human Rights Based Approach”, *OHCR, University of Essex* (September 2023): 13, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

²¹⁵ United Nations General Assembly, *Convention Relating to the Status of Refugees*, 28 July 1951, Article 33.

Respect to the principle of non-refoulement and pushbacks

returning individuals to places where they may face persecution, being tortured or even loss of life.²¹⁶ This legal principle prohibits automated pushbacks at borders without a thorough assessment of each migrant's personal circumstances. It mandates that individuals must be given the opportunity to inform authorities of their need for asylum and to have their applications for international protection examined.²¹⁷ The principle is enshrined in the Refugee Convention²¹⁸ and in Articles 18 and 19 of the EU Charter.²¹⁹ The legal provisions require states to implement effective asylum systems that respect the rights of individuals seeking protection. Consequently, this principle imposes legal obligations on the EU and its Member States to ensure that AI tools and systems are designed and implemented in ways that uphold, rather than undermine, the standards of non-refoulement.²²⁰ Furthermore, the decision as to whether someone is eligible for an international protection status must be made with precision, taking many factors into account. Relying solely on AI systems for this task is problematic, as these systems often lack the sensitivity needed to make such complex decisions and thereby violate human rights.²²¹

13. Privacy Rights

Although the right to privacy may appear less urgent than fundamental rights such as life, liberty, and non-refoulement, it still presents considerable risks to the rights and freedoms of migrants and refugees. This is particularly the case when the algorithms process biometric data, which “cannot be changed over time” and thus warrant special protection.²²² In the context of the EU’s external borders, migrants and refugees are frequently unable to safeguard their own privacy rights, as they are forced to provide personal data, including biometric data. The data collection of migrants, although often

²¹⁶ Boyce, Geoffrey Allan, Chambers, Samuel N. and Launis, Sarah. “Democrats’ ‘smart border’ technology is not a ‘humane’ alternative to Trump’s wall”, *The Hill* (11 February 2019), <https://thehill.com/opinion/immigration/429454-democrats-smart-border-technology-is-not-a-humane-alternative-to-trumps/>.

²¹⁷ Foster, Madeleine. “Refugee Protection in the artificial intelligence era: A test case for rights”, *Royal Institute of International Affairs* (September 2022): 10.

²¹⁸ United Nations General Assembly, *Convention Relating to the Status of Refugees*, 28 July 1951, Article 33.

²¹⁹ European Union, *Charter of Fundamental Rights of the European Union*, 2012, Articles 18 and 19.

²²⁰ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 25-30.

²²¹ *Ibid*, 220.

²²² Fuster González, Gloria. “Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence.” *EPRS, Scientific Foresight Unit* (2021): 1-22.

justified under the guise of identification, amounts to a form of coercion, undermining the autonomy of individuals in vulnerable situations.²²³

However, as already seen in earlier chapters, the use of AI technology goes far beyond simple identification. Especially when authorities are able to uncover every detail about a person with a single click, thereby making migrants completely traceable and stripping them of their privacy rights.²²⁴ This level of traceability has led some migrants to go to extreme lengths, such as damaging their fingertips, to avoid identification. However, when migrants refuse to allow their biometric data to be used by AI technology, they may face denial of humanitarian aid, which underscores the coercive impact of these technologies.²²⁵

IV. Challenges within AI Systems

The primary ethical and legal challenges linked to the use of AI in migration management include the risks arising from the opacity and unpredictability of these systems, the potential for bias and unlawful discrimination, and the difficulties these issues create in seeking redress for incorrect or unjust decisions.²²⁶ To effectively address these concerns, AI technology in migration management must align with the principles of responsible AI. As articulated by Boden et al., responsible AI should operate in a manner that is positive, desirable, and socially acceptable²²⁷. The following chapters will analyse the most pressing challenges associated with AI technologies. Through this analysis, the thesis will evaluate the human rights implications involved.

²²³ Lane, Lottie. "Clarifying Human Rights Standards through Artificial Intelligence", *Cambridge University Press, International and Comparative Law Quarterly* 71 (2022): 915-944, DOI: 10.1017/S0020589322000380.

²²⁴ Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 20, DOI: <https://doi.org/10.1186/s40878-022-00305>.

²²⁵ BBC News. „Sweden refugees mutilate fingers“ (2004), <https://tinyurl.com/fwp6h4by>, In: Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 20, DOI: <https://doi.org/10.1186/s40878-022-00305>.

²²⁶ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022): 9.

²²⁷ Boden, Margaret, et al., "Principles of Robotics: Regulating Robots in the Real World", *Connection Science* 29, no. 2 (2017): 124-129.

13.1. Lack of Transparency surrounding AI technology

Despite recent efforts to map out the use of AI in border and migration management, a significant knowledge gap persists. Scholars, civil society, and journalists have limited access to information on current and future AI applications.²²⁸

This lack of transparency arises from two key factors: First, states, which both deploy and finance these technologies (the deployers), often justify withholding information from the public by citing security concerns²²⁹. Private entities on the other hand, which are the providers of the technologies, withhold information to protect their commercial interests or knowledge in specific areas.²³⁰ Consequently, the full scope of AI used in border management often remains hidden until after deployment, only coming to light through investigations by civil society, journalists, or academics.²³¹ This is echoed by researchers who have pointed out the barriers they face when seeking information on the new technologies. Their requests for clarification were frequently denied on the grounds of national security or commercial interests. If responses were given, they were also often incomplete or lacked critical detail, further contributing to the overall opacity surrounding AI technologies used on migrants and refugees.²³²

14. Lack of algorithmic transparency

AI systems are susceptible to errors, inaccurate data, and inherent algorithmic biases that are often difficult to detect. Additionally, these algorithms are frequently criticised as "black boxes" because their operations are not transparent to the public.²³³ This lack of transparency is particularly pronounced in migration management, where the data used by the technologies intersects with national security concerns.²³⁴ In fact, the

²²⁸ McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCR, University of Essex* (September 2023): 4, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

²²⁹ Sullivan, Gavin. „The Law of the List: UN Counterterrorism Sanctions and the Politics of Global Security”, *Cambridge University Press* (2020), DOI: <https://doi.org/10.1017/9781108649322>.

²³⁰ Molnar, Petra. "Surveillance sovereignty: migration management technologies and the politics of privatization", in Idil Atak and Graham Hudson (eds). "*Migration, Security, and Resistance: Global and Local Perspectives*", Routledge (2021) 66-82, DOI: 10.4324/9781003058526-3.

²³¹ McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCR, University of Essex* (September 2023): 8-9, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

²³² *Ibid*, 231.

²³³ See, for example: Pasquale, Frank. "*The Black Box Society: The Secret Algorithms That Control Money and Information*", Harvard University Press (2016), ISBN 9780674970847.

²³⁴ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

lack of transparency regarding input data and algorithmic processes makes it difficult to understand how decisions are made, which complicates any efforts toward oversight and accountability. Given these challenges, it is necessary to provide migrants with the right information and maintain transparency around the systems used in migration management. Migrants will only have the possibility to contest flawed or biased decisions made by AI systems with the right information at hand.²³⁵ In other words, the right to transparency has a direct effect, or “domino effect”, on other rights, including privacy rights, the right to non-discrimination and even on questions as to who is accountable.²³⁶

A transparent AI system provides information about what actions it takes and why it takes them, and it must be verifiable²³⁷. Thus, any AI system used in migration management must communicate its processes by detailing the steps it takes to reach a decision. This includes explaining how it processes data, the criteria it uses to assess eligibility, and the reasoning behind categorising someone as ‘high’ or ‘low risk’ (the “what”). Additionally, it is essential to understand the rationale behind its outcomes, including the underlying logic (the “why”).²³⁸

Moreover, AI technologies and the underlying data must be open to examination by independent parties, which includes auditing. Auditing involves evaluating the system’s performance, accuracy, and compliance with legal and ethical standards. In practice, this could mean allowing external supervision of AI systems in border control by independent NGOs or conducting Data Protection Impact Assessments (DPIAs). Auditing ensures that the system operates as intended and do not cause harm or violate regulations or human rights.²³⁹ The requirement for a system to be “permissible to be audited” aligns with the broader principle of oversight. However, while auditing is a specific way of ensuring transparency, oversight includes a broader range of

²³⁵ Molnar, Petra. “Technology on the Margins: AI and Global Migration from a Human Rights Perspective,” *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

²³⁶ Lane, Lottie. “Clarifying Human Rights Standards through Artificial Intelligence”, *Cambridge University Press, International and Comparative Law Quarterly* 71 (2022): 938, DOI: 10.1017/S0020589322000380.

²³⁷ Hollanek, Tomasz. “AI Transparency: A Matter of Reconciling Design with Critique.” *AI & Society* 38 (2023): 2071-2079. <https://doi.org/10.1007/s00146-020-01110-y>.

²³⁸ Fuster González, Gloria. “Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence.” *EPRS, Scientific Foresight Unit* (2021): 1-22.

²³⁹ Fuster González, Gloria. “Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence.” *EPRS, Scientific Foresight Unit* (2021): 50-51.

Lack of algorithmic transparency

supervisory activities, such as following ethical guidelines²⁴⁰, codes of conduct, and regulatory frameworks.²⁴¹

Furthermore, both the GDPR and the AI Act impose transparency requirements on AI technologies. The GDPR states that the processing of personal data must be lawful, fair and transparent.²⁴² It also requires that information is communicated in a transparent manner so that the data subjects, or in this case migrants, can exercise their right to an effective remedy.²⁴³ This is important because migrants need to understand the decisions that affect them to exercise their rights. In other words, transparency and the right to a legal remedy are closely linked, as the latter depends on the former.²⁴⁴ The GDPR also includes the right to be informed about the collection of data, including its purpose limitations principle, and ensures that data subjects have the access to their personal data, and can correct this data.²⁴⁵

The AI Act goes further by requiring the registration of ‘high-risk’ AI systems in a public register, thereby providing a transparency requirement, giving information on which AI technology is used, and when and where it is used.²⁴⁶ However, Article 49 (4) AI Act undermines this transparency requirement, by stipulating that ‘high-risk’ AI systems in ‘migration, asylum and border management’ have to register this information in a ‘non-public section’ of an EU database.²⁴⁷ This drastically limits transparency and oversight over the AI technologies, as only the Commission and specific market authorities have access to this information, making it inaccessible for public-scrutiny.²⁴⁸

The decision to restrict the access to this information is largely driven by concerns from Member States, who fear that disclosing these details could jeopardise national security (See latter Chapter). Especially, German Members of Parliament have voiced apprehensions in this context and argued that a public register could expose operational weaknesses and compromises the capabilities of national border

²⁴⁰ See: High-Level-Expert Group on AI. “Ethics Guidelines for Trustworthy AI”, European Parliament (2019), <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai>.

²⁴¹ Fuster González, Gloria. “Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence.” *EPRS, Scientific Foresight Unit* (2021): 1-22.

²⁴² European Union, *GDPR*, Regulation (EU) 2016/679, Article 5 (1) (a).

²⁴³ European Union, *GDPR*, Regulation (EU) 2016/679, Article 12.

²⁴⁴ Ozkul, Derya. “Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe”, *Oxford: Refugee Studies Centre*, University of Oxford (2023).

²⁴⁵ European Union, *GDPR*, Regulation (EU) 2016/679, Article 13 and 15.

²⁴⁶ European Union, *AI Act*, COM(2021) 206 final, Recital 69, Article 51 and 52.

²⁴⁷ European Union, *AI Act*, COM(2021) 206 final, Article 49 (9).

²⁴⁸ European Union, *AI Act*, COM(2021) 206 final, Recital 131 and Article 13.

authorities.²⁴⁹ However, “*transparency represents a prerequisite for accountable government actions*” and the only way that migrants can seek legal redress for human rights violations caused by the AI systems.²⁵⁰

15. The Lack of accountability

Apart from issues of transparency, there is a lack of accountability regarding the deployment and development of AI within border governance.²⁵¹ In particular, there is ambiguity regarding who should be held accountable for errors in the development, deployment, or the use of these systems.²⁵² Accountability, in this context, demands that actors involved must be able to justify the activities of AI technologies to the public, or to the migrants and refugees.²⁵³ In other words, accountable AI requires that someone is answerable for an AI system, including for its behaviour and impacts.²⁵⁴ Conversely, if no one is held accountable for errors in AI systems, issues of causality, justice, and compensation arise.²⁵⁵ In the context of migration management, this lack of accountability can lead to severe consequences for migrants and refugees, including wrongful detention, deportation, and discrimination, further exacerbating their already vulnerable situations.

15.1. Who to hold accountable?

The question of who should be held accountable is not easy to resolve and must be analysed step by step. Since algorithms themselves cannot be held accountable, as they are not legal entities, the responsibility lies with the authorities behind these

²⁴⁹ Council of the European Union. “Regulation of AI-taking greater account of the specific characteristics of the public administration, particularly in the fields of security and migration”, WK 12308/2022. (2024): no.2) b), <https://www.asktheeu.org/es/request/12483/response/42858/attach/html/5/wk12308.en22.pdf.html>.

²⁵⁰ Busuioc, Madalina. “Accountable Artificial Intelligence: Holding Algorithms to Account”, *Public Administration Review* 81, 5 (2021): 825-829, <https://doi.org/10.1111/puar.13293>.

²⁵¹ Ibid, 250.

²⁵² Rodrigues, Rowena. “Legal and human rights issues of AI: Gaps, challenges and vulnerabilities”, *Journal of Responsible Technology* 4, no. 1000005 (2020): 1-12, <https://doi.org/10.1016/j.jrt.2020.100005>.

²⁵³ Bovens, Mark. “Analysing and assessing accountability: a conceptual framework”, *European Law Journal* 13, 4 (2007): 447, <https://doi.org/10.1111/j.1468-0386.2007.00378.x>.

²⁵⁴ Raji, I. Deborah, et al., „Saving Face: Investigating the Ethical Concerns of Facial Recognition Auditing”, AIES '20 (2020): 145-151. <https://doi.org/10.48550/arXiv.2001.00964> and Busuioc, Madalina. “Accountable Artificial Intelligence: Holding Algorithms to Account”, *Public Administration Review* 81, 5 (2021): 825-829, <https://doi.org/10.1111/puar.13293>.

²⁵⁵ Bartlett, Matt. “Solving the AI accountability gap: Hold developers responsible for their creations”, *Towards Data Science* (2019), found in: Rodrigues, Rowena. “Legal and human rights issues of AI: Gaps, challenges and vulnerabilities”, *Journal of Responsible Technology* 4, no. 1000005 (2020): 1-12.

The Lack of accountability

them.²⁵⁶ Initially, one might consider the providers of the AI system as the one to hold accountable. However, because providers are primarily private entities and most often minor players with limited control over how and where their technology is used, they may lack the foresight to anticipate all potential harms and, therefore, cannot be held fully accountable.²⁵⁷ In addition, holding solely providers accountable may lead to a 'chilling effect' on AI development.²⁵⁸

On the other hand, the deployers may be held accountable, which is in the context of migration management technologies either the EU or the Member State. As public institutions, they are also legally bound to uphold human rights. Thus, they cannot deploy AI systems, that violate these rights.²⁵⁹ However, over the last three decades the EU has shifted its executive powers on to agencies, especially in migration management. This decentralisation (See next Chapter) complicates the issue of accountability, because EU agencies have their own legal personality and enjoy a certain degree of administrative autonomy. To name two main players in migration management, it can be thought of Frontex and EU-LISA.²⁶⁰

The last in the chain is typically a human agent, who often lacks a comprehensive understanding of the system's inherent complexities and thus cannot be held accountable for all the processes carried out. This places the primary responsibility on the providers and deployers of these systems.²⁶¹

To sum up, the mixed cooperation between the providers, the EU, the agencies and the Member States complicates issues of accountability and makes it difficult to determine who is responsible for human rights violations in border spaces.²⁶² The situation is further compounded by the highly restrictive conditions for individuals to bring actions before the CJEU against measures taken by EU-agencies. This is particularly evident in the stringent criteria for determining what constitutes a

²⁵⁶ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022): 28-29.

²⁵⁷ Rodrigues, Rowena. "Legal and human rights issues of AI: Gaps, challenges and vulnerabilities", *Journal of Responsible Technology* 4, no. 1000005 (2020): 1-12.

²⁵⁸ Ibid, 257.

²⁵⁹ Bergh, Sylvia I., et al., "Marocco's Governance of Cities and Borders: AI Enhanced Surveillance Facial Recognition, and Human Rights", in: "*The Cambridge Handbook of Facial Recognition in the Modern State*" Cambridge Law Handbooks, Cambridge University Press (2024): 267-284.

²⁶⁰ Bast, Jürgen, et. al., "Human Rights Challenges to European Migration Policy", *The REMAP Study, Nomos/Hart* 36, 2nd revised edn (2022): 121-122.

²⁶¹ Ibid, 259.

²⁶² Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 306.

'reviewable act', the narrow standards for being 'directly and individually concerned', and the brief two-month deadline for filing such actions to redress.²⁶³

15.2. Agency Laundering

The answer to the question of who is ultimately responsible for AI systems is further complicated by the fact that states carry out agency laundering, which describes the shift of responsibility and accountability to the private sector and EU-agencies. The technologies used at borders are usually developed by private companies that have the expertise to create these advanced AI systems.²⁶⁴ The companies often receive research grants from EU institutions, such as the Horizon 2000 program, which was earmarked specifically for migration-related purposes. However, the funded private companies, which receive these grants, operate with little to no public oversight and develop these tools almost in secretive conditions.²⁶⁵ By purchasing these AI systems for migration-management purposes, the EU institutions effectively outsource their responsibilities, and thereby creates a privatised and opaque system around these new technologies used in border and migration management.²⁶⁶

This thesis contends that it is the government that shapes the possibilities and limitations within migration management, while private companies profit from developing these technologies.²⁶⁷ The primary concern with this outsourcing, or "agency laundering," is the lack of accountability. By outsourcing these developments, states can distance themselves from direct responsibility for actions that might not be legally feasible if undertaken directly by the state. Private entities or agencies, however, are not held to the same standards of accountability and human rights obligations as governmental institutions. This allows states to indirectly endorse

²⁶³ Bast, Jürgen, et. al., "Human Rights Challenges to European Migration Policy", *The REMAP Study, Nomos/Hart* 36, 2nd revised edn (2022): 121-122.

²⁶⁴ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 306.

²⁶⁵ Fort, Kristina. „Migration Management in the Era of AI: How emerging technologies shape the border space”, *Digitalisation and ICT, Humanitarianism and Conflict* (January, 2024), <https://blogs.lse.ac.uk/internationaldevelopment/2024/01/12/migration-management-in-the-era-of-ai-how-emerging-technologies-shape-the-border-space/>.

²⁶⁶ Ibid, 265.

²⁶⁷ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

practices that may infringe on human rights without being directly accountable for them.²⁶⁸

As an example, we may think of Amazon's 'Rekognition surveillance and facial recognition system', which can recognise up to 100 people in a single image and compare them against an extensive database of faces. This people-tracking technology was sold to law enforcement agencies and essentially benefited the government. It is highly doubtful that the government per se is allowed to develop such a privacy-invasive technology, also because the technology has been criticised by the American Civil Liberties Union as a "profound civil liberties and civil rights concern". This shows that the government can incentivize and profit from the developments of private actors while avoiding direct accountability when they do not uphold human rights standards.²⁶⁹

Moreover, much of migration management is carried out by international organisations, such as the UNHCR. As non-state actors, these organisations often facilitate power dynamics without being held to the same human rights responsibilities as states. To phrase it in *Benvinisti's* words, "states can exploit these international organisations and private actors to launder their legal responsibilities".²⁷⁰

15.3. The Global North and South divide

In addition, the modern surveillance landscape exacerbates the asymmetries between the migration actors in the Global North and South.²⁷¹ The EU provides millions of euros for the development of surveillance tools and even outsources some systems to non-democratic, repressive states, such as Libya, China, Palestine.²⁷² In these states, the legal safeguards necessary to prevent the misuse of AI systems and algorithmic tools in migration management are either weak or entirely absent. This lack of

²⁶⁸ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

²⁶⁹ Conger, Kate. "Amazon Workers Demand Jeff Bezos Cancel Face Recognition Contracts with Law Enforcement", *Gizmodo* (June 2018), available at: <https://gizmodo.com/amazon-workers-demand-jeff-bezos-cancel-face-recognition-1827037509>.

²⁷⁰ Benvenisti, Eyal. "Upholding Democracy Amid the Challenges of New Technology: What Role for the Law of Global Governance?", *European Journal of International Law* 29, no. 1 (February 2018): 9-82, <https://doi.org/10.1093/ejil/chy013>.

²⁷¹ *Ibid*, 270.

²⁷² Access Now. "Joint Statement: AI Act Fails Migrants and People on the Move", *Access now*, Press Releases (2024), available at: <https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move/>.

protection creates a significant risk of these technologies being abused, particularly by regimes with poor human rights records.²⁷³

The EU's status as a centre of innovation, often described as a "high-tech fortress", is indicative of a broader issue within global AI development.²⁷⁴ In fact, the Global North, which leads AI development, is largely driven by a "privileged, highly skilled, typically young, well-educated, white or Asian men", whose perspectives and interests shape the direction of technological advancements. In stark contrast, the Global South is often relegated to a passive role, compelled to adopt these technologies without any meaningful input in their design or implementation. This issue neglects the interests and needs of citizens in less technologically advanced countries. As a result, AI technologies developed in the Global North can exacerbate the historical divide between the Global North and South, reinforcing patterns of dominance, marginalisation, and subordination.²⁷⁵

Consequently, this situation further entrenches global inequalities, effectively dividing the world into those who wield influence over technological advancements and those who do not. Given these implications, it is necessary that the EU takes full accountability for the AI technologies it develops and exports. In other words, the EU must recognise its responsibility and must ensure that these technologies are not used to oppress citizens in repressive regimes.²⁷⁶

15.4. Counteracting gaps in accountability

The challenge of closing gaps in accountability, particularly within the context of European policies, can be achieved on multiple ways. One avenue for addressing these gaps involves statutory accountability mechanisms, such as the "right to explanation".²⁷⁷ This approach seeks to ensure that decisions, particularly those made by algorithmic systems are accompanied by justifications accessible to those affected,

²⁷³ Access Now. "Joint Statement: AI Act Fails Migrants and People on the Move", *Access now*, Press Releases (2024), available at: <https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move/>.

²⁷⁴ Fort, Kristina. "Migration Management in the Era of AI: How emerging technologies shape the border space", *Digitalisation and ICT, Humanitarianism and Conflict* (January, 2024).

²⁷⁵ Weber, Jutta and Prietl, Bianca. "AI in the age of technoscience", in "Routledge Social Science Handbook of Artificial Intelligence", *Routledge* 1st Edition (2021): 62-63, ISBN: 9780429198533.

²⁷⁶ *Ibid*, 273.

²⁷⁷ Mantelero, Alessandro. "Regulating AI within the Human Rights Framework: A roadmapping methodology", in: "*European Yearbook on Human Rights*", Intersentia, 1steds. (2023) 490, ISSN:9781839704543.

The Lack of accountability

which could also prevent a lack of transparency. However, the right to explanation has its shortcomings when used as a tool to ensure accountability, as it is not always possible to explain all decisions made by algorithms. In particular, it is not always possible to fully elucidate the rationale behind algorithmic decisions, or in other words, it is often difficult to explain why the algorithm bases its decisions on certain data. Consequently, the “right to explanation” is not a panacea for accountability gaps for AI technologies in border governance.²⁷⁸

A more robust approach would involve the establishment of governance structures specifically tailored to the needs of border control authorities and the people on the move. These structures should incorporate guiding principles that align AI systems with human rights, thereby enhancing both accountability and responsibility.²⁷⁹ Accountability can also be achieved by evaluating AI border technologies prior to their deployment, either by the providers or the deployers.

Essentially, the EU and its Member States must strictly adhere to the principles of legality, necessity, and proportionality when introducing any new AI technology.²⁸⁰ Essentially, the principle of legality requires the EU to provide a clear legal basis for the use of specific technologies, which necessitates both the enactment of dedicated legislation and a demonstration that the technology's use is predictable under existing laws. Given the current legal deficits, the EU must also acknowledge these deficits. Additionally, it must be demonstrated that the technology meets the principles of ‘necessity’ which means the technology is truly needed. The principle of ‘proportionality’ is fulfilled if the technology represents the least intrusive measure with respect to its impacts on human rights.²⁸¹

In conclusion, accountability is a fundamental pillar for ensuring justice in cases of human rights violations arising from the use of AI technology in migration management. While there may be no perfect solution to AI accountability,²⁸² the

²⁷⁸ Rodrigues, Rowena. “Legal and human rights issues of AI: Gaps, challenges and vulnerabilities”, *Journal of Responsible Technology* 4, no. 1000005 (2022): 1-12.

²⁷⁹ Okolo, T. Chinasa, Aruleba, Kehinde, and Obaido, George. “Responsible AI in Africa – Challenges and Opportunities”, *Palgrave Macmillan* (2023): https://doi.org/10.1007/978-3-031-08215-3_3.

²⁸⁰ McGregor, Lorna. “Digital Border Governance: A Human Rights Based Approach”, *OHCHR, University of Essex* (September 2023): 22-23, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

²⁸¹ *Ibid*, 280.

²⁸² Bartlett, Matt . “Solving the AI accountability gap: Hold developers accountable for their creations”, *Medium, Towards Data Science* (2019), <https://towardsdatascience.com/solving-the-ai-accountability-gap-dd35698249fe>.

enduring question of who bears responsibility, whether it is ‘the human or the machine’, will remain central to societal discourse for decades to come. This question will not be confined to migration management but will extend to areas such as litigation and judicial processes. Nonetheless, it is a critical question to address, particularly considering error rates and discriminatory outcomes in AI systems.²⁸³

16. Unfair, biased and discriminatory AI

AI systems can be biased, discriminatory and unfair.²⁸⁴ In the context of migration management where the stakes are exceptional high, any negative inferences with AI technologies can exacerbate systemic inequalities and increase the vulnerability of already marginalised groups.²⁸⁵

For instance, FRT have been shown to have higher error rates for non-Caucasian, female and dark-skinned faces. Similarly, the use of predictive analytics and algorithmic profiling highlight how AI can reinforce existing biases. By relying on historical data and predicted behaviours, which often contain racial and ethnic biases, they can disproportionately disadvantage certain groups of migrants.²⁸⁶ Moreover, instances of bias and discrimination within ADM systems are widely documented. Emotion recognition technologies can also be biased, as the monitoring of faces for signs of lying may be unjust and the systems becomes more sceptical and therefore discriminate the individual.²⁸⁷

In particular, machine learning technologies are susceptible to inheriting biases found in historical data, which can result in erroneous legal decisions. For instance, these technologies may learn from past cases that certain types of claims have a higher probability of success, not due to the merits of the cases, but because of easier

²⁸³ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 27, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

²⁸⁴ Giribaldi, Davide. „Intelligenza artificiale, tutti i pregiudizi (bias che la endono pericolosa

²⁸⁵ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330, and: Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 25, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

²⁸⁶ Foster, Madeleine. “Refugee Protection in the artificial intelligence era: A test case for rights”, *Royal Institute of International Affairs* (September 2022): 14.

²⁸⁷ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 1-5, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

Unfair, biased and discriminatory AI

access to legal advice and representation. This endangers marginalised groups who lack such access, as the system may learn that their claims are less likely to succeed. Consequently, AI tools trained on biased datasets, may perpetuate and even exacerbate these biases, leading to unjust legal outcomes.²⁸⁸

The issue of bias extends beyond specific AI applications to the very algorithms that drive them. In fact, it is widely documented that AI systems and their underlying algorithms are trained on data that reflects human biases and errors. Thus, resulting in the algorithm applying the same errors and biases as human decision-makers.²⁸⁹

The biases manifest in several ways. For example, they can lead to additional border checks, increased bureaucratic hurdles, increased surveillance of certain groups, wrongful detention, errors in the granting of benefits and even the denial of entry into EU territory.²⁹⁰

Several states have already started to experiment with ADM in migration management. If it is deciding on asylum applications, immigration detentions or other decisions, it is not sure how the technology will assess these cases, without being discriminatory. How is an automated system able to deal with the decisions on people's lives as these situations are highly complex and inherit various nuances which must be considered? Indeed, ADM systems often fail to adequately consider the individual circumstances of migrants, particularly when decisions are based on group-based data, historical cases, or profiling tactics.²⁹¹ In such cases, the system overlooks individual circumstances and focuses instead on group characteristics. The ECHR has prohibited in this context "collective expulsions from a territory without consideration of their personal circumstances", or in other words, deportations solely based on ADM decisions which lead to deportations.²⁹² To sum up, systems that overlook individual situations can result in discrimination, unjust deportations, and the detention of those who should be protected.

²⁸⁸ Lane, Lottie. "Clarifying Human Rights Standards through Artificial Intelligence", *Cambridge University Press, International and Comparative Law Quarterly* 71 (2022): 923.

²⁸⁹ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 1-5, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

²⁹⁰ Ibid, 289.

²⁹¹ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022): 13-14.

²⁹² Council of Europe. "Guide on Article 4 of Protocol No. 4 to the European Convention on Human Right: Prohibition of collective expulsions of aliens", European Court of Human Rights (2020), <https://www.refworld.org/jurisprudence/caselawcomp/echr/2020/en/119085>.

The challenge ahead lies in ensuring that AI systems can effectively distinguish between relevant or irrelevant or protected factors in migration management decisions. In fact, the AI technologies must exclude protected factors, such as race, ethnicity, gender, from its decision-making process to avoid discrimination.²⁹³ Yet, due to the opaqueness surrounding the data used by the algorithm to take its decisions and the intransparency regarding what weight is given to individual data points, it is often impossible to tell if the algorithm used any protected factor or not.

16.1. How can AI be discriminatory?

At this stage it is essential to examine how AI can lead to discrimination. Barocas and Selbst identify five unintentional ways AI can lead to discrimination: By defining the target variable and class labels, by labelling the training data, by collecting the training data, by selecting the features that an AI system uses for prediction and by using proxies. Additionally, AI systems can be purposefully used for discriminatory ends.²⁹⁴

The target variable is the specific outcome that the AI system should predict. In the context of border controls, this could be the "risk level" of a migrant to national security. If this target variable is not carefully defined, it could unintentionally reflect or reinforce existing biases.²⁹⁵

Class labels are the categories into which an AI system categorises data. For instance, in a system predicting the "risk level" of migrants, the data level might be divided into categories such as high, medium, and low risk. These labels help the system classify individuals or data points based on the criteria defined. However, the definition of class labels can lead to discriminatory outcomes. For example, if an AI system associates certain behaviours or characteristics, which are more common in specific ethnic groups, with a higher risk to security, it will unfairly discriminate against individuals from those groups.²⁹⁶

²⁹³ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022): 12.

²⁹⁴ Barocas, Solon and D. Selbst, Andrew, "Big Data's Disparate Impact", *California Law Review* (2016): 678, https://canvasstanford.edu/courses/60360/files/1469413/download?download_frd=1.

²⁹⁵ Zuiderveen Borgesius, Frederik. "Discrimination, Artificial Intelligence, and Algorithmic Decision-Making", *Council of Europe* (2018): 15-23.

²⁹⁶ *Ibid*, 295.

Unfair, biased and discriminatory AI

Additionally, bias can also arise from how training data is collected. If the data which is used by an algorithm is biased, the system will disproportionately scrutinise the discriminated group, leading to further findings within that group and reinforce that.²⁹⁷

Feature selection in AI systems can also introduce bias. This process identifies the data attributes that significantly impact the outcome. For example, an AI system used to assess asylum applications might consider factors like language proficiency or educational background. If certain migrant groups have less access to education or language learning resources, selecting these features could unfairly disadvantage them. Therefore, selecting inappropriate features can introduce bias, as these features might indirectly correlate with protected characteristics.²⁹⁸

Furthermore, AI can unintentionally discriminate through proxies, which are data points that correlate with protected characteristics such as race, nationality, or ethnicity without directly referencing them. For instance, a border control system might predict visa overstayers by analysing migrants' zip codes.²⁹⁹ The system could identify patterns linking certain zip codes to a higher security risk, inadvertently associating these postal codes with specific ethnic groups, simply because there are more of 'them' living there. Consequently, the algorithm learns to consider individuals with these zip codes as higher risk, leading to future discrimination. In other words, even if the algorithm does not explicitly use race or ethnicity as a criterion, it infers them from other data points such as postal codes.³⁰⁰

16.2. Automation bias and discriminatory human decision-making

When discussing bias within AI technology, attention often centres on the technology and algorithms as the primary sources of discriminatory decisions. However, research reveals that discrimination risks are similarly high for both fully and partly automated decisions, indicating that factors beyond the technology itself contribute to bias,

²⁹⁷ Zuiderveen Borgesius, Frederik. "Discrimination, Artificial Intelligence, and Algorithmic Decision-Making", Council of Europe (2018): 15-23.

²⁹⁸ Ibid, 297.

²⁹⁹ Neuwirth, Rostam J. "Prohibited artificial intelligence practices in the proposed EU artificial intelligence act (AIA)", *Computer Law & Security Review* 48, 105798 (2023): 8. <https://doi.org/10.1016/j.clsr.2023.105798>.

³⁰⁰ Ibid, 297.

particularly human factors.³⁰¹ One significant factor for this is "automation bias", which describes the increasing tendency to view automated decisions as inherently more accurate and more fair, leading people to trust these systems without question their own judgement and intuition. As a result, undue weight is placed in the recommendations made by the computer.³⁰² This blind trust fosters discrimination and leads to "rubber-stamping" algorithmically prepared decisions. The latter can result from a lack of ability on the part of the decision-maker or a lack of willingness to make appropriate individual assessments, coupled with a belief in the rationality and infallibility of new technologies.³⁰³

Moreover, biases within AI systems can reinforce pre-existing discriminatory attitudes in people, leading individuals to discriminate based on AI outcomes. The automated decisions align with and validate their prejudices, exacerbating discriminatory behaviour.³⁰⁴ In addition, human decision-makers may try to reduce their own responsibility by relying on the computer's recommendations, thus blaming the system for discriminatory outcomes rather than taking accountability themselves.³⁰⁵

Conversely, decisions made by humans are also susceptible to biases. Research indicates that border guards sometimes deviate from algorithmic system outputs just to match the decision to their personal biases and discriminatory attitudes.³⁰⁶ Recognising bias in human decisions is often more difficult compared to decisions made by AI, as humans either hide the factors that influence their decisions or are unaware of their own bias. In this respect, AI decision-making processes can offer advantages, particularly in reducing unconscious bias.³⁰⁷

Furthermore, machine learning algorithms are designed to only consider variables that improve the accuracy of predictions based on their training data. By

³⁰¹ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

³⁰² Ibid, 301.

³⁰³ Zuiderveen Borgesius, Frederik. "Discrimination, Artificial Intelligence, and Algorithmic Decision-Making", *Council of Europe* (2018): 15-23.

³⁰⁴ Alon-Barkat, Saar & Busuioc, Madalina. "Human–AI Interactions in Public Sector Decision Making: 'Automation Bias' and 'Selective Adherence' to Algorithmic Advice," *Journal of Public Administration Research and Theory* 33, no. 1 (January 2023): 153–169, <https://doi.org/10.1093/jopart/muac007>.

³⁰⁵ Zuiderveen Borgesius, Frederik. "Discrimination, Artificial Intelligence, and Algorithmic Decision-Making", *Council of Europe* (2018): 11.

³⁰⁶ Green, Ben. "The Flaws of Policies Requiring Human Oversight of Government Algorithms," *Computer Law & Security Review* 45 (2022): 105681, <https://doi.org/10.1016/j.clsr.2022.105681>.

³⁰⁷ Alon-Barkat, Saar & Busuioc, Madalina. "Human–AI Interactions in Public Sector Decision Making: 'Automation Bias' and 'Selective Adherence' to Algorithmic Advice," *Journal of Public Administration Research and Theory* 33, no. 1 (January 2023): 153–169.

The lack of privacy and data protection

refining these variables, it is possible to mitigate unconscious biases in decision-making processes.³⁰⁸

16.3. Counteracting discrimination

To effectively sanction or monitor discrimination and violations of the principles of equality and non-discrimination, it is essential to make such violations visible first, which is a task that is not always straightforward. Therefore, it is crucial to ensure a certain level of transparency in these systems, allowing individuals to understand how information flows and how data is weighted to arrive at decisions. In addition to transparency the right to receive an explanation must be respected and the right to receive appropriate information. For example, by notifying the individual on a decision made by the systems. Overall, it needs proactive measures to counteract discrimination, which involves professional training given developers, deployers and users of AI systems and as well as developing codes of conduct for situations with discriminatory outcomes.³⁰⁹

17. The lack of privacy and data protection

Furthermore, the ability of AI systems to analyse and learn from large datasets, which often come from multiple sources, raises significant concerns about data privacy and protection. When the data collected is excessive and irrelevant to its intended purpose, then the AI-enabled technology can interfere with the right to privacy and data protection principles.³¹⁰

For instance, using data from migrants' mobile phones, online dating profiles, or web searches to decide asylum applications is disproportionate and infringes on privacy rights.³¹¹ In countries like Austria, Germany, Denmark, Norway, the UK, and Belgium, laws allow the seizure and extraction of data from asylum seekers' mobile

³⁰⁸ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

³⁰⁹ Fjeld, Jessica, et. al "Principled Artificial Intelligence: Mapping Consensus in Ethical and Rights-Based Approaches to Principles for AI", *Cambridge, Berkman Klein Center Research Publication*, no. 1 (January 2020): 53. <http://dx.doi.org/10.2139/ssrn.3518482>.

³¹⁰ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 18, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

³¹¹ Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum governance in Europe", *Oxford: Refugee Studies Centre, University of Oxford* (2023), 64-66.

phones, which is then used in asylum procedures.³¹² This practice is neither necessary nor proportionate, and the assumption that such data reliably reflects an individual's truthfulness is flawed, as discrepancies may have legitimate explanations.³¹³

Moreover, governments increasingly use social media intelligence, which are the technologies that allow the monitoring of social media networking sites.³¹⁴ This is done either by the government themselves or with the help of private entities, which provide tools for monitoring the social media activities. These measures not only erode privacy rights and questions the proportionality of data collection practices, but also violate other data protection principles, such as the right to access data, the right not to be judged solely by automated decision-making, the right to rectify personal data, the right to erasure and the right to prevent or stop harmful processing.³¹⁵

Beyond these specific risks, AI systems pose a broader threat of becoming tools for intrusive overreach, enabling unwarranted intervention into the privacy of migrants. In contrast to the powerful entities collecting and processing their data, migrants often lack the control and oversight necessary to protect their personal information from misuse.³¹⁶

Lastly, there is also the challenge regarding data sharing, for example between state and non-state actors, which raises concerns of arbitrary use of data. Moreover, there is the common concern of data being shared with the asylum seeker's country of origin, which could pose significant risks to their safety.³¹⁷ These challenges intensify when databases become interoperable, as the whole data collection and storage framework becomes even more opaque (see Chapter 21.2).³¹⁸

³¹² Maeker, Morgan. „Europe is Using Smartphone Data as a Weapon to Deport Refugees“, *Wired UK* (July 2018), <https://www.wired.com/story/europe-immigration-refugees-smartphone-metadata-deportations/>.

³¹³ Molnar, Petra. „Testing Grounds: Migration Management Experiments and Reflections from the Ground Up“, *Refugee Law Lab online* (2020): 18, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds>.

³¹⁴ *Ibid.*, 313.

³¹⁵ Bartlett, Matt. „Solving the AI accountability gap: Hold developers responsible for their creations“, *Towards Data Science* (2019), found in: Rodrigues, Rowena. „Legal and human rights issues of AI: Gaps, challenges and vulnerabilities“, *Journal of Responsible Technology* 4, no. 1000005 (2020): 1-12.

³¹⁶ Rodrigues, Rowena. „Legal and human rights issues of AI: Gaps, challenges and vulnerabilities“, *Journal of Responsible Technology* 4, no. 1000005 (2020): 1-12.

³¹⁷ Foster, Madeleine. „Refugee Protection in the artificial intelligence era: A test case for rights“, *Royal Institute of International Affairs* (September 2022).

³¹⁸ Molnar, Petra. „Testing Grounds: Migration Management Experiments and Reflections from the Ground Up“, *Refugee Law Lab online* (2020): 32, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

18. The lack of respect of human dignity

Moreover, AI systems must not lead to the dehumanisation of individuals or reduce them to mere data points, in a way which interferes with human dignity. However, in cases of impersonal decision-making and the ignorance of individual circumstances, the human dignity is often compromised. Human dignity requires an acknowledgment of the complexity of human identity, including respecting the individual experiences and emotions. Furthermore, it demands respect for the inherent worth and dignity of every person, regardless of their background, characteristics, or circumstances.³¹⁹ In the context of migration management, the lack of personal interaction and the reliance on ADM can strip individuals of their dignity by failing to recognise their personal narratives and the hardships they have endured. Moreover, the impersonal nature of AI-driven decisions can exacerbate feelings of alienation among migrants, who may already be vulnerable and traumatised. The inability to communicate their story to a human decision-maker can lead to a profound sense of injustice and a feeling that their humanity is being denied.³²⁰

19. Lack of procedural fairness

Procedural fairness is a legal principle asserting that every individual is entitled to fair treatment and should not be subjected to arbitrary decisions. This principle encompasses the right to be heard, a fair trial, an impartial and independent decision-maker, an explanation for decisions, and the right to appeal unfavourable outcomes.³²¹ AI technologies pose several challenges in meeting these legal standards. First, this is due to the 'black-box barrier' and opacity of the AI systems, which hinder transparency and accountability. Second, AI systems often fail to meet specific administrative standards of asylum law, such as the requirement for written justifications for asylum decisions, among others.³²² This right to receive an appropriate justification may also

³¹⁹ Committee on Artificial Intelligence (CAI), "Draft Framework Convention on artificial intelligence, human rights, democracy and the rule of law, Draft Explanatory Report", *Council of Europe* (March 2024), <https://www.coe.int/en/web/artificial-intelligence/cai>.

³²⁰ Cataleta, Maria Stefania. "Humane Artificial Intelligence: The Fragility of Human Rights Facing AI", *East-West Center, Working Paper No. 2* (2020), <http://www.jstor.org/stable/resrep25514>.

³²¹ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

³²² See for example, Directive 2013/32/EU, Article 46.

fall short when ADM outcomes can simply not be explained.³²³ Generally, the transition from human to AI decision-makers in administrative law is fraught with uncertainties. While it is generally argued that technology is merely an aid to human decision-makers, in practice the distinction between machine and human decision-making is often blurred due various factors, including automation bias.³²⁴

In principle, any constraints on procedural fairness standards can infringe upon the human rights of migrants, including their right to an effective remedy, their right to non-discrimination, and their right to life. This is particularly critical in cases involving an international protection status or in deportation decisions, where the stakes are exceptionally high.³²⁵

19.1. Right to an effective remedy

The fundamental right to an effective remedy ensures that individuals have access to appropriate legal avenues to challenge decisions made by AI systems. According to the Council of Europe, remedies must be effective and accessible to comply with human rights: To be 'effective' the remedy must specifically address the situation in question. To be 'accessible' the remedy must be easily accessible to the person concerned, without major financial or bureaucratic obstacles.³²⁶ The right to an effective remedy is closely linked to the right to transparency. This is because the victim must have the necessary information at hand to even be able to even take legal or any other action against the automated outcome of the AI decision. Furthermore, the right to an effective remedy implies that any decision affecting the migrant must be well reasoned and carried out on an individual basis. Additionally, appropriate compensation should be available, not solely based on financial loss, but also adequately reflecting the violation of the human right itself.³²⁷

This thesis advances the argument that the EU must establish impartial and independent complaint-handling bodies at its borders to safeguard the human right to

³²³ Foster, Madeleine. "Refugee Protection in the artificial intelligence era: A test case for rights", *Royal Institute of International Affairs* (September 2022).

³²⁴ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 324.

³²⁵ *Ibid*, 324.

³²⁶ Committee on Artificial Intelligence (CAI), "Draft Framework Convention on artificial intelligence, human rights, democracy and the rule of law, Draft Explanatory Report", *Council of Europe* (March 2024).

³²⁷ *Ibid*, 326.

access adequate and effective remedies. These mechanisms should not be conflated with the general "human element" required in ADM process, as stipulated by the GDPR.³²⁸ Rather, these bodies should specifically assist migrants and refugees in obtaining appropriate and effective remedies and reparations. For these bodies to be effective, they must be adequately resourced, possess the necessary authority to access relevant information, and help in reaching decisions on complaints. Additionally, they must have the relevant expertise in AI border technologies. The information provided to these bodies must be meaningful, allowing both the migrant and the complaints-handling body to contest the decision if necessary. In more complex cases, border authorities must grant these bodies sufficient time to access and analyse the technological outcomes before taking any consequential actions, such as deportation or conviction. Furthermore, it is necessary that both Member States and the EU fully support these mechanisms by ensuring complete transparency regarding the AI technologies in use³²⁹This aligns with the protections enshrined in both in the ECHR, which guarantees the right to a fair trial and an effective remedy in its Articles 6 and 13³³⁰, as well as the EU Charter, which upholds the right to effective judicial protection in Article 47³³¹.

20. Migration as a testing ground for new technologies

This chapter examines whether the existing regulatory gap at the regional, national, and international levels³³² combined with the opacity surrounding AI technologies at the EU's external borders, is intentional. It explores the hypothesis that the EU may be intentionally using migrants as a 'testing ground' for emerging AI technologies.³³³

In fact, the regulatory vacuum in which these AI technologies are developed and deployed is not merely a byproduct of the rapid pace of technological innovation, rather, as this thesis argues, it reflects a deliberate strategy. The absence of comprehensive

³²⁸ European Union, GDPR, Regulation (EU) 2016/679, Article 22.

³²⁹ McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCR, University of Essex* (September 2023): 23, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

³³⁰ Council of Europe, *European Convention on Human Rights*, 1950, Articles 6 and 13.

³³¹ European Union, *Charter of Fundamental Rights of the European Union*, 2012, Article 47.

³³² McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCR, University of Essex* (September 2023): 5, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

³³³ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-328.

regulations and the lack of transparency facilitate unrestrained experimentation with these technologies, often without sufficient oversight or accountability.³³⁴ Yet, it affects primarily marginalised groups that are disproportionately exposed to the risks associated with these untested technologies. This argument is built on three key theses:

First, the perception of migrants and refugees as the „other“ has facilitated the implementation of AI technologies that infringe on human rights. This dehumanising perspective justifies the experimental use of these technologies, which would be highly likely unacceptable within EU Member States, where robust governance and oversight mechanisms such as data protection and procedural safeguards, are in place. However, at the borders, where state accountability is weaker and governance mechanisms are less established, they are nevertheless deployed.³³⁵

This development brings me to the research question, whether migrants possess fewer rights than EU-citizens? Indeed, the disparity in rights between citizens and non-citizens is not a new issue. Several scholars have illuminated this normalisation of contradictions inherent in the different allocation of rights, including Arendt³³⁶, Agamben³³⁷, Carens³³⁸, among others. They highlighted how the legal and political structures can perpetuate the unequal treatment of non-citizens, and how these structures reinforce a "hierarchy of rights".³³⁹ Thus, the argument that untested and invasive AI technologies are first applied to individuals with fewer rights, namely migrants and refugees, is thus plausible. Moreover, and as noted in previous chapters, the status of migrants and refugees as "non-citizens" limits their access to procedural safeguards and often undermines their ability to seek legal remedies. This lack of

³³⁴ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", Refugee Law Lab online (2020): 13-15, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

³³⁵ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-328.

³³⁶ Arendt, Hannah. "*The Origins of Totalitarianism*", Schocken Books (1951), in: Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-328.

³³⁷ Agamben, Giorgio. "*State of Exception*", University of Chicago Press (2005), in: Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-328.

³³⁸ Carens, Joseph H. "*The Ethics of Immigration*", OUP, Oxford (2013), Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-328.

³³⁹ *Ibid*, 335.

Migration as a testing ground for new technologies

access to justice and reparations makes them particularly vulnerable to being used in “high-risk-experiments” with new AI technologies.³⁴⁰

Second, the power imbalance between the EU on the one hand and the vulnerable migrant on the other raises ethical concerns regarding equality and justice. This power imbalance in border governance stems from the lack of agency of the migrants to refuse the use of AI technologies on them, which leads to the issue of free and informed consent. In fact, it is the overall migration regime which creates a deep dependency on states for immediate assistance, sometimes essential for the very survival, further exacerbating this power imbalance. This dependency makes it nearly impossible for migrants to challenge the use of such technologies, creating an environment “ripe for exploitation”.³⁴¹

Third, as discussed in the previous chapter on Agency Laundering, the EU and its Member States can evade accountability by outsourcing the development of AI technologies to the private sector. This outsourcing blurs lines of responsibility and complicates efforts to hold any party accountable, making it increasingly difficult, if not impossible, for migrants and refugees to seek redress for potential harms.³⁴²

In conclusion, these factors collectively exacerbate the vulnerability of migrants and suggests a deliberate strategy aimed at using them as a “testing ground for new technologies”.³⁴³

³⁴⁰ Molnar, Petra. “Technology on the Margins: AI and Global Migration from a Human Rights Perspective,” *Cambridge International Law Journal* 8, No. 2 (2019): 306.

³⁴¹ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 6-7, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

³⁴² *Ibid*, 340.

³⁴³ Molnar, Petra. “Technology on the Margins: AI and Global Migration from a Human Rights Perspective,” *Cambridge International Law Journal* 8, No. 2 (2019): 305-306.

21. The Criminalisation of Migration

Yet, AI systems do not exist in a vacuum, rather are they intricately linked to the social and political environments in which they function.³⁴⁴ It is through the technological advancements, that state control over people on the move has significantly increased.³⁴⁵ In this light, it is reasonable to argue that some EU states are using these technologies to promote nationalist agendas focused on stricter border controls and enhanced surveillance of migrants and refugees.³⁴⁶ This approach manifests in border spaces transforming in a site of criminality, with drones monitoring from the above and unmanned surveillance capabilities being deployed on the grounds. Moreover, maritime operations are enhanced, aimed at stopping vessels directly at sea.³⁴⁷ The EU has used the latter practice for years to curb migratory flows, which resulted in numerous deaths at sea.³⁴⁸ Although these measures are often justified under the guise of security, they effectively mask their dehumanising effects and reveal a serious convergence of technology, nationalism, and human rights violations.³⁴⁹

Overall, the AI-enabled surveillance tools often operate under the assumption that every migrant is a potential "*illegal migrant*" and effectively criminalise migration through a concept known as 'Crimmigration'.³⁵⁰ The label of being an 'illegal migrant' is problematic as it criminalises migrants and fosters a culture of exclusion and stigma. The term 'illegal' implies wrongdoing and overlooks the complex factors driving migration. Additionally, it undermines human rights by justifying severe and punitive measures and erodes legal protections for migrants. It also conflates different legal

³⁴⁴ Elliott, Anthony, ed. "The complex systems of AI: Recent trajectories of social theory", in: "*The Routledge Social Science Handbook of AI*", Routledge, 1st Edition (2023): 3-14. <https://doi.org/10.4324/9780429198533>.

³⁴⁵ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 34, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

³⁴⁶ Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23, DOI: <https://doi.org/10.1186/s40878-022-00305>.

³⁴⁷ Beduschi, Ana. „International migration management in the age of artificial intelligence“, *Oxford University Press* 9, no. 3 (2021): 588.

³⁴⁸ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 20, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

³⁴⁹ Elliott, Anthony, ed. "The complex systems of AI: Recent trajectories of social theory", in: "*The Routledge Social Science Handbook of AI*", Routledge, 1st Edition (2023): 3-14. <https://doi.org/10.4324/9780429198533>.

³⁵⁰ Fort, Kristina. „Migration Management in the Era of AI: How emerging technologies shape the border space“, *Digitalisation and ICT, Humanitarianism and Conflict* (2024), <https://blogs.lse.ac.uk/internationaldevelopment/2024/01/12/migration-management-in-the-era-of-ai-how-emerging-technologies-shape-the-border-space/>.

The inherent power of Data collection

issues, namely the unauthorised entry into the EU with criminal behaviour.³⁵¹ What is more, is that it violates the presumption of innocence, as migrants are presupposed to be criminals unless proven otherwise.³⁵²

V. The inherent power of Data collection

The widespread adoption of big data analytics and AI technologies has profoundly reshaped the field of migration management, introducing a complex dynamic of control and surveillance. While human activities consistently generate significant amounts of data, access to and management of this data is largely in the hands of state institutions and private sector entities due to strict data access restrictions. This centralisation of data control raises critical questions, especially since neither the migrant, who is the primary data subject, nor migration scholars can monitor or influence the way in which these data are used by governments. Such inequality in data access highlights the pronounced power differences in the field of migration management.³⁵³

22. Big Data

The term “Big Data” refers to large datasets, that includes information from a variety of sources and grows at an exponential pace.³⁵⁴ The analysis of this Big Data has provided social scientists with unprecedented insights into migration management issues, such as the analysis of temporary or circular migration patterns, as well as real-time monitoring of public opinion and media discourse on migration. In doing so, it provides information on aspects of migration which were previously unreachable. This brings advantages such as increased efficiency, improved preparedness for a migration influx and more ‘border security’.³⁵⁵

The application of Big Data in migration management can be broadly divided into two categories. The first involves analytical uses, aiming to provide faster and more

³⁵¹ Amelung, Nina. “Crimmigration Control across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases”, *Historical Social Research* 46, Nr. 3 (2021): 151-177.

³⁵² Cf. Atak, Idil and Simeon, James, eds. „*The Criminalization of Migration: Context and Consequences*“, McGill-Queen’s University Press (2018): 3-34, <https://doi.org/10.2307/j.ctv941wq2>.

³⁵³ Bircan, Tuba and Korkmaz Eren, Emre. “Big data for whose sake? Governing migration through artificial intelligence”, *Humanities & Social Sciences Communications* 8, no. 241 (2021): 1-5. <https://doi.org/10.1057/s41599-021-00910-x>.

³⁵⁴ Segal, Troy, “What is Big Data? Definition, How it Works, and Uses”, *Investopedia* (August 2024), <https://www.investopedia.com/terms/b/big-data.asp>.

³⁵⁵ *Ibid*, 353.

efficient processes in analysing migrants' data. The second category encompasses more speculative uses, such as AI lie detection and automated decision-making processes in visa and asylum applications. It is necessary to differentiate between these two categories, as they pose distinct risks to human rights.³⁵⁶

The risks associated with the first category, analytical uses, can be illustrated by the predictive analytical tools employed by the EUAA. As previously discussed, these tools raise significant concerns related to the principles of purpose limitation, consent of the data subject, data minimisation, and the overarching risk that governments may use this data to curb migration movements.³⁵⁷

The second category, speculative uses of Big Data, presents even more profound challenges. Pilot projects such as iBorderCtrl³⁵⁸, which essentially functioned as a lie-detection system, and the ROBORDER project³⁵⁹, which focused on creating autonomous border surveillance, exemplify the far-reaching human rights implications of these technologies. These projects highlight that the impact of Big Data in migration management extends well beyond issues of data protection and touches upon more fundamental rights, such as the right to life, non-refoulement, dignity, and the freedom from arbitrary surveillance.³⁶⁰

In summarising the most pressing risks associated with both categories, three key concerns emerge: First, there is the risk of introducing a more intrusive surveillance regime that infringes upon the human rights of migrants. Second, states and organisations may exploit the collected data in ways that are incompatible with ethical standards or the protection of individual rights, further exacerbating the vulnerabilities of migrant populations.³⁶¹ Third, the effective operation of these systems relies on a

³⁵⁶ Bircan, Tuba and Korkmaz Eren, Emre. "Big data for whose sake? Governing migration through artificial intelligence", *Humanities & Social Sciences Communications* 8, no. 241 (2021): 1-5. <https://doi.org/10.1057/s41599-021-00910-x>.

³⁵⁷ European Data Protection Supervisor (EDPS). "Statement by the Data Protection Officer on the European Asylum Support Office (EASO) Social Media Monitoring Reports (case 2018-1083)", Data Protection Officer, European Asylum Support Office (2019), https://edps.europa.eu/sites/default/files/publication/19-11-12_reply_easo_ssm_final_reply_en.pdf.

³⁵⁸ European Commission. "Intelligent Portable Border Control System", Fact Sheet <https://cordis.europa.eu/project/id/700626>.

³⁵⁹ Forti, Mirko. "AI-Driven Migration Management Procedures: Fundamental Rights Issues and Regulatory Answers", *BioLaw Journal*, no. 2 (2021): 433-451, <https://ssrn.com/abstract=3877083>.

³⁶⁰ Bircan, Tuba and Korkmaz Eren, Emre. "Big data for whose sake? Governing migration through artificial intelligence", *Humanities & Social Sciences Communications* 8, no. 241 (2021): 1-5. <https://doi.org/10.1057/s41599-021-00910-x>.

³⁶¹ Molnar, Petra. "New technologies in migration: human rights impacts", *Forced Migration Review* 61 (2019): 7-10, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

Big Data

continuous influx of data, which promotes the trend known as the "datafication of migration management".³⁶² This trend underscores the growing and never stopping dependency on extensive data collection, often at the expense of individual privacy and autonomy.³⁶³

It is essential to recognise that data collection and processing are far from neutral activities, particularly when carried out by powerful state actors targeting vulnerable populations.³⁶⁴ The knowledge derived from migrants' data can be exploited by states, public authorities, and organisations, often in ways that reinforce existing power imbalances and marginalise those who are already vulnerable.³⁶⁵ This exploitation of migration data can also be misinterpreted and manipulated to redistribute aid and resources, such as financial incentives, often favouring certain groups over others. Moreover, there is scientific evidence that migration data is frequently used for political purposes to stoke fear and xenophobia within society.³⁶⁶ This fabricated societal fear then serves as a pretext for implementing hard-line responses to migration crises. Responses that frequently fail to comply with international law and raise serious concerns about basic civil liberties and human rights.³⁶⁷

The misuse of data is not an abstract concern, but a reality seen in numerous historical and contemporary examples. For instance, in Myanmar, biometric data collected from Rohingya refugees has been used by oppressive governments to identify and forcibly remove these individuals from encampments. Similarly, in China, facial recognition and location tracking tools have been used to facilitate the persecution of Uighurs through a so-called 'Muslim tracking database'. The data

³⁶² Tsagarousianou, Roza. "The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe", *Media, Culture & Society* 46,4 (2024): 1-18. <https://doi.org/10.1177/01634437231214193>.

³⁶³ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 7-10, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

³⁶⁴ Lazcoz, Guillermo & De Hert, Paul. „Humans in the GDPR and AIA governance of automated and algorithmic systems: Essential pre-requisites against abdicating responsibilities”, *Computer Law & Security Review* 50, 105833 (2023): 1-20.

³⁶⁵ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 7-10, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

³⁶⁶ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 7, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

³⁶⁷ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

collection of marginalised groups is also deeply historical.³⁶⁸ For instance, during the Second World War, Nazi Germany collected extensive data on Jewish communities to facilitate the Holocaust.³⁶⁹ Another historical example is the Rwandan genocide in 1994, where ethnicity registries were used to register all Tutsis, marking them as part of the targeted minority.³⁷⁰ These historical and contemporary cases illustrate how data collection, especially when involving marginalised groups, is rarely neutral and can be manipulated for political purposes.

Furthermore, there is a significant lack of fairness in the way data is collected from migrants and refugees. Consider, for example, the EU's external border in Greece, where every migrant undergoes an extensive registration procedure facilitated by the EU's "digital firewall," comprising several large-scale IT databases³⁷¹. This process involves fingerprinting, collecting DNA samples, dental records, and conducting interviews to assess the legitimacy of asylum claims.³⁷² This exhaustive process of interviews and data gathering often occurs without obtaining the consent of migrants or providing a clear explanation of the procedures involved³⁷³. This exhaustive process of data gathering, and interviews often takes place without obtaining the migrants' informed consent or providing a clear explanation of the procedures involved. Consequently, this raises serious concerns about the principles of free and informed consent, while also instilling a sense of fear among migrants regarding the potential risk of deportation.³⁷⁴ Once their personal data is provided, migrants are categorised into groups such as asylum seeker, illegal migrant, economic migrant, or deportee. This categorisation not only determines the administrative

³⁶⁸ Cimpanu, Catalin. "Chinese Company Leaves Muslim-Tracking Facial Recognition Database Exposed", ZDNET (2019), www.zdnet.com/article/chinese-company-leaves-muslim-tracking-facial-recognition-database-exposed-online/.

³⁶⁹ Molnar, Petra. „New technologies in migration: human rights impacts”, *Forced Migration Review* 61 (2019): 7, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

³⁷⁰ Thomas, Elise. "Tagged, Tracked and in Danger: How the Rohingya got Caught in the UN's Risky Biometric Database", *Wired Magazine* (2018), <https://www.wired.com/story/united-nations-refugees-biometric-database-rohingya-myanmar-bangladesh/>.

³⁷¹ Beduschi, Ana. „International migration management in the age of artificial intelligence”, Oxford University Press 9, no. 3 (2021): 576-596. DOI:10.1093/migration/mnaa003

³⁷² Tsagarousianou, Roza. "The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe", *Media, Culture & Society* 46,4 (2024): 1-18. <https://doi.org/10.1177/01634437231214193>.

³⁷³ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 312-330.

³⁷⁴ *Ibid.*, 372.

Biometrics

processes they must go through, but also shapes the trajectory of their migration process in general.³⁷⁵

In an interview conducted at a Greek refugee camp in Moria, a young Iranian woman described her experience at the border: “*We are fingerprinted, asked for our passports, where we lived, why we left, and even to describe the streets we grew up. Then they decide on our fate. We are not able to argue back, to question*”³⁷⁶. This highlights that refugees not asked for their consent, nor is the process explained to them. Overall, there is a lack of fairness how these data is collected. This example also sheds light on the fact that migrants are well aware of the scope of the processes and understand the link between data collection and consequential decisions made regarding their status³⁷⁷.

Though often framed as enhancing security, data collection at borders raises concerns about informed consent and the ability to opt out, especially in power-imbalanced spaces, such as borders.³⁷⁸ Migrants and refugees cannot refuse biometric data collection, as it is tied to essential services like food and shelter. This lack of choice undermines their free will, raising serious concerns about the coercive use of technology on vulnerable populations.³⁷⁹ In other words, consent is never given freely and informed if it is obtained under any form of coercion, even if the coercion is disguised as a security need and faster delivery of humanitarian aid.³⁸⁰

23. Biometrics

In this context, the most often collected and used data at borders by AI systems is biometric data. This data is used to identify and verify people at borders. The EU uses facial recognition technology (FRT), fingerprint and iris scanners and other profiling techniques to capture people's biometric data. The data is then used to conduct ad hoc border controls, evaluate travel documents, perform risk assessments, forecast

³⁷⁵ Lazcoz, Guillermo & De Hert, Paul. „Humans in the GDPR and AIA governance of automated and algorithmic systems: Essential pre-requisites against abdicating responsibilities”, *Computer Law & Security Review* 50, 105833 (2023): 1-20.

³⁷⁶ Tsagarousianou, Roza. “The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe”, *Media, Culture & Society* 46,4 (2024): 8. <https://doi.org/10.1177/01634437231214193>.

³⁷⁷ *Ibid*, 376.

³⁷⁸ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

³⁷⁹ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 313.

³⁸⁰ *Ibid*, 378.

potential security threats, automate the processing of asylum applications, and provide decision-makers with insights on security measures.³⁸¹

Despite advancements in identification and verification technologies, several issues persist: The precision of these technologies varies due to contextual factors and inherent data biases. For example, even well-established methods like fingerprint identification have issues with data accuracy. Similarly, facial recognition technology's reliability depends on the quality of captured images, leading to data accuracy problems.³⁸² Research has shown that biometric border control systems often fail to account for natural changes in individuals' physical attributes, compromising their reliability as consistent identifiers.³⁸³ Additionally, relying on protected characteristics such as nationality, ethnicity, gender, family ties, and age raises concerns about non-discrimination. In fact, many algorithms used for biometric identification purposes are inherently biased towards gender and skin colour. Thus, biometric identification processes raise issues when it comes to the sense of belonging, particularly for undocumented migrants or refugees.³⁸⁴

24. EU databases and their future interoperability

It is also unclear where all this collected data is stored. In fact, the collection and processing of biometric data is promoted by the large-scale IT systems, which are developed and introduced by the EU.³⁸⁵ These systems have been analysed to transform Europe's borders into a new "digital border". The new systems are intended to be the link between the huge amounts of data on migrants and connect the areas of border controls, border facilities, detention and registration camps.³⁸⁶ Some researchers see the large IT systems as socio-technical settings that maintain the relationships between the human actors and the non-human actors, such as the software, servers and the data generated. The concept of "techno-politics" highlights

³⁸¹ Andreou, Angelanna. „e-Securing the EU Borders: AI in European Integrated Border Management“, *Journal of Politics and Ethics in New Technologies and AI* 2(1), e34287 (2023): 1-5. <https://doi.org/10.12681/jpentai.34287>

³⁸² Fuster González, Gloria. "Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence." *EPRS, Scientific Foresight Unit* (2021): 1-22.

³⁸³ *Ibid*, 382.

³⁸⁴ Tsagarousianou, Roza. "The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe", *Media, Culture & Society* 46,4 (2024): 1-18. <https://doi.org/10.1177/01634437231214193>.

³⁸⁵ *Ibid*, 382.

³⁸⁶ Glouftsiou, Georgios. "Governing circulation through technology within EU border security practice-networks", *Mobilities* 13, 2 (2018): 185-199, <https://doi.org/10.1080/17450101.2017.1403774>.

EU databases and their future interoperability

that these data systems deployed at EU borders are neither neutral nor abstract. Rather, they have a significant impact on the functioning of society and are therefore highly political.³⁸⁷ Moreover, the EU's investment in large-scale IT databases can be seen as to promote the previously mentioned trend of “datafication of migration management”³⁸⁸.

To illustrate the interaction between the EU databases, the following table shows the databases important in migration management and their primary purposes.

Table 2.: Large-scale EU IT systems in the field of migration management

IT System	Main purpose	Persons covered	Biometric identifiers
Eurodac	<ul style="list-style-type: none"> - Determining the state responsible for an application for international protection (prevents “Asylshopping”) - law enforcement 	<ul style="list-style-type: none"> - Migrants who crossed the EU borders irregularly 	<ul style="list-style-type: none"> - Fingerprints
VIS	<ul style="list-style-type: none"> - Visa applications - Law enforcement 	<ul style="list-style-type: none"> - Visa applicants 	<ul style="list-style-type: none"> - Fingerprints
SIS	<ul style="list-style-type: none"> - Law enforcement 	<ul style="list-style-type: none"> - Missing, vulnerable and wanted persons 	<ul style="list-style-type: none"> - Fingerprints, - Palm prints, - Facial image, - DNA profile
SIS-return	<ul style="list-style-type: none"> - Issuing alerts on third-country nationals subject to a return decision 	<ul style="list-style-type: none"> - Migrants in an irregular situation subject to a return decision 	<ul style="list-style-type: none"> - Fingerprints, - Palm prints, - DNA profile
SIS-border checks	<ul style="list-style-type: none"> - Issuing alerts for the purpose of refusing entry or stay 	<ul style="list-style-type: none"> - Third-country nationals convicted or suspected of crimes, - Migrants in an irregular situation 	<ul style="list-style-type: none"> - Fingerprints, - palm prints, - DNA profile

Source: Cf. FRA, “*Handbook on European law relating to asylum, borders and immigration*”, Edition 2020, Publications Office of the European Union (2020).

The existing systems have been fragmented for many years, which, while not strategic, has protected fundamental rights such as privacy and data protection by clearly defining the purpose and scope of each instrument. In fact, each EU database

³⁸⁷ Tsagarousianou, Roza. “The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of Europe”, *Media, Culture & Society* 0, 0 (2023): 12-15.

³⁸⁸ Ibid, 387.

is subject to a separate regulation, each containing specific data protection provisions.³⁸⁹ Due to a shift in policy, the EU now aims to make these fragmented databases interoperable, allowing different systems to communicate with each other. This means that authorities can conduct a single search for an individual across various interconnected IT systems simultaneously. In 2019, two Regulations on Interoperability, (EU) 2019/817 and (EU) 2019/818, came into effect. These Regulations established the core components of the new interconnected system.³⁹⁰

In principle, the new system forms the so-called Shared Biometric Matching System (sBMS), which will become one of the largest biometric systems worldwide once operational. It will extract biometric data from various EU databases, simplifying the search and cross-matching of biometric information, such as facial images and fingerprints. The sBMS will be managed by the agency EU-Lisa³⁹¹. Currently, the agency manages the SIS, VIS, and EURODAC databases, which are considered the digital frontier of the EU, as the other databases are not yet operational.³⁹² Once they are, EU-Lisa will also manage the new databases, namely the EES³⁹³, the ETIAS³⁹⁴ and the ECRIS-TCN³⁹⁵.

Scholars have highlighted that the interaction between these databases is imprecise and fragile, and it requires constant maintenance to ensure the data remains reliable and credible.³⁹⁶ Moreover, the Interoperability risks conflating the EU's legal and political objectives, such as intertwining asylum and immigration policy with police and judicial cooperation in criminal matters. This results in non-competent authorities

³⁸⁹ Blasi Casagran, Cristina. "Fundamental Rights Implications of Interconnecting Migration and Policing Databases in the EU", *Human Rights Law Review* 21 (2021): 433-457, DOI: 10.1093/hrlr/ngaa057.

³⁹⁰ FRA, "*Handbook on European law relating to asylum, borders and immigration*", Edition 2020, Publications Office of the European Union (2020), <https://fra.europa.eu/en/publication/2020/handbook-european-law-relating-asylum-borders-and-immigration-edition-2020>.

³⁹¹ EU Agency for the Operational Management of Large-Scale Information Systems in the Area of Freedom, Security, and Justice (EU-Lisa).

³⁹² Oliveira Martins, Bruno, Lidén, Kristoffer & Gabrielsen Jumbert, Maria. "Border security and the digitalisation of sovereignty: insights from EU borderwork", *European Security* 31, 3 (2022): 475-494, DOI: 10.1080/09662839.2022.2101884

³⁹³ The Entry/Exit System (EES) will register the entry and exit data and is able to refuse the entry of third-country nationals. It is regulated by the Regulation (EU) 2017/2226.

³⁹⁴ The European Travel Information and Authorisation System (ETIAS) establishes a pre-border check system for visa-free Third-Country Nationals and is regulated by Regulation (EU) 2018/1240.

³⁹⁵ The European Criminal Records Information system on Third-Country Nationals (TCN) is a centralised database, that enables EU MS to exchange information on the criminal records of TC convicted in the EU. It was created by the Regulation (EU) 2019/816.

³⁹⁶ Avello Martinez, Maria. "EU Borders and Potential Conflicts between New Technologies and Human Rights", *Peace & Security – Paix et Sécurité Internationales*, no. 11 (2023):16, http://dx.doi.org/10.25267/Paix_secur_int.2023.i11.1204

EU databases and their future interoperability

gaining routine access to personal data they previously could not access. Consequently, the decision to make large-scale IT systems interoperable would not only permanently and profoundly change the structure and functioning of these databases, but also reshape the interpretation of legal principles, and would thus be a “point of no return”.³⁹⁷

Given that the EU databases and their interoperability are distinct topics beyond the scope of this thesis, it is sufficient to conclude that interoperable databases enable AI systems to access and analyse an even more broad range of data of migrants and refugees, which inherently increases the risk of misuse and unauthorised access of data.³⁹⁸

³⁹⁷ Bunyan, Tony. „EU: Interoperability of Justice and Home Affairs databases: a point of no return”, *Statewatch* (undated), <https://www.statewatch.org/observatories/interoperability-eu-big-brother-database/> (accessed on 25.07.2024).

³⁹⁸ *Quintel*, Teresa. “Data Protection, Migration and Border Control: The GDPR, the Law Enforcement Directive and Beyond”, *Hart Studies in European Criminal Law* 17 (2022), ISBN: 9781509959655.

VI. Legislative Framework

The primary legal frameworks that can protect migrants from AI-driven threats are data protection laws, human rights legislation including non-discrimination laws, and the new AI Act.

25. Human Rights Legislation

The fundamental rights principles can derive from International Migration Law, which originates from customary international law and is reflected in the UDHR. Additionally, the fundamental rights derive from the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR). Additionally, there is the Convention against Torture (CAT) and the Convention on the Elimination of All Forms of Racial Discrimination (ICERD).³⁹⁹ Moreover, the Geneva Refugee Convention is important to consider with its non-refoulement principle.⁴⁰⁰

Apart from the international sources, there is regional Human Rights law. First and foremost, there is the ECHR which has the strongest legal force within the EU legal order, as its rights are mirrored in the EU Charter and in general principles of EU law. Article 6(3) TEU affirms that the ECHR inspires the scope of EU fundamental rights.⁴⁰¹ Thus, the EU must respect the rights guaranteed in the ECHR, despite not being a formal party to the Convention.⁴⁰² The ECHR safeguards several rights, including the right to life, the prohibition of torture, the right to liberty and security, the right to a fair trial, the right to respect for private and family life, and the right to an effective remedy, among others. The EU is obliged to protect these rights of all individuals within its jurisdiction, including migrants and asylum seekers.⁴⁰³

In addition, the EU Charter specifically protects third-country nationals through its provisions on international protection. In particular, through its Article 18, which asserts that "the right to asylum shall be guaranteed [...]" and thus encompasses the non-

³⁹⁹ Carrera, Sergio and Stefan, Marco. „*Fundamental Rights Challenges in Border Controls and Expulsion of Irregular Immigrants in the European Union: Complaint Mechanisms and Access to Justice*“, Routledge, 1st eds (2020): 158.

⁴⁰⁰ Bast, Jürgen, et. al., “Human Rights Challenges to European Migration Policy”, *The REMAP Study, Nomos/Hart 36*, 2nd revised edn (2022): 23-25.

⁴⁰¹ Fuster González, Gloria. “Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence.” *EPRS, Scientific Foresight Unit* (2021): 22.

⁴⁰² *Ibid*, 400.

⁴⁰³ Human Rights Committee General Comment No. 15 1986; *M.S.S. v. Belgium and Greece*; Advisory Opinion OC-21/14 2014.

refoulement principle.⁴⁰⁴ However, this provision lacks autonomous legal effect and does not constitute a law with direct effect. Instead, its effective implementation is contingent upon the enactment of EU secondary legislation and the implementation of measures under national law.⁴⁰⁵

25.1. Non-discrimination law

The right to non-discrimination states that differences in treatment based on protected characteristics is either unjust or need to be at least justified. The positive right to non-discrimination encompasses the negative right, which is the prohibition of discrimination. The right is closely linked to other fundamental human rights, such as the right to equal treatment, the right to an effective remedy, and the right to data protection and privacy.⁴⁰⁶ The right to non-discrimination is rooted in several legal frameworks in the EU. First, there is the Article 14 of the ECHR, which prohibits both direct and indirect discrimination. Direct discrimination occurs when individuals are treated less favourably based on a protected characteristic, such as race or origin. Indirect discrimination happens when seemingly neutral practices disproportionately disadvantage certain groups unless justified by a legitimate aim. However, the prohibition of indirect discrimination often lacks clear and easily applicable rules, leading to interpretative challenges.⁴⁰⁷

Second, there is Article 21 of the EU Charter, which also enshrines the right to non-discrimination, explicitly prohibiting discrimination based on nationality, national origin, race, and membership of a national minority.⁴⁰⁸ However, its effectiveness in border control is limited, since it mainly addresses discrimination within national laws and practices. Furthermore, it does not specifically address the admission of third-country nationals into the EU and includes exemptions for public order, which can be

⁴⁰⁴ Carrera, Sergio and Stefan, Marco. „*Fundamental Rights Challenges in Border Controls and Expulsion of Irregular Immigrants in the European Union: Complaint Mechanisms and Access to Justice*”, Routledge, 1st eds (2020): 239.

⁴⁰⁵ Ippolito, Francesca. “Migration and Asylum Cases before the Court of Justice of the European Union: Putting the EU Charter of Fundamental Rights to Test?”, *European Journal of Migration and Law* 17 (2015): 1-38.

⁴⁰⁶ Haitzma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

⁴⁰⁷ Cataleta, Maria Stefania. “Humane Artificial Intelligence: The Fragility of Human Rights Facing AI”, *East-West Center, Working Paper No. 2* (2020), <http://www.jstor.org/stable/resrep25514>.

⁴⁰⁸ European Union, *Charter of Fundamental Rights of the European Union*, 2012, Article 21.

misused to justify discriminatory practices in migration management.⁴⁰⁹ The Article is similar to Article 18(1) of the TFEU, which has extensive legal precedents, such as the Vatsouras and Koupatantze case. However, this prohibition is also only of importance for EU citizens and generally inapplicable to third-country nationals.⁴¹⁰

Considering adjudication, the CJEU provided a landmark decision concerning discrimination and algorithmic profiling in the border security context. In its decision, the CJEU identified several risks to human rights, including the right to data protection, data privacy and the right to non-discrimination.⁴¹¹ However, as already mentioned in the Chapter on the Human Element, the judges failed to acknowledge factors such as automation bias.

26. The Artificial Intelligence Act

The Artificial Intelligence Act (AI Act) was adopted in March 2024 by the European Parliament⁴¹² and presents the world's first attempt to regulate AI. It was promoted as bringing forward innovative, “trustworthy and accountable” AI, thereby presenting an opportunity to address the negative impacts of AI on human rights at EU borders⁴¹³. The Act categorises different types of technologies and systems depending on the risks they pose to fundamental rights.⁴¹⁴ The higher the risk to fundamental rights, the greater the safeguards and requirements for the systems. The Act classifies the systems into four categories, namely systems with unacceptable risk, high risk, limited risk and minimal risk.⁴¹⁵

Yet, the question arises as to who is responsible for classifying AI systems according to their risk levels. The Act stipulates that the provider must determine whether the system qualifies as an AI system under the AI Act's scope⁴¹⁶ and

⁴⁰⁹ Ippolito, Francesca. “Migration and Asylum Cases before the Court of Justice of the European Union: Putting the EU Charter of Fundamental Rights to Test?”, *European Journal of Migration and Law* 17 (2015): 1-38.

⁴¹⁰ Ibid, 409.

⁴¹¹ Court of Justice of the European Union, Case C-817, 2022, paras. 123, 203.

⁴¹² European Union, AI Act, COM(2021) 206 final.

⁴¹³ Ada Lovelace Institute, “People, risk and the unique requirements of AI – 18 recommendations to strengthen the EU AI Act”, Policy briefing (March 2022), <https://www.adalovelaceinstitute.org/wp-content/uploads/2022/03/Policy-briefing-People-risk-and-the-unique-requirements-of-AI-18-recommendations-to-strengthen-the-EU-AI-Act.pdf>

⁴¹⁴ Position of the European Parliament, of 13 March 2024, on the Artificial Intelligence Act (COM(2021)0206), Article 1, https://www.europarl.europa.eu/doceo/document/TA-9-2024-0138_EN.html.

⁴¹⁵ Ibid, 413.

⁴¹⁶ It must fall under the legal definition of Article 3 (1) of the AI Act.

subsequently assess the risks it poses to fundamental rights.⁴¹⁷ If the market surveillance authority, however, has reason to believe that a system poses a high risk, even if it has not been officially classified as such, the authority is empowered to conduct an evaluation and implement "appropriate corrective" measures as necessary.⁴¹⁸ The classification as such is necessary in determining whether the AI system is subject to the prohibition under Article 5 (prohibited AI systems) or falls within the scope of Article 6 (high-risk AI systems).⁴¹⁹

In the context of migration management, Annex III includes four use cases of AI systems, which classify automatically as 'high-risk': First, the use of AI by law enforcement agencies as lie detectors or to recognise individuals' emotional states. Second, the use of AI for risk assessments. Third, the use of AI systems to verify the authenticity of travel documents of migrants and asylum seekers. Lastly, the use of AI to support authorities in examining asylum applications.⁴²⁰ This list can be amended by the Commission through a delegated act.⁴²¹

According to the Commission, any AI system falling under these use cases is automatically classified as a high-risk system. Yet, Article 6 (3) appears to provide "a *de minimis clause*"⁴²² as it states that an AI system does not fall under the high-risk classification if "*it does not pose a significant risk of harm to the health, safety or fundamental rights of natural persons, including by not materially influencing the outcome of decision making*"⁴²³. This creates an exemption for less invasive systems, but it also introduces legal uncertainty in the terms of classifications of 'high-risk' systems. Providers invoking this exemption clause are only required to register a brief reasoning in a non-public EU database and submit documentation upon request by national authorities⁴²⁴. The lack of public access to this database raises concerns about

⁴¹⁷ European Union, AI Act, COM(2021) 206 final, Article 51.

⁴¹⁸ European Union, AI Act, COM(2021) 206 final, Article 80.

⁴¹⁹ European Union, AI Act, COM(2021) 206 final, Article 5 and 6.

⁴²⁰ European Union, AI Act, COM(2021) 206 final, Annex III, Section 7.

⁴²¹ European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022):1-19.

⁴²² Stewart, Sarah. "The regulation of AI-based migration technologies under the EU Act: (Still) operating in the shadows?", *European Law Journal* (2024): 124-135, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/eulj.12516>.

⁴²³ European Union, AI Act, COM(2021) 206 final, Article 6 (3).

⁴²⁴ European Union, AI Act, COM(2021) 206 final, Article 6 (4) and (5).

transparency, as it remains possible that AI systems impacting fundamental rights could be wrongly excluded from the ‘high-risk’ requirements in Article 6.⁴²⁵

26.1. Prohibition of the Article 5

Article 5 of the AI Act prohibits AI practices which pose an “unacceptable risks” and specifically addresses “real-time remote biometric identification systems in public spaces”⁴²⁶. These systems compare individuals in surveillance footage against predefined databases, typically watchlists. The application of these systems involves the collection and analysis of biometric data from individuals. Article 5 of the new AI Act addresses these systems prohibits their use.⁴²⁷

However, the provisions’ scope appears overly narrow, as it inadequately addresses the broader implications of biometric technologies. In fact, it excludes ‘biometric categorisation technologies’ from its scope. Such systems aim to classify individuals into categories such as sex, age, hair colour, eye colour, sexual or political orientation, and ethnic origin, often based on protected characteristics, thereby posing significant human rights risks.⁴²⁸ Thus, they need to be included in the prohibition of Article 5 AI Act. Failing to do so would imply that the EU endorses the notion that it is acceptable to categorise individuals based on their sensitive biometric data.⁴²⁹

Also, the provision leads to the notion to only prohibit the use of ‘biometric identification technologies’ in public spaces which are either used by the government or police. This definition does not address concerns about surveillance at borders, where controversial biometric identification technologies are prevalent. These technologies avoid regulatory bans by being classified as ‘post’ identification rather than ‘real-time’, or by falling into one of the broad exemptions outlined by Article 5.⁴³⁰

⁴²⁵ Stewart, Sarah. “The regulation of AI-based migration technologies under the EU Act: (Still) operating in the shadows?”, *European Law Journal* (2024): 124-135, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/eulj.12516>.

⁴²⁶ European Digital Rights (EDRi). “Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act”, *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-19.

⁴²⁷ European Union, AI Act, COM(2021) 206 final, Article 5.

⁴²⁸ Fuster González, Gloria. “Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence.” *EPRS, Scientific Foresight Unit* (2021), 1-22.

⁴²⁹ *Ibid*, 428.

⁴³⁰ Molnar, Petra. “The EU’s AI Act and its Human Rights Impacts on People Crossing borders”, Migration Strategy Group in: *Dialogue on Tech and Migration, DoT.Mig* (2020): 1-6.

Moreover, emotion recognition technologies, as previously discussed, are scientifically unproven and unreliable. Therefore, these AI systems and the whole underlying technology must be included in the Article 5 as well.⁴³¹

26.2. High-risk AI systems

Unlike systems classified as presenting unacceptable risks and therefore entirely prohibited, high-risk systems are required to comply with specific requirements rather than facing a complete prohibition.⁴³² Furthermore, the Act adopts a sector-based approach and classifies AI applications as low or high risk depending on their field of use. The Act designates “biometric identification and categorisation of natural persons” and “migration, asylum, and border control management” among others, as high-risk sectors due to the considerable impact AI can have in these areas.⁴³³ This classification indicates that AI technology can have a more serious impact in high-risk sectors compared to other sectors. Given the vulnerable situation of migrants and asylum seekers, this is an important recognition.

AI systems classified as high risk must meet specific safeguards. Recital 43 of the AI Act lists some of these safeguards, namely “*high quality of the datasets to minimise discriminatory outcomes, technical documentation, record-keeping, transparency, human oversight, robustness, accuracy and cybersecurity*”⁴³⁴. Subsequently, Recitals 44 to 54 provide further definitions and explanations of these terms. While these pre- and post-application requirements, or safeguards, broadly align with the GDPR, they offer little practical guidance for the use of AI systems in migration management. Future delegated acts must detail these safeguards more comprehensively to ensure effective implementation.

26.3. Shortcomings of the AI Act

Further the Act, like it came into force, does not provide an opportunity to fully ban certain migration technologies, such as algorithmic profiling techniques, predictive

⁴³¹ Molnar, Petra. “*The EU’s AI Act and its Human Rights Impacts on People Crossing borders*”, Migration Strategy Group in: Dialogue on Tech and Migration, DoT.Mig (2020): 1-6.

⁴³² European Union, AI Act, COM(2021) 206 final, Article 5 and 6.

⁴³³ DG Home. “Rules on migration, asylum and border management in the AI proposal”, *European Commission* (2020). <https://www.statewatch.org/media/3074/eu-council-ai-act-com-presentation-borders-migration.pdf>.

⁴³⁴ European Union, AI Act, COM(2021) 206 final, Recital 43.

analytics, emotion recognition, and lie detectors.⁴³⁵ These technologies should be included in the prohibition provision of Article 5, at least within the sector of migration management, as they threaten fundamental human rights, including the right to life, liberty, and security.⁴³⁶ Additionally, the list of high-risk AI systems in Annex III, Section 7, fails to encompass all AI technologies used in migration management.⁴³⁷

Moreover, the AI Act does not have retroactive effect, meaning it does not apply to high-risk AI systems that were placed on the market before its date of application. This means the existing AI systems will only fall under the scope if they undergo significant changes in their design or intended purpose.⁴³⁸ Clearly, this exception completely removes all existing high-risk AI systems from the scope of application and thereby presents another shortcoming within the current Act.

This is amplified by the exemption of EU large-scale migration databases in its Article 83, which states that the Act does not apply to the AI systems which are “components of the large-scale IT databases”, established by the EU⁴³⁹, if they have been put into service at the date of application of the Regulation or within 12 months afterwards.⁴⁴⁰ This exempts AI tools within large-scale EU databases such as the SIS, VIS, Eurodac, the Entry/Exit System, ETIAS and ECRIS-TN. In other words, the EU sets a bad example with its own systems and excludes its own systems from the scope from the very beginning.⁴⁴¹

Furthermore, the Regulation does not prohibit the export of harmful technologies into third countries. This is insofar important, since EU-based companies are world leaders in the development of AI systems. Research indicates that AI technologies are being exported to countries such as China and Palestine, where they can be used to intimidate and repress individuals.⁴⁴² This introduces a global aspect to the Act,

⁴³⁵ European Union, AI Act, COM(2021) 206 final, Article 5.

⁴³⁶ Molnar, Petra. “*The EU’s AI Act and its Human Rights Impacts on People Crossing borders*”, Migration Strategy Group in: Dialogue on Tech and Migration, DoT.Mig (2020).

⁴³⁷ European Union, AI Act, COM(2021) 206 final, Annex III, Section 7.

⁴³⁸ DG Home. “Rules on migration, asylum and border management in the AI proposal”, *European Commission* (2020).

⁴³⁹ Vavoula, Niovi. “Unpacking the EU Proposal for an AI Act: Implications for AI systems used in the context of migration, asylum and border control management”, *TPQ* 20, no. 4 (2022): 124.

⁴⁴⁰ European Union, AI Act, COM(2021) 206 final, Article 83.

⁴⁴¹ European Union, AI Act, COM(2021) 206 final, Annex IX.

⁴⁴² Access Now. “Joint Statement: AI Act Fails Migrants and People on the Move”, *Access now*, Press Releases (2024), available at: <https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move/>.

The Artificial Intelligence Act

underscoring the need to prevent exporting technologies to countries that may exploit them against vulnerable groups.⁴⁴³

Additionally, the Act includes an overly broad exemption for migration authorities concerning transparency and surveillance requirements. The Act mandates that authorities employing high-risk AI systems are required to register these systems in a publicly accessible database. Yet, law enforcement and migration management authorities are completely exempt from this requirement.⁴⁴⁴ This exemption significantly hinders migrants and asylum seekers from accessing information on where and how AI systems are employed. Consequently, the Act fails to provide migrants with the transparency needed to redress any decisions made by AI systems.⁴⁴⁵

In addition, there is the “national security exemption”, which is basically a blanket exemption to the requirements of high-risk AI systems.⁴⁴⁶ It permits Member States to exclude themselves and their high-risk AI technologies under the guise of national security from the given requirements. This could lead to a misuse in migration matters, thereby creating a loophole that undermines accountability for the deployed AI technologies.⁴⁴⁷ I argue that this blanket exemption is fundamentally flawed, as the AI Act is a regulation that must be uniformly adhered to by all Member States. It is imperative that the regulations are stringent and consistently applied to every Member State to ensure the ethical deployment and accountability of AI technologies, particularly in the sensitive context of migration management.

To summarise, despite the useful classifications within the Regulation, the AI Act falls short of being a comprehensive solution for migrants' rights and leaves numerous issues unresolved, such as transparency, accountability, and legal clarity. can both create and exacerbate systemic racism and discrimination, particularly against marginalised groups. Moreover, its provisions do not adopt an intersectional approach, overlooking the considerable power imbalances between those who develop or deploy

⁴⁴³ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

⁴⁴⁴ European Union, AI Act, COM(2021) 206 final, Annex VIII, no. 11.

⁴⁴⁵ European Digital Rights (EDRi). "Uses of AI migration and border control: A fundamental rights approach to the Artificial Intelligence Act", *Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch* (2022): 1-20.

⁴⁴⁶ Molnar, Petra. "The EU's AI Act and its Human Rights Impacts on People Crossing borders", Migration Strategy Group in: *Dialogue on Tech and Migration, DoT.Mig* (2020): 1-6.

⁴⁴⁷ *Ibid*, 446.

these technologies and the individuals affected by them.⁴⁴⁸ In short, the lack of comprehensive prohibitions, the broad exclusions in the high-risk classifications, and the broad exemptions for EU large-scale IT databases and exemptions regarding justified with national security issues, collectively weaken the Act's effectiveness in protecting vulnerable populations.⁴⁴⁹

27. Final thoughts and recommendation

The aim of this chapter is to summarise the findings and give five recommendations for strengthening the protection of human rights affected by AI technologies at borders.

First, policymakers must adopt binding directives and laws that encompass the AI technologies in migration management. This requires that the AI Act is amended through delegated acts referring to the uses of AI in migration management more specifically. In principle, all its shortcomings mentioned in the previous chapters must be addressed. I argue that these legal gaps exist because the EU's AI Act is so comprehensive that it is almost impossible to fully regulate all areas in a single piece of legislation. It is anticipated that the Commission will adopt delegated acts on specific areas soon, which should include migration management. This further development of the legal act is necessary to truly regulate the situation at the EU's external borders. In addition, these delegated acts should provide border actors with an implementable guideline on how to manage error rates and algorithmic discrimination within the systems. Even more so, the policymakers must ensure when creating these delegated acts that the voices of those directly affected by AI systems, namely migrants and refugees, are heard.⁴⁵⁰ This inclusion is necessary to make the laws truly effective and human rights compliant. Unfortunately, the way in which the Act has now come into force will have less impact in practice, even if Article 5 already provides for a prohibition and some requirements for "high-risk" AI systems have been laid out.

⁴⁴⁸ Molnar, Petra. "The EU's AI Act and its Human Rights Impacts on People Crossing borders", Migration Strategy Group in: Dialogue on Tech and Migration, DoT.Mig (2020); 1-6.

⁴⁴⁹ Access Now. "Joint Statement: AI Act Fails Migrants and People on the Move", *Access now*, Press Releases (2024), available at: <https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move/>.

⁴⁵⁰ Mantelero, Alessandro. "Regulating AI within the Human Rights Framework: A roadmapping methodology", in: "European Yearbook on Human Rights", Intersentia, 1steds. (2023) 489, ISSN:9781839704543.

Final thoughts and recommendation

Apart from the AI Act, there is also no other appropriate regulatory framework which regulates the new uses of AI technology in the management of migration.⁴⁵¹ The lack of regulation, the lack of transparency and accountability results in that the technology is developed in a so-called „black box“, and the information does not go through to the public, thereby it is difficult to understand how technology operates and is deployed in these sensitive contexts.⁴⁵²

Therefore, there must be an explicit commitment to transparency and making public which AI technology is being developed and used in border governance. This can be achieved through public reports and registers detailing which technologies are being developed, how they are used, and for what purposes. Transparency should also extend to EU-funded entities such as EU-Lisa, Frontex, and Europol. The inclusion of large-scale EU databases in the AI Act is a necessary step toward protecting human rights, but it is equally important to establish an independent body to oversee and review the use of both existing and proposed AI technologies in migration management.⁴⁵³ This body could function similarly to the EU Ombudsman, offering recommendations on maintaining accountability and transparency in EU institutions⁴⁵⁴, but with a specific focus on AI in migration contexts and a presence at border locations.

In line with the UN High Commissioner for Human Rights and the AI Act, a “risk-proportionate approach” to AI regulation is the way forward.⁴⁵⁵ This approach necessitates that all AI technologies must meet standards of legality, proportionality, and respect for fundamental rights.⁴⁵⁶ Certain AI technologies pose an unacceptably high risk to fundamental rights and must be banned completely, until they are in line with the latter mentioned standards, or strictly regulated. For example, using AI for risk assessments based on protected characteristics such as nationality, ethnicity, race, or

⁴⁵¹ Molnar, Petra. “Testing Grounds: Migration Management Experiments and Reflections from the Ground Up”, *Refugee Law Lab online* (2020): 6, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

⁴⁵² *Ibid*, 451.

⁴⁵³ Stewart, Sarah. “The regulation of AI-based migration technologies under the EU Act: (Still) operating in the shadows?”, *European Law Journal* (2024): 124-135, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/eulj.12516>.

⁴⁵⁴ European Ombudsman, “Public access to EU documents and the role of the European Ombudsman”, *European Ombudsman: What we do* (undated), <https://www.ombudsman.europa.eu/en/areas-of-work/access-to-documents> (accessed on 21.08.2024).

⁴⁵⁵ OHCHR. “The right to privacy in the digital age: Report of the United Nations High Commissioner for Human Rights”, *A/HRC/48/31* (2021): §45, <https://www.ohchr.org/en/calls-for-input/2021/right-privacy-digital-age-report-2021>.

⁴⁵⁶ *Ibid*, 451.

religion is unjustifiable. Emotion recognition technologies should also be banned due to insufficient research on their effectiveness and the high risk of discriminations.⁴⁵⁷

Third, accountability gaps must be addressed, including issues of agency laundering, the export of AI technologies, and the lack of clarity around public-private accountability.⁴⁵⁸ State and public institutions must be transparent about the projects they fund, and mechanisms should be in place for fundamental rights experts to challenge these funding decisions. Public-private partnerships should not obscure responsibility for AI technologies.⁴⁵⁹

Fourth, regulatory measures must ensure that appropriate remedies are available for individuals whose rights are violated. These remedies must be effective and accessible to all migrants and refugees without bureaucratic obstacles. Essentially, it must be guaranteed that AI technologies do not restrict or violate procedural rights, which can occur due the general opaqueness of the algorithms or the inability to recognise or rectify errors within ADM processes.⁴⁶⁰

Moreover, greater efforts must be made to build trust and accountability towards the new AI systems. This requires a concerted effort that goes beyond developing legal frameworks to encompass broader societal engagement. It is necessary to foster open dialogue and meaningful knowledge exchange among policymakers, academics, technologists, civil society, and, most importantly, the communities directly affected by these technologies. This thesis argues that the focus needs to be on the people who have experienced displacement and the use of new technologies. Their perspectives must be prioritised and must be at the forefront, rather than any financial objectives or security concerns.⁴⁶¹ We need to listen to their views on how these technologies should be integrated into refugee camps, border security, or refugee hearings.⁴⁶²

⁴⁵⁷ McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCHR, University of Essex* (September 2023): 24, <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

⁴⁵⁸ Busuioc, Madalina. "Accountable Artificial Intelligence: Holding Algorithms to Account", *Public Administration Review* 81, 5 (2021): 825-829, <https://doi.org/10.1111/puar.13293>.

⁴⁵⁹ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 6, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

⁴⁶⁰ Forti, Mirko. "AI-Driven Migration Management Procedures: Fundamental Rights Issues and Regulatory Answers", *BioLaw Journal*, no. 2 (2021): 433-451, <https://ssrn.com/abstract=3877083>.

⁴⁶¹ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 6, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

⁴⁶² Molnar, Petra. "New technologies in migration: human rights impacts", *Forced Migration Review* 61 (2019): 8, <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

28. Conclusion

This thesis explored the impact of AI technologies on human rights within the context of EU border governance, addressing how these systems can be developed and deployed in ways that respect fundamental rights. The findings revealed significant human rights concerns, including risks to the right to non-refoulement, the right to life and liberty, and the right to privacy and data protection.⁴⁶³

Moreover, the thesis highlighted the potential of AI technologies to exacerbate discrimination, entrench biases, and weaken the protections afforded to migrants and refugees under European and international law.⁴⁶⁴ To mitigate these risks, AI systems must be designed and deployed with strict adherence to human rights principles, which includes ensuring transparency, accountability, and access to remedies for affected individuals. The phenomenon of automation bias, where individuals uncritically follow algorithmic recommendations due to a belief in their infallibility, further underscores that mere human oversight is insufficient to prevent human rights violations by AI systems.⁴⁶⁵

Furthermore, the thesis argues that while AI systems are changing the framework for border and migration management by tightening measures and increasing the surveillance towards migrants, they do not per se lead to less migrants and refugees in Europe. Rather, the deployed technologies pressure migrants to find alternative, even more deadly migratory, routes to reach their destination countries.⁴⁶⁶

Moreover, the thesis raised the question of whether the expansion of technology at the EU's external borders serves as a new method of criminalising migrants and reinforcing racialised suspicion against them.⁴⁶⁷

To affirmatively address this question, I have developed my argument in three key ways. Firstly, I argue that the intersection of crime and migration control with AI

⁴⁶³ Catelli, Chiara. "Beyond walls and fences: EU funding used for a complex and digitalised border surveillance system", *PICUM* (2024): 27, <https://picum.org/blog/thematique/eu-migration-policies/>.

⁴⁶⁴ Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up", *Refugee Law Lab online* (2020): 1-5, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

⁴⁶⁵ Huggins, Anna. "Addressing Disconnection: Automated Decision-Making, Administrative Law and Regulatory Reform," *University of New South Wales Law Journal* 44 (2021): 1067, <https://doi.org/10.53637/WCGG2401>.

⁴⁶⁶ Chander, Sarah. "Regulating Migration Tech: How the EU's AI Act can better protect people on the move", *EDRi* (May 2022): 1-24.

⁴⁶⁷ Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective," *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

technologies fosters the emergence of the figure of the suspicious and potentially unlawful migrant, also known as the “crimmigrant other”.⁴⁶⁸ Secondly, I acknowledge that disparities in existing rights reinforce the perception that non-Europeans possess fewer rights solely because they are outside the EU. This is reflected in the fact that vulnerable groups, such as migrants and refugees, have limited access to a fundamental rights protection due to the lack of complaint and accountability mechanisms.⁴⁶⁹ Third, this thesis argues that the EU’s insufficient regulation of AI technologies may not be a coincidence but rather a deliberate strategy.⁴⁷⁰ By implementing AI at its borders without comprehensive legal safeguards, the EU risks exploiting migrants as experimental subjects for new technologies. This approach in turn prioritises technological advancement over the protection of human rights. Also, such an experimental approach is highly unlikely to appear within the EU due to the presence of stricter accountability regulations.

The criminalisation of migrants is exacerbated by an ongoing political shift in Europe towards right-wing parties, which often perceive immigration as a threat. In fact, this shift further exacerbates the criminalisation and racialised suspicion of migrants, while reinforcing non-entrée policies aimed at maintaining the so-called “Fortress Europe”.⁴⁷¹ To counteract this trend, there is an urgent need for educational efforts and research to shed light on the realities at Europe’s external borders. Clearly, this is a challenge given the current opacity surrounding migration management and the area being under-researched and poorly understood.

Finally, this thesis advocates for the use of AI systems in migration management in a manner that does not compromise human rights protection in favour of efficiency.⁴⁷² Although AI has the potential to enhance the implementation of EU policies, its application must be carefully regulated to avoid unintended negative impacts on migrants and refugees. Even if the EU keeps a pro-migration stance and

⁴⁶⁸ Amelung, Nina. “Crimmigration Control across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases”, *Historical Social Research* 46, Nr. 3 (2021): 151-177.

⁴⁶⁹ Molnar, Petra. “Technology on the Margins: AI and Global Migration from a Human Rights Perspective,” *Cambridge International Law Journal* 8, No. 2 (2019): 305-330.

⁴⁷⁰ *Ibid*, 469.

⁴⁷¹ Amelung, Nina. “Crimmigration Control across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases”, *Historical Social Research* 46, Nr. 3 (2021): 151-177.

⁴⁷² Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23, DOI: <https://doi.org/10.1186/s40878-022-00305>.

Conclusion

aims to balance security with human rights, the inherent shortcomings of AI, such as biases within algorithms and the overall opaqueness, pose significant risks. Therefore, it is necessary that AI deployment in migration management is guided by a genuine intention to uphold human rights, as the effectiveness of this balance will ultimately prevent migrants to become victims to human rights violations enabled by AI technology.⁴⁷³

⁴⁷³ Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23, DOI: <https://doi.org/10.1186/s40878-022-00305>.

29. Bibliography

29.1. Articles

Alon-Barkat, Saar, and Madalina Busuioc. "Human–AI Interactions in Public Sector Decision Making: 'Automation Bias' and 'Selective Adherence' to Algorithmic Advice." *Journal of Public Administration Research and Theory* 33, no. 1 (2023): 153–169. <https://doi.org/10.1093/jopart/muac007>.

Amelung, Nina. "Crimmigration Control Across Borders: The Convergence of Migration and Crime Control Through Transnational Biometric Databases." *Historical Social Research* 46, no. 3 (2021): 151-177. DOI: 10.12759/hsr.46.2021.3.151-177.

Andreou, Angelanna. "e-Securing the EU Borders: AI in European Integrated Border Management." *Journal of Politics and Ethics in New Technologies and AI* 2, no. 1 (2023): 1-5. <https://doi.org/10.12681/jpentai.34287>. *Baldaccini*, Anneliese. "Counter-Terrorism and the EU Strategy for Border Security: Framing Suspects with Biometric Documents and Databases". *European Journal of Migration and Law* 10 (2008): 31-49. DOI: <https://doi.org/10.1163/138836407X261308>.

Barocas, Solon, and Andrew D. Selbst. "Big Data's Disparate Impact." *California Law Review* (2016): 678. https://canvasstanford.edu/courses/60360/files/1469413/download?download_frd=1.

Beduschi, Ana. "International Migration Management in the Age of Artificial Intelligence." *Oxford University Press* 9, no. 3 (2021): 576-596. DOI:10.1093/migration/mnaa003.

Benvenisti, Eyal. "Upholding Democracy Amid the Challenges of New Technology: What Role for the Law of Global Governance?" *European Journal of International Law* 29, no. 1 (February 2018): 9-82. <https://doi.org/10.1093/ejil/chy013>.

Blasi Casagran, Cristina. "Fundamental Rights Implications of Interconnecting Migration and Policing Databases in the EU." *Human Rights Law Review* 21 (2021): 433-457. DOI: 10.1093/hrlr/ngaa057.

Boden, Margaret, Joanna Bryson, Darwin Caldwell, Kerstin Dautenhahn, Lilian Edwards, Sarah Kember, Paul Newman, et al. "Principles of Robotics: Regulating

Bibliography

Robots in the Real World. *Connection Science* 29, 2 (2017). doi:10.1080/09540091.2016.1271400.

Bor, Sherry, and Nicole Chepto Koech. "Balancing Human Rights and the Use of Artificial Intelligence in Border Security in Africa." *Journal of Intellectual Property and Information Technology Law* 3 (2023). <https://doi.org/10.52907/jipit.v3i1.260>.

Busuioc, Madalina. "Accountable Artificial Intelligence: Holding Algorithms to Account", *Public Administration Review* 81, 5 (2021): 825-829, <https://doi.org/10.1111/puar.13293>.

Carammia, Marcello, Stefano Maria Iacus, and Teddy Wilkin. "Forecasting Asylum-Related Migration Flows with Machine Learning and Data at Scale." *Sci Rep* 12 (2022). <https://doi.org/10.1038/s41598-022-05241-8>.

Catelli, Chiara. "Beyond walls and fences: EU funding used for a complex and digitalised border surveillance system", *PICUM* (2024): 1-56, <https://picum.org/blog/thematique/eu-migration-policies/>.

Chander, Sarah. "Regulating Migration Tech: How the EU's AI Act Can Better Protect People on the Move." *EDRi* (2022). <https://edri.org/our-work/regulating-migration-tech-how-the-eus-ai-act-can-better-protect-people-on-the-move/>.

Csernaton, Raluca. "Constructing the EU's High-Tech-Borders: FRONTEX and Dual-Use Drones for Border Management", *European Security* 27, 2 (2018): 183, DOI: <https://doi.org/10.1080/09662839.2018.1481396>.

De Leon, Jason and Michael Wells. "The Land of Open Graves, Living and Dying on the Migrant Trail", *University of California Press* 36, 1st eds (2015): 1-20, <https://www.ucpress.edu/book/9780520282759/the-land-of-open-graves>.

Dumbrava, Costica. "Artificial intelligence at EU borders: Overview of applications and key issues", *EPRS: European Parliamentary Research Service* (2021) DOI:10.2861/91831.

Foster, Madeleine. "Refugee Protection in the Artificial Intelligence Era: A Test Case for Rights." *Royal Institute of International Affairs* (2022): 1-34, <https://doi.org/10.55317/9781784135324>.

Fuster González, Gloria. "Person Identification, Human Rights and Ethical Principles - Rethinking Biometrics in the Era of Artificial Intelligence." EPRS, Scientific Foresight Unit (2021), <https://free-group.eu/2021/12/17/person-identification-human-rights-and-ethical-principles-rethinking-biometrics-in-the-era-of-artificial-intelligence/>.

Ghezelbash, Daniel. "Technology and countersurveillance: holding governments accountable for refugee externalization policies," *Globalizations* (2022): 10. <https://doi.org/10.1080/14747731.2022.2051274>.

Glouftsiou, Georgios. "Governing circulation through technology within EU border security practice-networks", *Mobilities* 13, 2 (2018): 185-199. <https://doi.org/10.1080/17450101.2017.1403774>.

Haitsma, Lucas. "Regulating Algorithmic Discrimination through Adjudication: The Court of Justice of the European Union on Discrimination in Algorithmic Profiling Based on PNR Data," *Frontiers in Political Science* 5, Article 1232601 (2023):1-15, <https://doi.org/10.3389/fpos.2023.1232601>.

Hollanek, Tomasz. "AI Transparency: A Matter of Reconciling Design with Critique." *AI & Society* 38 (2023): 2071-2079. <https://doi.org/10.1007/s00146-020-01110-y>.

Rothwell, Janet, Z.Bander, J.O'Shea, D.Mclean. "Silent talker: a new computer-based system for the analysis of facial cues to deception", *Applied Cognitive Psychology* 20, 6 (2006): 757-777, DOI: <https://doi.org/10.1002/ACP.1204>.

Ippolito, Francesca. "Migration and Asylum Cases Before the Court of Justice of the European Union: Putting the EU Charter of Fundamental Rights to Test?" *European Journal of Migration and Law* 17 (2015): 1-38, DOI:10.1163/15718166-12342070.

Ivanov, Stanislav and Craig Webster. "Automated decision-making: Hoteliers' perceptions", *Technology in Society* 76 (2024): 1-2, <https://doi.org/10.1016/j.techsoc.2023.102430>.

Lane, Lottie. "Clarifying Human Rights Standards through Artificial Intelligence", Cambridge University Press, *International and Comparative Law Quarterly* 71 (2022): 915-944, DOI: 10.1017/S0020589322000380.

Bibliography

Lazcoz, Guillermo, and Paul De Hert. "Humans in the GDPR and AIA Governance of Automated and Algorithmic Systems: Essential Pre-Requisites Against Abdicating Responsibilities." *Computer Law & Security Review* 50 (2023): Article 105833, <https://doi.org/10.1016/j.clsr.2023.105833>.

Mayson, Sandra G. "Bias In, Bias Out", *Yale Law Journal* 128, 2218 (2018), https://scholarship.law.upenn.edu/faculty_scholarship/2393.

Molnar, Petra. "New technologies in migration: human rights impacts". *Forced Migration Review* 61 (2019), <https://ora.ox.ac.uk/objects/uuid:97fdb385-98b0-4ce8-9576-cee47f34cf43/files/sn583xw27t>.

Molnar, Petra. "Technology on the Margins: AI and Global Migration from a Human Rights Perspective." *Cambridge International Law Journal* 8, no. 2 (2019): 305-330, https://www.academia.edu/41675472/Technology_on_the_margins_AI_and_global_migration_management_from_a_human_rights_perspective.

Molnar, Petra. "Testing Grounds: Migration Management Experiments and Reflections from the Ground Up". *Refugee Law Lab online* (2020): 1-57, <https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf>.

Molnar, Petra. "The EU's AI Act and its Human Rights Impacts on People Crossing Borders." Migration Strategy Group in Dialogue on Tech and Migration, DoT.Mig (2020), <https://www.bosch-stiftung.de/en/publication/eus-ai-act-and-its-human-rights-impacts-people-crossing-borders>

Møhl, Perle. "Biometric Technologies, Data and the Sensory Work of Border Control." *Ethnos* 87, no. 2 (2022): 241-256. DOI: 10.1080/00141844.2019.1696858.

Neuwirth, Rostam J. "Prohibited artificial intelligence practices in the proposed EU artificial intelligence act (AIA)", *Computer Law & Security Review* 48, 105798 (2023): 1-14, <https://doi.org/10.1016/j.clsr.2023.105798>.

Panebianco, Stefania, Iole Fontana. "When responsibility to protect 'hits home': the refugee crisis and the EU response", *Third World Quarterly* 39,1 (2018): 1-17, <https://doi.org/10.1080/01436597.2017.1369035>.

Raji, Inioluwa Deborah, Timnit Gebru, Margaret Mitchell, Joy Buolamwini, Joonseok Lee, and Emily Denton. "Saving Face: Investigating the Ethical Concerns of Facial Recognition Auditing", *Proceedings of the 2020 AAAI/ACM Conference on AI, Ethics, and Society, AIES '20* (2020) :145-151, <https://doi.org/10.1145/3375627.3375820>.

Sadik, Giray, and Ceren Kaya. "The Role of Surveillance Technologies in the Securitization of EU Migration Policies and Border Management", *International Relations* 17, no. 68 (2020): 145-160, <https://www.jstor.org/stable/10.2307/26980741>.

Samson Ayinla, Benjamin, Olukunle Oladipupo Amoo, Akoh Atadoga, Temitayo Oluwaseun Abrahams, Femi Osasona and Oluwatoyin Ajoke Farayola. "Ethical AI in practice: Balancing technological advancements with human values", *International Journal of Science and Research Archive* 11, 1 (2024): 1311-1326, DOI: <http://dx.doi.org/10.30574/ijjsra.2024.11.1.0218>.

Searle, John. "Minds, Brains, and Programs", *Behavioral and Brain Sciences* 3, no. 3 (1980): 418, DOI:10.1017/S0140525X00005756.

Shyamasundar, R.K. "The Computing Legacy of Alan M. Turing (1912-1954)", *Current Science* 12 (2014): 1678, https://www.researchgate.net/publication/297349135_The_computing_legacy_of_Alan_M_Turing_1912-1954.

Stewart, Sarah. "The regulation of AI-based migration technologies under the EU Act: (Still) operating in the shadows?", *European Law Journal* (2024): 124-135, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/eulj.12516>.

Szwed, Agata. "The Use of Artificial Intelligence in Migration-Related Procedures in the European Union - Opportunities and Threats." *Procedia Computer Science* 207, Issue C (2022): 3639-3645, <https://doi.org/10.1016/j.procs.2022.09.424>.

Tewari, Jolly and Malobika Bose. "History of Artificial Intelligence", *Indian Journal of Law and Legal Research* 2 (2023), <https://www.ijllr.com/post/history-of-artificial-intelligence>.

Tsagarousianou, Roza. "The Datafication of Migrant Bodies and the Enactment of Migrant Subjectivities: Biometric Data, Power and Resistance at the Borders of

Bibliography

Europe", *Media, Culture & Society* 46, no. 4 (2024): 1-18, <https://doi.org/10.1177/01634437231214193>.

Tufekci, Zeynep. "Algorithmic Harms Beyond Facebook and Google: Emergent Challenges of Computational Agency", *Colorado Technology Law Journal* 13 (2): 217, <https://ctlj.colorado.edu/wp-content/uploads/2015/08/Tufekci-final.pdf>.

Vavoula, Niovi. "Unpacking the EU Proposal for an AI Act: Implications for AI Systems Used in the Context of Migration, Asylum and Border Control Management." *TPQ* 20, no. 4 (2022): 119-127, <http://turkishpolicy.com/article/1100/unpacking-the-eu-proposal-for-an-ai-act-implications-for-ai-systems-used-in-the-context-of-migration-asylum-and-border-control-management>.

29.2. Books

Bast, Jürgen, Frederick von Harbou and Janna Wessels. "*Human Rights Challenges to European Migration Policy*", The REMAP Study, *Nomos/Hart* 36, 2nd revised eds. (2022), <https://doi.org/10.5771/9783748926740>.

Bergh, Sylvia I, Issam Cherrat, Francesco Colin, Katharina Natter and Ben Wagner. "Marocco's Governance of Cities and Borders: AI Enhanced Surveillance Facial Recognition, and Human Rights", in: "*The Cambridge Handbook of Facial Recognition in the Modern State*" Cambridge Law Handbooks, Cambridge University Press (2024): 267-284, <https://doi.org/10.1017/9781009321211>.

Buchkremer, Rüdiger, Thomas Heupel, and Oliver Koch. „*Künstliche Intelligenz in Wirtschaft & Gesellschaft: Auswirkungen, Herausforderungen & Handlungsempfehlungen*“. Springer Gabler, Wiesbaden (2020), <https://link.springer.com/book/10.1007/978-3-658-29550-9>.

Carrera, Sergio and Marco Stefan. "*Fundamental Rights Challenges in Border Controls and Expulsion of Irregular Immigrants in the European Union: Complaint Mechanisms and Access to Justice*", Routledge, 1st eds (2020): 261, ISBN 9781032174877.

De Schutter, Olivier. "*International Human Rights Law*", Cambridge University press 3rd eds. (2019): 722, DOI: 10.1017/9781108564588.

Elliott, Anthony, ed. "*The Routledge Social Science Handbook of AI*", Routledge, 1st eds (2023), <https://doi.org/10.4324/9780429198533>.

Pasquale, Frank. "The Black Box Society: The Secret Algorithms That Control Money and Information", Harvard University Press (2016), ISBN 9780674970847.

Mantelero, Alessandro. "Regulating AI within the Human Rights Framework: A roadmapping methodology", in: "European Yearbook on Human Rights", Intersentia, 1steds. (2023) 490, ISSN:9781839704543.

Mainzer, Klaus. "Künstliche Intelligenz – Wann übernehmen die Maschinen?", Springer. 1st eds (2016): 2-3, <https://link.springer.com/book/10.1007/978-3-662-58046-2>.

Molnar, Petra. "Surveillance sovereignty: migration management technologies and the politics of privatization", in Idil Atak and Graham Hudson (eds). "Migration, Security, and Resistance: Global and Local Perspectives", Routledge (2021) 66-82, DOI: 10.4324/9781003058526-3.

*Nalbandian, Lucia. „An eye for an ‚I‘: a critical assessment of artificial intelligence tools in migration and asylum management“, *Comparative Migration Studies* 10, 32 (2022): 1-23, DOI: <https://doi.org/10.1186/s40878-022-00305>.*

Ozkul, Derya. "Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum Governance in Europe", Oxford: Refugee Studies Centre, University of Oxford (2023). DOI:10.13140/RG.2.2.24295.46248.

Quintel, Teresa. "Data Protection, Migration and Border Control: The GDPR, the Law Enforcement Directive and Beyond", Hart Studies in European Criminal Law 17 (2022), ISBN: 9781509959655.

Skaug Sætra, Henrik. „A typology of AI applications in politics“, in: A. Visvizi, M. Bodziany (Eds.) "Artificial Intelligence and its Contexts: Advanced Sciences and Technologies for Security Applications", Springer (2021): 27-43, DOI: 10.1007/978-3-030-88972-2_3.

Sullivan, Gavin. „The Law of the List: UN Counterterrorism Sanctions and the Politics of Global Security“, Cambridge University Press (2020), DOI: <https://doi.org/10.1017/9781108649322>.

Bibliography

Weber, Jutta and Bianca Prietl. “AI in the age of technoscience”, in “*Routledge Social Science Handbook of Artificial Intelligence*”, Routledge 1st Edition (2021), ISBN: 9780429198533.

Wolf, Sarah. “*The Security Sector Governance-Migration Nexus: Rethinking how Security Sector Governance matters for migrants’ rights*”, Ubiquity Press, SSR Paper 19 (2021): 5-6. DOI: 10.5334/bcl.

29.3. Case Law

Court of Justice of the European Union, Case C-817, 2022, paras. 123, 203.

29.4. Legislation

Council of Europe. 1950. *Convention for the Protection of Human Rights and Fundamental Freedoms*. Council of Europe Treaty Series 005. Strasbourg: Council of Europe.

European Union. 2010. *Charter of Fundamental Rights of the European Union*. Official Journal of the European Union C83, vol. 53. Brussels: European Union.

European Union. 2012. *Treaty on European Union and the Treaty on the Functioning of the European Union*. 2012/C 326/01.

European Union. 2016. *General Data Protection Regulation (GDPR)*, Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016. Official Journal of the European Union L119. Brussels: European Union.

European Union. 2021. *Artificial Intelligence Act (AI Act)*. Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts. COM(2021) 206 final. Brussels: European Union.

United Nations General Assembly. 1951. *Convention Relating to the Status of Refugees*. 28 July 1951.

29.5. Publications

Committee on Artificial Intelligence (CAI), “Draft Framework Convention on artificial intelligence, human rights, democracy and the rule of law, Draft Explanatory Report”, Council of Europe, March 2024, <https://www.coe.int/en/web/artificial-intelligence/cai>.

DG Home. "Rules on Migration, Asylum and Border Management in the AI Proposal." European Commission, 2020. <https://www.statewatch.org/media/3074/eu-council-ai-act-com-presentation-borders-migration.pdf>.

European Digital Rights (EDRi). "Uses of AI Migration and Border Control: A Fundamental Rights Approach to the Artificial Intelligence Act." Migration and Technology Monitor, the Platform for International Cooperation on Undocumented Migrants (PICUM) and Statewatch, 2022. <https://www.accessnow.org/wp-content/uploads/2022/05/Uses-of-AI-in-migration-and-border-control.pdf>.

FRA. "Fundamental rights at Europe's southern sea borders", Publications Office of the European Union, 2013. https://fra.europa.eu/sites/default/files/fundamental-rights-europes-southern-sea-borders-jul-13_en.pdf.

FRA. "Fundamental Rights at Land Borders: Findings from Selected European Union Border Crossing Points", Publications Office of the European Union, 2014. <https://fra.europa.eu/en/publication/2014/fundamental-rights-land-borders-findings-selected-european-union-border-crossings>. *FRA*. "Handbook on European Law Relating to Asylum, Borders and Immigration." Edition 2020, Publications Office of the European Union, 2020. <https://fra.europa.eu/en/publication/2020/handbook-european-law-relating-asylum-borders-and-immigration-edition-2020>.

Frontex. "Artificial Intelligence-based capabilities for the European Border and Coast Guard", Frontex: Executive Summary 1810, March, 2021. <https://www.frontex.europa.eu/publications/artificial-intelligence-based-capabilities-for-the-european-border-and-coast-guard-final-report-CYyjo>.

Luyten, Katrien. "Addressing pushbacks at the EU's external borders", European Parliament, EPRS October 2022. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/738191/EPRS_BRI\(2022\)738191_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/738191/EPRS_BRI(2022)738191_EN.pdf).

McGregor, Lorna. "Digital Border Governance: A Human Rights Based Approach", *OHCHR, University of Essex*, September 2023. <https://www.ohchr.org/sites/default/files/2023-09/Digital-Border-Governance-A-Human-Rights-Based-Approach.pdf>.

Bibliography

OHCHR. "The right to privacy in the digital age: Report of the United Nations High Commissioner for Human Rights", A/HRC/48/31, September 2021. <https://www.ohchr.org/en/calls-for-input/2021/right-privacy-digital-age-report-2021>.

Waters, Nick, Emmanuel Freudenthal, Logan Williams. "Frontex at Fault: European Border Force Complicit in 'illegal' pushbacks, *Bellingcat, Lighthouse Reports* (2020), <https://www.bellingcat.com/news/2020/10/23/frontex-at-fault-european-border-force-complicit-in-illegal-pushbacks/>.

29.6. Webpages

Access Now. "Joint Statement: AI Act Fails Migrants and People on the Move", *Access now* (undated), <https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move/> (accessed on 26 June 2024).

Boyce, Geoffrey Allan, Chambers, Samuel N. and Launis, Sarah. "Democrats' 'smart border' technology is not a 'humane' alternative to Trump's wall", *The Hill* (11 February 2019), <https://thehill.com/opinion/immigration/429454-democrats-smart-border-technology-is-not-a-humane-alternative-to-trumps/> (accessed on 15 August 2024).

Bunyan, Tony. „EU: Interoperability of Justice and Home Affairs databases: a point of no return”, *Statewatch* (undated), <https://www.statewatch.org/observatories/interoperability-eu-big-brother-database/> (accessed on 24 July 2024).

Cimpanu, Catalin. "Chinese Company Leaves Muslim-Tracking Facial Recognition Database Exposed", *ZDNET* (2019), www.zdnet.com/article/chinese-company-leaves-muslim-tracking-facial-recognition-database-exposed-online/ (accessed on 7 August 2024).

Conger, Kate. "Amazon Workers Demand Jeff Bezos Cancel Face Recognition Contracts with Law Enforcement." *Gizmodo* (June 2018), <https://gizmodo.com/amazon-workers-demand-jeff-bezos-cancel-face-recognition-1827037509> (accessed on 20 May 2024).

European Commission. "Intelligent Portable Border Control System", Fact Sheet (2019), <https://cordis.europa.eu/project/id/700626> (accessed on 13 August 2024).

European Ombudsman. "Public access to EU documents and the role of the European Ombudsman". *European Ombudsman: What we do* (undated), <https://www.ombudsman.europa.eu/en/areas-of-work/access-to-documents> (accessed on 21.08.2024).

Fang, Lee and Biddle, Sam. "Google Ai Tech Will Be Used For Virtual Border Wall, Cbp Contract Shows", *The Intercept* (2020), <https://theintercept.com/2020/10/21/google-cbp-border-contract-anduril/> (accessed on 28 August 2024).

Foldout Solution. „Foldout Border Surveillance Technology: Through foliage detection of illegal cross-border activities”, *Foldout* (undated), <https://foldout.eu/> (accessed on 28 August 2024).

Feldstein, Steven. "The Global Expansion of AI Surveillance." *Carnegie Endowment for International Peace* (17 September 2019), <https://carnegieendowment.org/research/2019/09/the-global-expansion-of-ai-surveillance?lang=en> (accessed on 7 May 2024).

High-Level-Expert Group on AI. "Ethics Guidelines for Trustworthy AI", European Parliament (2019), <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai>.

Maeker, Morgan. „Europe is Using Smartphone Data as a Weapon to Deport Refugees“, *Wired UK* (July 2018), <https://www.wired.com/story/europe-immigration-refugees-smartphone-metadata-deportations/> (accessed on 27 August 2024).

Roborder.eu. „Project structure“, *Roborder.eu* (undated), <https://roborder.eu/the-project/project-structure/> (accessed on 28 August 2024).

Segal, Troy, "What is Big Data? Definition, How it Works, and Uses", *Investopedia* (2024), <https://www.investopedia.com/terms/b/big-data.asp> (accessed on 13 August 2024).

Statewatch. "EU-Spain: New report provides an "x-ray" of the public funding and private companies in Spain's "migration control industry", *Statewatch* (2017), <https://>

Bibliography

www.statewatch.org/news/2017/november/eu-spain-new-report-provides-an-x-ray-of-the-public-funding-and-private-companies-in-spain-s-migration-control-industry/ (accessed on 20 August 2024).

Tresspass.eu. “Matched Betting: How profitable can it be?”, *Tresspass.eu* (undated), <https://www.tresspass.eu/> (accessed on 28 August 2024).

Thomas, Elise. “Tagged, Tracked and in Danger: How the Rohingya got Caught in the UN’s Risky Biometric Database”, *Wired Magazine* (2018), <https://www.wired.com/story/united-nations-refugees-biometric-database-rohingya-myanmar-bangladesh/> (accessed on 9 August 2024).

Tyler, Hannah. “The Increasing Use of Artificial Intelligence in Border Zones Prompts Privacy Questions”, *Migration Policy Institute* (2022), <https://www.migrationpolicy.org/article/artificial-intelligence-border-zones-privacy> (accessed on 24 May 2024).

29.7. Statements

European Data Protection Supervisor. “Statement by the Data Protection Officer on the European Asylum Support Office (EASO) Social Media Monitoring Reports (case 2018-1083)”, Data Protection Officer, European Asylum Support Office (2019). https://edps.europa.eu/sites/default/files/publication/19-11-12_reply_easo_ssm_final_reply_en.pdf.

Council of Europe. “Guide on Article 4 of Protocol No. 4 to the European Convention on Human Right - Prohibition of collective expulsions of aliens”, *European Court of Human Rights* (2020), <https://www.refworld.org/jurisprudence/caselawcomp/echr/2020/en/119085>.

Council of the European Union. “Regulation of AI-taking greater account of the specific characteristics of the public administration, particularly in the fields of security and migration”, WK 12308/2022. (2024): no.2) b), <https://www.asktheeu.org/es/request/12483/response/42858/attach/html/5/wk12308.en22.pdf.html>.

UN Special Rapporteur on the human rights of migrants. “Report on means to address the human rights impact of pushbacks of migrants on land and at sea: Report of the Special Rapporteur on the human rights of migrants, Felipe González Morales”,

A/HRC/47/30 (12 May 2021), § 54, <https://documents.un.org/doc/undoc/gen/g21/106/33/pdf/g2110633.pdf>.

UN Special Rapporteur on the situation of human rights defenders. “Greece migration policy having a “suffocating effect” on human rights defenders says UN expert”, OHCHR (22 June 2022), <https://www.ohchr.org/en/press-releases/2022/06/greece-migration-policy-having-suffocating-effect-human-rights-defenders>).

UN Special Rapporteur on contemporary forms of racism. “Report of the Special Rapporteur on contemporary forms of racism, racial discrimination, xenophobia and related intolerance” A/77/549 (2022), para 22, <https://documents.un.org/doc/undoc/gen/n22/651/88/pdf/n2265188.pdf>.

29.8. Table References

Table 1: Rodrigues, Rowena. “Legal and Human Rights Issues of AI: Gaps, Challenges, and Vulnerabilities.” *Journal of Responsible Technology* 4 (2020), <https://doi.org/10.1016/j.jrt.2020.100005>.

Table 2: FRA. “Handbook on European Law Relating to Asylum, Borders and Immigration.” Edition 2020. Publications Office of the European Union, 2020, <https://fra.europa.eu/en/publication/2020/handbook-european-law-relating-asylum-borders-and-immigration-edition-2020>.