Algorithmic governmentality and social control in migration management

by Mara Maretti, Clara Salvatori[*]

Artificial intelligence (AI) is reshaping migration governance. Framed by algorithmic governmentality, this study examines AI systems across transit and destination countries, showing how they reconfigure classification and control by reducing personal experiences to risk profiles and enabling automated surveillance. Beyond this, it stresses the urgency of critical sociology to analyse AI-driven power shifts and shape human rights-based policies.

Keywords: migration; datafication; artificial intelligence; governmentality; algorithms; migration governance.

Governamentalità algoritmica e controllo sociale nella gestione delle migrazioni

L'intelligenza artificiale (IA) sta rimodellando la governance della migrazione. Inquadrato nella prospettiva della governamentalità algoritmica, questo studio analizza i sistemi di IA nei paesi di transito e destinazione, mostrando come riconfigurino classificazione e controllo riducendo le esperienze personali a profili di rischio. Sottolinea l'urgenza di una sociologia critica e di politiche fondate sui diritti umani.

Parole chiave: datificazione; intelligenza artificiale; governamentalità; algoritmi; migrazione; governance delle migrazioni.

Introduction

The scale and complexity of global human mobility have expanded significantly in recent decades, with the United Nations Department of Economic and Social Affairs (UN DESA) reporting that international migrants have nearly doubled from 154 million in 1990 to 304 million in 2024 (UN DESA, 2025). This growth has led to significant transformations in how states and international organisations approach migration governance, with digital technologies emerging as central instruments in this evolving

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landscape. As migration flows intensify and diversify, artificial intelligence, big data and algorithmic systems are increasingly deployed to anticipate, manage and control human mobility.

This study demonstrates that algorithmic interventions in migration governance transcend operational efficiency, engendering novel schemas of classification and control which profoundly influence the responses of policymakers, institutions and public sentiment. To this purpose, a systematic mapping of the main AI-based systems currently employed in migration governance is proposed. These systems are compared according to several criteria: type of technology used, institutional actors involved, territorial scope, stated objectives, ethical and legal implications, degree of algorithmic transparency, and impact on migrants' rights. Our comparative analysis yields four typologies: border-control, migrant-management, return-enforcement and asylum-support systems. According with Rouvroy and Berns (2013), reveals that AI acts not as a neutral administrative device but as an agent transforming the relations among states, international bodies and migrants

Moreover, the research contributes to the wider debate on *algorithmic governmentality*, as conceptualised by Rouvroy and Berns (2013), by demonstrating that artificial intelligence – particularly within the domain of migration – does not function as a neutral instrument of administrative efficiency. Rather, it operates as a powerful mechanism that reconfigures relationships between states, international organisations and mobile individuals. The case studies examined underline how the automation of decisions in this field raises fundamental questions on agency, ethical responsibility and justice in the digital era. The following sections critically investigate the functioning of these systems, their implications and the scope for developing alternative models that balance administrative efficiency with the protection of human rights and individual dignity.

1. Theoretical framework

The intersection of artificial intelligence and migration constitutes an emerging field of sociological inquiry, revealing new modalities of power. Contemporary governmentality increasingly operates with computational systems that collect, categorise, and analyse data on migrants, profoundly reshaping how human mobility is managed (Beduschi, 2021).

AI-based technologies are reconfiguring migration governance regimes by structuring what Rouvroy and Berns (2013) describe as *algorithmic governmentality*: systems that do not merely reflect social reality but actively produce

regimes of truth, continually reshaping how migrants are classified, monitored, and governed.

Foucault's concept of governmentality (2009) provides a useful framework for interpreting these transformations. It is understood as the "conduct of conduct", a form of power that operates not through direct coercion but by shaping the field of possible actions and guiding the choices of individuals and populations. In his *genealogy of power*, Foucault identifies a shift from sovereign disciplinary regimes to regulatory forms of power that operate using security dispositifs and the production of truth regimes (Foucault, 2004). Algorithmic governmentality extends this logic by three key characteristics: large-scale, automated data collection, algorithmic processing to identifying statistical correlations, and anticipatory action based on predictive outputs (Rouvroy, Berns, 2013). The distinctiveness of this form of governance lies in its operation at an infra-individual level, bypassing reflective awareness (Rouvroy, 2013). Unlike disciplinary forms of power that act through visible institutions and explicit norms, algorithmic governmentality imposes an "immanent normativity" that shapes the very space of possible action, rather than prescribing behaviour directly.

In the context of migration, this marks a paradigmatic shift from earlier governance regimes that relied on disciplinary surveillance and fixed norms. The datafication of mobility management has enabled this transition to algorithmic forms of control (Broeders, Dijstelbloem, 2015). Algorithmic governmentality modulates the migrant's range of action through continuous analysis of their digital traces classifying individuals not by pre-existing social categories but through fluid behavioural patterns (Cheney-Lippold, 2017). This aligns with what Deleuze (1995) described as a *society of control*, in which disciplinary forms of power give way to continuous modulations governed by codes that regulate differential access to spaces and resources. In current digital era, such modularity is expressed through algorithmic profiling processes which, as Amoore (2013) notes, produce not precise knowledge of individuals but a probabilistic mapping of their potential for action and decision-making. As a result, algorithmic migration governance is structured around a regime of truth not based on objective representation but on the production of specific "performative ontologies" (Law, Urry, 2004), making migrants governable through their reduction to data patterns.

Recently, Bigo (2020) has identified three key functions which characterised algorithmic governmentality in migration field: transforming individuals into data patterns, anticipating migratory flows by means of predictive modelling, and automating decisions previously left to human discretion. Within this framework, the "truth" of the migrant no longer emerges from inquiries into

substantive identity, but from aggregated statistical correlations based on their digital behaviours. This resonates with Lyon's (2018) concept of a *culture of surveillance*, where control is exercised through preventive normalisation without the need for consent or awareness. Migrant datafication, as exemplified by International Organisation of Migration (IOM)'s MIDAS and United Nations High Commissioner for Refugees (UNHCR)'s PRIMES, transforms individual attributes into biometric profiles, enabling cross-border tracking and service allocation, yet flattening nuanced life histories into standardised datasets, frequently without migrants' informed consent (Singler, 2021; Madianou, 2019).

As van Dijck (2014) notes, datafication represents not merely a digitalisation process but rather an ontological shift that translates human experience into statistical correlations. Within migration contexts, this fragments identities into what Deleuze (1995) termed *dividuals* – discrete, manipulable units of data – altering the conditions under which migrants are recognised as rights-bearing subjects. Such fragmentation carries tangible consequences: when asylum seekers are reduced to biometric data points, Global Positioning System (GPS) traces and metadata, their personal narratives of persecution risk being overshadowed by automated assessments privileging consistency and plausibility. On this point, Metcalfe and Dencik (2019) document how systems increase rejection rates by flagging trauma-induced nonlinear narratives as incoherent.

Beyond the operational function of algorithmic systems, Introna (2016) clarifies the structural logic of datafication, identifying three interrelated mechanisms: *selective visibilisation* (emphasising certain aspects of identity while obscuring others), *forced commensurability* (reducing heterogeneous experiences to standardised metrics), and *anticipatory normalisation* (reshaping individual profiles in line with predictive expectations of risk or integration). These processes reveal that datafication is never neutral but inherently political, embedding specific worldviews within ostensibly objective technical infrastructures. This becomes evident in structural biases pervading algorithmic systems. As Beduschi (2021) argues, models trained on historical or incomplete data tend to replicate and amplify existing prejudices – particularly those related to nationality, ethnicity, or mobility patterns – thereby producing systemic inequalities masked as objectivity. The datafication processes underlying these systems inherently embed discriminatory logics that disproportionately affect marginalised populations (Leurs, Shepherd, 2017). Such bias emerges both from unbalanced data selection practices and predictive modelling approaches that prioritise statistical correlations over contextual and qualitative assessment.

Nevertheless, adopting algorithmic governmentality requires critical reflection on its analytical limits. Weiskopf and Hansen (2023) emphasise how algorithmic governmentality reconfigures the space of ethics, requiring new frameworks for understanding moral responsibility in automated decision-making systems. Critics warn against overly deterministic approaches that portray migrants solely as passive classification objects, neglecting their capacity to resist and reconfigure algorithmic rule conditions (Walters, Tazzioli, 2023). In practice, algorithmic regimes are marked by instability, contestation, and failure (Aradau, 2023). Migrant subjectivities, far from being fully governed, may act as agents of counter-conduct (Foucault, 2009), introducing unpredictability exceeding predictive logic. The notion of insurgent politics draws attention to collective practices that – despite arising from conditions of extreme precarity – interrogate and transform governance technologies (Lecadet, 2023). For this reason, analyses must therefore attend to such frictions, local contexts heterogeneity, and resistances emerging at the nexus of subjectivity, technology, and power.

2. Comparative Analysis of Automated Systems in Migration Governance

To understand the impact of automated systems employed in migration management, a comparative analysis of existing technologies was undertaken. The research systematically catalogued 61 AI systems, selected from 2015 to 2024, via comprehensive web-based investigation of academic and non-academic databases (Scopus, Web of Science, Google Scholar) using keywords such as "migration management" AND/OR "border control" AND ("Artificial Intelligence" OR "large language models" OR "machine learning" OR "predictive analysis"), institutional reports (UNHCR, IOM, Frontex, DG Home Affairs UE) and official documentation from national agencies (BAMF, CBP, IRCC). This catalogue is not exhaustive and reflects heterogeneous geographic coverage: some emerging systems in Africa and Southeast Asia may not have been captured.

These systems were subsequently classified according to multiple criteria: level of technological advancement (Tab. 1), geographical distribution and specific operational functionalities (Tab. 2). Regarding the classification of AI technological levels employed, these were defined according to six successive developmental stages, progressing from the most elementary to the most advanced. The most basic level includes rule-based systems, which operate through deterministic IF-THEN logic. These are typically found in traditional migration registries and eligibility verification tools. Their function is often

limited to mechanical bureaucratic tasks, offering minimal flexibility or learning capacity. The second level comprises supervised machine learning algorithms trained on labelled datasets, enabling predictions as seen in Swiss refugee allocation systems, which estimates the potential "integration merit" of applicants based on historical data patterns. Deep learning and computer vision form the third level, with neural networks performing facial recognition and behavioural analysis. Tools like iBorderCtrl and facial scanning technologies at European Union borders exemplify this class, enabling forms of algorithmic behavioural surveillance. The fourth category encompasses advanced biometric systems that integrate multimodal biometric data (such as iris, fingerprint, and facial recognition) with AI capabilities. Systems like Eurodac, MIDAS, and IrisGuard fall into this category, marking a significant shift towards the reduction of the migrant to a fully digitised biometric profile. At the fifth level, optimisation and matching algorithms, designed to allocate resources or individuals based on system-wide efficiency logics, are positioned. In this category are comprised matching systems used in Canada and Switzerland for refugee placement prioritise performative optimisation over individual preferences or rights, reflecting a systemic orientation towards administrative rationality. Finally, the most advanced level consists of large language models and generative AI, capable of autonomous content generation, human-like interaction, and self-learning. Although not yet widely deployed in operational migration governance, early experiments such as International Rescue Committee (IRC)'s Signpost.AI – a chatbot offering legal and asylum information – raise critical concerns regarding decision-making opacity and asymmetrical access to rights.

Tab. 1 – AI Systems for migration governance

Category	*Description*	*Technological level*	*Social Impact*
1. Rule-based systems	Deterministic if-then logic	Low	Mechanic bureaucratisation
2. Supervised machine learning	Training on labelled datasets	Medium	Predictive assessment of "integration merit"
3. Deep Learning and Computer Vision	Neural networks for facial/emotion recognition	Medium - High	Algorithmic behavioural surveillance
4. Advanced Biometric Systems	Multimodal biometrics and AI	High	Reduction of the migrant to a biometric profile
5. Optimisation/Matching Algorithms	Resource and allocation optimisation	High	Efficiency over rights

6. LLMs and Generative AI	Language models for automated interaction and decision-making	Very high (4th generation)	Opacity, asymmetrical access to rights

The analysis reveals a clear progression in technological sophistication, which has fundamentally transformed approaches in migration management. This evolution has produced a transition from systems initially oriented towards bureaucratic process mechanisation to technologies enabling pervasive monitoring of migrants through comprehensive collection of biometric and behavioural characteristics.

Concurrently, one observes increasing decision-making autonomy in intelligent systems, which are transitioning from mere support tools to entities capable of making critical determinations with limited human oversight. This phenomenon corresponds with a concerning rise in algorithmic opacity, marked by the progressive abandonment of explicit rules in favour of "black box" architectures that remain largely inscrutable even to their developers.

Within this evolutionary framework, a rigorous examination of implications for fundamental rights and the shifting representation of migrants within institutional systems becomes imperative. What emerges is an ontological transformation in which individuals are no longer recognised as a subject of rights but reframed as a dataset optimised for algorithmic management.

As technological complexity increases, so too do the associated ethical and social challenges, reorienting the discourse from administrative efficiency to deeper transformations in how migrants are perceived, categorised and processed by institutions.

Considering the distribution of the catalogued systems according to geographical region and operational function, a significant disparity becomes evident. There is a clear predominance of the Global North: European and North American implementations together account for approximately two-thirds of all documented systems. Intermediate adoption levels are observed in Asia and Oceania, while African implementation remains minimal. Three additional systems operate on a global scale. From a functional analysis perspective, border control emerges as the primary application, followed by information provision, asylum processing, integration services and return management. The concentration of border control technologies in Europe and North America reflects their role as principal destinations for international migration.

Tab. 2 - Identified Cases by Region and Function

Geographical Area	*Border control*	*Asylum requests*	*Deportation control*	*Integration*	*Information support*	*Total*
Europe	7	4	3	3	3	20
North America	6	3	3	4	3	19
Asia	4	1	1	1	1	8
Oceania	3	1	1	1	1	7
Africa	2	1	0	0	1	4
Global	0	0	0	0	3	3
Total	22	10	8	9	12	61

Conclusion

Artificial intelligence in migration governance is not just a technological innovation but constitutes the emergence of new classification and control mechanisms that fundamentally reshape relations between states, international organisations, and migrants. The research exposes unequal geographies of algorithmic power, where advanced systems are developed and managed by Global North states while those in the Global South remain mere implementation territories, subjected to foreign decision-making models lacking local adaptation and accountability. This creates an algorithmic divide that reproduces existing hierarchies through a dual dynamic: countries with advanced predictive capabilities impose standardised frameworks for risk and integration assessment, while transit and origin states must implement these tools without meaningful participation in their design or the ability to contest their determinations. This asymmetry consolidates algorithms as transnational mechanisms of power that reinforce existing hierarchical relations, rather than serving as neutral technical instruments.

Borders increasingly function as a mobile biometric network, tracking migrants across time and space through digital identification systems embedded in pervasive surveillance regimes. This shift reduces personal identity to computational risk profiles, subordinating access to rights to compliance with often invisible algorithmic criteria. Migrant datafication emerges as a mechanism of systematic dehumanisation, transforming the complexity of individual existence into measurable parameters and predefined categories – at the cost of erasing human dimensions, personal narratives, and specific socio-cultural contexts.

Additionally, the deployment of big data and AI in migration governance ultimately serves institutional rather than migrant interests (Bircan, Korkmaz, 2021). Massive collection of personal and biometric data, often without

genuine informed consent, produces a "surveillance bargain": migrants are compelled to surrender privacy and informational self-determination in exchange for access to fundamental rights such as asylum or humanitarian aid. This dynamic raises serious concerns about the human rights impacts of new technologies in migration contexts (Molnar, 2019). Especially concerning is the overlap between migration and criminal surveillance systems, which fosters structural criminalisation by positioning migrants as suspects rather than individuals in need of protection.

Analysis of the 61 documented systems further highlights a persistent tension between administrative efficiency and the protection of fundamental rights. These technologies embed assumptions about migration and risk reinforcing systemic bias, particularly when trained on historical data that reproduces past prejudices under a veneer of objectivity.

However, such transformation is not unidirectional. Alongside emerging technocracy, significant forms of resistance and counter-use arise, including legal contestation strategies, technological evasion practices, and advocacy movements for more ethical AI governance in migration contexts. These practices of counter-conduct, push beyond algorithmic prediction, challenging dominant paradigms and opening space for political contestation. Within these legal, political, and social domains, there is the potential to reimagine governance models that reject reductive profiling in favour of recognising the complexity and dignity of migrant lives. The core challenge emerging from this analysis involves developing governance models that, while benefiting from digital innovation, remain grounded in principles of social justice and human rights, avoiding a drift towards total control that reduces migration to algorithmic calculation. Policy measures should mandate algorithmic impact assessments, conduct regular independent audits of AI systems for bias and transparency, and implement participatory co-design processes involving Global South stakeholders, ensuring that these technologies facilitate not only control and security but also pathways to inclusive integration and the protection of fundamental human rights.

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