

THREE OPEN GRAVES: BORDER NECROTECHNICS AND THE DESIGN OF DEATH AT THE DIGITAL FRONTIER

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ABSTRACT

Drawing on fieldwork from the unmarked graves of Sidero in the Greek region of Evros to the Sonoran desert and the deadly crossings at Ceuta in July 2026, this piece introduces the concept of border necrotechnics: the assemblage of automated systems, databases, and surveillance architectures through which states and corporations decide which lives are rendered killable, deportable, or indefinitely surveilled at and beyond the border. Building on Achille Mbembe's necropolitics and on scholarship tracing how racial hierarchy is encoded into law and technology, I argue that the deaths of people on the move at increasingly digitised borders are better understood as foreseeable outcomes of political and technological design than as accidents of geography. The piece traces how responsibility is dispersed across a lucrative border-industrial complex, including firms whose technologies are marketed through their deployment against Palestinians, and how regulatory carve-outs such as those in the EU AI Act sustain zones of experimentation. It closes by setting out pathways toward accountability, transparency, and community-led alternatives.

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1. Introduction

Almost as a pilgrimage, whenever I am in the region that bisects Turkey and Greece, I make the drive to Sidero, a small village near the town of Soufli in the Greek border region of Evros. Soufli is flanked by golden poplars that cut through the landscape like sharp teeth. Outside this small village lies a cemetery of unmarked graves, a resting place for those who died making the journey to Europe. The majority of the graves carry no name at all, though three or four have inscriptions sent to the Imam of this village by the families of the deceased, painstakingly carved into raw, unpolished marble by hand. The last time I was there, I touched the fresh earth on the grave of a young woman who died on the 2nd

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of February, 2021, only eight months before my visit. She was born in 1993. Decayed bouquets of yellowed roses lay atop her grave, a remnant of recognition and an act of care from the villagers who buried her. While paying my respects, suddenly something green and putrid caught my eye, standing water collected in holes which had been crudely gnawed out of the earth nearby. Three open graves await.

I have spent the past eight years documenting how new technologies of border management, including surveillance, automated decision-making, and various experimental projects, are playing out in migration control.¹ The people buried in places like Sidero were not shot at the border, and they did not drown in a shipwreck of the kind that occasionally breaks into the global news cycle. They died in the way that a great many people seeking asylum now die at the edges of the wealthy world, pushed by infrared cameras, drones, and sensor networks into terrain where the environment itself does the killing, and where each death can afterwards be filed away as an accident of geography rather than the foreseeable outcome of policy.

What I want to do in this piece is to trace the line that runs from those three open graves to the procurement contracts, risk-scoring systems, and regulatory carve-outs that produce them, and to argue that we need more precise language for what is being built at the world's borders. In my new book, *Border Necrotechnics: Automation, Surveillance, and the Racial Politics of Migration Control* (Palgrave Macmillan 2026), published open access so that the communities it documents can actually read it, I name this infrastructure directly.² Border necrotechnics describes the assemblage of automated systems, databases, and surveillance architectures through which states and corporations decide which lives are rendered killable, deportable, or indefinitely surveilled at and beyond the border.

2. Borders kill by design

In 2026, already violent global border policies are sharpened through the use of digital technologies developed for the purposes of border control and migration management. These technologies separate families, push people into life-threatening terrain, and exacerbate the historical and systemic discrimination that is a daily reality for people on the move and other marginalised communities. Border spaces also serve as testing grounds for new technologies,³ places where regulation is deliberately limited and where an anything-goes frontier attitude informs the development and deployment of surveillance at the expense of people's lives.

¹ P. MOLNAR, *The Walls Have Eyes: Surviving Migration in the Age of Artificial Intelligence* (The New Press, 2024), <https://thenewpress.org/books/the-walls-have-eyes/>.

² P. MOLNAR, *Border Necrotechnics: Automation, Surveillance, and the Racial Politics of Migration Control* (Palgrave Macmillan 2026), DOI 10.1007/978-3-032-32070-4, available open access at <https://link.springer.com/book/9783032320698>. see also Petra MOLNAR, "The Racial Necrotechnics That Lead to Death By Design at Automated Borders," *Tech Policy Press*, 17 August 2026, <https://www.techpolicy.press/the-racial-necrotechnics-that-lead-to-death-by-design-at-automated-borders/>.

³ Supra note 1.

Today there are millions of people on the move because of the forces of colonialism and imperialism, conflict, instability, environmental collapse, and economic precarity. In response, states and international organisations involved in migration management have expanded their use of technological experiments across border enforcement, decision-making, and data mining, so that through every point of a person's journey they are impacted by risky and unregulated technologies used to control movement. People crossing borders, whether by force or by choice, are talked about in apocalyptic terms, and that vocabulary of inundation is underscored by growing xenophobia and racism.⁴ Not only are the underlying claims factually incorrect, they legitimise far-reaching state incursions and increasingly hardline policies of surveillance and techno-solutionism.⁵

When trying to understand the impacts of migration management and border technologies, whether AI lie detectors, surveillance drones, or various automated decision-making tools, it is important to consider the broader ecosystem in which these technologies develop, an ecosystem which is increasingly replete with the criminalisation of migration, anti-migrant sentiment, and practices such as pushbacks leading to thousands of deaths at borders.

For example, in February of 2022, I was in the Sonoran desert at the US and Mexico border to see firsthand the impacts of technologies being tested out there. These technological experiments include various automated and AI-powered surveillance towers sweeping the desert, as well as the robotic quadrupeds announced by the Department of Homeland Security's Science and Technology Directorate, which have now joined the global arsenal of border enforcement technologies.⁶ The future being built here is not just more technology, it is more death. Thousands of people have already perished making the dangerous crossing, like Mr. Alvarado, a young husband and father from El Salvador who left in search of a better life for his family and who succumbed mere kilometres from a major highway, and whose memorial site we visited after hours of trekking through the desert.

The available evidence suggests that surveillance and smart borders do not deter people from making dangerous crossings. Instead, people are forced to change their routes towards less inhabited terrain, leading to loss of life both in the Sonoran desert and along the maritime borders of the European Union. The geographers Samuel Chambers,

⁴ See for example D.R. CISNEROS, "Contaminated Communities: The Metaphor of 'Immigrant as Pollutant' in Media Representations of Immigration," *Rhetoric & Public Affairs* 11, no. 4 (2008): 569-601, <https://muse.jhu.edu/article/261933>. For a recent computational analysis of the same dehumanising register, see J. MENDELSON, C. BUDAK, "When People are Floods: Analyzing Dehumanizing Metaphors in Immigration Discourse with Large Language Models," <https://arxiv.org/html/2502.13246v2>.

⁵ Supra note 1, see also EUROPEAN COMMISSION JOINT RESEARCH CENTRE, "Public discourse on migration shaped by misinformation and conspiracy theories," 5 June 2025, https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/public-discourse-migration-shaped-misinformation-and-conspiracy-theories-2025-06-05_en;

EUROPEAN COMMISSION, "New report sheds light on the power of migration narratives," 27 May 2025, https://home-affairs.ec.europa.eu/news/new-report-sheds-light-power-migration-narratives-2025-05-27_en.

⁶ US DEPARTMENT OF HOMELAND SECURITY, SCIENCE AND TECHNOLOGY DIRECTORATE, "Robot Dogs Take Another Step Towards Deployment at the Border," 1 February 2022, <https://www.dhs.gov/science-and-technology/news/02/01/feature-article-robot-dogs-take-another-step-towards-deployment>.

Geoffrey Boyce, and Sarah Launius have documented in detail how deaths in the Arizona desert rose sharply after the introduction of smart border surveillance towers, as crossings shifted into ever more remote and lethal terrain.⁷ Comparable patterns, in which surveillance displaces crossings into more dangerous routes rather than preventing them, have been documented at Spain's southern border, and human rights monitors have raised similar concerns about aerial surveillance in the Mediterranean and about pushbacks along the Poland and Belarus frontier. If these technological experiments continue, I fear that in the not so distant future people like Mr. Alvarado could be pursued by high-speed, military-grade technology designed to kill.

In 2024 the International Organization for Migration recorded the deadliest year on record for people on the move, with almost nine thousand deaths documented worldwide, and its Missing Migrants Project has now spent more than a decade counting bodies that the systems producing them do not count.⁸ On the 30th and 31st of July 2026, tens of thousands of people crossed into Ceuta, many of them swimming around the breakwater at Tarajal, at what Human Rights Watch describes as one of the most fortified external borders of the European Union, a frontier layered with fencing, cameras, and maritime patrols. Spanish authorities confirmed at least seventy-two deaths, while civil society monitors counting the bodies recovered on both sides of the border have put the toll considerably higher.⁹ Within days, Spain had begun installing a floating barrier off the Tarajal breakwater, and twenty-two EU member states had issued a joint letter calling for coordinated action and the strengthening of external borders. They did not ask why people continue to die at one of the most closely watched frontiers in the world, and in my reading their response amounts to a call for more of the same infrastructure that shaped the

⁷ S.N. CHAMBERS, G.A. BOYCE, S. LAUNIUS, "Mortality, Surveillance and the Tertiary 'Funnel Effect' on the U.S.-Mexico Border: A Geospatial Modeling of the Geography of Deterrence," *Journal of Borderlands Studies* (2019), <https://www.tandfonline.com/doi/abs/10.1080/08865655.2019.1570861>. On comparable dynamics at Spain's southern border, where surveillance tools have been found to push people towards more dangerous journeys, see EUROMED RIGHTS and ALGORACE, *Digital Technologies for Migration Control at the Spanish Southern Border* (October 2024), <https://euromedrights.org/publication/new-report-an-analysis-of-digital-surveillance-technologies-for-migration-control-at-the-spanish-southern-border/>. On aerial surveillance in the Mediterranean and pushbacks at the Poland and Belarus border, see *infra* notes 33 and 20.

⁸ INTERNATIONAL ORGANIZATION FOR MIGRATION, "2024 is Deadliest Year on Record for Migrants, New IOM Data Reveals," <https://www.iom.int/news/2024-deadliest-year-record-migrants-new-iom-data-reveals>; see also the MISSING MIGRANTS PROJECT, <https://missingmigrants.iom.int/>.

⁹ HUMAN RIGHTS WATCH, "Rapid Returns Follow Migrant Crossings to Ceuta," 3 August 2026, <https://www.hrw.org/news/2026/08/03/rapid-returns-follow-migrant-crossings-to-ceuta> (dates of the crossings, figure of at least 72 deaths, and description of Ceuta as among the most fortified external EU borders); C. PONS, M.F. GORE, "Spain installs floating barrier in Ceuta after deadly migrant rush," Reuters, 1 August 2026, republished at <https://theprint.in/world/spain-installs-floating-barrier-in-ceuta-after-deadly-migrant-rush/3003258/>. On the higher toll reported once bodies recovered in Moroccan waters were counted, drawing on figures from Caminando Fronteras and Spanish officials, see MIDDLE EAST EYE, "Ceuta migrant disaster death toll rises to 141, Morocco's deadliest in recent history," 5 August 2026, <https://www.middleeasteye.net/news/ceuta-migrant-disaster-death-toll-rises-morocco-deadliest-recent-history>. On surveillance infrastructure at Ceuta, see *supra* note 7; see also N. AKEHURST, *Jacobin*, 3 August 2026, <https://jacobin.com/2026/08/spain-ceuta-border-crossing-morocco>.

conditions in which these people died.¹⁰

Events like Ceuta collapse whatever distinction there may be between the spectacular and the cumulative. The deaths that were televised were acute enough to summon leaders to emergency summits, yet in my analysis they cannot be separated from the same steady accumulation of fences, cameras, and surveillance apparatuses that had been narrowing the corridors of movement for years. Rob Nixon calls this slow violence, harm that is incremental, attritional, and not attributable to any single event, which is precisely why it escapes the accountability that a single act of violence would provoke.¹¹ No single official can be said to have killed anyone, and this dispersal of responsibility is, I argue, precisely how the system reshapes the geography of survival while evading account.

3. Why border necrotechnics

My concept of border necrotechnics is indebted to a longer intellectual genealogy.¹² It builds most directly on Achille Mbembe's theorisation of necropolitics, the sovereign power to expose certain populations to death and to consign them to death-worlds, which itself extends Frantz Fanon's account of the colonised as those relegated to a zone of nonbeing where violence is ordinary and life is rendered disposable.¹³ It also draws on scholars such as E. Tendayi Achiume, Simone Browne, and Ruha Benjamin, who have traced how racial hierarchy is encoded into law, surveillance, and technology.¹⁴

Where sovereign violence once required a visible decision, border necrotechnics now disperses that decision across databases that flag bodies as risky, sensors that redirect journeys into hostile terrain, and administrative platforms that render immigration detention routine and indefinite.¹⁵ In these environments, exposure to harm becomes infrastructural, cumulative, and diffused across so many actors, interfaces, and design

¹⁰ AL JAZEERA, "Why has the EU called an emergency meeting on Spain migrants?," 2 August 2026, <https://www.aljazeera.com/news/2026/8/2/why-has-the-eu-called-an-emergency-meeting-on-spain-migrants-surge>.

¹¹ R. NIXON, *Slow Violence and the Environmentalism of the Poor* (Harvard University Press, 2011), <https://www.jstor.org/stable/j.ctt2jbsgw>.

¹² Supra note 2.

¹³ A. MBEMBE, "Necropolitics," *Public Culture* 15, no. 1 (2003): 11-40, <https://read.dukeupress.edu/public-culture/article-abstract/15/1/11/31714/Necropolitics>; F. FANON, *Black Skin, White Masks* (Pluto Press, 1986), https://monoskop.org/images/a/a5/FANON_Frantz_Black_Skin_White_Masks_1986.pdf.

¹⁴ E.T. ACHIUME, "Racial Borders," *Georgetown Law Journal* 110 (2022), https://www.law.georgetown.edu/georgetown-law-journal/wp-content/uploads/sites/26/2022/05/ACHIUME_RacialBorders.pdf; S. BROWNE, *Dark Matters: On the Surveillance of Blackness* (Duke University Press, 2015), <https://read.dukeupress.edu/books/book/147/Dark-MattersOn-the-Surveillance-of-Blackness>; R. BENJAMIN, *Race After Technology*, <https://www.ruhabenjamin.com/>.

¹⁵ See also D. GHEZELBASH, P. MOLNAR, *From Surveillance to Empowerment: Advancing the Responsible Use of Technology in Alternatives to Detention* (Kaldor Centre for International Refugee Law, International Detention Coalition, and Refugee Law Lab, September 2025), in collaboration with C. GOTTARDO, A. NAPOLITANO, <https://www.unsw.edu.au/content/dam/pdfs/law/kaldor/2025-09-technology-in-alternatives-to-detention.pdf>.

choices that the violence becomes disaggregated from any single act or decision, and therefore far more difficult to contest and challenge. The importation of more and more border technologies renders political decisions as neutral and as questions of computation, laundering the responsibility of states and private actors alike. Read together, the evidence from Evros, the Sonoran desert, and Ceuta suggests that the deaths this system produces are better understood not as malfunctions or byproducts but as a sign that the system is working as it has been designed to work.

This is also why the vocabulary of reform keeps failing us. Tech policy conversations in Washington and Brussels continually shy away from confronting the reality of the deaths at the sharp end of these systems, preferring instead to focus on risk assessments, proportionality, safeguards, and bias audits, if they engage at all. Harms that are structural, from people denied entry without explanation to people seeking asylum misclassified by opaque risk scores, are thereby reframed as implementation challenges awaiting more robust regulation, while the bordering systems themselves are never in question.

4. Techno-racial borders

Border necrotechnics inherits a centuries-old project of racial exclusion.¹⁶ Modern migration control descends directly from colonial governance, from the biometric registration of colonised populations to the surveillance of communities deemed suspect and the collective restriction of their movement.¹⁷ Contemporary borders function as mechanisms for reinscribing and preserving global racial hierarchy, systematically constraining the mobility of people racialised as African, Arab, Muslim, or otherwise non-Western while movement in the other direction remains largely frictionless.

Digital border technologies contribute to this lineage by expanding the scale of operations and by giving an appearance of objectivity to decision-making that shields racialised judgement from scrutiny. Risk-scoring tools sort people on the move by perceived danger, biometric infrastructures map racialised bodies into permanent suspect categories, and predictive analytics evaluate people not for anything they have done but for what they might do, a form of punishment without crime that runs continuously and preemptively. Modern digitised borders reinscribe the old racial order, made normalised and considerably more difficult to contest. As I argue at greater length in the book, the racial logic at the centre of modern borders is not an unfortunate byproduct but the key

¹⁶ E.T. ACHIUME, "Racial Borders," *Georgetown Law Journal* 110, no. 3 (2022): 445, https://www.law.georgetown.edu/georgetown-law-journal/wp-content/uploads/sites/26/2022/05/ACHIUME_RacialBorders.pdf.

¹⁷ EUROPEAN DIGITAL RIGHTS, "The colonial biometric legacy at the heart of the new EU asylum system," <https://edri.org/our-work/the-colonial-biometric-legacy-at-heart-of-new-eu-asylum-system/>; K. WEITZBERG, "Biometrics, Race Making, and White Exceptionalism: The Controversy over Universal Fingerprinting in Kenya," *Journal of African History*, <https://www.cambridge.org/core/journals/journal-of-african-history/article/abs/biometrics-race-making-and-white-exceptionalism-the-controversy-over-universal-fingerprinting-in-kenya/B69DDDFE3FECE158E157BB40304B2B6A>.

organising principle of the digital border itself, and AI systems do not simply reflect racial inequalities, they automate them at scale under the guise of objectivity.¹⁸

We already know that facial recognition performs poorly and discriminatorily on Black and Brown faces, and that algorithmic decision-making frequently relies on biased data sets which render biased results. At the border more specifically, how can an AI-type lie detector deal with differences in cross-cultural communication or with the impact of trauma on memory? Human decision-makers already have serious difficulty with these complex factors, and yet the European Union funded exactly such a system through the iBorderCtrl project, then fought a multi-year transparency battle to keep the details of that research from public view.¹⁹

These decisions about where to deploy border technologies and on whom are also highly racialised, and replete with very real power differentials. When Ukrainian refugees were welcomed with open arms, hundreds of people continued to freeze in the forest at the Poland and Belarus border, another site of border technology experiments, where pushbacks and abuse have continued to be documented for years.²⁰

5. Carceral borders

Greece has been one of the frontier sites of the European Union and a testing ground for much of what is later exported elsewhere.²¹ The region of Evros separating Greece and Turkey is one of these sites, and it is where the cemetery at Sidero lies. This is where Frontex has piloted aerostat machines, where long-range acoustic devices, the sound cannons whose deployment alarmed even the European Commission, were rolled out along the river, and where the border fence has been extended year on year.²² In February 2026 the Greek Prime Minister committed to extending that fence along the entire Greek and Turkish land border, with roughly seventy-five kilometres already complete and further

¹⁸ Supra note 2.

¹⁹ On iBorderCtrl and the litigation over access to its research documents, see EUROPEAN DIGITAL RIGHTS, “European court supports transparency in risky EU border tech experiments,” <https://edri.org/our-work/european-court-supports-transparency-in-risky-eu-border-tech-experiments/>; and J. SÁNCHEZ-MONEDERO, L. DENCİK, “The politics of deceptive borders: ‘biomarkers of deceit’ and the case of iBorderCtrl,” *Information, Communication & Society*, <https://www.tandfonline.com/doi/full/10.1080/1369118X.2020.1792530>.

²⁰ HUMAN RIGHTS WATCH, “Poland: Brutal Pushbacks at Belarus Border,” 10 December 2024, <https://www.hrw.org/news/2024/12/10/poland-brutal-pushbacks-belarus-border>. See also P. MOLNAR, “Digital border technologies, techno-racism and logics of exclusion,” *International Migration* 61, no. 5 (2023): 307-312, <https://doi.org/10.1111/imig.13187>.

²¹ Supra note 1.

²² EURONEWS, “EU alarmed by Greece’s use of sound cannons at border to deter asylum seekers,” 3 June 2021, <https://www.euronews.com/my-europe/2021/06/03/eu-alarmed-by-greece-s-use-of-sound-cannons-at-border-to-deter-asylum-seekers>. On drones and AI at the Greek border more generally, see HOMO DIGITALIS, “Drones & Artificial Intelligence at Greece’s high-tech borders,” <https://homodigitalis.gr/en/posts/131019/>.

advanced technical surveillance promised alongside it.²³ All the while, new deaths at that border continue to be reported.

Greece is also the epicentre of the rise of new prison-like refugee camps in the Aegean islands, part of an increasingly virtual Fortress Europe. Kos, where one of these camps sits, is also one of the sites of the EU-funded ROBORDER project, which explicitly aimed to develop a fully functional autonomous border surveillance system with unmanned mobile robots including aerial, water surface, underwater, and ground vehicles, operating both independently and in swarms.²⁴ I urge you to think about where those resources would be better spent.

The island of Samos is yet another site where border violence and technology intersect. I was there for the opening of the brand new high-tech camp in September of 2021, one of five closed controlled access centres opening on five Greek islands, all funded by the European Union.²⁵ Replete with all sorts of high-tech interventions, it is worth noting that the camp did not have running water two weeks before its opening. Speaking to a young mother from Afghanistan on the eve of her family being forcibly transferred there, she hurriedly typed out a message to me: if we go there, we will go crazy. This is what the new camps look like, surrounded by layers of barbed wire, with algorithmic motion and risk detection surveillance, fingerprint scanners, and even virtual reality technology tested out to monitor the people living inside. Two of these systems, Kentauros and Hyperion, were rolled out without the data protection safeguards Greek and European law require, and in 2024 the Greek data protection authority issued a record fine of one hundred and seventy-five thousand euros against the Ministry of Migration and Asylum over their deployment.²⁶

Through more and more technology, migration control increasingly functions as punishment without a crime, criminalizing human movement yet operating beyond the procedural safeguards of criminal law.²⁷ AI and automated systems extend and intensify that carceral control across space and time. Detention becomes routine, indefinite, and administratively invisible, while the responsibility for it is diffused so widely across

²³ GREEKREPORTER, “Mitsotakis Commits to Extending Evros Fence to Cover Entire Greco-Turkish Border,” 26 February 2026, <https://greekreporter.com/2026/02/26/mitsotakis-commits-extending-evros-fence-cover-entire-greco-turkish-border/>.

²⁴ ROBORDER, “autonomous swarm of heterogeneous ROBots for BORDER surveillance,” European Commission CORDIS project fact sheet, Grant Agreement 740593, <https://cordis.europa.eu/project/id/740593>.

²⁵ REFUGEE SUPPORT AEGEAN, “Samos CCAC,” <https://rsaegean.org/en/samos-2023/>; AMNESTY INTERNATIONAL, “People seeking asylum detained in EU-funded ‘pilot’ refugee camp on Samos,” July 2024, <https://www.amnesty.org/en/latest/campaigns/2024/07/people-seeking-asylum-detained-in-samos-camp-in-greece/>.

²⁶ EUROPEAN DIGITAL RIGHTS, “Greek Ministry of Asylum and Migration face a record-breaking €175,000 fine for the border management systems Kentauros & Hyperion,” <https://edri.org/our-work/greek-ministry-of-asylum-and-migration-face-a-record-breaking-e175000-fine-for-the-border-management-systems-kentauros-hyperion/>. On their launch without safeguards, see BALKAN INSIGHT, “Asylum Surveillance Systems Launched in Greece without Data Safeguards,” 9 September 2022, <https://balkaninsight.com/2022/09/09/asylum-surveillance-systems-launched-in-greece-without-data-safeguards/>.

²⁷ See C.C. GARCÍA HERNÁNDEZ, “Creating Crimmigration,” *Brigham Young University Law Review* 2013, no. 6 (2014): 1457-1515, <https://digitalcommons.law.byu.edu/lawreview/vol2013/iss6/4>, see also J. STUMPF, *The Crimmigration Crisis: Immigrants, Crime, and Sovereign Power*, 56 Am. U. L. Rev. 367 (2006), also open access at digitalcommons.wcl.american.edu/aulr/vol56/iss2/3.

contractors, ministries, and interfaces that punishment becomes infrastructural rather than attributable.

6. The lucrative border-industrial complex

However, at the end of the day this conversation is not really about technology. It is about broader questions, questions about which communities get to participate in conversations around proposed innovation, and which groups of people become testing grounds for border technology experiments.²⁸

Why does the private sector get to determine, time and again, what we innovate on and why, in the often problematic public-private partnerships which states are increasingly keen to make in today's global AI arms race? The deliberate entanglement between states and private technology firms forms a deadly border-industrial complex, a network of defence contractors, surveillance companies, data brokers, and venture-backed startups profiting from the criminalisation of mobility.²⁹ Building on Ruth Wilson Gilmore's analysis of racial capitalism,³⁰ what we see at the border is the convergence of profit incentives and racialised policing, where people on the move become simultaneously security threats and revenue streams.

The same corporate names recur across continents and across the very different landscapes I have worked in. Palantir Technologies, long the subject of litigation and investigation over its work with US Immigration and Customs Enforcement, was reported in 2025 to have been awarded a thirty million dollar contract to build ImmigrationOS, a platform explicitly designed to accelerate identification, tracking, and removal.³¹ Elbit Systems, the Israeli defence contractor whose surveillance sensors line Israel's separation barrier in the occupied West Bank and the perimeter of Gaza, and whose drones have flown over Gaza throughout the genocide, built and expanded the integrated fixed towers that now stand on the sovereign land of the Tohono O'odham Nation in Arizona, over the objections of many Nation members, and has long marketed its products as "field-proven"

²⁸ Supra note 1

²⁹ See for example T. MILLER, *More Than a Wall: Corporate Profiteering and the Militarization of US Borders* (Transnational Institute, September 2019), <https://www.tni.org/en/publication/more-than-a-wall>. PDF: <https://www.tni.org/files/publication-downloads/more-than-a-wall-report.pdf>. See also Todd MILLER, *Empire of Borders: The Expansion of the US Border Around the World* (Verso, 2019), <https://www.versobooks.com/products/264-empire-of-borders>.

³⁰ R.W. GILMORE, *Golden Gulag: Prisons, Surplus, Crisis, and Opposition in Globalizing California* (Berkeley: University of California Press, 2007), American Crossroads series, <https://www.ucpress.edu/books/golden-gulag/paper>.

³¹ AMERICAN CIVIL LIBERTIES UNION, "All the Ways Palantir is Assisting Trump's Abusive Removal Campaign," <https://www.aclu.org/news/privacy-technology/palantir-deportation-roundup>; IMMIGRATION POLICY TRACKING PROJECT, "Palantir awarded \$30 million to build ImmigrationOS surveillance platform for ICE," <https://immpolicytracking.org/policies/reported-palantir-awarded-30-million-to-build-immigrationos-surveillance-platform-for-ice/>; ELECTRONIC PRIVACY INFORMATION CENTER, *EPIC v. ICE (Palantir Databases)*, <https://epic.org/documents/epic-v-ice-palantir-databases/>.

on Palestinians.³² The Heron drones that surveil the Mediterranean for Frontex are manufactured by Israel Aerospace Industries and operated under a four-year contract that began in 2025, with Airbus as prime contractor for the maritime surveillance service.³³ Cellebrite's phone extraction tools have been used to search the mobile devices of people seeking asylum in Europe, a practice that the German Federal Administrative Court has since found unlawful in its indiscriminate form.³⁴

Many of the systems sold to European and North American border authorities are marketed and validated through their prior deployment against Palestinians. The UN Special Rapporteur on the occupied Palestinian territory has documented how drones largely developed and supplied by Elbit and Israel Aerospace Industries, the same firms whose drones and towers now watch the Mediterranean and the Sonoran desert, have flown over Gaza surveilling Palestinians and delivering target intelligence, in a campaign that a UN Commission of Inquiry concluded in September 2025 amounts to genocide. This documented circulation of firms and hardware is the empirical ground of my argument; the further claim that the targeting logics refined in Gaza travel outward with that hardware into the border-industrial complex is an interpretive one, which I draw from this pattern rather than from any single contract.³⁵ Investigative reporting on the Lavender

³² W. PARRISH, "Border Patrol, Israel's Elbit Put Reservation Under Surveillance," *The Intercept*, 25 August 2019, <https://theintercept.com/2019/08/25/border-patrol-israel-elbit-surveillance/>. On drones developed and supplied by Elbit Systems and Israel Aerospace Industries and their use over Gaza, see UN HUMAN RIGHTS COUNCIL, *From Economy of Occupation to Economy of Genocide: Report of the Special Rapporteur on the Situation of Human Rights in the Palestinian Territories Occupied since 1967*, A/HRC/59/23, 2 July 2025, <https://www.ohchr.org/en/documents/country-reports/ahrc5923-economy-occupation-economy-genocide-report-special-rapporteur>.

³³ NAVAL NEWS, "EU's Frontex procures new Israeli UAV for maritime surveillance," December 2024, <https://www.navalnews.com/naval-news/2024/12/eus-frontex-procures-new-israeli-uav-for-maritime-surveillance/>; AIRBUS, "Frontex selects AIRBUS for maritime surveillance," December 2024, <https://www.airbus.com/en/newsroom/stories/2024-12-frontex-selects-airbus-for-maritime-surveillance>.

On the human rights consequences of Frontex aerial surveillance, see HUMAN RIGHTS WATCH, "Airborne Complicity: Frontex Aerial Surveillance Enables Abuse," 8 December 2022, <https://www.hrw.org/video-photos/interactive/2022/12/08/airborne-complicity-frontex-aerial-surveillance-enables-abuse>. On the earlier Frontex framework contracts with AIRBUS (with IAI's Heron) and Elbit (with its Hermes), see M. AKKERMAN, "Frontex awards €50 million in border surveillance drone contracts to AIRBUS, IAI and Elbit," *Stop Wapenhandel*, 30 October 2020, <https://stopwapenhandel.org/?p=2615>.

³⁴ PRIVACY INTERNATIONAL, "Surveillance Company Cellebrite Finds a New Exploit: Spying on Asylum Seekers," <https://privacyinternational.org/long-read/2776/surveillance-company-cellebrite-finds-new-exploit-spying-asylum-seekers>; HERTIE SCHOOL, "The German Federal Administrative Court's landmark ruling on mobile phone data extraction in asylum procedures," <https://www.hertie-school.org/en/news/detail/content/like-handing-my-whole-life-over-the-german-federal-administrative-courts-landmark-ruling-on-mobile-phone-data-extraction-in-asylum-procedures>.

³⁵ On the circulation of technologies between the Israeli military and European border enforcement, see BUSINESS & HUMAN RIGHTS RESOURCE CENTRE, "Frontex's contracted companies reportedly operating surveillance equipment to monitor migrants and refugees crossing the Mediterranean; utilised by the Israeli military in its assaults on Gaza," <https://www.business-humanrights.org/en/latest-news/frontexs-contracted-companies-reportedly-operating-surveillance-equipment-to-monitor-migrants-refugees-crossing-the-mediterranean-utilized-by-the-israeli-military-in-its-assaults-on-gaza-incl-co-responses/>; and VISUALIZING PALESTINE, "Watched," <https://visualizingpalestine.org/visual/watched/>. See also supra note 32; UN INDEPENDENT INTERNATIONAL COMMISSION OF INQUIRY ON THE OCCUPIED PALESTINIAN TERRITORY, "Israel has committed genocide in the Gaza Strip, UN Commission finds," 16 September 2025, <https://www.ohchr.org/en/press-releases/2025/09/israel-has-committed-genocide-gaza-strip-un>.

and Gospel systems documented how automated target generation was used to produce kill lists at a speed and scale that no human review could meaningfully check.³⁶ These particular targeting systems have not been documented at European or North American borders, but they show where the automation of suspicion leads when it is insulated from scrutiny and accountability. Yet, instead of greater safeguards, the industry seems to be booming. On the 31st of August 2026, Greece and Israel signed the Achilles Shield agreement, a deal worth around three billion euros for a multi-layered air defence array built entirely from Israeli systems, including Rafael's David's Sling and SPYDER and Israel Aerospace Industries' Barak MX, which Israel's Ministry of Defense described as the largest defence export deal in the history of the two countries' relations. Achilles Shield is a military rather than a border system, but it deepens Greece's reliance on the same Israeli defence industry whose products circulate through European border enforcement, in the very country whose land border holds the cemetery at Sidero.³⁷

Corporate secrecy is central to how this system sustains itself. Companies invoke trade secrets to block access to algorithmic logic, data sources, and error rates, shielding themselves from liability while allowing states to evade their human rights obligations and avoid legal scrutiny. This is also a clear manifestation of digital colonialism,³⁸ the extraction and commodification of data from populations who have no meaningful ability to refuse. As the growing and lucrative border-industrial complex shows, there is big money to be made by big tech at the expense of the rights and lives of people relegated to the margins, and the hubris of that industry combined with the allure of quick fixes does nothing to address the systemic reasons why people are forced to move in the first place.³⁹

For example, whose priorities really matter when we choose to build violent sound cannons or AI-powered lie detectors at the border, instead of using AI to identify racist border guards?

7. Law, governance, and the deliberate gaps that perpetuate harm

[commission-finds](#); and A. LOEWENSTEIN, *The Palestine Laboratory: How Israel Exports the Technology of Occupation Around the World* (Verso, 2023).

³⁶ Y. ABRAHAM, "Lavender: The AI machine directing Israel's bombing spree in Gaza," +972 Magazine, 3 April 2024, <https://www.972mag.com/lavender-ai-israeli-army-gaza/>. On the Gospel (Habsora) system, see Yuval ABRAHAM, "'A mass assassination factory': Inside Israel's calculated bombing of Gaza," +972 Magazine, 30 November 2023, <https://www.972mag.com/mass-assassination-factory-israel-calculated-bombing-gaza/>.

³⁷ THE TIMES OF ISRAEL, "Greece inks record \$3.5 billion deal to buy comprehensive missile defense system from Israel," <https://www.timesofisrael.com/greece-inks-record-3-5-billion-deal-to-buy-comprehensive-missile-defense-system-from-israel/>; AL JAZEERA, "Why Greece is betting on Israel's Achilles Shield," 2 September 2026, <https://www.aljazeera.com/opinions/2026/9/2/why-greece-is-betting-on-israels-achilles-shield>. On the signing on 31 August 2026 and the systems included, see also BREAKING DEFENSE, "Greece inks \$3.4B deal for multi-layered Israeli air defense system," August 2026, <https://breakingdefense.com/2026/08/greece-inks-3-4b-deal-for-multi-layered-israeli-air-defense-system/>. The AL JAZEERA piece cited above is an opinion article by R.G. PINFOLD.

³⁸ See N. COULDRY, U.A. MEJIAS, *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism* (Stanford University Press, 2019); See NYABOLA 2024

³⁹ See also *supra* note 1.

Border technologies have profound impacts on people's human rights and civil liberties.⁴⁰ Privacy rights are engaged when data is shared with repressive governments, or when international organisations share information gathered during humanitarian emergencies. Freedom of movement and the principle of non-refoulement come into play when a person's right to life, liberty, and security of the person is engaged as they are pushed back, with that pushback facilitated by predictive and surveillance technologies.

But when and why did we decide that these are the appropriate tools to use, particularly without adequate governance or accountability mechanisms in place for when things go wrong? Immigration decisions are already opaque, discretionary, and hard to understand, even when human officers rather than technologies are the ones deciding. Many of us have had difficult experiences trying to get a work permit, reunite with a spouse, or adopt a baby across borders, not to mention seek refugee protection because of conflict and war. Technological experiments to augment or replace human immigration officers have drastic results. In the United Kingdom, roughly seven thousand students were wrongly ordered to leave the country after a voice recognition analysis accused them of cheating on an English language acquisition test, a scandal that the National Audit Office later found had swept up people with no meaningful route to challenge the finding against them.⁴¹ In the United States, Immigration and Customs Enforcement has worked with Palantir and other private companies to track and separate families and to enforce deportations and detentions of people escaping violence in Central and Latin America. In the European Union, tens of thousands have died in the Mediterranean and Aegean seas and at Europe's land borders in conditions shaped by weaponised surveillance technologies.

When these events occur, what happens if you want to challenge one of these automated decisions? Where does responsibility and liability lie, with the designer of the technology, its coder, the immigration officer, or the algorithm itself? Should algorithms have legal personality in a court of law, not unlike a corporation? It is paramount that we begin to answer these questions, since much of the decision-making related to immigration and refugee determinations already sits at an uncomfortable legal nexus, where the impact on the rights of individuals is significant and life-changing even though procedural safeguards are weak.

Border technologies thrive in spaces of legal ambiguity, in zones where human rights protections are weakened, transparency is absent, and accountability is diffuse.⁴² International refugee law and human rights principles such as non-refoulement theoretically constrain state action, yet they contain no mechanism designed for the algorithmic governance of mobility. Opacity, extraterritoriality, dual-use technologies, private sector involvement, and limited pathways to redress together create the structural

⁴⁰ See supra note 1.

⁴¹ On the National Audit Office investigation into the Home Office's response to alleged cheating in TOEIC English-language tests, see ELECTRONIC IMMIGRATION NETWORK, <https://www.ein.org.uk/news/national-audit-office-releases-report-its-investigation-home-offices-response-cheating-toeic>.

⁴² See supra note 2.

conditions that enable technological harm, and the regulatory initiatives that exist offer only incremental improvement.

The European Union’s Artificial Intelligence Act is the most comprehensive attempt to date to regulate these technologies, and it classifies border systems as high-risk on paper while carving out the law enforcement, national security, and migration control applications where the stakes are highest, leaving oversight substantially to self-assessment and internal compliance with little prospect of meaningful redress.⁴³ These carve-outs are political compromises rather than technical oversights. As the civil society coalition Protect Not Surveil has argued, together with EDRi, Access Now, Privacy International, PICUM, EuroMed Rights, and many others, the Act’s treatment of migration reflects a broader European trajectory away from rights protections for people on the move and towards offshoring, deportation, and carceral containment.⁴⁴ Unfortunately, other jurisdictions have faced similar issues. Canada’s proposed artificial intelligence legislation died on the Parliament floor while being silent on migration altogether, while the United States approach remains fragmented and, under the current Trump administration, actively hostile to the premise that these systems require constraint at all.

I would argue that the creation of legal black holes in migration management technologies is deliberate. It allows for opaque zones of technological experimentation that would not be permitted in other spaces. The grey spaces of migration management technology remain largely uncontested, and people on the move are cast as the abject and feared Other, and that casting justifies unregulated technological experimentation under the guise of efficiency and security.⁴⁵ Powerful states in the Global North justify this experimentation through permanent vigilance, activity, and intervention, concentrating the locus of power and technological development in North America and Europe to be deployed against the Majority World, in order to prevent the unwanted Other from arriving. The very rhetoric of migration management implies that people crossing borders must be controlled because they threaten national sovereignty, particularly at a moment when more and more states are turning inward and reifying their sovereign power. When sovereignty is felt to be under threat, the state justifies its control over populations through repeated spectacles and messaging about necessary national security and border control at the exclusion of the Other. This performance is particularly cogent where the law is suspended, as in Australia’s extraterritorial and extra-legal immigration detention policies,

⁴³ For analysis of the AI Act’s shortcomings in the migration context, see *Verfassungsblog*, “The EU’s AI Act and Migration Control: Shortcomings in Safeguarding Fundamental Rights,” <https://verfassungsblog.de/eus-ai-act-and-migration-control-shortcomings-in-safeguarding-fundamental-rights/>; and Tech Policy Press, “One Year On, EU AI Act Collides With New Political Reality,” <https://www.techpolicy.press/one-year-on-eu-ai-act-collides-with-new-political-reality/>.

⁴⁴ PROTECT NOT SURVEIL COALITION, <https://protectnotsurveil.eu/>; “Joint statement: A dangerous precedent: how the EU AI Act fails migrants and people on the move,” <https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move/>; EUROPEAN DIGITAL RIGHTS, “#ProtectNotSurveil: The EU AI Act fails migrants and people on the move,” <https://edri.org/our-work/protect-not-surveil-eu-ai-act-fails-migrants-people-on-the-move/>.

⁴⁵ See *supra* note 2

or, as in the case of technological development, where there simply is no law, or very little of it.

Academia plays its own role in legitimising high-risk experimental technologies, lending a veneer of objectivity and scientific rigour to projects, data gathering exercises, and policies which are inherently harmful to people on the move. The research funding streams that produced iBorderCtrl and ROBORDER did not appear from nowhere. They were reviewed, hosted, and co-authored by universities.

8. Futures beyond border necrotechnics

Border necrotechnics does not distribute death at random. In the name of preserving apartheid regimes, white supremacy, and western neocolonial extractivism, the broader project of modern bordering preserves a racial distribution of wealth and mobility that was built through centuries of imperialism and colonialism, through extraction, enslavement, and the drawing of the very borders that people now die crossing.

Tendayi Achiume and others have argued that the colonial project never really ended but changed form, and that migration from the Majority World can therefore be understood not as a crisis or a humanitarian claim upon the conscience of wealthy states but as a form of decolonisation in its own right. On this reading, people from formerly colonised countries are not strangers petitioning for entry into unrelated political communities but co-sovereigns of an international system built out of their dispossession.

If there is even a little space to recognise the reparative nature of migration, then border necrotechnics becomes clearly legible as the enforcement arm of a bordering system that refuses to acknowledge the debt owed to the Majority World. Limited as they may appear, there remain pathways to change at the policy level. Ending the trade secret protections that allow private vendors to hide error rates from the people harmed by them, demanding procurement transparency for a border-industrial complex in which firms market technologies battle-tested in Palestine for deployment in Arizona, and committing to a moratorium on border technologies that contravene established human rights principles is a start. Within the European context, that also means the concrete demands our coalition partners have long put forward, including prohibiting predictive analytics used to facilitate pushbacks and closing the migration carve-outs in the AI Act.

We also need far more regulation, oversight, and accountability for border technologies used not only by states but by international organisations, including the United Nations, whose humanitarian data practices too often escape the scrutiny applied to governments.

But it is becoming increasingly clear that reformist approaches will ultimately fail unless we engage with the central logics that underpin our border systems in the first place. The harms of AI at the border are not inevitable. They reflect political choices about how societies understand migration, security, and human movement, and different choices are available. Technology could be built collaboratively with mobile communities and

grounded in dignity, autonomy, and justice rather than in efficiency and deterrence: asylum-support applications co-designed with displaced communities, community-controlled databases, and privacy-centred communication platforms. As long as mobility is framed as a threat, AI will be mobilised to contain, sort, and exclude. If mobility is understood as a human right and a global reality, technology could instead serve as a tool for empowerment rather than punishment.

To explicitly name border necrotechnics is to reassemble harms that have been deliberately dispersed across databases, sensors, and contracts into a single legible structure of responsibility, and to insist, as the evidence gathered here leads me to conclude, that the lonely deaths in the cemetery at Sidero are not accidents of geography but the foreseeable outcomes of political and technological design.

But what has been designed can also be refused.

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