

Artificial Intelligence (AI) in Immigration Decision Making

A Cross-Jurisdictional Review of Automated Decision Making in Immigration Systems in the EU, Germany, New Zealand, the United States, and Canada

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PII

POLICY INNOVATION
INITIATIVE

PRESENTATION OUTLINE



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CASE STUDIES: OPPORTUNITIES & CHALLENGES

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- GERMANY
- NEW ZEALAND
- UNITED STATES
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ISSUE STATEMENT

**WHAT CAN CANADA LEARN FROM
OTHER JURISDICTIONS ON
RESPONSIBLE USE OF AI IN MIGRATION
DECISION MAKING?**

BACKGROUND

MANY COUNTRIES ARE INCREASING THEIR USE OF AI AND AUTOMATED DECISION-MAKING

- **Complex migration crises:** there is an increasing number of immigrants and refugees
- **As a response:** Immigrant-hosting countries have implemented artificial intelligence (AI) and automated decision-making systems
- **Proponents of AI use:** Incorporating AI into immigration decision-making may lead to “neutral, logical, and consistent outcomes” (Akhmetova, 2020)



BACKGROUND — KEY CHALLENGES

OPPONENTS OF AI USE: AUTOMATION ENTAILS UNFAIR BIASES



Most systems lack the ability to deal with the “nuance and complexity” of each case, creating room for bias, discrimination, and privacy breaches (Molnar, 2018).



May encode racial or gendered discrimination leading to exclusionary practices in case processing.



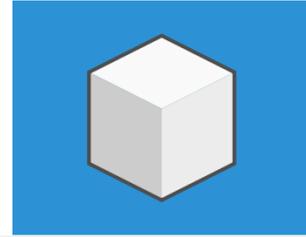
May exacerbate pre-existing discrimination and socio-economic challenges.

EXAMPLES OF AI IN IMMIGRATION SYSTEMS



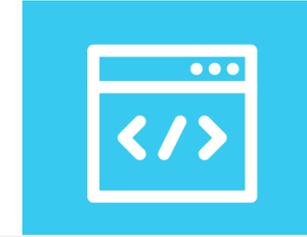
BIOMETRIC IDENTIFICATION

Remote biometric identification systems take a biometric image and match it against other images stored in a reference database.



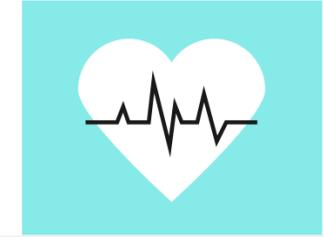
BLOCKCHAIN-BASED PROCESS MANAGEMENT

Blockchain helps to facilitate the automation of cross-organizational process management like the immigration system through a shared and transparent exchange of encrypted data. It essentially helps to scale AI systems.



ALGORITHMIC RISK ASSESSMENTS

Systems often developed using machine learning to assess individuals risk levels for the purpose of applicant triaging, duplication of information, flagging errors, or to provide future recommendations for housing and/or employment.



EMOTION DETECTION IN AUTOMATED BORDER CONTROL

Emotion detection systems aim to detect mental states and emotions based on the examination of facial expressions, often in conjunction with other physiognomic characteristics (heart rate, gaze direction, etc).



CASE STUDIES

OPPORTUNITIES AND CHALLENGES

EUROPEAN UNION

PURPOSE: STRENGTHEN BORDER CONTROL AND MITIGATE SECURITY RISKS RELATED TO CROSS-BORDER TERRORISM AND SERIOUS CRIME

Major types of AI applications that the EU used:

1) **Biometric Identification** -- automated fingerprint and face recognition

- Biometric images being matched against other images stored in a database
 - Closed set identification -- the subject's data is known to be in the reference database
 - Open-set identification -- the subject's data is not known if the subject is in the reference database

2) **Emotion Detection**

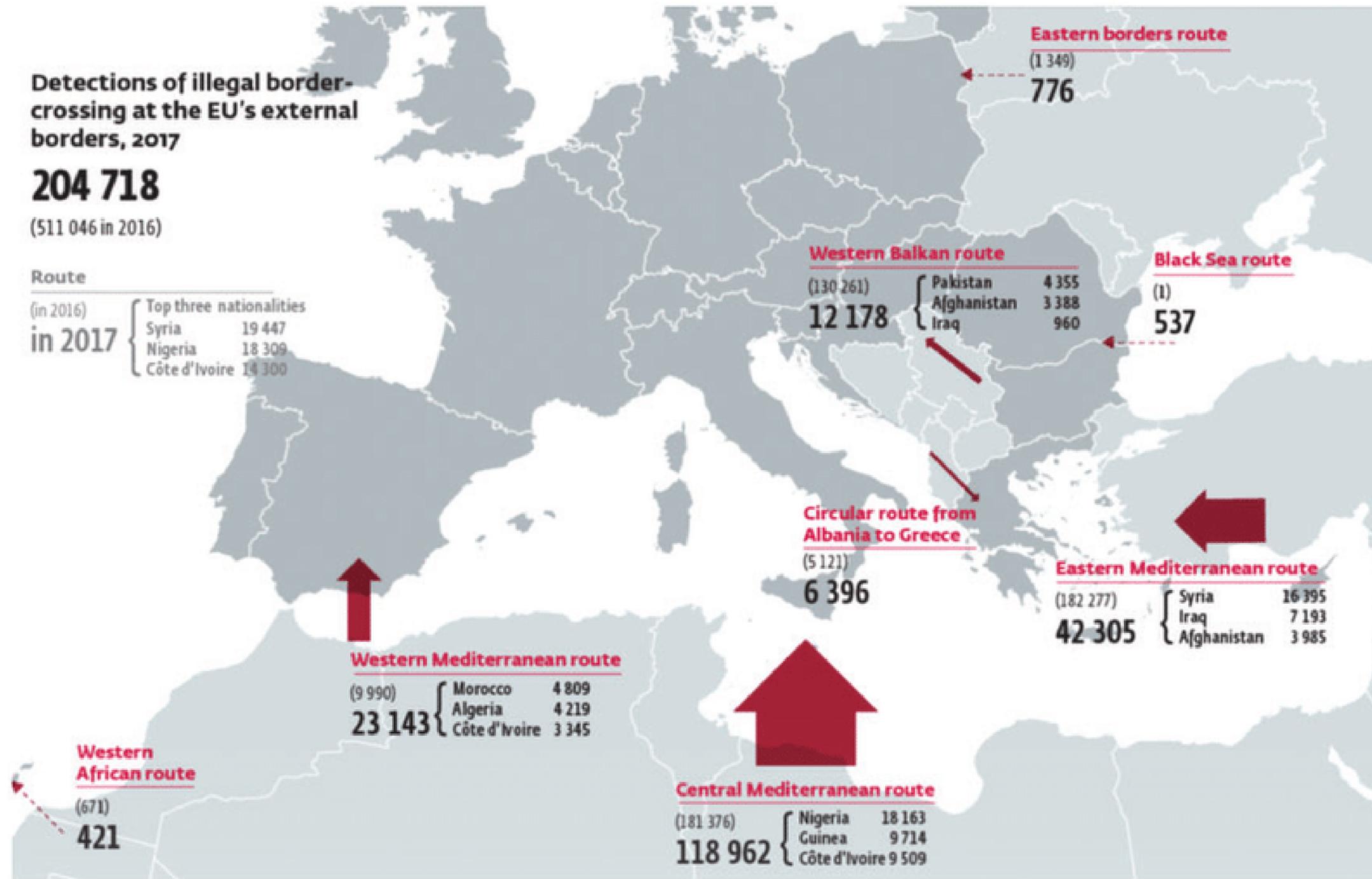
- Technologies that aim to detect mental states and emotions based on the examination of facial expressions, often in conjunction with other physiognomic characteristics

3) **Algorithmic Risk Assessment**

- Assessing individual risks of security and irregular migration
 - Visa Information System and European Travel Information Authorisation System



EUROPEAN UNION



AI tools for migration monitoring, analysis and forecasting

1. **Frontex risk analysis** -- monitors migratory flows and carries out risk analysis related to all aspects of the integrated border management, contributes to developments in research and innovation relevant to the management of external borders

EUROPEAN UNION

2. European Asylum Support Office (EASO) monitoring -- fosters EU Member States' cooperation on asylum, Early Warning and Forecasting System to monitor the situation in third countries and forecast the number of asylum applications that EU Member States can expect

- Goal is to understand and predict arrivals of third-country nationals that might exert particular pressure on national asylum and reception authorities

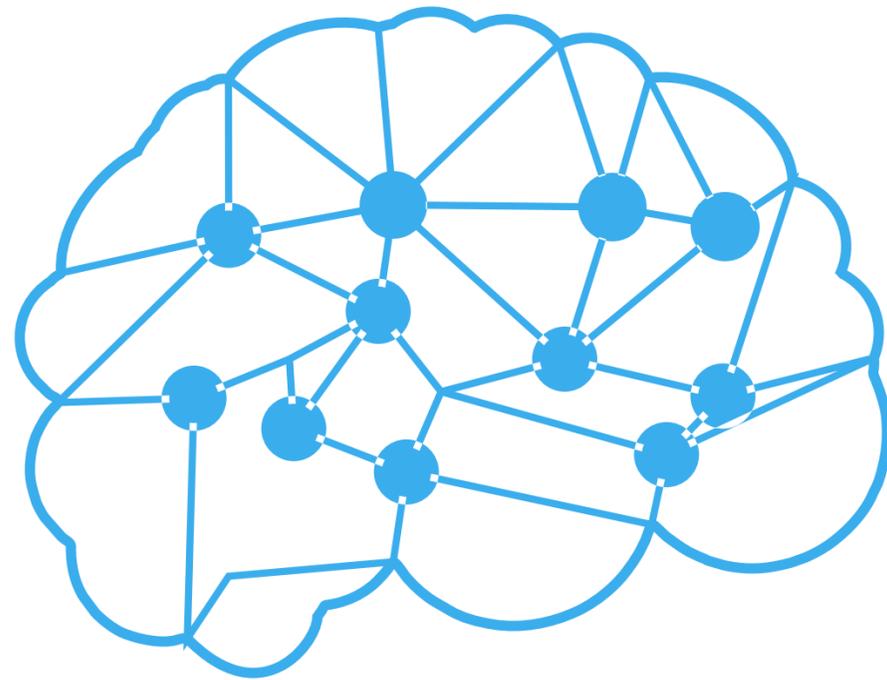
3. Europol Innovation Hub – discuss operational issues related to the implementation of EU smart borders and interoperability

- Develop accountability principles for AI used in the area of freedom, security and justice, and another project to develop AI initiatives



EUROPEAN UNION

KEY ISSUES



- **Reliability of technologies**
 - Accuracy of biometric identification
 - Accuracy of emotion detection AI
 - Accuracy of risk assessment algorithms
- **Fundamental rights**
 - Bias and discrimination
 - Data protection and privacy
 - The risk of unlawful profiling
 - Transparency in EU research funding on AI

GERMANY

PURPOSE: ASSIST IN BURDEN OF PROOF REGARDING NATIONALITY IN THE CASE OF NO PROPER DOCUMENTATION

3 main AI programs utilized by The German Federal Office for Migration and Refugees (Bundesamt für Migration und Flüchtlinge BAMF):

1) Dialect recognition

- Provide proof for applications regarding country of origin, particularly in **cases lacking full documentation** and security against false claims
- Applicants describe a series of images for around two minutes, which allows a program to **analyze actual spoken language, rather than a claimed language**
- Error rate pegged at 15%, with **no independent scientific monitoring** on the usefulness of language biometric tests, how often this program is used



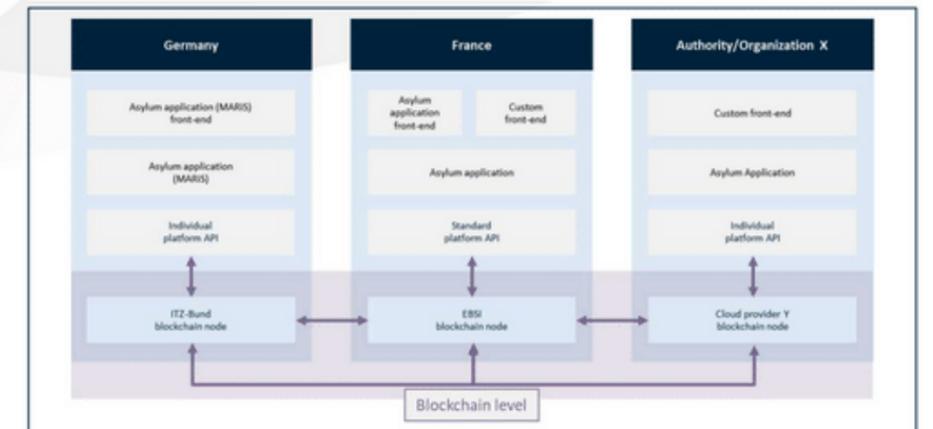
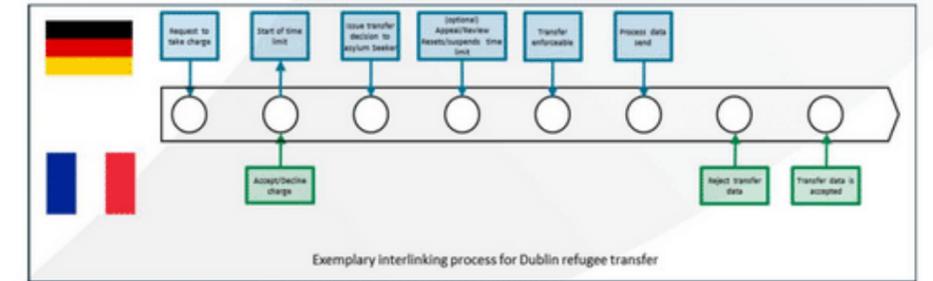
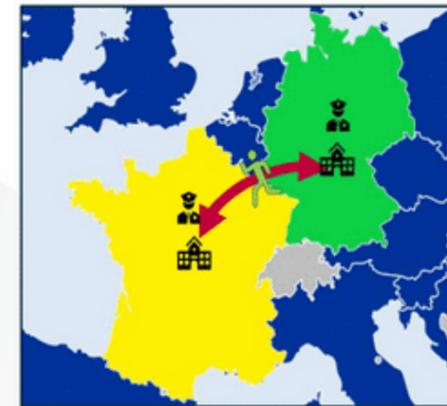
GERMANY

2) Digital device analysis

- Applicants without proper documentation are required to **submit digital devices as a cooperative requirement** - devices include cell phones, laptops, and tablets
- The purpose of the program is act as a threshold of proof to support claims or the **weed out fraudulent claims regarding nationality**; country codes of contacts, call history, language of text messages, geodata were all extracted to conclude nationality
- The usefulness of this program is not clear, as **only 1/3 of the searches could be corroborated with documentation**; the remainder “did not reveal any relevant information content with regard to identity and origin.”

3) Blockchain

- Blockchain acts as a crucial part of **standardizing the refugee process across the EU**; Germany in particular has a decentralized refugee system and thus, requires blockchain to sync information across different authorities
- According to a slide-deck from the German Presidential Office (EU2020.de), the blockchain provides a “**single source of truth**,” and also flags applications for three different stages: Next, Attention, Critical Error



GERMANY: KEY ISSUES

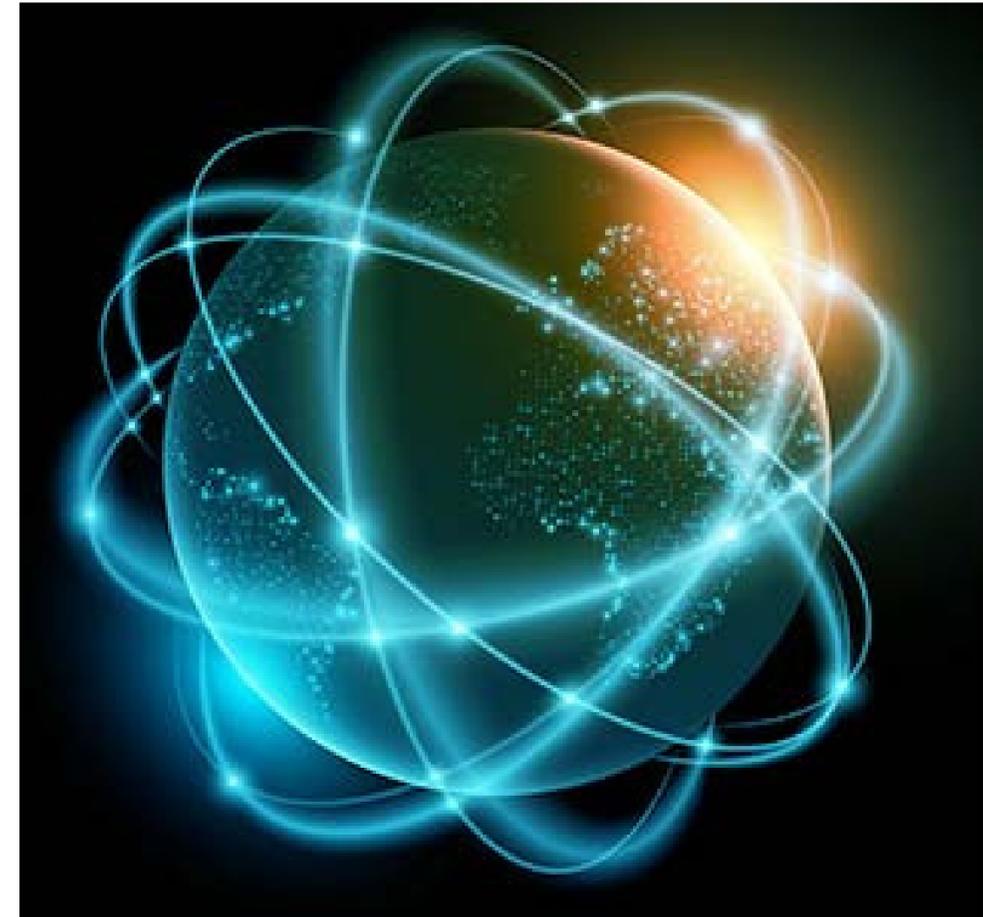
- **Accuracy of technology and standardization of measurements:** what is the standard of error by which border agents and immigration staffers are merely looking for proof of nationality versus looking at sensitive personal information? what is the threshold of proof? how are the standards being set and what considerations for biases are there?
- **Safety and data protection:** what type of encryption and storage is in place to ensure data is safely stored or disposed of post-application?

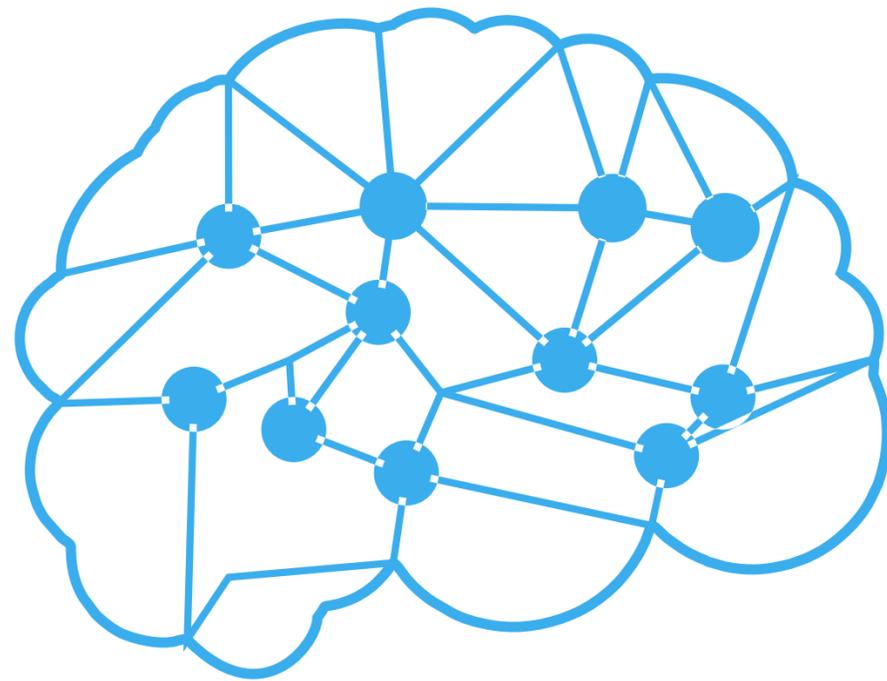


NEW ZEALAND

PURPOSE: INCREASE ACCURACY BY ENSURING THAT CORRECT AND COMPLETE INFORMATION IS PROVIDED AT EACH STAGE

- INZ uses operational algorithms for different categories, including customer segmentation (essentially profiling) based on risk, and customer screening based on eligibility/alerts/watchlists
- INZ's operational process has 6 steps for the customer journey: Interest, Enquire, Apply, Assess & Decide, Travel, Stay
 - Multiple algorithms used during NZ's immigrant decision making process: IDMe (scan an application and see if there is already an individual in the data base with similar data)
- Visa Application Risk Triage (customer segmentation/profiling)
 - AI tool
 - Assigns 'risk-levels' based on information in application, and risk rules.
- Tools: global address finder, photo-quality checker, and a passport eChip verification mobile app
 - Help reduce the backlog
 - Faster processing of migrant skilled worker applications





NEW ZEALAND

KEY ISSUES

- **Ethical and regulatory issues**
- **Limited human rights jurisdiction**, although profiling is illegal
 - NZ claims that software doesn't make final decisions on who is let into the country
 - Software was being used to track and deport "undesirable migrants"
- **11k irregular migrants** who tried to enter the country were data profiled based on age, gender, country of origin, law run in's and health service usage

USA - ANNIE

PURPOSE: TACKLE THE GAP BETWEEN HIGH NUMBERS OF REFUGEE AND LOW NUMBER OF EMPLOYMENT

The vision is to create a system that is refugee-centered: currently **prioritizes employment rates** rather than refugee preferences

- Headed by the Hebrew Immigrant Assistance Society (HIAS), **all resettlement recommendations are based on HIAS connections** and programs (if HIAS has no work in a particular state, a recommendation won't be made there).
- The software utilizes a **algorithm that matches and cross-references thousands of data points** (health, age, education, languages, skillset, family) to provide recommendations for employment and housing
- "It's important to understand **the tool is not making the decisions**," says Mike Mitchell, the HIAS associate vice president of U.S. programs. "It's making **recommendations to improve—not replace**—decisions made by humans."

The logo for HIAS (Hebrew Immigrant Assistance Society) features the letters 'HIAS' in a bold, blue, sans-serif font. The letter 'I' is replaced by a white silhouette of a person with their arms raised in a gesture of welcome or support.

**Welcome the strange
protect the refugee.**



USA - ANNIE

KEY ISSUES

Key concerns and potential risks:

- **Data limitation:** successfulness linked to amount of data available, both in what an individual provides and how many people are entered into the system
- **Bias and lack of sensitivity:** can it measure a city's overall safety against newcomers? Does placing employment truly result in the highest level fo benefit?
- **Accountability and oversight** on data privacy and management
- **Unclear vision for expansion:** how will data be managed when exporting the program abroad?



CANADA

PURPOSE: TO DEAL WITH THE HIGHER VOLUME OF APPLICANTS GOING THROUGH THE IMMIGRATION SYSTEM

The Canadian immigration system is federally regulated by the Ministry of Immigration, Refugees and Citizenship Canada (IRCC). The IRCC has made use of AI in an immigration and refugee law context, as well as in border and national security screening including:

1. "Predictive analytics" to automate activities by immigration officials

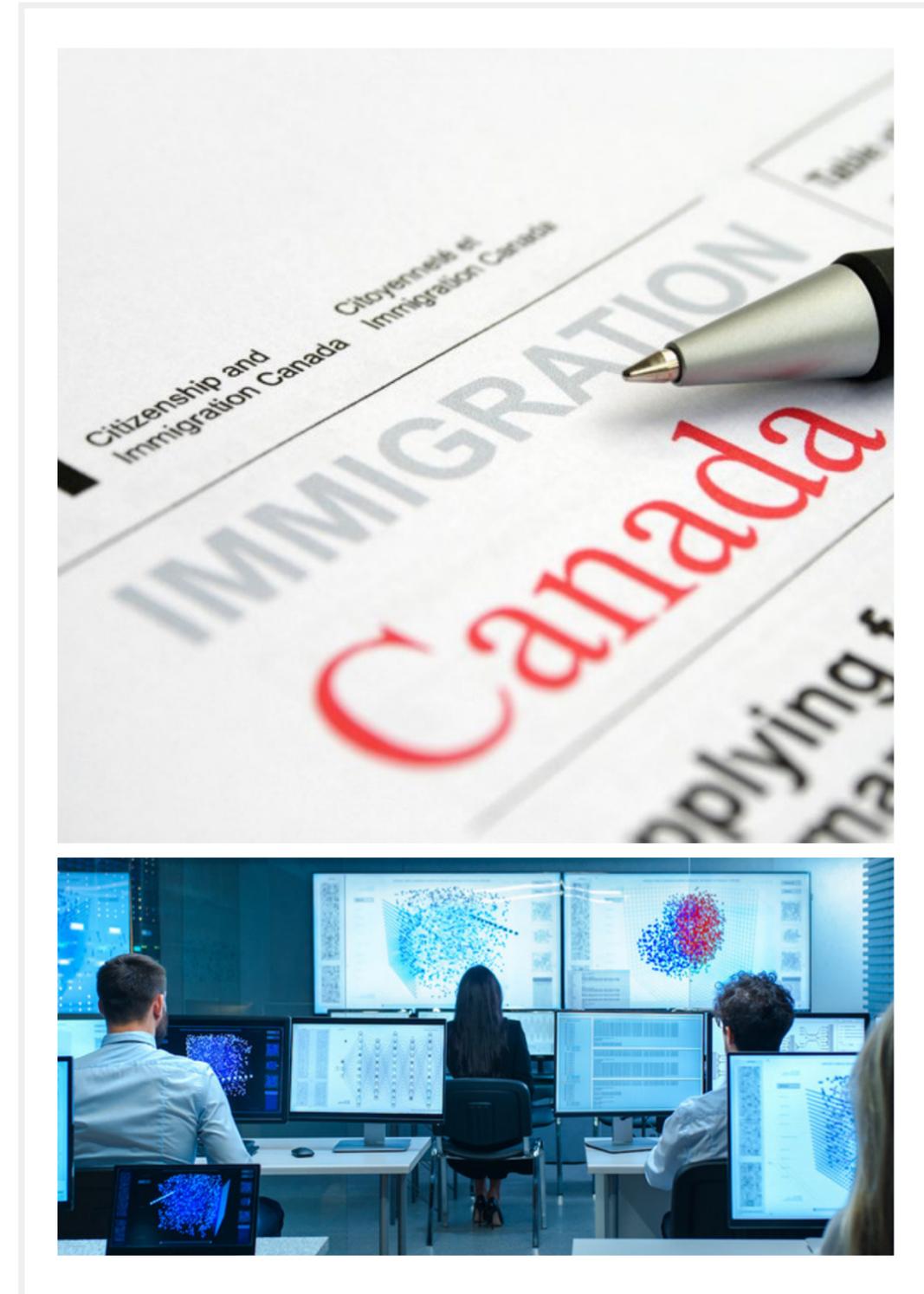
- Predictive analytics is used to filter and sort applications based on risk level, similar to New Zealand

2. Express Entry Comprehensive Ranking System Pilot

- Ranking system for the Express Entry applicant stream commonly known as the points-based immigration system for economic migrants

3. Chinook system

- The Chinook system is an excel-based system that enables batch processing of applications



CANADA

TIMELINE OF AI AND AUTOMATED DECISION MAKING ADOPTION

2014

Beginning of Canada's use of automated decision making — "predictive analytics"—to sort and filter people's applications.

2017

The Canadian Institute for Advanced Research is appointed to lead the \$125 million, ***Pan-Canadian Artificial Intelligence Strategy***

2018

IRCC pilots an AI system in the Express Entry application

Joins France to create the ***International Panel on AI***

Government of Canada releases the ***Responsible Use of AI*** guideline

2019

The Government of Canada issues a ***Directive on Automated Decision Making*** to impose obligations on public sector delivery to ensure systems are deployed in a risk-free manner

2021 - PRESENT

IRCC discloses its use of an excel-based tool, ***Chinook***, to deal with the higher volume of applications caused by pandemic delays.

Appeal case example: *Abigail Ocran v. the Minister of Citizenship and Immigration*



CANADA

KEY ISSUES

- **Binary options** for complex cases
- **Bias, discrimination, and error** in decision-making
- **Lack of transparency** around data use and storage, even as an application is denied
- **Lack of oversight** and accountability measures
- **Delays** in application and appeals process pose the risk of prolonged family separation, interrupted work or studies, detention, or deportation
- **Safeguards and oversight is limited** in an immigration and refugee law context, and becomes even more complex when it intersects with national security law

LESSONS FROM ABROAD - KEY CONSIDERATIONS

➤ Technology Considerations



Standardization & Transparency

Any measures to evaluate the system's accuracy and fairness, its rate of error, or any assessments related to privacy (i.e. Privacy Impact Assessment) should be made public **to minimize the risk of any arbitrary decisions**, as well as any inappropriate profiling of individuals or encoded bias.



Accuracy of Technology & Measurements

Any technological systems must be subject to **ongoing review to ensure usefulness of data** collected in order to determine relevancy of technology.

➤ Human Rights Considerations



Accountability & Oversight on Data Privacy

Inclusion of third party stakeholders must be accountable to up-to-date data privacy legislation **to ensure no inappropriate usage of personal information** and responsible shared technological access by the press and public to programming.



Informational Self-Determination & Data Privacy

Refugees are the most vulnerable of the migratory bodies, and having their **right to privacy protected should be at the center of all algorithmic discussions**.

CONCLUSION & RECOMMENDATIONS

1 Disclose all automated decision making / AI systems in use within Canada's immigration system

This could take the form of a detailed report published by the government of Canada declaring the purpose of each system, description and use of training data, whether the system is a product or service of a private vendor, the metrics used to evaluate accuracy, etc.

2 Introduce new or update existing legislative frameworks that guide use, access, and storage of data

Since 2019, there have been calls to update the federal Privacy Act and the Personal Information Protection and Electronics Documents Act to create a legal obligation for government to safeguard personal information. Changes would also need to include purpose-specific access to data, stronger disclosure rules, and more public information about data use, especially for the private sector.

3 Normalize the use of modern privacy safeguards

Introduce and normalize the use of encryption and the use of blockchain, a type of shared database, in the development of all automated decision making / AI systems.

4 Disclose all automated decision making / AI systems in use within Canada's immigration system

Include clear requirements for peer-review and scientific validation throughout the development process, prior to adoption by government (IRCC and associated departments).

**Questions or
comments?**

APPENDIX 1: A NOTE ON TERMINOLOGY, EXCERPT FROM BOTS AT THE GATE

The terms artificial intelligence (AI), machine learning, and predictive analytics have been used by various Canadian federal departments and agencies in the context of immigration. As of August 2018, the preferred term in that draft (now elevated to a draft Directive) was **automated decision systems**—though earlier versions have also made reference to **automated systems, decision support systems, machine learning, and machine intelligence**.

Automated decision systems process information in the form of input data using an **algorithm** (or algorithms) to generate an output of some kind. At its most basic level, **an algorithm is a set of instructions**, “a recipe composed in programmable steps,” designed for the purpose of “organizing and acting on a body of data to quickly achieve a desired outcome.” Certain algorithms, including those that use techniques like machine learning, are “trained” using a large, existing corpus of data, which allows the algorithm to classify and “generalize beyond the examples in the training set.” These systems are generally designed to map an input to an output based on a set of labeled training examples. For example, training data could include a body of case law, a collection of photographs, or a database of statistics—some or all of which have been pre-categorized or labeled based on the designer’s criteria. A system designed to recognize images of cars captured by traffic camera footage can therefore be trained on a body of images labelled as “contains car” (and potentially as “does not contain a car”). As the system is exposed to more data, it may improve its ability to identify cars and reduce its error rate—noting that the potential for error cuts both ways: a system may identify non-cars as cars, just as it may fail to recognize a car when one appears in a given image.

Source: Molnar, P., & Gill, L. (2018). Bots at the Gate: A Human Rights Analysis of Automated Decision Making in Canada’s Immigration and Refugee System. The Citizen Lab. Retrieved November 25, 2021, from <https://citizenlab.ca/wp-content/uploads/2018/09/IHRP-Automated-Systems-Report-Web-V2.pdf>

APPENDIX 2: EU RESEARCH & REPORTS

Artificial Intelligence at EU Borders: Overview of Applications and Key Issues,

[https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/690706/EPRS_IDA\(2021\)690706_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/690706/EPRS_IDA(2021)690706_EN.pdf)

Machines Learn That Brussels Writes the Rules: The EU's New AI Regulation,

<https://www.brookings.edu/blog/techtank/2021/05/04/machines-learn-that-brussels-writes-the-rules-the-eus-new-ai-regulation/>

The Use of Digitalization and Artificial Intelligence in Migration Management, <https://www.oecd.org/migration/mig/EMN-OECD-INFORM-FEB-2022-The-use-of-Digitalisation-and-AI-in-Migration-Management.pdf>

APPENDIX 3:

NEW ZEALAND RESEARCH & REPORTS

Algorithm charter for Aotearoa New Zealand, <https://www.data.govt.nz/toolkit/data-ethics/government-algorithm-transparency-and-accountability/algorithm-charter/>

Artificial Intelligence: Shaping a Future New Zealand, <https://www.mbie.govt.nz/dmsdocument/5754-artificial-intelligence-shaping-a-future-new-zealand-pdf>

Government Use of Artificial Intelligence in New Zealand, <https://www.otago.ac.nz/caipp/otago711816.pdf>

Towards trustworthy and trusted automated decision-making in Aotearoa,
<https://digitalcouncil.govt.nz/advice/reports/towards-trustworthy-and-trusted-automated-decision-making-in-aotearoa/>

Towards a trusted, people-centred digital future, <https://digitalcouncil.govt.nz/assets/Uploads/DC-Report-Infographic-2021.pdf>

APPENDIX 4: GERMANY RESEARCH & REPORTS

<https://www.migrationdataportal.org/data-innovation-59>

<https://www.ai-fora.de/germany-2/>

<https://netzpolitik.org/2018/die-it-tools-des-bamf-fehler-vorprogrammiert/>

<https://netzpolitik.org/2018/asylverfahren-handy-durchsuchung-bringt-keine-vorteile/>

https://migrationnetwork.un.org/sites/g/files/tmzbdl416/files/docs/cdr_20201007_blockchainusecasesinthegermanasylumprocedure_eu-prasentation.2pdf_0.pdf

<https://www.politico.eu/article/germany-offers-refugees-benefits-in-kind-to-return-home/>

APPENDIX 5: US RESEARCH & REPORTS

<https://privacyinternational.org/node/3129> - <https://oecd-opsi.org/innovations/annie/>

<https://www.overtureglobal.io/story/introducing-annie-the-digital-job-hunter-for-refugees>

<https://www.dezeen.com/2019/08/22/annie-moore-algorithm-refugee-us/#>

APPENDIX 7: CANADA RESEARCH & REPORTS

<https://www.compas.ox.ac.uk/2020/how-ai-is-being-used-in-canadas-immigration-decision-making/>

<https://cila.co/chinook-and-canadian-immigration-an-efficiency-enhancing-tool-or-cause-for-concern/>

<https://www.sciencedirect.com/science/article/pii/S0308596120300689>

<https://policyoptions.irpp.org/fr/magazines/october-2018/governments-use-of-ai-in-immigration-and-refugee-system-needs-oversight/>

<https://www.cigionline.org/articles/using-ai-immigration-decisions-could-jeopardize-human-rights/>

<https://citizenlab.ca/wp-content/uploads/2018/09/IHRP-Automated-Systems-Report-Web-V2.pdf>

<https://theconversation.com/canada-should-be-transparent-in-how-it-uses-ai-to-screen-immigrants-157841>

<https://pm.gc.ca/en/news/backgrounders/2018/12/06/mandate-international-panel-artificial-intelligence#:~:text=The%20mission%20of%20the%20International,diversity%2C%20innovation%20and%20economic%20growth>