



AIRPORTS COUNCIL
INTERNATIONAL

Fly AI Forum 2025

**Human vs. Algorithmic Decision-Making: Rethinking
Regulatory and Policy Approaches for a Changing
Paradigm**

Sébastien Colmant - 23 April 2025

Setting the Stage: The Evolution of Aviation Security

1987



2025



Setting the Stage: The Evolution of Aviation Security

Whilst technology did evolve over the 20 years:

- Human decision-making has been, and still is, the cornerstone of aviation security (avsec).
- Algorithms have entered the picture but have not fully displaced human judgment.
- The “gold standard” is still based on human decisions, with algorithms seen as a supplementary tool

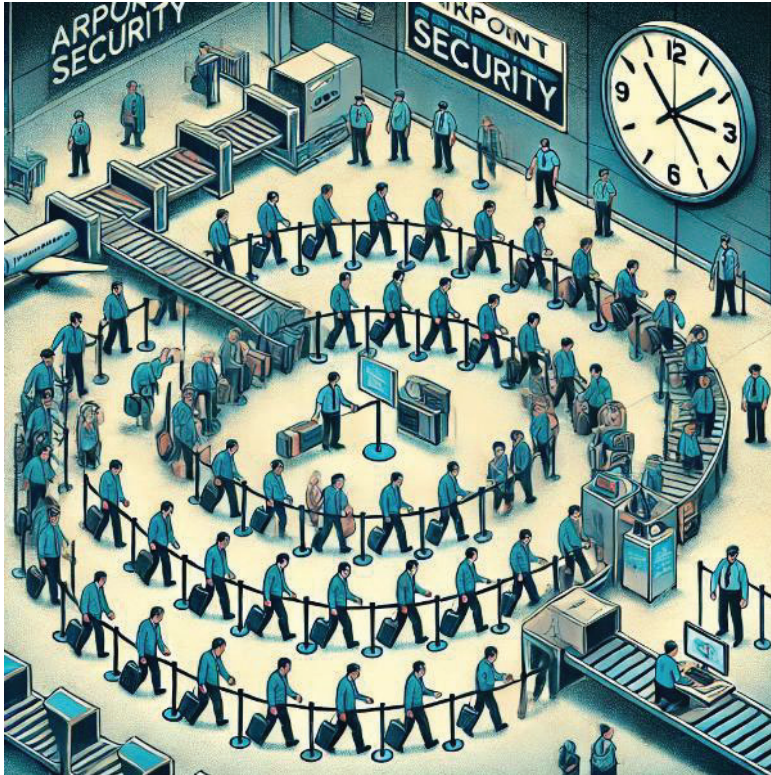


Repetitive Tasks in AVSEC

Many security assignments require repetitive tasks and close monitoring for rare events—functions that humans perform poorly

U.S. Congress, Office of Technology Assessment, *Technology Against Terrorism: Structuring Security*, 1992.

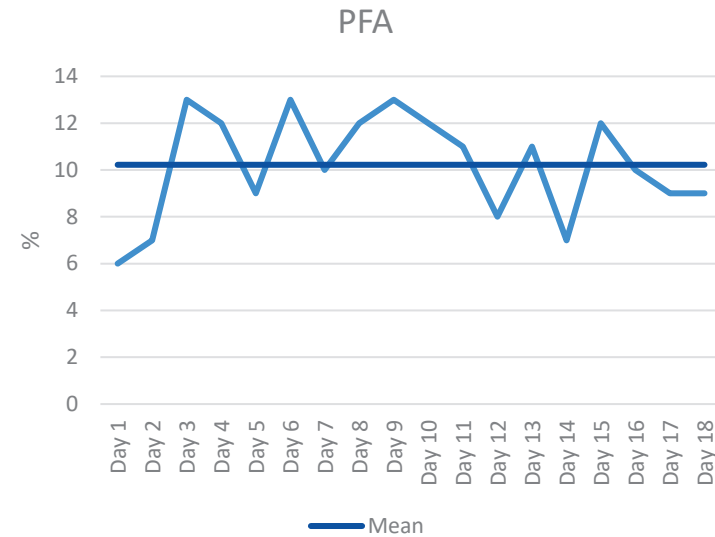
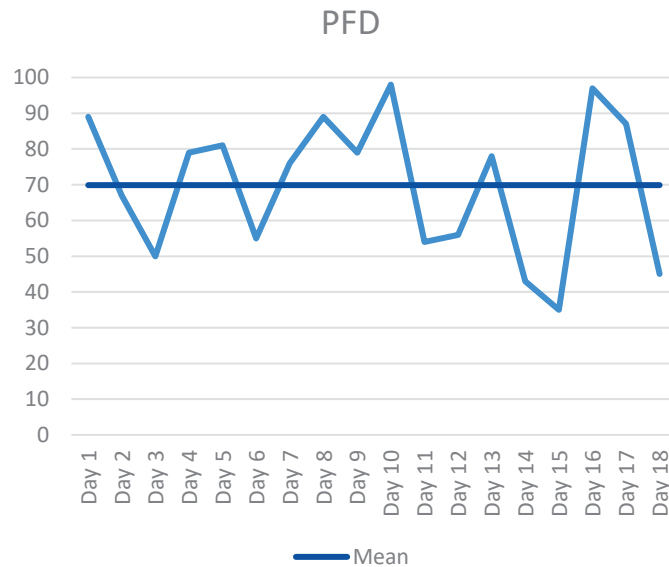
A daily shift for a Security Officer – 2021



	Daily \approx	Yearly \approx
“Do you have any liquids?”	280	61600
Pat-downs	140	30800
Images	560	123200
“I’m sorry but you can’t keep this bottle of XYZ.”	28	6160

- Based on:
 - 7 hours time on task/shift,
 - rotation between 5 positions
 - 200 pax/hour/lane and 2 images per passenger
 - 50% AR at the Security Scanner (primary equipment)
 - 5% Images non LAG compliant.
 - 220 shifts/year

Consequences



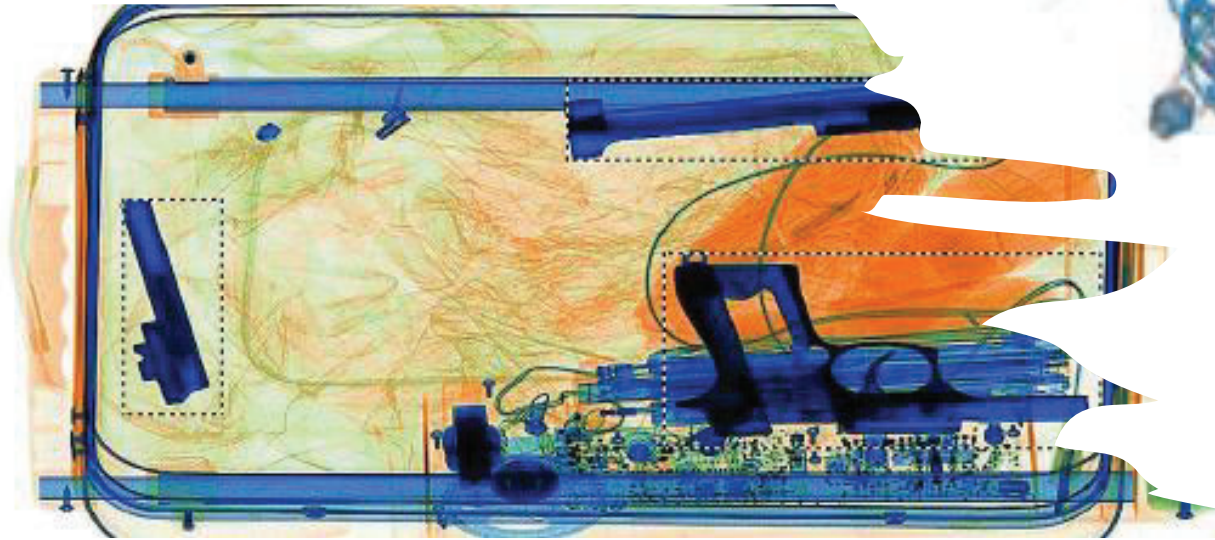
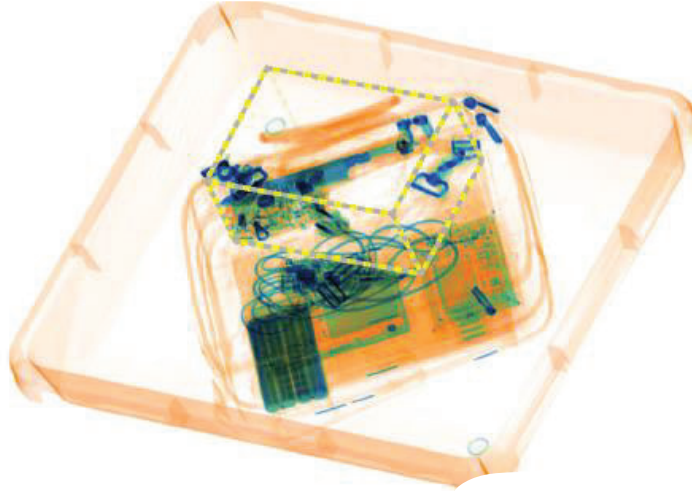
- Inconsistency of detection level from one day to another.
- Inconsistency of operational outcome (PFA) that could lead to significant variation in workload for the other SO allocated to the lane.

Consequences

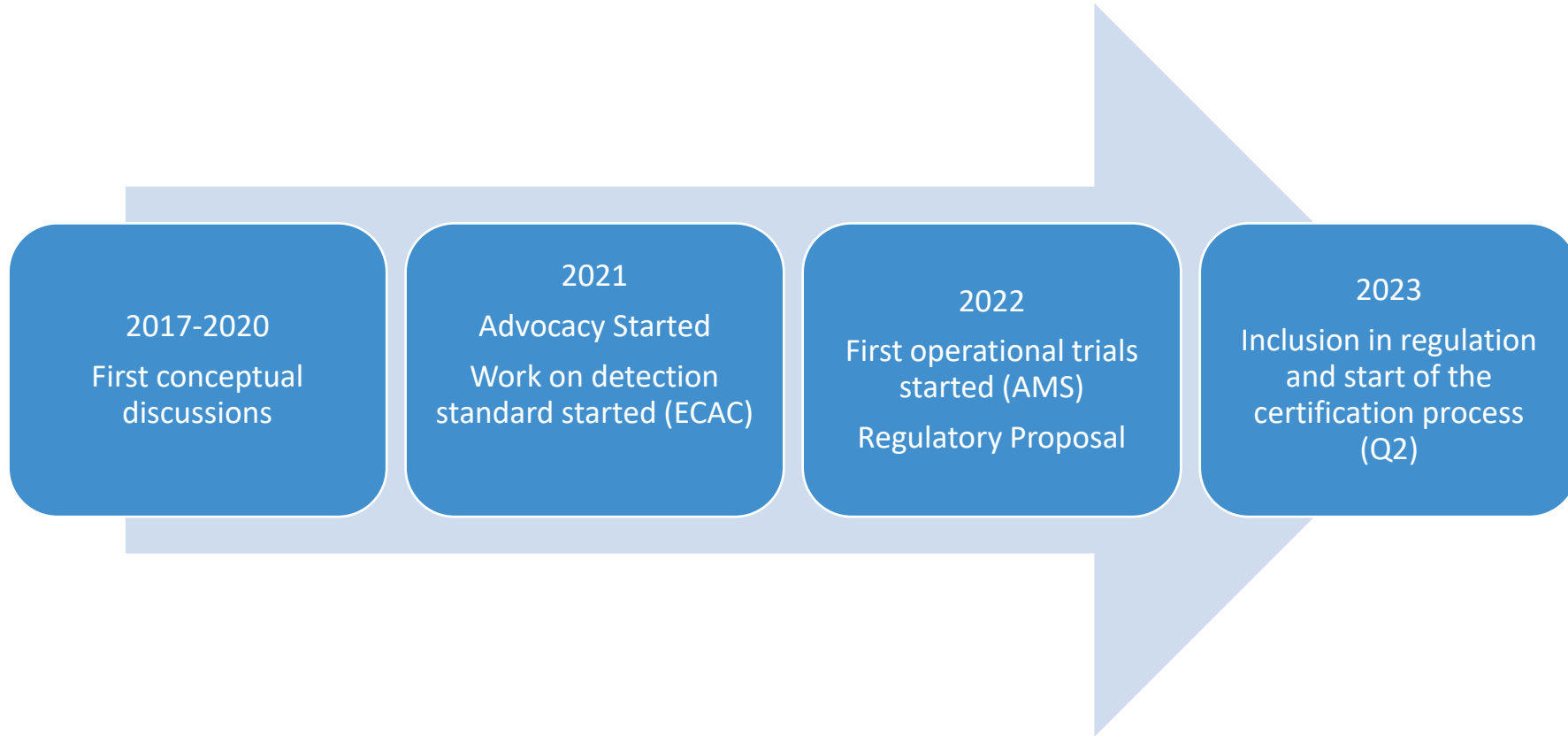
- The impact on PFD is difficult to estimate but some proxy data are interesting to consider:
 - > 4432 guns found by TSA in 2019 for a total of 824 millions screened pax (1/186K pax)
 - > 3257 guns found by TSA in 2020 for a total of 324 millions screened pax (1/100K pax)
 - > Whilst a number of variables could explain this increased ratio of gun found/pax (e.g.: change in pax demographic) the lower workload and reduced repetitiveness at checkpoint due to the COVID restrictions might have an impact



Automated Prohibited Item Detection System (shape recognition)



A fast journey to Regulatory adoption!



But not yet a reality in pax checkpoint!

We have to align with
international partners...
Regulator A

We would like a better
detection standard...
Regulator B

We would like to study how
it combines with other
algorithms... Regulator C

We will try hard to find a
reason to say no...

Regulators' Resistance to AI in Aviation Security

Regulatory bodies' reliance on human decision-making as the "gold standard" in aviation security.

Fear of accountability: Who is responsible if an AI system makes a mistake?

Historical preference for human-based decision-making in high-stakes environments.

The challenge of changing regulations to accommodate new technology.

AVSEC is far away from AI

Algorithms are not evolutive



No “big data” approach to screening



Standards: list of known threats combined with probability of detection



Testing and certification not tailored to retest regularly improved algorithms

Rethinking Regulatory Frameworks for AI in Aviation Security



- Need for a paradigm shift in regulatory thinking: from human-centric to hybrid AI-human decision-making.
- Build trust in AI by providing clear, transparent guidelines on AI decision-making processes and accountability.
- Implement AI-based decision-making in phases, starting with lower-risk areas to build confidence.
- Governments must incentivize AI-driven initiatives and research in aviation security.

Conclusion and Call to Action

- To stay ahead of evolving threats, regulators must rethink their approach to aviation security.
- Collaborative efforts are needed to build trust in AI and implement it effectively.
- Let's act now to ensure a safer, more secure future for aviation.



Thank you

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