

EASA Annual Safety Conference 2024 – Panel 4

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Artificial Intelligence



Automation and AI @ ANS



- **Introduction**
 - AI definition
 - AI Approaches
 - AI Classification
 - Ongoing work on AI in aviation
- **Enablers**
 - ML lifecycle and explainability
 - Safety Aspects
 - Certification
 - Common Data Infrastructure
 - Human-Machine Collaboration
- **Fields of Application**
 - General Applications of AI
 - Examples for ATM/ANSPs
- **Conclusions**

Low hanging fruits – at first glance

- 1) voice recognition – read back – hear back;
training
- 2) demand prediction – optimal sectorisation
capacity
management;
- 3) even or tailored distribution of workload
- 4) conflict resolution advisory – assured safety
with increased capacity



Low hanging fruits – dilemmas

- **voice recognition Improves Safety and Makes Trainings flexible**
 - + can alert ATCOs in case read backs are not correct;
can substitute pseudo pilots – can make trainings flexible
 - Loss of pseudo pilot jobs – however it is always difficult to recruit people
- **demand prediction - optimal sectorization**
 - + helps in flow management and in optimising workforce allocation
 - may increase the number of on-watch-time of ATCOs this may lead to fatigue
- **demand prediction - even or tailored distribution of workload**
 - + adapts the workload to ATCO capabilities, distributes the workload evenly during shifts
 - loss of empathy – decisions are taken on cold logic
- **conflict resolution advisory – increased capacity**
 - + ATCOs get more time to decide, reduces the mental workload and thus fatigue
 - ATCOs get lazy no need to think, loss of competency, expanded time in simulations

Safety Aspects

The safety assurance of ML-based algorithms is a new issue

Safety of existing software is based on the assumption the software is fully explainable it is not always true for ML, as of the “black box” part

data becomes part of the algorithm specifications

we go from certifiable algorithms to certifiable data sets and training programs

explainability – understand the behaviour and the decision mechanisms of the ML tool

Assure the quality, size, composition, adequacy of the datasets, all datasets are complete and correct, and that appropriate safeguards are in place to protect the datasets

verification and validation in simulated or real (e.g. passive “shadow” mode) environment

consider the AI/ML integration effect to human performance

Human-Machine Collaboration

AI have to be integrated in a socio-technological ecosystem

AI can complement and augment human capabilities

AI model needs to be developed using data and continuously be refined with the help of human feedback (corrections) until it reaches a point where the model has an acceptable level of performance

Roles and responsibilities of human actors in the functional system will change with the introduction of AI-based models

Applications would take over certain tasks from ATCOs (and from other human operators), changing the way of working

Keeping the human in the loop is essential in a synergic human-machine collaboration and contributes to the resilience of the functional system.

My personal view:

Every development has its own advantages and disadvantages - however careful and adequate application of AI and automation can finally bring more safety and other benefits for the society than socioeconomic problems – and Humans will be always be kept in the loop – jobs (by number) won't disappear however may need new and different skills and thus other people – but it won't happen overnight

THANK YOU

