SafeTeam

SafeTeam
A comprehensive approach to Human-autonomy teaming in aviation

CONTEXT
Integration of higher levels of automation in aviation through the introduction of AI digital assistants.

OBJECTIVES
Propose methodologies for both experts and non-experts enabling optimal human-automation **teaming.**

En-route digital assistant
Aims to enhance en-route ATCOs' situational awareness and help supervisors anticipate airspace sector workload, enabling more efficient and safer operations.

V5
Victor5: enhances existing traffic count metrics by incorporating weighted KPIs reflecting interactions among traffic.

Methodology definition

Use Case Application

Model Key System Factors and Interactions
Analyze the context of the intended design, as altering one factor can affect others across different levels.

ATCOs Systems Analysis

- TASKS
- ARTIFACTS
- AGENTS
- PROCESSES
- ORGANIZATION
- REGULATIONS

A detailed description of the systems, including supervision tasks assigned to supervisors, with consideration of all subtasks, available tools, partners, and their interactions, supported by interviews and Hierarchical Task Analysis.

Assess collaboration issues and risks
Agents' new or affected tasks may introduce risk that must be mitigated.

Identified Risks
– Comprehension of the system model by ATCOs
– Quality and accuracy of the complexity metric
– Misuse linked to confidence bias
   (over-confidence or under-confidence)

iterative process

Design safe human-autonomy teaming
Use human-autonomy teaming design principles to mitigate identified risks.

Design principles considered
– Agents should be able to share their status and intentions:
   Visual representation of the different KPIs considered and their respective levels
– Agents should be directable:
   Allow ATC to manipulate the weight of each KPI

iterative process

Evaluate Human performance
Designs and solutions need to be evaluated with adapted metrics exploring the Human-Machine collaboration.

Evaluation proposal
Experimental protocol comparing the proposed design solutions. Relies on both objective and subjective metrics across 3 levels and 11 relevant dimensions:
– Teaming metrics (e.g., Explanation satisfaction)
– Attitude toward the artificial partner (e.g., Controllability)
– Operator state (e.g., Workload)

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