

Forum TERATEC

20 - 21 OCTOBRE 2026

PARIS · PALAIS DES CONGRÈS

DASSAULT AVIATION

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AI IN AEROSPACE DEFENSE
from Innovation to Qualification

Atelier A6 – L'IA de Défense : de la recherche à la production

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A NEW ARTIFICIAL INTELLIGENCE FLIES ABOARD THE RAFALE

Dassault Aviation demonstrates new **sovereign AI** algorithms in **flight** on the **Rafale** developed by the company's engineers, and leveraging the collaboration with Thales/CortAIx.

Integrating AI into aerospace combat requires:

- **supervised & controlled AI** for **human-centric** operations
- **resource-efficient AI** compliant with **embedded** constraints.

Scaling from innovation to qualification requires:

- **qualification & justification** proportional to performance/risks
- operational data reliability and quality assurance
- leveraging domain expertise and cross-domain synergy

Dassault Aviation, industrial architect and complex systems integrator, leveraging sovereign partnerships.



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APPLICATION OF AI SYSTEMS IN AERONAUTICS



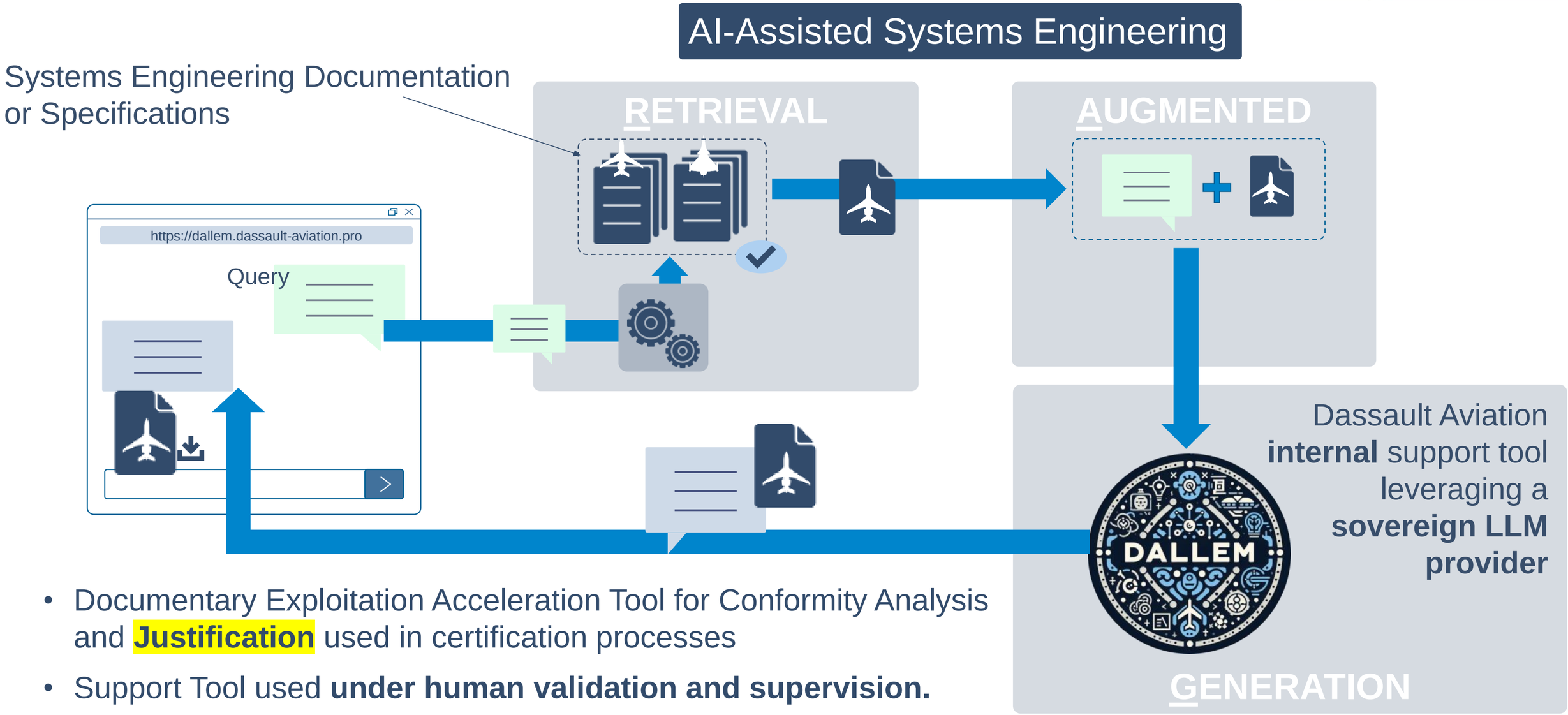
Experimentation of early runway incursion detection AI system

Rigorous regulatory framework:

- **military** and civil (performance, robustness, and security)
- product and process compliance
- development assurance
- proportional **justification & qualification** based on performance/risks

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JUSTIFICATION ACCELERATOR



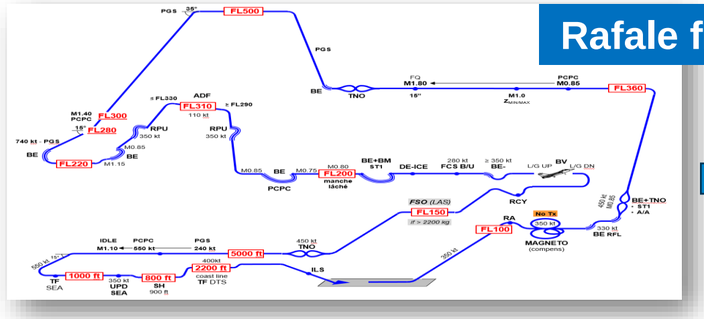
- Documentary Exploitation Acceleration Tool for Conformity Analysis and **Justification** used in certification processes
- Support Tool used **under human validation and supervision.**

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QUALIFICATION ACCELERATOR

Machine Learning from vibro-acoustic instrumentation data: accelerations, vibrations, noise





Rafale flights database

- Parameters
- Flight phases
- Phenomena
- Gaps
- Models (traceability)

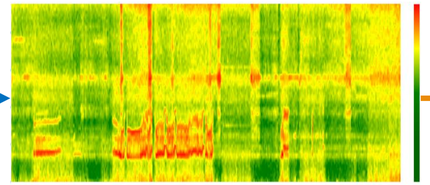
Machine Learning

**** Rafale* Neural Predictive AI model**

*** Dassault Aviation Provider**

→ Qualification support tool : detection of vibro-acoustic anomalies/phenomena

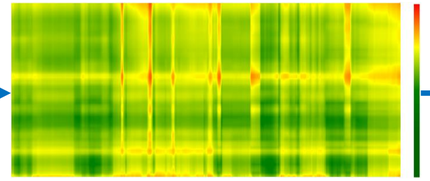
Rafale Acceptance or diagnostic test flight



Measured image

**** Rafale* Neural Predictive AI model**

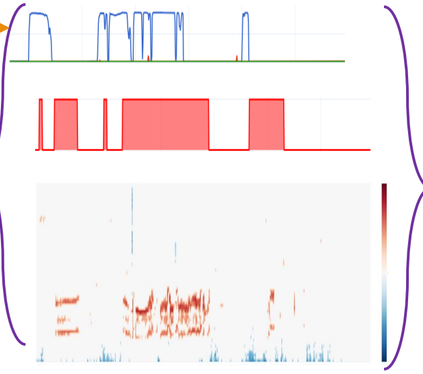
ϕ_i **Prediction**



AI Model predicted Image

γ_j **Detection**

δ_i **Gap**



Automatic Synthesis

Human Expert diagnostic

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FROM AI INNOVATION TO QUALIFICATION IN AIRCRAFT

Proportional **justification & qualification** requires:

- **means of compliance** adapted to the achievable performance levels and the **associated risks**
- requirements that are **verifiable and adapted** to needs, intended performance levels and **risks**
- feasable regulatory certification requirements: e.g. AI in-service monitoring, incremental qualification …



Experimental civil non-intrusive system to objectify the Human-System Relationship



Experimentation of early runway incursion detection AI system

For some machine learning AI technologies specificities **scaling AI from innovation to qualification** requires advanced trustworthy **AI IVVQ methods & tools** (Integration, Verification, Validation & Qualification).

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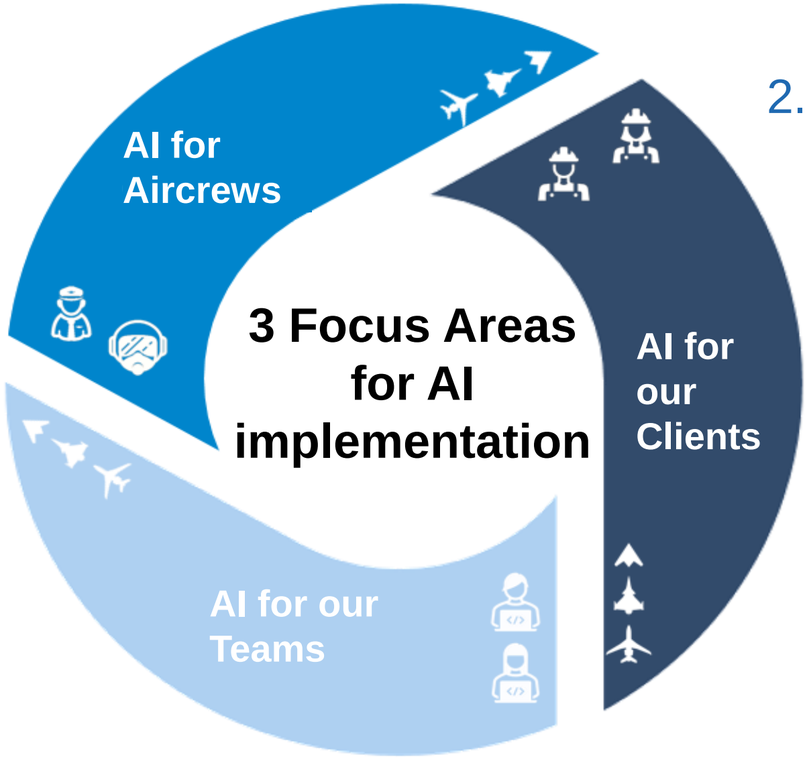
AI SYSTEMS IMPLEMENTATION AT DASSAULT AVIATION

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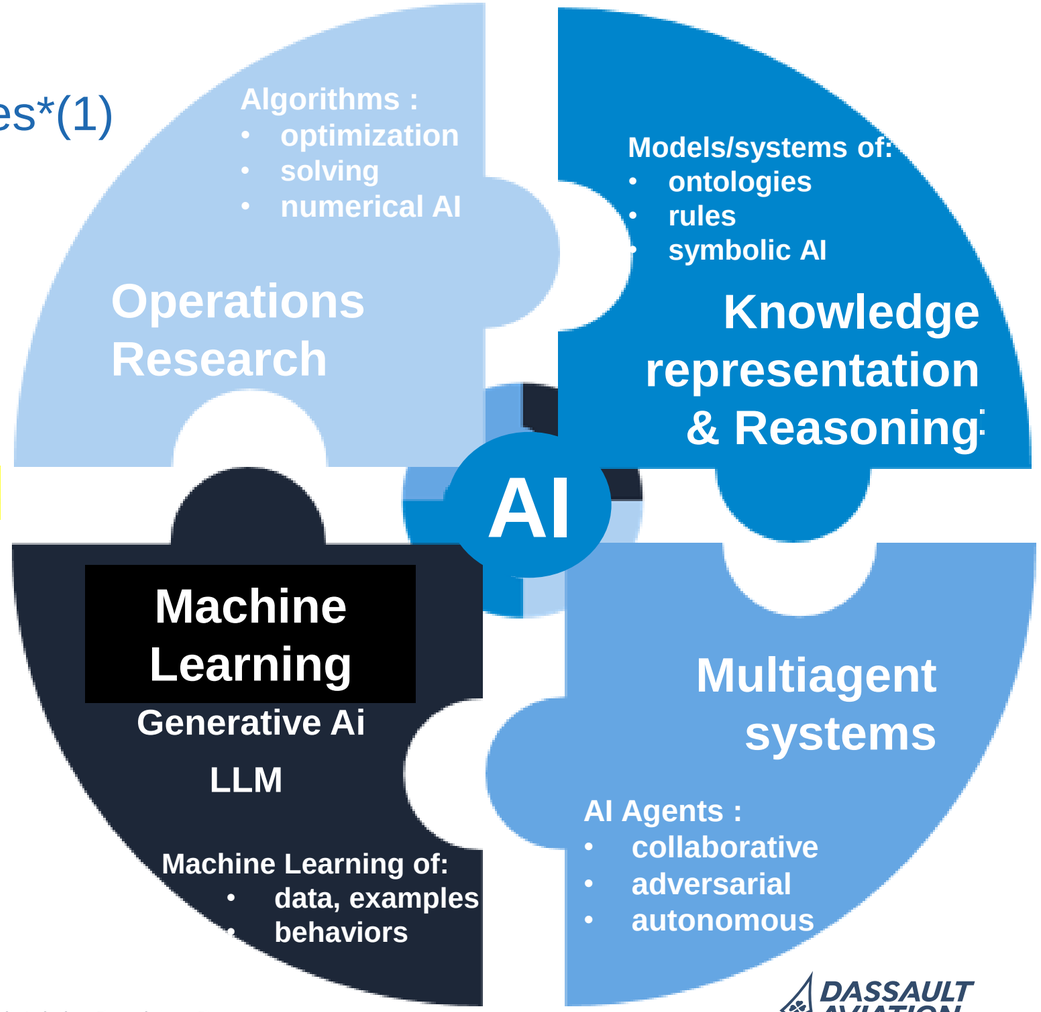
*(1) DGA – Guide de recommandations pour la spécification et la qualification de systèmes intégrant de l'Intelligence Artificielle, 2021 (2ème édition)

Robust, compliant and justified **supervised & controlled AI** systems require the **right AI technology** **in the right use case with :**

1. adapted hybridized **trustworthy AI** technologies*(1)
2. adapted Integration, Verification, Validation and Qualification methods
3. AI Tools for Accelerating Qualification and Justification



the right AI IVVQ methods use-case by use-case



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DASSAULT AVIATION

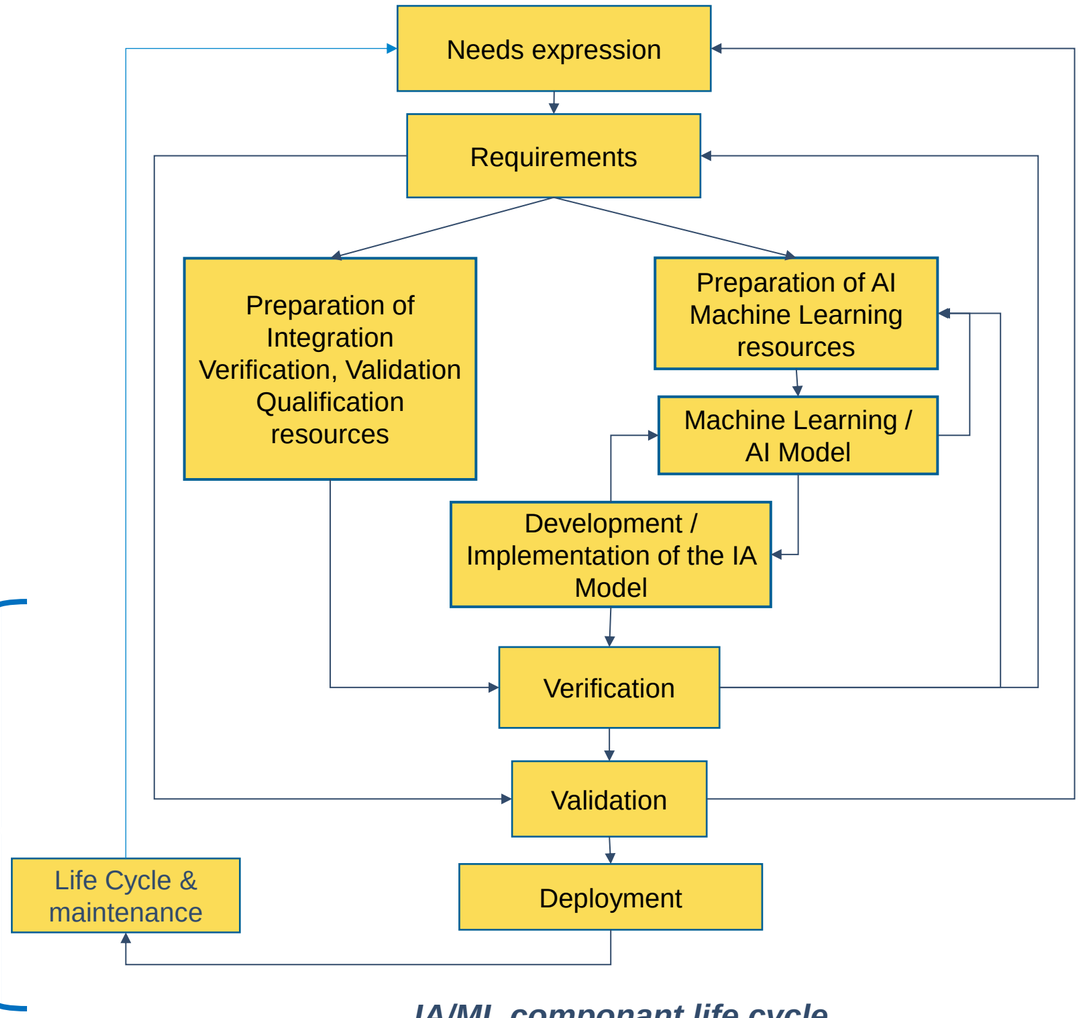
DEFENSE AI PERSPECTIVES FOR AEROSPACE

Findings

- Rapid development of **AI-accelerated engineering,** computing and simulation capabilities
- Dassault Aviation's expertise as **architect** of complex system-of-systems solutions for **collaborative air combat**

Challenges

- **Sovereign AI** technologies: ecosystem and partnerships
- **Trustworthy AI** technologies: legally compliant, robust, and aligned with National and EU ethical principles (e.g., human oversight, autonomy design principles, …), …
- **Integration, Verification, Validation & Qualification** (and development) **methods and tools**: **IVVQ** effective and adapted for **proportionate implementation** aligned with expected performance and risks.



IA/ML componant life cycle

Illustration from General Recommandation BNAE RG AERO 000740 (2025) BNAE Bureau de Normalisation Aéronautique Espace "AI component development cycle" https://www.bnae.fr/en

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QUESTIONS ?

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