

PROJECT

# NEUROQUAD

## DISRUPTIVE “NEURO-QUANTUM-AI TECHNOLOGY SYMBIOSIS” FOR REAL-TIME COGNITIVE MONITORING AND DECISION SUPPORT TO IMPROVE PILOT CONTROL AND SAFETY

NEUROQUAD aims to advance real-time cognitive monitoring and decision-support systems for military pilots operating in highly automated and cognitively demanding environments.



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8

PARTNERS

6

COUNTRIES

€3.9M

TOTAL BUDGET

36

MONTHS



IN ONE CLICK

Coordinator	Programme	Period
MULTIVERSE COMPUTING	EDF	2026-2028
	Sector	
	DEFENCE	

### 01 Challenge

Previous studies have not addressed issues comprehensively or integrated AI with quantum computing to provide the foundation for a future airborne solution. The primary issues to be addressed include low signal-to-noise ratio, limited real-time processing, neurophysiological measurement individual variability, predictive limitations, delayed feedback loops, scalability and adaptability issues, one-size-fits-all issues, AI-based models, readiness assessments, integration challenges, and limited embedded data processing capabilities.

### 02 Solution

The project explores the disruptive integration of neurotechnology, artificial intelligence, and advanced computing approaches to improve our understanding of, monitoring of and prediction of pilots' cognitive states during flight. By combining advanced signal processing with AI-based predictive models, NEUROQUAD seeks to enhance human-machine interaction and improve pilot control, safety, and performance in real time.

### 03 Impacts

The proposed technologies will enable adaptive aircraft systems capable of responding dynamically to the pilot's cognitive condition, supporting decision-making under stress and reducing the risk of human error. Beyond defence applications, the outcomes of NEUROQUAD have strong dual-use potential. Possible civilian applications include cognitive monitoring in aviation and air traffic control, safety-critical industrial environments, emergency response operations, and healthcare contexts requiring continuous assessment of mental states under high pressure.