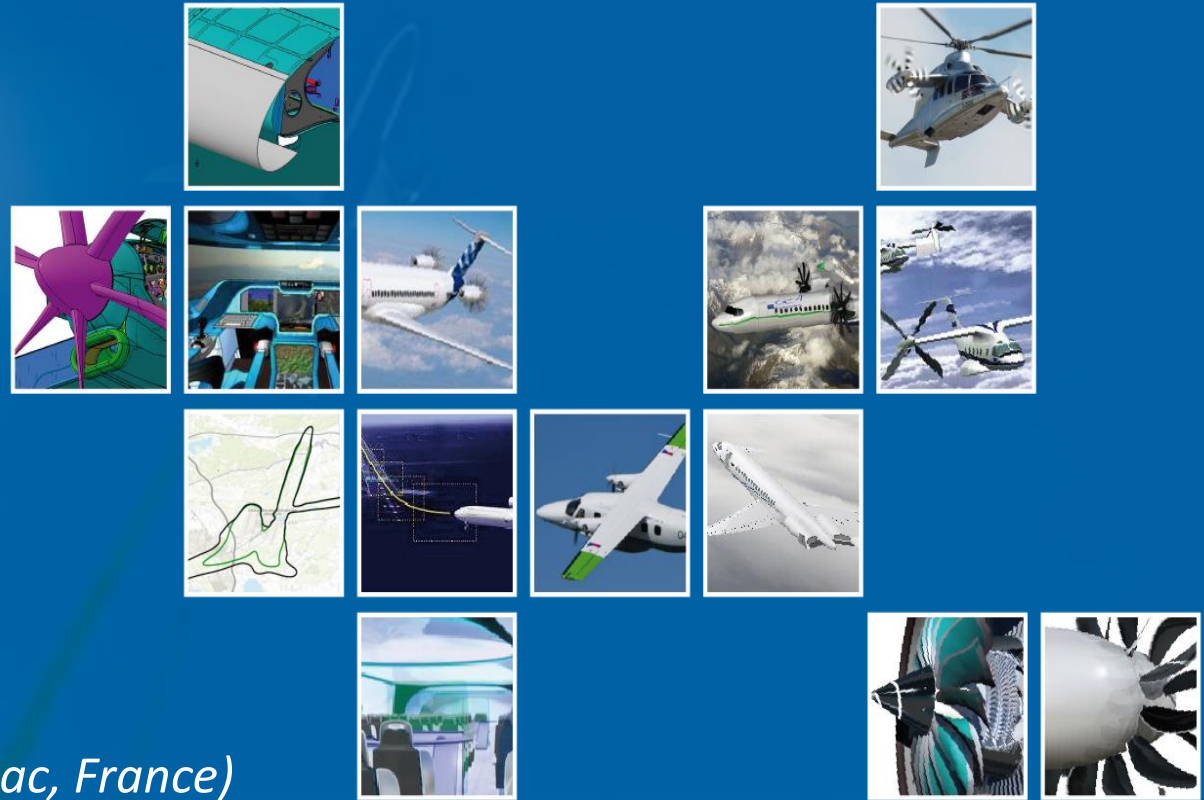# CfP10 Info Day: Technical Session

7th May 2019
Location: CCI Occitanie (Blagnac, France)

JTI-CS2-2019-CFP10-AIR-02-85

Title: Development of a multifunctional system for complex aerostructures assembly, assisted by neural network softwares

WP Location: AIR ITD – WP B-4.3

Objectives:

The aim of the Topic is to **develop** and **validate** a <u>Multifunctional Assembly Cell, based on neural network software, able to interface mixed/augmented reality devices and co-robot technologies</u>. The Artificial Intelligence system with neural network will integrate different technologies, in order to achieve:

- higher aircraft quality targets;

- to reduce to zero the risk of failures due to manual activities.

The system will dramatically innovate the method to assembly and inspect aerostructures, with significant cost reduction and improved competitiveness. The system will be validated at Topic Manager Plant for REG IADP Fuselage/Cabin full scale demonstrator assembly.

Tasks description:

- Task 1: **Trade-off Analysis for Use Cases**

➢ Based on mixed reality, augmented reality and collaborative robot, all assisted by neural network application, a predictive cost-benefit analysis will be performed for the 4 cases described above . This will be confirmed with actual data after completion of Task 5.

Tasks description:

- Task 2: **IA assisted cell architecture study and definition:**

➢ General requirements and specifications for the whole cell will be defined, on the basis of use cases application.

Tasks description:

- Task 3: **Engineering and manufacturing requirements definition**

➢ Study and development of technical guidelines and release of suitable models to be used in Task 4 and 5.

Tasks description:

- Task 4: **IA assisted cell development**

➢ Detailed design and development of the whole cell shall be performed. Neural network application shall be developed and verified. A list of needed HW, SW and materials will be defined for acquisition. Intermediate reviews will be performed to better address the project.

Tasks description:

- Task 5: **Use Cases development**

➢ According to Topic demonstrator assembly, Use Cases will be defined in detail and tested with IA assisted cell devices. In particular, also by mean of simplified/sub-component tests, the application on barrel will be defined taking into account all requirements and constraints for safe, quality acceptable and industrially suitable operations. This task will be partially performed at Topic manager site.

Tasks description:

- Task 6: **IA assisted cell validation**

➤ Cell architecture, SW, HW and neural network application will be applied to perform the requested Use Cases. A final verification of assumptions and estimate of Task 1 will be done. This task will be mainly performed at Topic manager site.

JTI-CS2-2019-CFP10-AIR-02-85

Major Deliverables:

Deliverables			
Ref. No.	**Title - Description**	**Type***	**Due Date**
D1.1	Trade-off Analysis for Use Cases	R	T0 + 2
D2.1	IA assisted cell architecture study and definition	R	T0 + 4
D3.1	Engineering requirement guideline	R	T0 + 4
D3.2	Engineering models	D	T0 + 5
D3.3	Manufacturing requirement guideline	R	T0 + 8
D4.1	IA assisted cell Preliminary Review	R	T0 + 6
D4.2	IA assisted cell Final Review	R	T0 + 12
D5.1	IA assisted cell HW acquisition	HW	T0 + 6
D5.2	Use Cases Preliminary review	R	T0 + 6
D5.3	Use Cases Final review	R	T0 + 12
D6.1	Test book for use cases	R	T0 + 13
D6.2	IA assisted cell and use cases preliminary test	R	T0 + 15
D6.3	IA assisted cell and use cases validation test	R	T0 + 18
D6.4	Final Report with trade-off validation	R	T0 + 18

Type: R=Report, D=Data, HW=Hardware

Milestones:

Milestones (when appropriate)			
Ref. No.	**Title - Description**	**Type***	**Due Date**
M1	IA assisted cell architecture definition	R	T0 + 4
M2	IA assisted cell HW acquisition	HW	T0 + 6
M3	IA assisted cell Final Review	R	T0 + 12
M4	Test book for use cases	R	T0 + 13
M5	IA assisted cell and use cases validation test	R	T0 + 18

Type: R=Report, D=Data, HW=Hardware

JTI-CS2-2019-CFP10-AIR-02-85

Special Skills:

- Proven experience in aircraft assembly process;

- Proven experience in automatic machine for aerospace;

- Proven experience in manufacturing process analysis and optimization;

- Proven experience in systems integration;

- Proven experience in mixed reality and machine learning application;

- Proven experience in cost estimation at industrial level for composite structure assembly

Indicative Funding Topic Value: 900 K€

Duration of the action: 18 Months

Any questions?

Info-Call-CFP-2019-01@cleansky.eu

Last deadline to submit your questions:
5th July 2019 (17.00 Brussels Time)