Haiku

Human AI teaming Knowledge and Understanding for aviation safety

Overview of the project

(HORIZON Europe Project | September 2022 – August 2025)

Simone Pozzi & Vanessa Arrigoni (Deep Blue)

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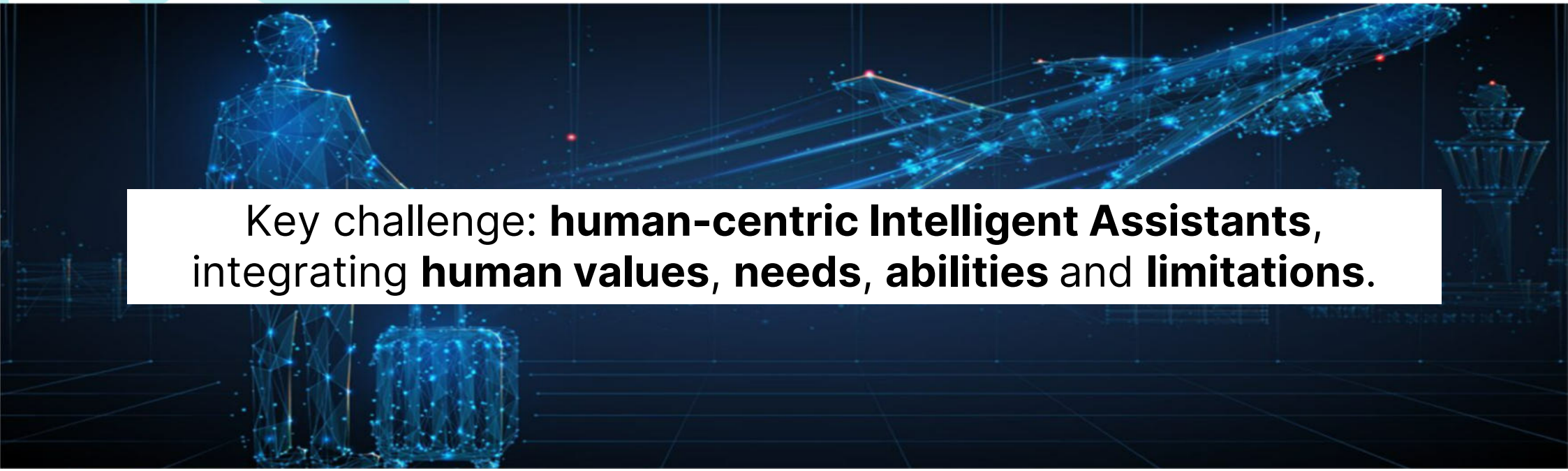
This project has received funding by the European Union's Horizon Europe research and innovation programme HORIZON-CL5-2021-D6-01-13 under Grant Agreement no 101075332

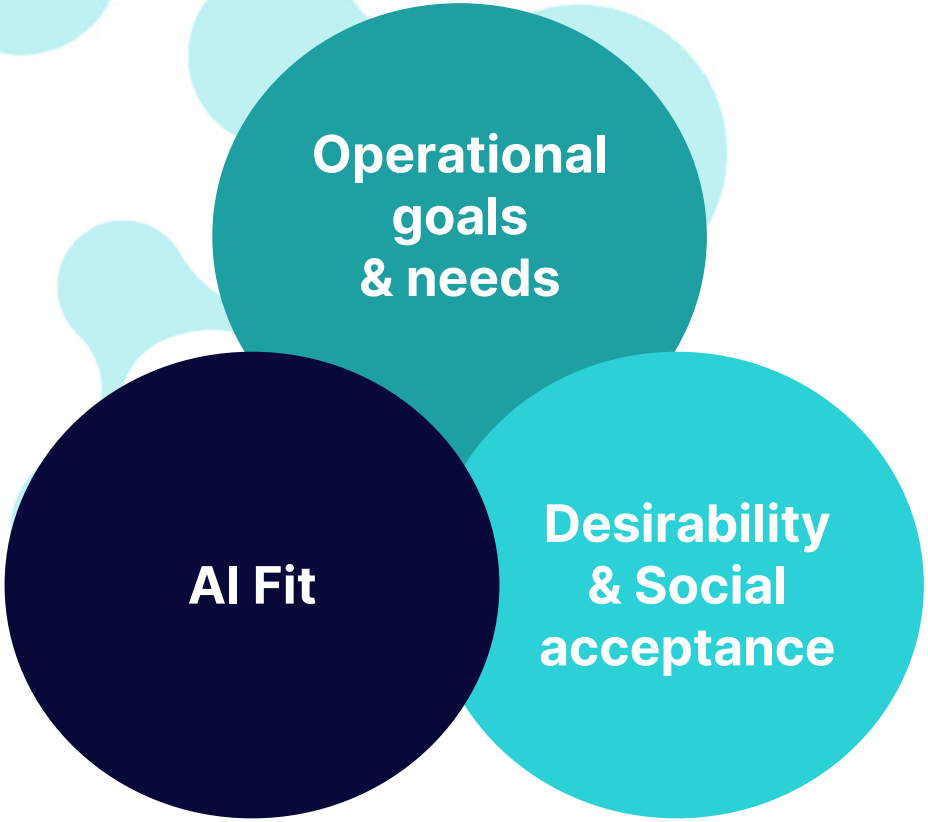
Our goal

Developing **Human-Centred AI-Based Intelligent Assistants** for **safe**, **secure**, **trustworthy** and **effective** **Human-AI partnerships** in **aviation** systems.



Key challenge: **human-centric Intelligent Assistants**, integrating **human values**, **needs**, **abilities** and **limitations**.

Our approach



- **Human-centred approach**
  starting from users' needs and pain points
- **Analysis of how technology changes human activity**
  doing the same job with a digital assistant is not "doing the same job"

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Our mix of expertise

15 Partners from 10 different countries

Three communities: **Human Factors**, **end-users, technology** suppliers

deepblue
PROJECT COORDINATOR

EUROCONTROL

CHPR

EMBRAER

ENAC

LFV

LINKÖPING UNIVERSITY

skyway

THALES

BORDEAUX INP

CATIE

Suite5
We Deliver Intelligence

DFK

ENGINEERING
THE DIGITAL TRANSFORMATION COMPANY

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

END-USERS

London Luton Airport

ADVISOR

EASA
European Aviation Safety Agency

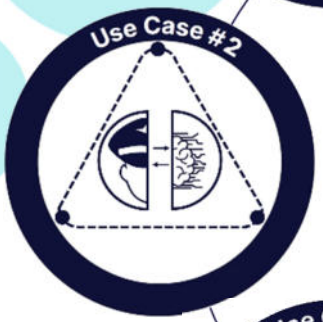
Our 6 use cases

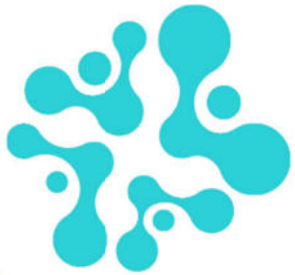
Haiku

Intelligent Assistant in the **cockpit** to assist in "**startle response**"
Led by ENAC

Airport Intelligent Assistant to monitor indoor **spread of infectious diseases**
Lead by CERTH

Intelligent Assistant in the **cockpit** to assist in **route planning/replanning**
Led by THALES & EMBRAER





Intelligent Assistant to improve **airport safety** through data analysis
Lead by EUROCONTROL & ENGINEERING
+ London Luton Airport

Intelligent Assistant for **Urban Air Mobility** to assist in **traffic management**
Lead by Linköping University & LFV

Intelligent Assistant for **tower controllers** to assist in **routine and repetitive tasks**
Lead by Skyway

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Scan for our website

HAIKU USE CASE#1

Lead by ENAC

How can **AI** support **pilots** during **startling and surprising events**?

The **FOCUS** Intelligent Assistant

Flight **O**perational **C**ompanion for **U**nexpected **S**ituations

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Use Case #1
HAIKU UC#1
Martin, pilot
Scan to watch
the UC#1 Video

HAIKU UC#1

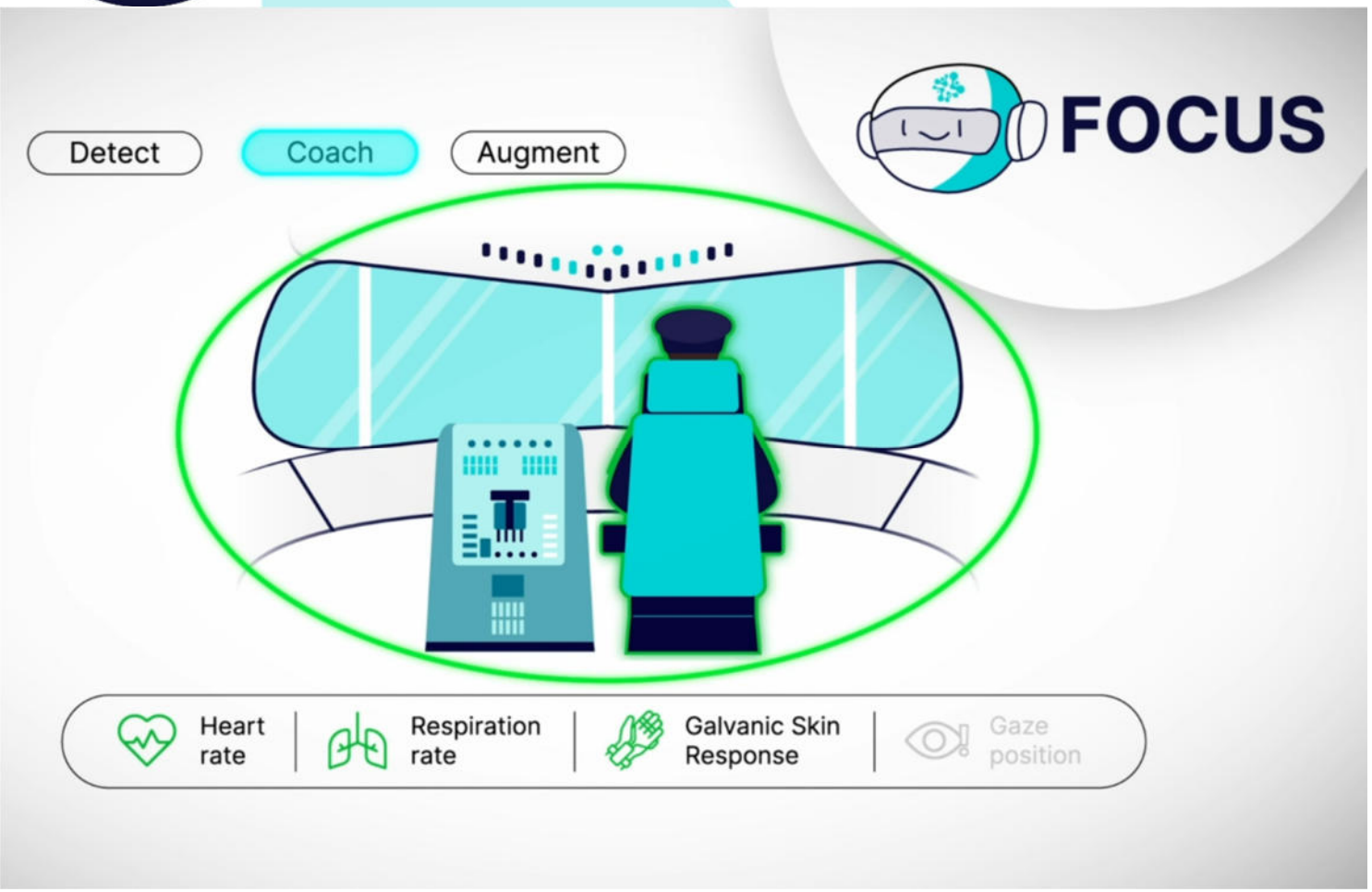
The IA TASKS

Detection of cases of **startle** and **surprise** in Single Pilots operations ...

... via **physiological parameters**

HAIKU UC#1

The IA TASKS



Supporting Single Pilots in **managing emotion and stress** during startling and surprise events …

… Through **biofeedback**

HAIKU UC#1

The IA TASKS

Augmenting Single Pilots **situational awareness**…

… By **drawing attention** towards important parameters

Our outputs

INTELLIGENT ASSISTANTS

Developed and validated for:

- Airline operations
- ATM
- Urban Air Mobility
- Airport Operations

HUMAN FACTORS APPROACHES for AI

- Explainability framework
- Human Factors Assurance process

SOCIETY

- Analysis of Liability and Ethics
- Design and assessment of new human roles
- Safety Culture Safeguards for Aviation Organisations

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Development of Safety, HF and security approaches for Human IA Systems

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HAIKU UC#1

Overview of Saf-HF-Liability results

Potential critical event

The IA inaccurately assesses the need for the startle procedure, leading to a **notification when it is unnecessary**

Safety: Overload due to unnecessary notification

HF: Inconsistent warnings may erode the pilot's trust

Liability:

- Product Liability risk for AI providers
- Corporate Liability risk: end-users training

An App for Evaluating Human-AI Teaming systems

- 170 Guidelines
- Includes EASA Guidelines
- Builds on SESAR Human Performance Assessment Process
- Already trialed on 2 HAIKU Use Cases

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What is the impact on human role?

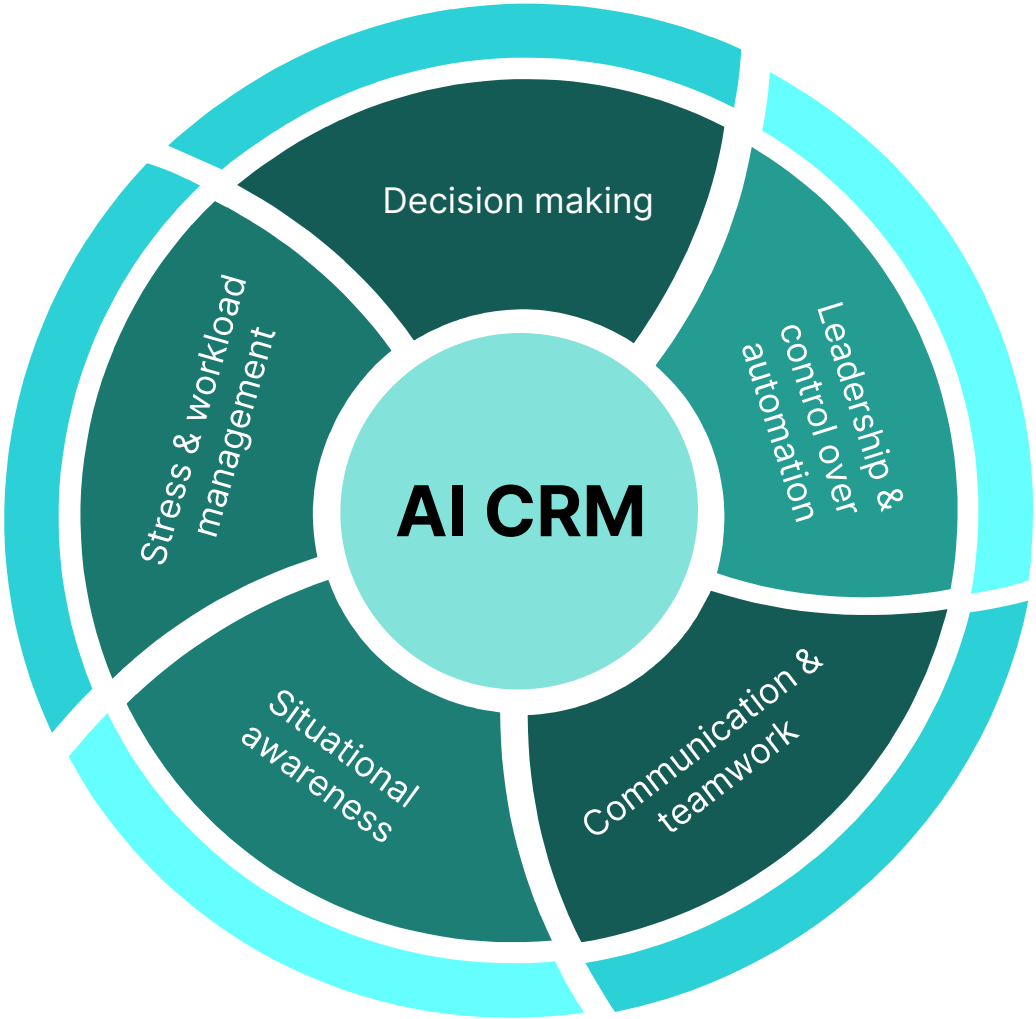
Future interactions between pilots and their environment

↓

Revised skill-set

↓

New training requirements for pilots



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THANK YOU!

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