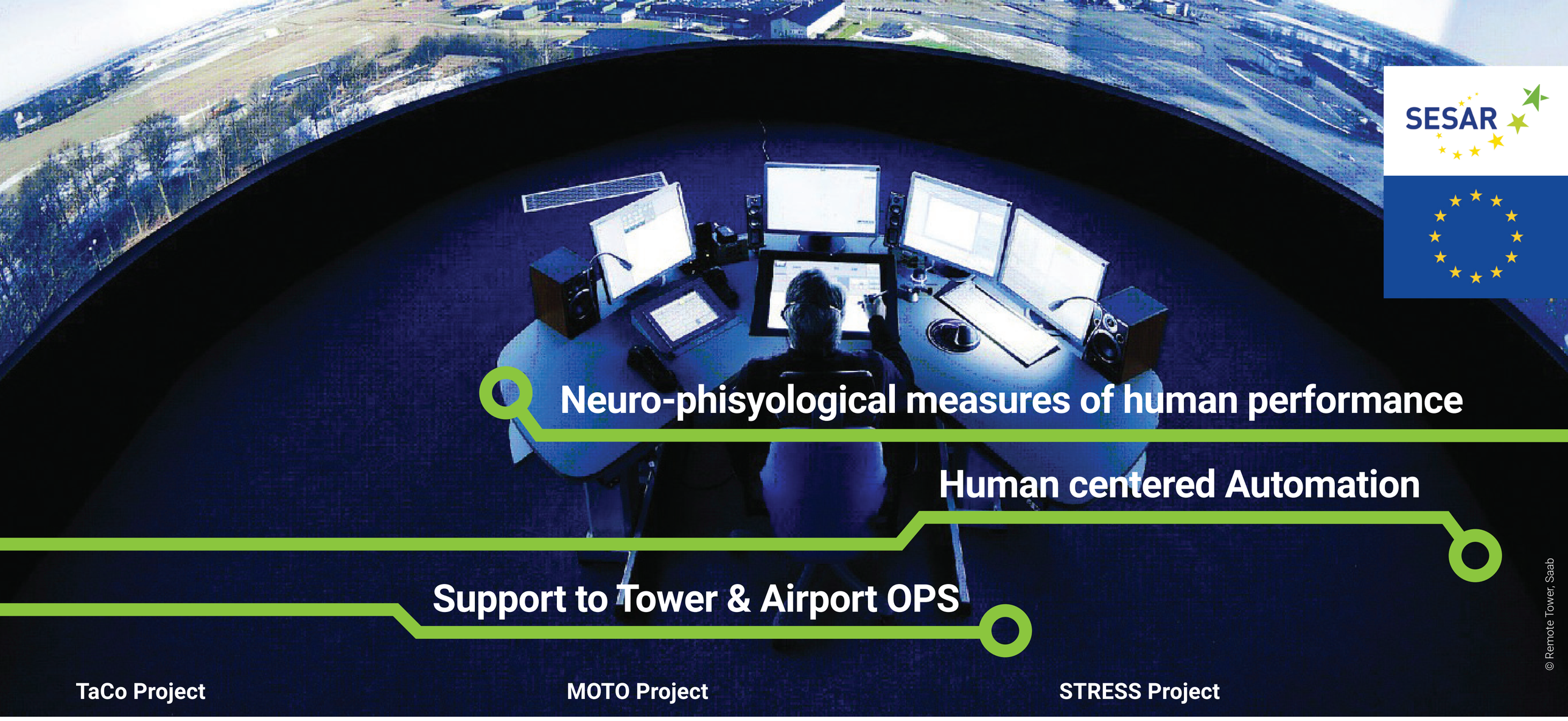

SESAR

Neuro-phisyological measures of human performance

Human centered Automation

Support to Tower & Airport OPS

© Remote Tower, Saab

TaCo Project

TAKE CONTROL

Automation cannot be defined at design time only. Smooth handover to humans and user programming are keys to manage unusual situations.

OBJECTIVES

TaCo aims to define an automated system able to both support ground and tower controllers' tasks in airport operations and assess its own ability to deal with non-nominal conditions. When needed, it should be sensitive enough to transfer responsibilities and tasks back to the controller, in a timely and graceful manner that makes him/her comfortable with the inherited tasks.

METHOD

TaCo promotes a user centred approach to automation design for facilitating the controller's forward thinking, in line with the A-CDM (Airport- Collaborative Decision Making). Malta International Airport (MIA) is our main case study to define:

→ the ability of the system to assess the situation and recognise the need for a human intervention;

→ graceful handover of bad situations to the controllers;

→ algorithms and solutions for optimizing the behaviour of the agents involved in the system;

→ the suitability of solutions like user programming for monitoring and tuning the system behaviour.

OUTCOMES

→ Analysis of ground operations in MIA and definition of scenarios where automation supports the controller;

→ Proof of concept of automated support tools (e.g. sequencing, conflict detection and resolution);

→ Interaction model for the automation-human and human-automation handover of control;

→ Evaluation of the concept according to the expected technology readiness level (TRL1).

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MOTO Project

MOTO
THE EMBODIED REMOTE TOWER

The main objective of MOTO is to identify the key multimodal *stimuli* required on RTO to enhance the sense of Presence experienced by ATCOs.

OBJECTIVES

1 Assessment of the role of multimodal acquisition of information in current control tower operations.

2 Definition of user requirements to reconstruct multimodal perception in a remote tower simulation platform and development of augmented multimodal interfaces.

3 Definition of brain-physiological indexes, customized for Remote Tower operations, to monitor aspects of Human Performance.

4 Validation of the above mentioned results in realistic ATM operational conditions through simulation facilities in baseline RTO and augmented RTO scenarios and in radically changed ones.

METHOD

→ Visual, acoustic and vibration information measurement in Real Air Traffic Control Tower;
→ Sense of presence measurements;
→ Neurophysiological measurements.

OUTCOMES

→ Scenarios of embodied cognition in tower operations;

→ Requirements for more realistic multimodal remote tower platforms;

→ Multimodal solutions to improve ATCO performance;

→ Neuro-physiological classifiers to monitor human performance in Tower, in particular in RTO context.

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STRESS Project

STRESS
Human Performance neurometrics toolbox for highly automated systems design

STRESS supports the transition to higher automation levels in aviation, by addressing, analysing and mitigating its impact on the Human Performance aspects associated to the future role of Air Traffic Controllers in the context of future SESAR scenarios.

OBJECTIVES

1 To identify and validate neurophysiological indexes for monitoring in real-time the controllers' mental state;

2 To use them to study the impact of advanced highly automated system on controllers' performance envelope;

3 To provide automation design guidelines to support human performance during safe transitions from high levels of automation to low levels, and viceversa.

METHOD

→ Measurement of neurophysiological indexes in simulated ATM environment.

→Iterative approach.

OUTCOMES

→ Future scenarios;
→ Neurophysiological indexes;
→ Human Performance envelope in future scenarios;
→ Automation design guidelines.

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