Diversion Assistant in WP7

HOLISTIC HUMAN FACTORS AND SYSTEM DESIGN
OF ADAPTIVE COOPERATIVE HUMAN-MACHINE SYSTEMS

Domain

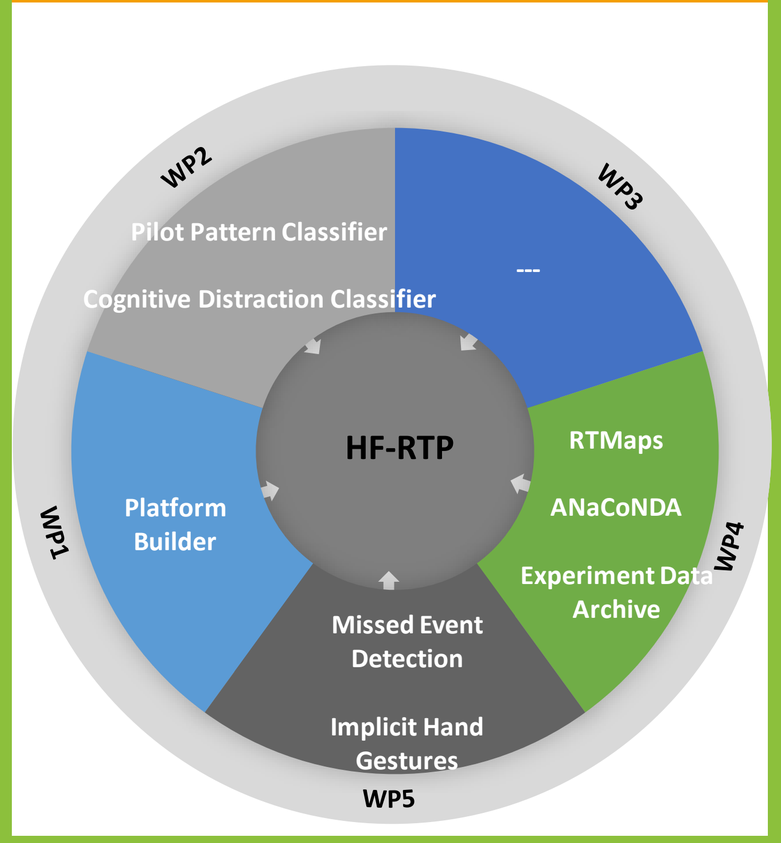
Motivation

Diversion is a complex task that happens infrequently and in varying conditions. Proper solution requires **integration** of various pieces of information – digital and paper, displaced across the cockpit in short time and in parallel with securing aircraft and communication.

Diversion assistant integrates the information and runs necessary calculations for pilot supporting **strategic planning** and **reducing workload** when situation happens.

Diversion task is suitable for **adaptation** to the state of the crew. Available diversion options are evaluated for their difficulty and their priority is modified by assessed level of **workload or fatigue** of the crew. Also crew activity is monitored and intervention triggered if incorrect action is detected.

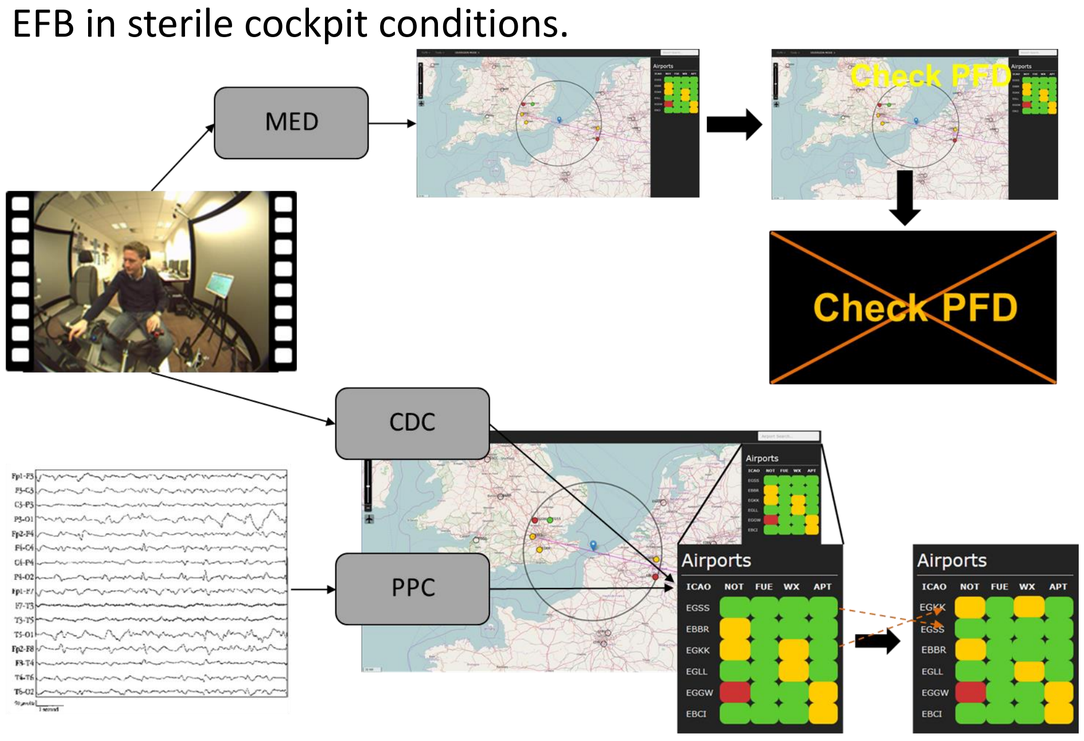
Applied MTTs



Current State: Tailored HF-RTP

Adaption use-case in diversion

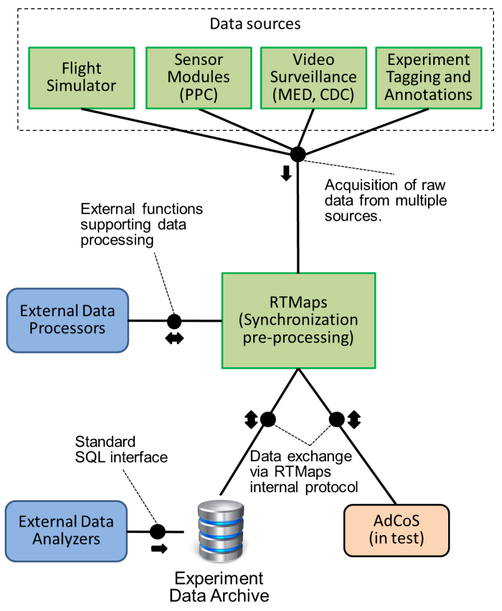
Combining information about pilot's direction of look via **Missed Event Detector (MED)** of HF-RTP with cockpit context improves **safety** especially in high workload situations. The system was deployed to enforce safe use of EFB in sterile cockpit conditions.



Physiological and behavioural data are processed with respect to workload and fatigue via **Pilot Pattern Classifier (PPC)** and **Cognitive Distraction Classifier (CDC)** of HF-RTP in order to adjust suitability of airports to current state of the pilot. **Safety** and **efficiency** of diversion is improved. The tools were demonstrated in proof-of-concept experiments.

Data management use-case

In complex experiments a proper data management significantly reduces non-productive overhead work of highly skilled HF experts. Common problems of synchronization, versioning and sharing were successfully addressed by combination of **RTMaps** and **Experiment Data Archive** of HF-RTP. Tools were deployed in several experiments during the development of Diversion assistant AdCoS.



Project KPI's

Baseline Overall		Overall 1b	
time (MM)	62.1	time (MM)	50.85
resources	0	resources	0
cost RC (Euro)	0	cost RC (Euro)	0
cost NRC (Euro)	510020.7	cost NRC (Euro)	405016.95

Overall-Savings Comparison of 0 – 1c		% reduction
time (MM)	**11.25**	18.12
resources	**0**	0
cost RC (Euro)	**0**	0
cost NRC (Euro)	**105003.75**	20.59

Results

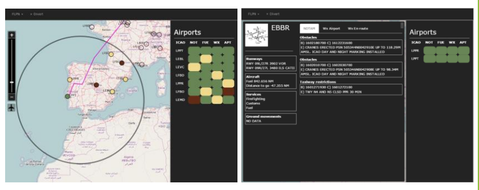
Diversion assistant at TRL4

Diversion assistant AdCoS integrated the critical pieces of information needed for qualified prioritization of available airports.

Application was tested in simulated scenarios with

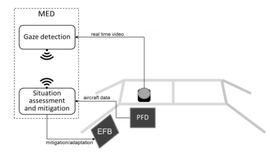
- overall time reduced by 11% and
- 8 of 10 points on usability scale.

The novelty aspects of the concept are covered in eight filed patent applications on algorithms and HMI design.



Adaptation in diversion maneuver

Behavioral markers assed by MED were used to ensure safe use of EFB in diversion.



Physiology markers assessed by PPC and CDC proved valuable for workload and fatigue mitigation.

Better data management

RTMaps and EDA tools naturally solve issues with data synchronization, versioning and sharing.

EFB infrastructure made re-usable and portable to various SW/HW platforms.

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Consortium

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