HoliDes newsletter

December 2014

Welcome to HoliDes!

HoliDes (Holistic Human Factors and System Design of Adaptive Cooperative Human-Machine Systems) *presents its first newsletter edition. Newsletters will inform you every four months on the status and progress of our project, on the scientific and technical milestones achieved, on the relevant events, publications and more.*

HoliDes addresses development and qualification of ***Adaptive Cooperative Human-Machine Systems (AdCoS)*** *where many humans and many machines act together, cooperatively, in a highly adaptive way, to guarantee fluent and cooperative task achievement. The safe landing of an airplane is one example of a task that is collaboratively shared between several humans and machines: pilots and air traffic controllers work together, while being supported by semi-autonomous systems like auto-pilots and flight management systems.*

While existing systems adapt within the interaction between one human and one machine, HoliDes extends this scope and considers cooperation between many machines and many operators. The project investigates new ways to pro-actively communicate system adaptations to human operators, according to the operators' situation and capacities.

Our goal is to develop processes, techniques and software tools that enable development and qualification of AdCoS in four domains: Health, Aeronautics, Control Rooms and Automotive. *Several psychological, computer science and engineering questions are to be solved within this project that involves partners from industry and research institutions from seven European countries.*

Welcome!

Dr.ing. Sebastian Feuerstack
project manager of HoliDes,
OFFIS e.V.

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ARTEMIS & ITEA Co-summit 2015
Berlin, 10 - 11 March 2015

HOLIDES 2015: the first workshop on Holistic Human Factors and System Design of Adaptive Cooperative Human-Machine Systems
Nice, 22 - 27 March 2015

HoliDes Project at a glance

Project name	HoliDes (Holistic Human Factors and System Design of Adaptive Cooperative Human-Machine Systems)
Artemis-JU call	2012
Grant agreement	332933
Budget	€23.28 M
Number of partners	31
Number of countries	7
Project Coordinator	Andreas Ludtke, OFFIS (DE)
Application domains	Health, Aeronautics, Control Room, Automotive
Keywords	Adaptive Cooperative Human Machine Systems (AdCos); Development & Qualification Methods; Methods, Techniques & Tools (MTT); Automated Re-Configuration of Human-Machine Cooperation; Reference Technology Platform (RTP); Human Factors (HF);
Website	www.holides.eu

Project objectives

HoliDes aims at closing the design productivity gap between potential and capability by:

- **reducing the cost of adaptive cooperative system development in compliance with human factors and safety regulations**
- **reducing the needed development cycles when applied to innovative and ambitious AdCoS**
- **fostering Embedded Systems for AdCoS that are reusable in different safety-critical domains**

Expected project results include:

- **A methodology to facilitate development & qualification of AdCoS against human factors and safety regulations**; that is to be achieved by formalizing and extending the informal descriptions of human factors and safety standards, guidelines and best practices, by also highlighting commonalities between Health, Aeronautics, Control Rooms and Automotive domains.
- **Advanced techniques for the empirical analysis of AdCoS**, to cope with the management of the huge number of evaluation scenarios and with the dynamic progression of each scenario produced by the adaptiveness of the considered systems.
- **A framework for adaptation on a local & global level**, i.e., both at one-to-one & many-to-many human machine interaction levels, including new real-time measurements techniques of the external and internal AdCoS context and new reusable algorithms for the re-configuration of AdCos.
- **A Human Factors Reference Technology Platform (HF-RTP)**, which integrates all techniques and tools allowing full interoperability across the whole industrial development and qualification life cycle in a holistic way, taking into account multiple human factor views as well as multiple technical views.
- **Applications for AdCoS** that demonstrate adaptations in these systems in compliance with human factors and safety regulations; such applications will be developed and assessed **by using the methods, techniques and tools (MTT)** defined and developed in the project, and will be also integrated in the HF-RTP.

Where are we now

The HoliDes project has **just turned its first year** and successfully accomplished the first review process. The project workplan foresees three HF-RTP design cycles and at the moment the project is completing the first one.

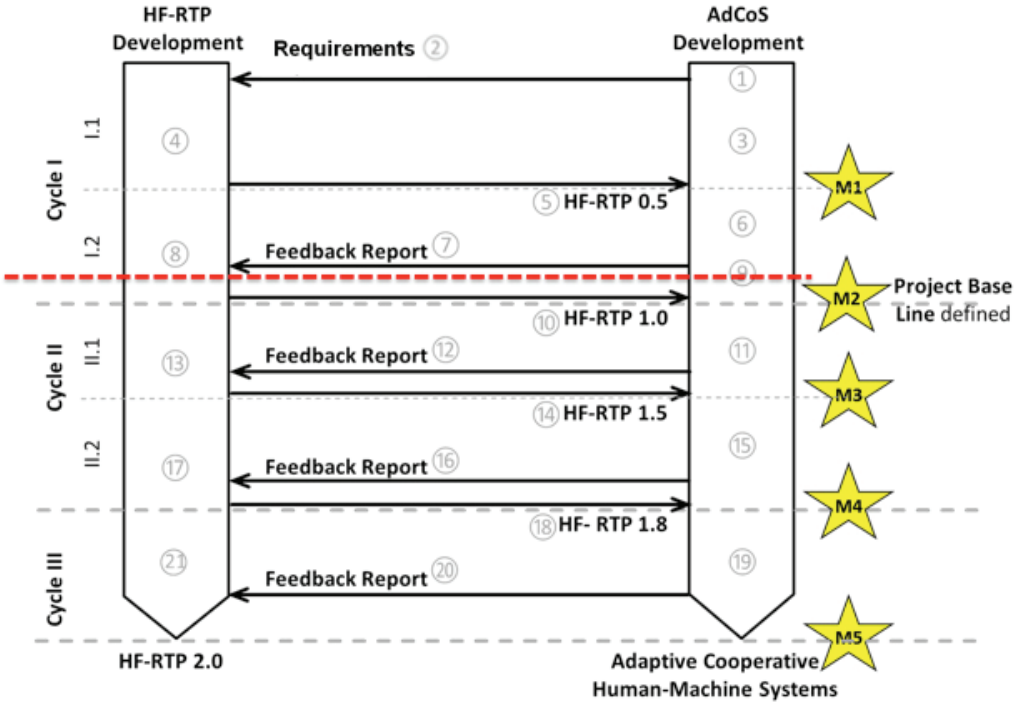

Figure 1. HF-RTP development timeline - Approaching Milestone 2

At the beginning, **requirements for the HF-RTP MTT** have been defined and classified, starting from the analysis of the application scenarios and the related AdCos to be developed in the four domains of the project.
A special attention has been paid to cross-domain requirements concerning human factors. **Comprehensive documentation of HF regulations** has been reviewed and compiled with the contributions from all the involved partners. Indeed, the **HoliDes HF-RTP** is conceived to adapt and extend the principles of the RTP developed in the CESAR[1] Artemis project to cope with **human factors issues**, such as how to make the overall system behavior adapt to the **human agent's psycho-physiological state and situation awareness**. In other words, one of our main challenges is to design RTP tools and services (i.e., tools and services compliant with the Inter-Operability Standard (IOS), based on **OSLC** (Open Services for Lifecycle Collaboration)), enabling for fast design, development and qualification processes of AdCos that keep into consideration the HF dimension.
According to the aforementioned preliminary analysis cycle, a **first specification of the HF-RTP (version 0.5)** has been designed and delivered, thus completing project Milestone 1. Based on the feedback gathered, a refinement process is being carried out (and it is near to completion), in order to derive new/updated requirements to be agreed upon among all the Industrial Partners. We are currently delivering the resulting **HF-RTP version 1** and the **assessment of the project baseline**, needed as the basis for identifying the benefits of the HF-RTP in terms of costs, time and effort needed throughout the product life-cycle.

Requirements integration of all AdCoS and MTT requirements with a special focus on cross-domain requirements concerning the human factors domain.

Description of the RTP technology architecture, Description of and definition of the first HF-RTP Vs. 0.5

Definition of the framework for adaptation.

Comprehensive and extensively reviewed documentation of HF regulations.

Figure 2. Highlights - HoliDes first year results

Figure 3. Turin's general assembly, Centro Ricerche FIAT, 25th-27th November 2014

Upcoming events

ARTEMIS & ITEA Co-summit 2015

The 2015 Co-summit, jointly organised by ARTEMIS & ITEA, will be held in **Berlin on 10th & 11th March** at the Berlin Congress Center, located at Alexanderplatz in the city centre of Berlin.

The 7th edition of the Co-summit, is featuring international keynote speakers, a high level panel discussion, an inspiring project exhibition including speakers corners fuelled by the project teams themselves. The Co-summit will be dedicated to ***'Smart Industry: impact of software innovation'***:

"The fourth industrial revolution is already on its way. This revolution is driven by giant leaps in software innovation and promises to radically alter the face of industry in the coming decades. Automated production systems using advanced robotics increasingly communicate with each other on detailed aspects of production, connecting previously fragmented manufacturing processes. This offers great opportunities to capitalise on software and advanced technology across entire development and production processes."

Like all ARTEMIS projects, HoliDes will participate as well, with a dedicated booth show and live demos of the first project results. Join us for the 2015 Co-summit!

HOLIDES 2015: the first workshop on Holistic Human Factors and System Design of Adaptive Cooperative Human-Machine Systems

HOLIDES 2015 is the 1st workshop on Holistic Human Factors and System Design of Adaptive Cooperative Human-Machine Systems.

It is co-located with COGNITIVE 2015, the 7th International Conference on Advanced Cognitive Technologies and Applications, organized by the International Academy, Research, and Industry Association (IARIA).
COGNITIVE 2015 will collect works related to the following tracks: BRAIN – Brain information processing and informatics; COGNITION – Artificial intelligence and cognition; AGENTS – Agent-based adaptive systems; AUTONOMY: Autonomous systems and autonomy-oriented computing; APPLICATIONS, on agent-oriented modeling and methodologies, agent-based interaction protocols and cognitive architectures, and others.
COGNITIVE 2015 and HOLIDES 2015 will be held in Nice (France), on 22nd – 27 th March.