

**Information and Communication Technologies (ICT)  
Programme**

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***D7.1: CERBERO Website***

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**Abstract:**

This document presents the website that we constructed to disseminate CERBERO results.

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3	Thales Alenia Space España, SA	TASE	ES
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## Document Revision History

<b>Date</b>	<b>Ver.</b>	<b>Contributor (Beneficiary)</b>	<b>Summary of main changes</b>
31/01/2017		UniSS	Website On Line
24/05/2017	V0.1	UniSS, UniCA	Initial draft of the Website associated report
25/05/2017	V0.1	USI	Comments and Review
30/05/17	V0.2	UNISS	New release for final approval

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## **1. Executive Summary**

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This deliverable presents the main structure of the first release of the CERBERO website, by means of few screenshots and links to its page.

### **1.1. Related Documents**

- Deliverable D1.1: Kick-off Progress Report
- Deliverable D2.1a: CERBERO Scenarios Description
- Deliverable D7.2a: CERBERO Dissemination and Communication Plan

## 2. CERBERO website

CERBERO website is <http://www.cerbero-h2020.eu/>

The [Home Page](#) [1] includes (see Figure 1) a brief introduction to the CERBERO Project: “*The Cross-layer model-based framework for multi-objective design of Reconfigurable systems in uncertain hybrid environments (CERBERO) project aims at developing a design environment for CPS based of two pillars: a cross-layer model based approach to describe, optimize, and analyze the system and all its different views concurrently; an advanced adaptivity support based on a multi-layer autonomous engine. To overcome the limit of current tools, CERBERO provides: libraries of generic Key Performance Indicators for reconfigurable CPSs in hybrid/uncertain environments; novel formal and simulation-based methods; a continuous design environment guaranteeing early-stage analysis and optimization of functional and non-functional requirements, including energy, reliability and security.*” It also shows (see Figure 2) CERBERO Project information and its key personnel, representing the project core and leading team.



Figure 1 CERBERO Home Page

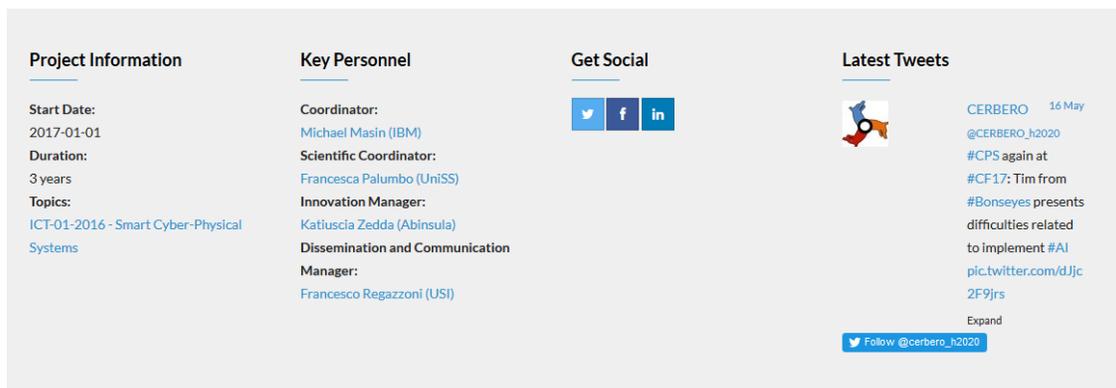


Figure 2 – Information, Core Team and Shortcuts to social profiles.

Moreover, the social profiles of the CERBERO project and the latest tweets regarding CERBERO are available at the bottom of the main page.

The following sections describe the website pages.

## 2.1. The Project

The [Project Overview](#) [2] (see

Figure 3) page describes briefly the technological background of the CERBERO project: “ICT is embedded and pervasive into our daily lives. The notion of Cyber Physical Systems (CPS) has emerged: embedded computational collaborating devices, capable of controlling physical elements and responding to humans. The Cross-layer model-based framework for multi-objective design of reconfigurable systems in uncertain hybrid environments (CERBERO) project aims at developing a design environment for CPS based of two pillars: a cross-layer model based approach to describe, optimize, and analyze the system and all its different views concurrently; an advanced adaptivity support based on a multi-layer autonomous engine. To overcome the limit of current tools, CERBERO provides: libraries of generic Key Performance Indicators for reconfigurable CPSs in hybrid/uncertain environments; novel formal and simulation-based methods; a continuous design environment guaranteeing early-stage analysis and optimization of functional and non-functional requirements, including energy, reliability and security.”. It provides also a brief description of the project pillars, indicating in which WPs they will be addressed.

### Overview

ICT is embedded and pervasive into our daily lives. The notion of Cyber Physical Systems (CPS) has emerged: embedded computational collaborating devices, capable of controlling physical elements and responding to humans. The Cross-layer model-based framework for multi-objective design of reconfigurable systems in uncertain hybrid environments (CERBERO) project aims at developing a design environment for CPS based of two pillars: a cross-layer model based approach to describe, optimize, and analyze the system and all its different views concurrently; an advanced adaptivity support based on a multi-layer autonomous engine. To overcome the limit of current tools, CERBERO provides: libraries of generic Key Performance Indicators for reconfigurable CPSs in hybrid/uncertain environments; novel formal and simulation-based methods; a continuous design environment guaranteeing early-stage analysis and optimization of functional and non-functional requirements, including energy, reliability and security.

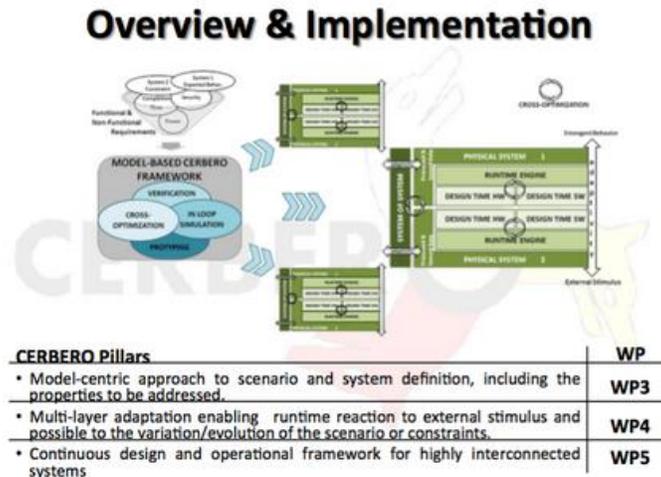


Figure 3 – CERBERO Overview and Pillars.

The [Project Participants](#) [3] (see Figure 4) page shows the

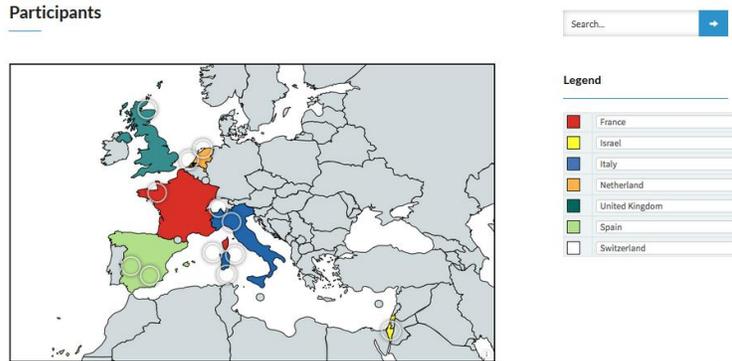


Figure 4 – Involved Countries.

list of the participants to the CERBERO project with an interactive map, where countries of beneficiaries are highlighted in different colours. For each country, it is possible to separately select the beneficiaries and to open the related people page, which includes the short biography of each key personnel involved in the project.

## IBM ISRAEL – SCIENCE AND TECHNOLOGY LTD

### People

#### Michael Masin, CERBERO Project Coordinator

He is a Research Staff Member (RSM) in the Systems & IoT Engineering group at IBM Research – Haifa and has served as the technical lead and Principle Investigator for numerous projects, both with government and private customers. Michael’s research interests focus on the development of engineer-friendly tools and applications for deterministic and stochastic combinatorial multi-objective optimization. These include simulation and optimization-based engineering of complex systems and system of systems design, control, scheduling and logistics. Michael received his masters in mechanical engineering from the Moscow State University of Railway Transport, and then went on to get his masters and PhD in industrial engineering at the Technion – Israel Institute of Technology. He has published many papers in leading professional journals and conferences, filed 10 IBM patents, and continues to supervise graduate students at the Technion and Tel Aviv University.

#### Evgeny Shindin

He is a RSM in the Systems & IoT Engineering group at IBM Research – Haifa and in final stages of his Ph.D. at Haifa University, Israel. He has M.A. degree in statistics from Haifa University, Israel and M.Sc degree in Computer Science from Kharkov Technical University of Radio and Electronics, Ukraine. His Ph.D. work is focused on simplex-type algorithms for continuous-time linear programming under the supervision of Prof. Gideon Weiss.

### Participants

- > ABINSULA SRL
- > AMBIESENSE
- > CENTRO RICERCHE FIAT
- > IBM ISRAEL – SCIENCE AND TECHNOLOGY LTD
- > INSTITUT NATIONAL DES SCIENCES APPLIQUEES DE RENNES
- > SCIENCE AND TECHNOLOGY BV
- > THALES ALENIA SPACE ESPANA
- > TNO
- > UNIVERSITÀ DEGLI STUDI DI CAGLIARI
- > UNIVERSITÀ DEGLI STUDI DI SASSARI
- > UNIVERSITÀ DELLA SVIZZERA ITALIANA
- > UNIVERSIDAD POLITECNICA DE MADRID

Figure 5 – Key Personnel per Participant

Finally, the [Project Use Cases](#) [4] page shows a brief description of each CERBERO use case. A complete description of the use cases is provided in deliverable D2.1a.

Use Cases



**Self-Healing System for Planetary Exploration**

The objective of this use case is twofold. On one side it focuses on a single unique embedded CPS; while, on the other, it focuses on its integration with other systems of a planetary exploration mission. The use case focus on the future planetary exploration rover, which will be the first mission to combine the capability to move across the surface and to study future planetary exploration at depth. The primary goal is to provide self-monitoring and self-healing capabilities by means of high performance sensor processing techniques, triggering dynamic reconfiguration of the embedded computing system to overcome the failures caused by the radiation or the harsh environmental conditions. The second objective focuses on a wider scenario taking into account the SoS typical of a planetary exploration scenario, which has different actors and system contributing to the final objectives, i.e. astronauts, supporting satellites, earth control station, exploration rovers and other support facilities among others. CERBERO is mainly conceived to define self-healing and self-adaptive processing systems capable of operating in such a critical environment.



**Ocean Monitoring**

A type of smart video-sensing unmanned vehicles with immersive environmental monitoring capabilities composes the SoS representative of this scenario. Such marine robots can be remote controlled within wireless reach and visible sight, and capable of self-operation and navigation. Robots will be equipped with new sensing and processing capabilities, not only to navigate and operate the robot, but also for data analysis and information fusion. Real-time processing and adaptation is required to address the rapidly changing environment conditions in order to obtain or maintain positions on sea. The aim is for the electronic components of the robots to be 100% battery driven, solar and wind charged, which would be particularly helpful in challenging recharging scenarios, i.e. the Arctic areas during winter time, or when communication with the vehicle has temporarily been lost. CERBERO will define algorithms for data analysis and information fusion to enable smart adaptation strategies to address rapidly changing environment conditions in order to obtain or maintain positions on sea.



**Smart Travelling for Electric Vehicle**

The third scenario is the most networked one, being composed of different sub-systems, including the Electric Vehicle, the Person possessing a Personal Agenda, the Smart Energy Grid and the Smart Mobility that provides mobility-aware functionality (e.g. parking places, charge points, etc.). Due to the different involved heterogeneous concurrent sub-systems, this scenario requires a high degree of autonomy and support for adaptability to cope with real life circumstances. Moreover, it requires to integrate the distributed communication layers of the different involved systems. The proposed model-based approach and its corresponding design framework is meant to facilitate the design of such a complex CPSoS, where several dependencies and a plethora of highly different requirements have to be considered.

Figure 6 – CERBERO Use Cases.

2.2. Dissemination

The Dissemination page depicts the activities related to the dissemination of CERBERO related information. In particular, this section includes:

- the list of the [Deliverables](#) [5] that have already been submitted to the EC. Public deliverables will be made available here.
- the list of the [Publications](#) [6] on CERBERO activities once available. According to the open access policy chosen (gold or green) publications will be made available here.
- CERBERO [Glossary](#) [7] of the keywords. In this page, we intend to define all the relevant keywords for the CERBERO project and the Cyber-Physical System domain in general.

This page will be continuously updated with new contents.

Deliverables

Number	Name	WP	Lead	Date
D7.1	Website	WP7	UniSS	M2

Figure 7 – Dissemination: deliverables.

### Publications

- M. Masín, F. Palumbo, H. Myrhaug, J. A. de Oliveira Filho, M. Pastena, M. Pelcat, L. Raffo, F. Regazzoni, A. A. Sanchez, A. Toffetti, E. de la Torre, K. Zedda, "Cross-layer Design of Reconfigurable Cyber-Physical Systems", DATE – International Conference on Design and Test Europe, 2017 (to be presented).

Figure 8 - Dissemination: publications.

### Glossary

ALL A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

- [Cyber-Physical System](#)

Figure 9 - Dissemination: glossary.

## 2.3. Events

The Events page in the CERBERO website will include the list of relevant [Industrial](#) [8] and [Research](#) [9] events, where CERBERO members are involved as participants or as organizers.

Moreover, [Consortium Meetings](#) [10] will also be included in this list.

## 2.4. Communication

This page is basically connected to traditional communication means. It collects all the audio and video material related to CERBERO events ([Multimedia](#) [11]) and the links to the newspaper articles dealing with CERBERO or mentioning the project ([Press](#) [12]).



## 2.5. CPS Summer School

The [CPS Summer School](#) [13] page collects the links to the schools the CERBERO members are participating to. Summer and Winter Schools are seen by CERBERO members as fundamental opportunities to disseminate the project results. Therefore, in this page we will advertise the schools where we intend to participate.

### CPS Summer School 2017

CERBERO participants will give lectures on CERBERO findings and topics at the [CPS Summer School 2017 Web site](#).

### **3. References**

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- [1] "CERBERO Home Page," [Online]. Available: <http://www.cerbero-h2020.eu/>.
- [2] "CERBERO Project Overview," [Online]. Available: <http://www.cerbero-h2020.eu/overview/>.
- [3] "CERBERO Project Participants," [Online]. Available: <http://www.cerbero-h2020.eu/participants/>.
- [4] "CERBERO Use Cases," [Online]. Available: <http://www.cerbero-h2020.eu/use-cases/>.
- [5] "CERBERO Dissemination Deliverables," [Online]. Available: <http://www.cerbero-h2020.eu/deliverables/>.
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