R&D OPPORTUNITIES
Forging partnerships for a sustainable future

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Our technology perspective

With 20 years of cross industry experience, our group of companies deliver robust ICT products and services for the public authorities and develop next generation proof of concepts, in key technology areas, like:

Public Safety Answering Point (**PSAP**), Geographic Information System (**GIS**),
River Information System (**RIS**), Visa Information System (**VIS**),
Intelligent Transport System (**ITS**), Cloud, **e-health**,
Internet of Things (**IoT**), Machine Learning (**ML)**,
Key Enabling Technologies **(KETs**), Unmanned Aerial Vehicle (**UAV**)

ICT   **Robotics**   **Transport**   **Environment**   **Agriculture**   **Health and well-being**

Research and Innovation track record

International EU Funded Projects

Projects	26
Cumulated grant value	€4,5M
Co-funding	€2,3M
Budget range per project	€ 160K -500K
Funding sources	H2020, AAL, CIP, CEF, ECSEL, ERANET, EUREKA, FP7-PHP, ESA-ARTES, ROSA-STAR
Thematic Areas	IoT & Robotics (8), Medical and Assisted living (7), Emergency services & Safety (5), Mobility and Logistics (3) Cloud (2), GIS (1)

technology
systems and services international

R&D Project portfolio

Area	Topic
Medical	• A smart telecare solution with an AI component for early diagnosis of infectious diseases **(SPIDEP)**
Human-centered solutions	• Providing elderly people with help-on-demand services on the smartphone **(MobileSage)** • An innovative easy-to-use and unobtrusive system to support older workers and the relevant stakeholders in reducing and managing occupational physical and mental stress **(Fit4Work)** • An integrated, smart platform enabling elderly people to have access to a number of services and information directly from their TV set at home **(HEREiAM)** • A personalized tool that can monitor biological signals and recommend various relaxation activities "just-in-time". **(StayActive)** • An open-source and context-aware accessibility layer to improve the day-to-day life of people with IDD by helping them to interact with the information society. **(ABLE-TO-INCLUDE)** • Study and develop the next generation of multimedia streaming systems to be used over wireless networks **(MITSU)**
Emergency services & safety	• An in-vehicle emergency call service based on 112, the common European Emergency number and piloting of NG112 functionalities **(HeERO, HeERO2** and **IHeEERO)** • A feasible short to medium-term solution for the implementation of next-generation Emergency Services, benefitting from the capabilities enabled by the IP connectivity. **(NEXES)** • Making emergency response software available through satellite links **(GovSatCom)**
GIS	• Set up the Cluster for Application and Technologies for Earth Observation **(RO-CEO)**

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Area	Topic
Cloud	• A Cloud plug-and-play platform for public entities **(CloudOpting)** • A "Business Process as a Service" Platform, where domain-specific business processes are supported by workflows that optimally match the ICT support for selected process. **(CloudSocket)**
IoT	• Leverage modern Internet of Things technologies in order to radically change the home heating experience for health, comfort, and well-being, with AI component. **(SmartHEAT)** • Infrastructure-to-vehicle telematics communication to exchange specific traffic information **(COOPERS)** • a surveillance and monitoring system provided with unmanned aerial platforms for reducing the effects of the incidents with impact on the critical infrastructures. **(MUROS)** • Deployment of Cooperative ITS services and technologies applied to logistics. **(CO-GISTICS)**
Robotics	• Expansion of the use of AUVs/ROVs and facilitate the creation, planning, and execution of maritime and offshore operations **(SWARMS)** • Development an industrial robot to perform highly accurate operations on medium and large industrial platforms **(MEGAROB, KRAKEN)** • Mechatronics Hardware in the Loop (HIL) and Software in the Loop (SIL) controls, automatization, testing & simulation for an advanced management system of a bio-refinery installation **(BIOCON)**
Mobility	• Advanced mobility services to electric vehicles **(SMARTCEM)**
Logistics	• Architecture for a distributed open system for the exchange of information among key logistics actors, with an automatic data exchange for efficient traffic of vessels along the Danube. **(AEOLIX)** • Reference methodology to correctly estimate CO_2 emission reductions achieved by information and communication technologies (ICT) applied to intelligent transport systems (ITS). **(AMITRAN)**

Horizon Europe synergies

LOOKING FOR: **consortium partners and coordinators** working on **R&D project proposals**

OUR INPUT: **mobile apps**, software integration, innovative **software platforms** Interoperability, **cloud based portals**, including for **IoT and Robotics**, AI modules for developing software functionalities (like **computer vision**, **machine learning**, and **human-machine language interaction**), **GIS**

AREA: **ICT Industry 4.0 functionalities** applicable in **all 5 clusters** under the Second Pillar of **HorizonEU,** and the **EIC** challenges.

THEMES: **Health innovations; Essential generic and digital technologies; Clean, connected mobility; Innovative SMEs, Circular economy**

R&D MISSIONS: Adapting to climate change, including transforming society
Oceans, seas, coastal waters and healthy inland
Smart and climate-neutral cities
Cancer fight and prevention
Soil and food health

Highlights

from our innovation project's portfolio

Pan-European in-vehicle emergency call service "eCall" to 112

HeERO was an in-vehicle emergency call service based on 112, the common European Emergency number. The call is generated either manually by vehicle occupants or automatically via in-vehicle sensors. It establishes a voice connection directly with the relevant Public Safety Answering Point and sends a minimum set of incident data to the operator.

Main objectives:

• Upgrade the infrastructure for interoperability of "eCall" standard at European level;

• Achieve interoperability of the service with the roadmap;

• Extending HeERO 1 to new countries (see map);

• Coordinate pre-deployment pilots.

Consortium: 44 partners from 14 countries**;**

Coordinator: EUROPEAN ROAD TRANSPORT TELEMATICS IMPLEMENTATION COORDINATION ORGANISATION S.C.R.L. (ERTICO-ITS EUROPE), Belgium

Impact:
The HeERO project prepared, carried-out and coordinated 112 eCall pre-deployment pilots at European level taking into account the common European standards defined and approved by the European Standardisation Bodies . HeERO delivered a set of reports on eCall implementation and best practices which will help and accelerate the deployment of the service in the participating Member States and also in the countries not involved in the pilots.

Website: http://www.heero-pilot.eu/view/en/home.html

SMARTCEM - Smart Connected Electro Mobility

The smartCEM project developed information and communication technologies solutions to overcome the current limitations of electric vehicles (EV), by applying advanced mobility services to EV (navigation, efficient driving, trip management, charging station management).

Main objectives:

• Increase the user acceptance of EV by at least 15%;

• Address elements such as business models, legal aspects and privacy;

• Optimization of the energy use in the vehicle and infrastructure;

• Support pan-European interoperability and standardization;

• Testing in Barcelona, San Sebastian, Newcastle, Turin and generalization.

Main result of the project: ICT services which will facilitate vehicle-sharing, public transportation or freight distribution and optimize the performance of Electric Vehicles.

Consortium: 27 partners; **Coordinator**: Clúster de Movilidad y Logística (Spain)

**Website:** http://www.smartcem-project.eu

The all in one manufacturing machine

In the key enabling technologies area, our previous expertise was involved in the **MEGAROB** and **KRAKEN** continuation projects aimed at integrating manufacturing technologies for the development of the most accurate and largest subtractive and additive devices in the world, by developing a disruptive hybrid manufacturing concept that can equip SMEs and large industries with affordable all-in-one machines for custom design, production / repair and quality control of functional parts (made of aluminum, heat-resistant or combined materials from 0.1m to 20m) by deploying new subtractive and additive technologies, in large workspaces without requiring designated utility space. Our companies lead the overall software development, and showcased the development and integration of high-level software programs.

Main objectives:

• Development of a high level control system with a specific accuracy correction algorithm, a dedicated Computer Aided Manufacturing, an alignment and centering algorithm and a virtual simulation environment;

• Performing milling, drilling, deburring, grinding, polishing, screwing, welding, painting;

• Applications in industrial sectors: aeronautics, marine, renewable energy, construction and civil engineering.

RESIN ADDITIVE MANUFACTURING

METAL ADDITIVE MANUFACTURING

SUBTRACTIVE MANUFACTURING
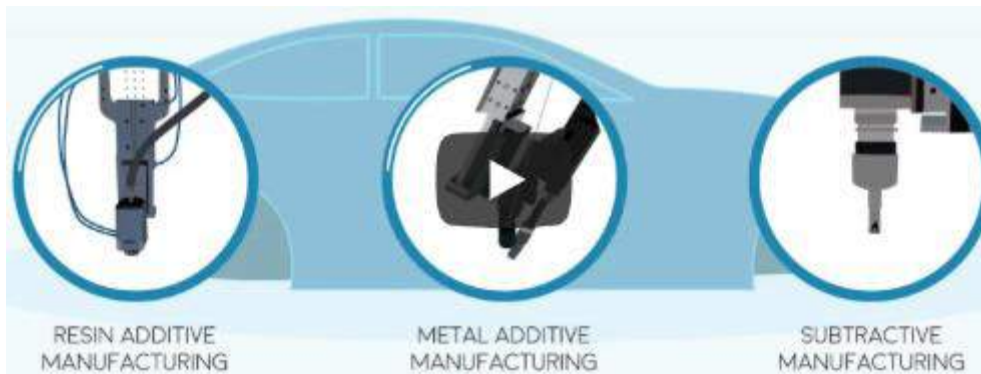
Consortium: 8 partners
Coordinator: Fundacion AITIIP (Spain)

hthttp://www.megarob.eu; https://krakenproject.eu/

Smart and Networking Underwater Robots in Cooperation Meshes

SWARMs project which designed, developed, and implemented a new generation of integrated platforms to facilitate networked AUV / ROV cooperation, to increase autonomy in the context of complex, numerous industrial activities, especially assistance in the maintenance and upkeep of underwater construction systems.

Our companies had a leading role in SWARMs, being involved with validating the entire system architecture and software communication protocol, and, as end-user, we had our own small underwater robot in a group of submarines, commissioned to achieve common tasks in a semi-autonomous way (individual activity supervised by an operator).

SWARMs 1st set of demonstrations (video)
Black Sea, Mangalia, Romania, 03-12 July 2017

VARMS///

Cooperative Logistics for Sustainable Mobility of Goods (Co-Gistics)

CO-GISTICS targeted an effective increase of energy efficiency and a more sustainable mobility of goods through the deployment of Cooperative ITS services and technologies applied to logistics.

Main objectives:

• Deployment of cooperative intelligent transport systems (C-ITS) applied to logistics;
• Intelligent parking and delivery areas;
• Multimodal cargo;
• CO2 emission estimation and monitoring;
• Priority and Speed advice, Eco-drive support;
• Testing in Arad, Bilbao, Bordeaux, Frankfurt, Thessaloniki, Trieste, Vigo.

Consortium: 31 partners;
Leader: EUROPEAN ROAD
TRANSPORT TELEMATICS
IMPLEMENTATION
COORDINATION
ORGANISATION S.C.R.L.
(ERTICO-ITS EUROPE),
Belgium

Website: http://cogistics.eu

NEXES - next generation emergency system

NEXES is a next generation emergency system bringing:

- **Enhanced communication and end-to-end connectivity between citizens and emergency services**, empowering citizens to reach emergency authorities (e.g., PSAP operators, EROs and FRs) by total conversation calls, using VoIP, real-time text (RTT) and/or videos, giving citizens a choice of best-suited communication channels to reach emergency services, while providing PSAPs a spectrum of additional contextual information.

- **Improved interoperability among emergency services**, creating a common emergency service IP-network to connect several PSAPs, but also EROs and FRs, with redundancy and interoperability features.

To fulfill the delivery of next generation emergency services, NEXES builds upon already identified pressing end-users needs, requirements and ambitions, relevant standards and protocols and existing open source IP-based communications technologies and interoperability solutions.

NEXES integrates systems and Apps developed in-house by NEXES partners (already market available), aligned with the creation of IP- enabled emergency services, and prepares a Validation Framework (including an open testbed) available to third parties, benefitting the emergency services community.

Consortium: 17 partners**; Coordinator:** RINICOM Limited (UK)

Website: http://nexes.eu/

Assessment Methodologies for ICT in Multimodal Transport from User Behavior to CO2 Reduction (AMITRAN)

The Amitran project developed a reference methodology to correctly estimate CO_2 emission reductions achieved by information and communication technologies (ICT) applied to intelligent transport systems (ITS).

Main objectives:

• Developed a CO_2 assessment methodology for the entire effects chain (from user behavior to CO_2 production);

• Designed open interfaces for models and simulation tools;

• Produced an online knowledge base.

Smart, secure and user friendly heating monitoring and control for elderly people

The SmartHeat project proposed to leverage on modern Internet of Things technologies in order to radically change the home heating experience for health, comfort and well being of elderly people, focused on:

- Development of a smart, secure and elderly friendly system for heating monitoring and control
- Development of smartTRV technology, a smart version of the current eTRVs
- Use of a set of technologies capable of understanding the environment and the user needs

- **Smart algorithm**
    - The main decision module of the project
    - Uses Machine Learning algorithms to learn the user's behavior and preferences and automatically adjust the temperature according to them
    - Models the room occupancy schedule and the room's reaction to heating

- **Mobile application**
    - Provides the users with an easy-to-use method to monitor and interact with the system
    - Graphical interface designed with elderly users in mind
    - Allows users or caretakers to control the heating system remotely

Design and implementation of a low cost smart system for pre-diagnosis and telecare for infectious diseases in elderly people

The SPIDEP project is a framework meant to support early diagnosis of infectious diseases, by implementing a smart telecare solution. The system includes an inference system built upon Machine Learning to improve diagnosis and prevention of diseases and is capable of running in isolated areas, with the objectives to:

- Build an end to end platform which uses biometric sensors for telecare capable of properly functioning in isolated areas
- Develop a big database of clinical data obtained by patient telecare and an intelligent platform for the automatic early detection of infectious diseases which will assist the medical personnel in their decision process

Web interface
- Provides the interface between the medical personnel and the system
- Connects with the decision component and provides disease detection alarms and interaction methods with the smart algorithms
- Provides data visualizations which help the medical personnel get a clear overview of the situation

Mobile application
- Provides the interface between system and patients / caretakers
- Capable of connecting with a wide range of biometric sensors
- Designed with security and performance in mind

SPIDEP

Situated Adaptive Guidance for the Mobile Elderly (MobileSage)

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MobileSage provided elderly people with context-sensitive, personalized and location-sensitive ICT tools which allow them to carry out and solve everyday tasks.

Main objectives:

• Providing elderly people with help-on-demand services by a personal agent on the smartphone;

• Help can be provided both in the home environment and on travel;

• Providing adaptive and contextual software;

• Nominated at AAL Award 2013.

Work with no stress about the stress (StayActive)

The idea of StayActive project was to provide older adults with a personalized tool which can monitor some of their biological signals and recommend various relaxation activities "just-in-time" (take a break, listen music, read a book, play a relaxation game).

Main objectives:

• Develop a mobile platform that records the context and the activity of the user and detect stress patterns;

• Monitoring the skin temperature, hear rate, breath rate, Galvanic skin response and blood pressure under real conditions;

• Providing just-in-time recommendations for reducing stress.

An interoperable platform for self-care, social networking and managing of daily activities at home (HEREiAM)

The Hereiam project developed an integrated, smart platform enabling elderly people to have access to a number of services and information directly from their TV set at home.

Main objectives:

• Provide an integrated system of communication for elderly;

• Develop an interoperable platform for self care and social networking;

• Managing of daily activities at home and improved quality of life;

• Testing in Netherlands and Italy.

HEREiAM

Self-management of physical and mental fitness of older workers (Fit4Work)

The aim of the project was to develop an innovative easy-to-use and unobtrusive system that will support older workers and the relevant stakeholders in reducing and managing physical and mental stress resulting from their occupation.

Main objectives:

• Develop an innovative system capable of detecting, monitoring and countering physical and psychological stress related to occupation of older adults;

• Use of 3D motion sensing, wearable wellness sensors, ambient sensors, mobile devices, AAL middleware and cloud services to provide personalized recommendations through intuitive virtual reality based user applications;

• Develop a light-weight coupling of non-distracting devices with a smartphone equipped with a 3D motion sensor and a watch-like wellness sensor;

•Testing in Netherlands and Poland.

Fit4Work

The data sharing network for logistics

The consortium ambition led to the development of a **state of the art architecture for a distributed open system for exchange of information among key logistics actors** (commercial companies as well as relevant authorities), enabling increased use and impact of such information in the value chain.

The AEOLIX Platform represents a critical way forward of supply chain visibility and interoperability through decentralized information sharing. AEOLIX cloud services provide connectivity to multi-actor data and in-house or cloud-based applications, processes and services, thus enhancing collaboration and interoperability, potentially across the entire transport and logistics sector.

AEOLIX services through its dashboards offers cross supply chain visibility in a number of living labs, which were built with the aim of testing new business models in all 9 transport corridors of Europe.

Particularly in Living Lab Danube, aimed at facilitating the automatic exchange of information for an efficient circulation of vessels along the Danube, AEOLIX offers economic benefits as an alternative to the existing business practices.

The Danube Living Lab, lead by our company, has researched innovative collaboration methods to accelerate operations and reduce administrative costs, and to increase the operational efficiency of the use of inland water, specifically by designing, developing and testing a more competitive information system to enhance the Users' logistics performance.
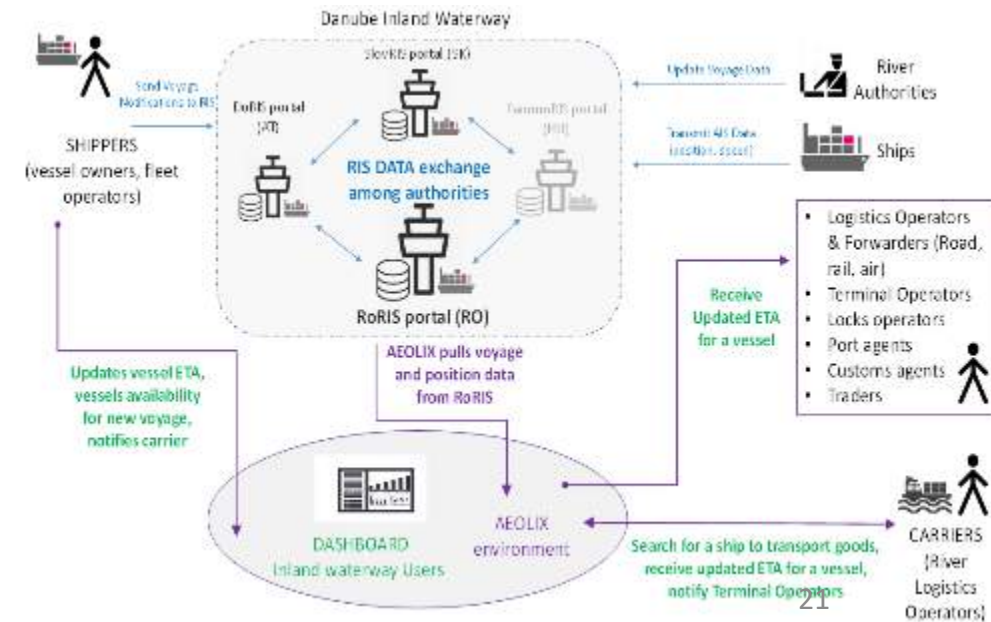
Building a network of expertise

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