



# Horizon 2020

## New Robotics Projects 2021



EUROPEAN  
ROBOTICS  
FORUM

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# New Robotics Projects 2021

Co-funded by the Horizon 2020 Framework  
Programme of the European Union

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## INTRODUCTION

We are proud to announce the 24 new robotics projects launched in January 2021. These new Horizon 2020 projects work on robotics in application areas. They have been selected from various call topics:

### [ICT-46-2020: Robotics in Application Areas and Coordination and Support](#)

The selected Research and Innovation Actions (RIA) focus on Robotics Core Technology – important components that contribute to increasing the autonomy of robotics systems, key to making them useful in many applications. In addition, a set of Innovation Actions (IA) will set up large-scale pilots capable of demonstrating the use of robotics at scale in actual or highly realistic operating environments and showing high levels of socio-economic impact in the sectors of agri-food and agile production, which were prioritised in this call. Finally, one Coordination and Support Action (CSA) will work to support the adoption of robotics, to raise public awareness and understanding of robotics and to address major non-technical roadblocks to the widespread adoption of robotics in Europe, such as legal, ethical, socio-economic, cyber-security, data protection and privacy issues.

### [ICT-47-2020: Research and Innovation boosting promising robotics applications](#)

The Research and Innovation Actions are aimed at increasing the physical intelligence of robots in order to boost promising robotic applications with high socio-economic impact and a small environmental footprint.

### [DT-ICT-12-2020: AI for the smart hospital of the future](#)

The large scale pilots developed in the selected projects are expected to pave the way for the transition towards significantly improved healthcare in Europe. The objective of these projects is to demonstrate the added value of AI and robotics in such a critical sector for our society through their successful integration in existing health and care facilities, such as hospitals, primary care centres and care homes.

Overall, all these projects will not only have an impact in the chosen application sectors, or within these projects, but they are expected to advance the field of robotics in Europe even after they have finished.

The projects are all working to improve the society we live in by tackling very important technological or application-driven challenges, as prioritised in the strategy developed by SPARC, the Public-Private Partnership for Robotics in Europe (see the Strategic Research Agenda).

We look forward to following these new projects and accompanying them on the road to success in order to make the promised potential of AI and robotics real for the European society and economy.

**Juha Heikkilä**, Head of Unit  
**Cécile Huet**, Deputy Head of Unit  
*Robotics and Artificial Intelligence  
 Innovation and Excellence*

## **ICT-46-2020: RESEARCH AND INNOVATION ACTIONS (RIA) - ROBOTICS CORE TECHNOLOGY**



## PARTNERS

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<https://www.uniroma3.it/>

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<https://www.kth.se/en>

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<https://www.uniroma1.it/>

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e del Lazio Meridionale**  
<https://www.unicas.it/>

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<https://www.dti.dk/>

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<https://pale.blue/>

**PAL Robotics SL**  
<https://pal-robotics.com/>

**AGRIMESSINA Srl**  
<https://www.agrimessina.it/>

**Romana Servizi Amministrativi Srl**  
<https://www.rsaservizi.eu>

## COORDINATOR:

**Andrea Gasparri**  
[gasparri@inf.uniroma3.it](mailto:gasparri@inf.uniroma3.it)

**PROJECT WEB-SITE:**  
<https://canopies-project.eu/>

[@CanopiesProject](#)

Facebook: Robotics4EU

# CANOPIES

*A Collaborative Paradigm for Human  
Workers and Multi-Robot Teams in  
Precision Agriculture Systems*

Call *H2020-ICT-46-2020*  
 Duration *1 January 2021 – 31 December 2024*  
 Project ID *10106906*

## OBJECTIVES

Since the beginning of the 20th century, numerous attempts have been made to commercialize the work of agriculture and increase productivity. While manpower is a central element of any agricultural activity, the development of efficient data-driven technological solutions based on Robotics and Artificial Intelligence is key for the sustainable agriculture in the future. In this context, the EU-funded CANOPIES project across four years will explore a novel paradigm of human-robot collaboration in the field, facing the concrete test case of the harvesting and pruning operations in table-grape vineyards. The project will demonstrate how a team of heterogeneous robots, some with robotics arms, others with carrying capabilities, will operate in collaboration with farm workers, opening new perspectives on farm and crop management.



## EXPECTED IMPACT

The expected impact of CANOPIES project focuses on:

- From a scientific standpoint we will develop novel human-robot interaction methodologies for enhanced safety and coexistence; novel human-robot collaboration methodologies for increased system adaptability and intuitive usability; and novel multi-robot coordination methodologies for improved scalability.
- From a technological standpoint we will develop novel heterogeneous robotic platforms for an effective interaction with farmworkers to mitigate the greater complexity of permanent crops as compared with field crops.
- From a societal standpoint we will promote a new concept of farming to render the agri-food sector appealing for young generations by supporting a better education for interacting with cutting-edge technological solutions, and by ensuring a higher profit through the deployment of the proposed integrated system.



## PARTNERS

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www.oru.se

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www.tum.de

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www.unipi.it

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www.epfl.ch

**University of Lincoln**  
www.lincoln.ac.uk

**ACT Operations Research IT SRL**  
www.act-operationsresearch.com

## COORDINATOR:

**Dr. Achim J. Lilienthal**  
achim.lilienthal@oru.se

**PROJECT WEB-SITE:**  
<https://darko-project.eu>  
@darko\_project

## DARKO

**DYNAMIC AGILE PRODUCTION  
ROBOTS THAT LEARN AND OPTIMISE  
KNOWLEDGE AND OPERATIONS**

Call H2020-ICT-2018-20  
Duration 1 January 2021 – 31 December 2024  
Project ID 101017274

## OBJECTIVES

- **O1: Time/energy efficient manipulation** through pick & place in motion and throwing objects with inherently elastic manipulators and flexible end-effectors.
- **O2: Efficiency and safety in human-robot coproduction** through human motion prediction, learning and exploiting activity patterns, mutual communication of intent and risk-aware planning.
- **O3: Efficient deployment** through failure-aware and failure-resilient mapping and localisation, semantic mapping and information transfer from heterogeneous map priors.
- **O4: Risk-aware operation for safety and efficiency** by principled, local and global risk assessment through predictive models that account explicitly for risk probabilities.

## EXPECTED IMPACT

### I1: Improved technical capabilities

E.g.: AI-enabled 3D perception and scene understanding and dynamic manipulation capabilities for agile production, health care, agri-food, etc.

### I2: Demonstration of applications in logistics and agile production at TRL6

Integration and demonstration of DARKO in realistic settings: at a BSH (Bosch Siemens Home Appliances) warehouse and a permanent demonstrator at ARENA2036 (Stuttgart).

### I3: Lowering of technical barriers within logistics and agile production

Particularly: greater dependability, higher efficiency, increased safety in dynamic environments, planning considering predictions of people and other dynamics and risks.







## PARTNERS

**INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS**

[www.iccs.gr](http://www.iccs.gr)

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[www.crf.it](http://www.crf.it)

**UNIVERSITY OF APPLIED SCIENCES  
UPPER AUSTRIA**

[www.fh-ooe.at](http://www.fh-ooe.at)

**AEGIS IT RESEARCH GMBH**

[aegisresearch.eu](http://aegisresearch.eu)

**LEIBNITZ RESEARCH CENTRE FOR  
WORKING ENVIRONMENT AND  
HUMAN FACTORS**

[www.ifado.de/ifadoen](http://www.ifado.de/ifadoen)

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TECHNOLOGY-HELLAS**

[www.forth.gr](http://www.forth.gr)

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[www.cal-tek.eu](http://www.cal-tek.eu)

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[www.tu-darmstadt.de](http://www.tu-darmstadt.de)

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[www.unisa.it](http://www.unisa.it)

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MATERIAL FLOW AND LOGISTICS**

[www.iml.fraunhofer.de](http://www.iml.fraunhofer.de)

**ACC ACCREA BARTLOMIEJ STANCZYK**

[engineering.accrea.com](http://engineering.accrea.com)

**PROFACTOR GMBH**

[www.profactor.at](http://www.profactor.at)

**EUNOMIA LIMITED**

[www.eunomia.services](http://www.eunomia.services)

## COORDINATOR:

**Prof. Maria Pateraki**

[info@felice-project.eu](mailto:info@felice-project.eu)

**PROJECT WEB-SITE:**

[www.felice-project.eu](http://www.felice-project.eu)

[@FeliceH2020](https://twitter.com/FeliceH2020)

## FELICE

**FLEXIBLE ASSEMBLY MANUFACTURING  
WITH HUMAN-ROBOT COLLABORATION  
AND DIGITAL TWIN MODELS**

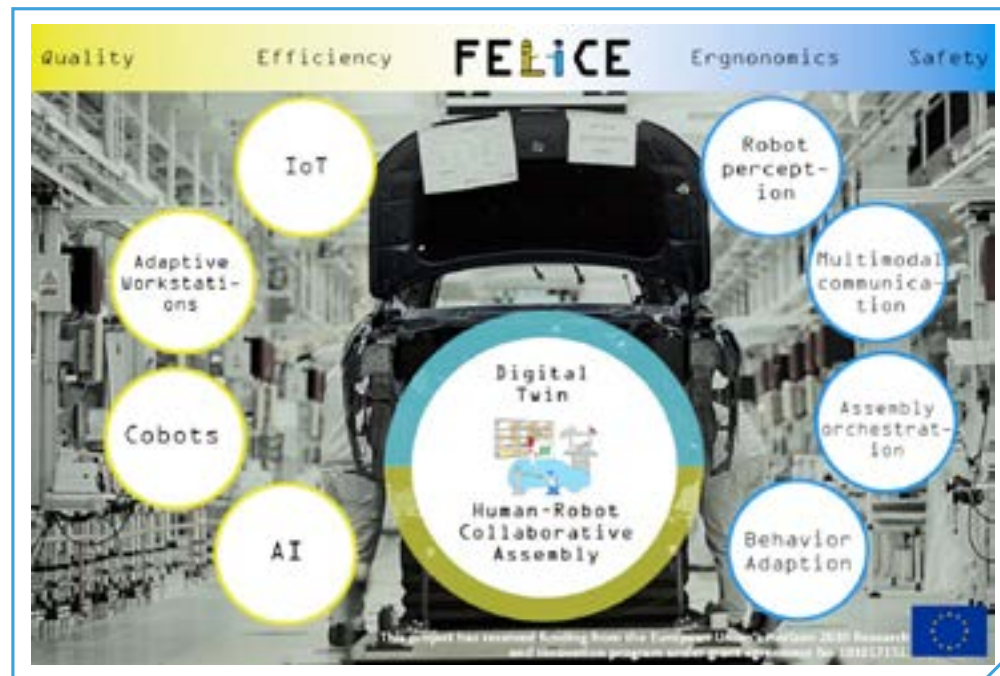
Call *H2020-ICT-46-2020*

Duration *1 January 2021 – 30 June 2024*

Project ID *101017151*

## OBJECTIVES

FELICE aspires to design the next generation assembly processes required to address urgent needs in manufacturing. It unites multidisciplinary research in robotics, AI, computer vision, data analytics, process optimization and ergonomics to deliver a modular platform capable to integrate and harmonize an array of autonomous and cognitive technologies aiming to increase the agility and productivity of an assembly production system and also ensure the safety and physical and mental well-being of human workers. To achieve these goals, technologies will be developed combining the accuracy and endurance of robots with the cognitive ability and flexibility of humans. Such flexible and configurable technologies will support future manufacturing assembly floors to become agile, and address Industry 4.0 adaptation.



## EXPECTED IMPACT

FELICE will set a new paradigm in industrial assembly lines, with lower costs, improved flexibility and agility utilizing a single mobile platform that supports on demand different workstations and tasks. It is human-centric and will ensure the security and privacy of the used data. Individual workers and company will mutually benefit, because FELICE will directly link their needs and encounter the unconstrained and unpredictable human behaviour. Its innovations will increase the workers' life-quality and work-ability, address healthy and safe work environments and decrease automation bias using multimodal guidance, risk prediction and notification. Its impact extends to most human-robot collaboration applications.



## PARTNERS

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<https://asl.ethz.ch>

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<http://www.alonsomora.com>

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UNIVERSITÄT BONN**  
<https://www.ipb.uni-bonn.de>

**UNIVERSITY OF EDINBURGH**  
<https://www.edinburgh-robotics.org>

**UNIVERSITY OF TWENTE**  
<https://www.utwente.nl/en/eemcs/hmi>

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<https://www.karolinska.se>

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<http://www.en.usz.ch>

**ABB AB**  
<https://global.abb/group>

**IDMIND**  
<https://www.idmind.pt>

## COORDINATOR:

**Roland Siegwart**  
[rsiegwart@ethz.ch](mailto:rsiegwart@ethz.ch)  
**PROJECT WEB-SITE:**  
[www.harmony-eu.org](http://www.harmony-eu.org)  
@eu\_harmony

# HARMONY

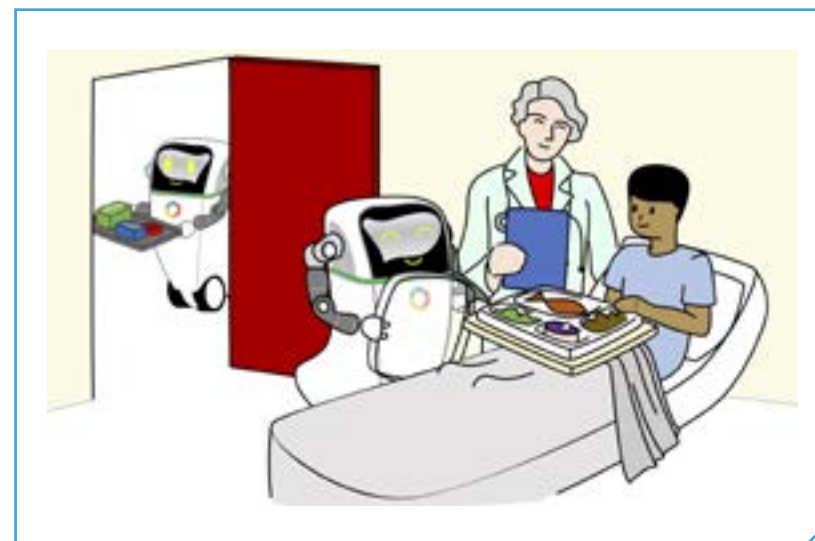
**ENHANCING HEALTHCARE WITH  
ASSISTIVE ROBOTIC MOBILE  
MANIPULATION**

Call *H2020-ICT-46-2020*  
Duration *11 January 2021 – 30 June 2024*  
Project ID *101017008*

## OBJECTIVES

The vision of Harmony is to enable robust, flexible and safe autonomous mobile manipulation technology for use in human-centred environments. Our objectives make fundamental contributions to existing cognitive mechatronic technologies:

- Formalise an object-based world representation
- Develop robotic localisation and mapping for an object-based environment
- Provide adaptive, congestion-free motion plans in human-centred spaces
- Learning grasping and manipulation from demonstration via an immersive control interface
- Develop robust and compliant whole-body motion planning and control for interacting with unknown objects
- Deliver safety and acceptability recommendations for the use of mobile manipulators in human-centred environments.



## EXPECTED IMPACT

**IMPACT 1:** Harmony mobile manipulation technologies will allow service robots to integrate seamlessly into human-centred environments such as in hospitals, where they can expand our existing healthcare capacity.

**IMPACT 2:** Advanced fundamental robotic capabilities (scalable representations, robust grasping, motion planning under uncertainty, safety around humans, etc.) directly meet growing needs in all sectors, e.g., healthcare, agile manufacturing, agri-foods, as well as industrial inspection and maintenance.

**IMPACT 3:** Beyond providing flexible and user-friendly automation, Harmony will bridge the gap in existing industry standards to cover mobile manipulators. This will clarify technology certification requirements and remove existing barriers to expand the use of assistive robots, increase industry uptake and ultimately strengthen Europe's competitiveness in the co-bot market.





## PARTNERS

### Aero41

[www.aero41.ch](http://www.aero41.ch)

### ATB

[www.atb-bremen.de](http://www.atb-bremen.de)

### AVL

[www.avl.com](http://www.avl.com)

### Bonn-Rhein-Sieg University

[www.h-brs.de](http://www.h-brs.de)

### Cyprus Civil Defence

[www.civildefence.com.cy](http://www.civildefence.com.cy)

### Domaine Kox

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### Fraunhofer IESE

[www.iese.fraunhofer.de](http://www.iese.fraunhofer.de)

### KIOS

[www.kios.ucy.ac.cy](http://www.kios.ucy.ac.cy)

### KUKA Assembly & Test

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### Locomotec

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### Luxsense

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### The Open Group

[www.opengroup.org](http://www.opengroup.org)

### Technology Transfer Systems

[www.ttsnetwork.net](http://www.ttsnetwork.net)

### University of Hull

[www.hull.ac.uk](http://www.hull.ac.uk)

### University of Luxembourg

[www.uni.lu](http://www.uni.lu)

### University of York

[www.cs.york.ac.uk](http://www.cs.york.ac.uk)

## COORDINATOR:

### Scott Hansen

[s.hansen@opengroup.org](mailto:s.hansen@opengroup.org)

### PROJECT WEB-SITE:

[www.sesame-project.org](http://www.sesame-project.org)

# SESAME

## SECURE AND SAFE MULTI-ROBOT SYSTEMS

Call H2020-ICT-2020-2

Duration 1 January 2021 – 31 December 2023

Project ID 101017258

## OBJECTIVES

SESAME is developing an open, modular, configurable, model-based approach for the systematic engineering of dependable multi-robot systems. The innovative technologies will enable the development of multi-robot systems capable of operating dependably in open configurations, and in conditions of uncertainty that include the potential of cyber-attacks.



## EXPECTED IMPACT

SESAME will deliver to European industries substantial improvements for multi-robot systems in the following areas:

- Accuracy – improved robot self-localization accuracy using collaborative sensor-fusion combining data from multiple sensors from multiple robots
- Robustness – collaborative intelligence algorithms will enable a robotic team to cope with more severe failures
- Efficiency – novel perception-aware trajectory planning will reduce time required for multi-robot task execution
- Safety – improved coverage of hazards, especially those related to emergent behaviour and uncertainty
- Security – increased coverage of cyber

risks and extended scope of robotics security assurance

- Adaptability – multi-robot systems will be able to adapt to observed conditions at runtime providing substantial performance gains
- Quality – intelligent testing of the operational design quickly uncovers corner cases that could violate safety or security requirements

Multi-robot systems will provide innovative solutions for a wide range of industrial challenges and SESAME will lower the development costs and deliver greater assurance of the safety, security and dependability of multi-robot systems.



## PARTNERS

**BioLAGO e.V. (Germany)**

[www.biolago.org](http://www.biolago.org)

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[www.tecnalia.com](http://www.tecnalia.com)

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[www.cea.fr](http://www.cea.fr)

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[www.tuwien.ac.at](http://www.tuwien.ac.at)

**Uni Bremen (Germany)**

[www.ai.uni-bremen.de](http://www.ai.uni-bremen.de)

**ASTECH Projects (England)**

[www.astechprojects.co.uk](http://www.astechprojects.co.uk)

**INVITE GmbH (Germany)**

[www.invite-research.com](http://www.invite-research.com)

## COORDINATOR:

**Maike Neumann, BioLAGO e.V.**

[Maike.neumann@biolago.org](mailto:Maike.neumann@biolago.org)

**PROJECT WEB-SITE:**

*website under construction*

 [@eu\\_harmony](#)

# TRACEBOT

**TRACEABLE ROBOTIC HANDLING OF  
STERILE MEDICAL PRODUCTS**

Call *H2020-ICT-46-2020*

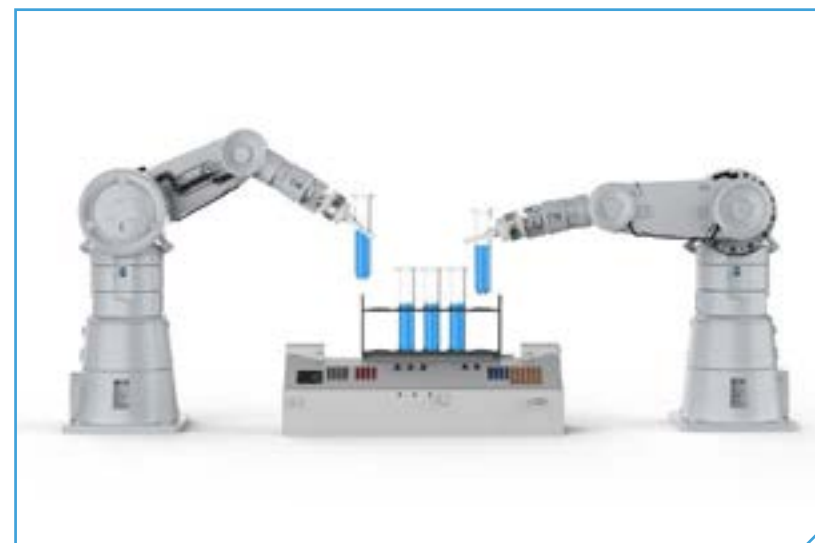
Duration *11 January 2021 – 30 June 2024*

Project ID *101017008*

## OBJECTIVES

Creating new healthcare products requires testing huge numbers of samples. Today manual procedures dominate, since regulations require understanding of the execution of each process step and systematic checking to verify task completion. Unfortunately, this traceability is not yet fully provided by actual robotic systems so that robot cannot comply with regulations in place, and cannot yet be trusted to perform life-critical tasks such as assembling and testing medical devices on their own. Verification has to be performed outside the robotics system by additional sensors resulting in additional complexity.”

To fill this gap, TraceBot aims at developing a generic, safe and efficient robotic solution proposing traceable manipulation actions, handling medical products and checking every assembly step for creating the required audit trail, producing safe and failure-resistant operations, and coping with safety critical laboratory automation environments.



## EXPECTED IMPACT

To maximise impact, TraceBot has adopted sterility testing as use case, a key process in the distribution of medical products. The industries are highly competitive and innovative, being a major sector for the EU, turning over €1000bn/year and providing 10 million jobs. Automation is needed to reduce cost, to improve the quality of production and working conditions. The capability to verify and trace robot actions would overcome a barrier in medical industries. We also expect this use-case to turn into a showcase of advanced robotic technologies, such as perception, manipulation

and reasoning, enabling stakeholders to envision such systems into other regulated manipulation processes they are relying on.

## **ICT-46-2020: INNOVATION ACTIONS (IA) - ROBOTICS FOR AGRI-FOOD, AND AGILE PRODUCTION**



## PARTNERS

**Berner Fachhochschule**

<https://www.bfh.ch>

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<https://www.biba.uni-bremen.de>

**Mr. NeC B.V.**

<https://www.mr-nec.nl>

**Fundacion AITIIP**

<https://www.aitip.com/en>

**Universidad de Deusto. Departamento de Tecnologías Informáticas, Electrónicas y de la Comunicación**

<https://deustotech.deusto.es>

**Pôle EMC2**

<https://www.pole-emc2.fr>

**Cabka Group GmbH**

<https://cabka-ips.com>

**IKOR**

<https://ikor.es/es>

**SIGMA Clermont**

<https://www.sigma-clermont.fr>

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<https://imr.ie>

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**Industrial S.L**

<https://nutai.com>

**Steripack**

<https://steripackgroup.com>

**STAM**

<https://www.stamtech.com>

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<https://www.icpe.ro>

**Vicomtech**

<https://www.vicomtech.org/en>

**MOSES**

<https://mosesproductos.com>

**Prizztech LTD**

<https://www.prizztech.fi>

## COORDINATOR:

**Prof. Dr. Norman Urs Baier**

[norman.baier@bfh.ch](mailto:norman.baier@bfh.ch)

## PROJECT WEB-SITE:

[www.acrobaproject.eu](http://www.acrobaproject.eu)

[@ AcrobaProject](#)

# ACROBA

**AI-DRIVEN COGNITIVE ROBOTIC  
PLATFORM FOR AGILE PRODUCTION  
ENVIRONNEMENTS**

Call **HH2020-ICT-46-2020**

Duration **1 January 2021 – 31 June 2024**

Project ID **101017284**

## OBJECTIVES

As modern industrial robotic systems become smarter and more flexible, utilising them in lower-scale industrial environments is increasingly becoming a viable option. Generally, industrial robotics is tailored towards specific, large-scale operations, making its implementation too complex and costly for smaller operators. The EU-funded ACROBA project aims to develop a groundbreaking concept of scalable cognitive robotics platforms to revolutionise industrial production. It will achieve this through the use of cutting-edge technology and the application of agile manufacturing principles.



## EXPECTED IMPACT

The expected strategic impact of ACROBA project focuses in:

- IMPACT 1: Improve competitiveness by the improvement and standardisation of advanced robotic solutions and make it accessible to SMEs.
- IMPACT 2: Reduce management & installation costs of industrial robotics solutions
- IMPACT 3: Enhance hardware & software efficiency in cognitive robotics for different production use-cases



## PARTNERS

**UNIVERSITEIT MAASTRICHT**  
[www.maastrichtuniversity.nl](http://www.maastrichtuniversity.nl)

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 TECHNOLOGIKIS ANAPTYXIS**  
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[www.entocycle.com](http://www.entocycle.com)

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[www.invertapro.com](http://www.invertapro.com)

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[www.fieldlabrobotics.com](http://www.fieldlabrobotics.com)

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[www.foodscalehub.com](http://www.foodscalehub.com)

**AgriFood Lithuania DIH**  
[www.agrifood.lt](http://www.agrifood.lt)

## COROSECT

**COGNITIVE ROBOTIC SYSTEM FOR  
 DIGITALIZED AND NETWORKED  
 (AUTOMATED) INSECT FARMS**

Call *H2020-ICT-46-2020*  
 Duration *1 January 2021 – 31 December 2023*  
 Project ID *101016953*

## OBJECTIVES

- Secure sustainable, environmentally friendly food for humans and animals
- Bring new insights to automated insect farming, allowing for a sustainable growth and automation of insect farms
- Develop novel digitalized integrated robotic solutions based on the Reference Architecture Model Industry 4.0
- Create an advanced safe collaboration environment, where humans and robots harmoniously share and undertake processing and manipulation tasks
- Advance AI-based cognitive perception at different phases of the life cycle of the insect farming process
- Develop cognitive robots with sophisticated capabilities for robotic actions planning and control

**CENTRO INTERNAZIONALE DI ALTISTUDI  
 AGRONOMICI MEDITERRANEI**  
[www.iamb.it](http://www.iamb.it)

## COORDINATOR:

**Dr. Rico Mockel**  
[rico.mockel@maastrichtuniversity.nl](mailto:rico.mockel@maastrichtuniversity.nl)

**PROJECT WEB-SITE:**

[www.corosect.eu](http://www.corosect.eu)

[@CoRoSect](https://twitter.com/CoRoSect)



## EXPECTED IMPACT

CoRoSect makes a vital contribution to securing a sustainable, environmentally friendly food production for humans and animals from insects at large scale and in an automated way.

Thereby CoRoSect has the potential to reduce the risk of international conflicts, to help protecting the environment, and to protect and increase the quality of life of many people.

By producing food from insects, greenhouse gas emission and organic waste will be reduced, while land and water are used more efficiently.

CoRoSect will advance the state-of-the-art in robotics, artificial intelligence, and digitalization for industry and agriculture thereby improving working conditions of workers.





## PARTNERS

### PROFACTOR GMBH

<http://www.profactor.at>

### IT+ROBOTICS SRL

<https://www.it-robotics.it/en/>

### ABELE INGENIEURE GMBH

<https://www.abele-ingenieure.com/en/>

### UNIVERSITÀ DEGLI STUDI DI PADOVA

<http://robotics.dei.unipd.it/>

### DEUTSCHES ZENTRUM FÜR LUFT

– UND RAUMFAHRT EV

<https://www.dlr.de/zlp/en/>

### BALTICO GMBH

<http://www.baltico.eu/en/home.html>

### DALLARA AUTOMOBILI SPA

<https://www.dallara.it/en>

### AALBORG UNIVERSITEIT

<https://www.hri.tech.aau.dk/>

### CONSIGLIO NAZIONALE DELLE RICERCHE

<https://www.stiima.cnr.it/en/>

## COORDINATOR:

Dr. Christian EITZINGER

[Christian.eitzinger@profactor.at](mailto:Christian.eitzinger@profactor.at)

## PROJECT WEB-SITE:

[www.drapebot.eu](http://www.drapebot.eu)

# DRAPEBOT

## COLLABORATIVE DRAPING OF CARBON FIBER PARTS

Call H2020-ICT-46-2020

Duration 1 January 2021 – 31 December 2024

Project ID 101006732

## OBJECTIVES

Draping is the process of placing soft and flexible patches of textile material (in this case carbon or glass fibre fabric) on a 3D shape during the manufacturing of composite parts. 30% of aerospace composite parts are still produced through draping, while many automotive and almost all marine structures are made this way. The DRAPEBOT project will develop human-robot collaboration methods to enable draping processes that currently cannot be automated. It will focus on AI methods and real-time behaviour to enhance the efficiency of the process through sensor feedback.



## EXPECTED IMPACT

The DRAPEBOT project will develop an efficient human-robot collaboration scheme that creates a potential for about 20.000 robotic installations in the aerospace, automotive and boatbuilding industry as well as in a large number of composite part manufacturers in Europe. With its particular focus on efficiency and increased productivity it will reduce manufacturing costs by 30% to 50% and enable the application of robotics in new applications.

At a higher level DRAPEBOT will have an impact on human-robot collaboration in general as it will demonstrate how a collaborative approach can achieve a substantial productivity improvement over human-only or robot-only schemes.



## PARTNERS

**ATOS IT SOLUTIONS AND SERVICES IBERIA SL**

<https://www.atos.net>

**CENTRE FOR EUROPEAN POLICY STUDIES**

<https://www.ceps.eu>

**SERESCO SA**

<https://seresco.es>

**AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS**

<https://www.csic.es>

**BODEGAS TERRAS GAUDA SA**

<https://www.terrasgauda.com>

**WAGENINGEN UNIVERSITY**

<https://www.wur.nl>

**TEKNOLOGIAN TUTKIMUSKESKUS VTT OY**

<https://www.vttresearch.com>

**BIOSENSE INSTITUTE - RESEARCH AND DEVELOPMENT INSTITUTE FOR INFORMATION TECHNOLOGIES IN BIOSYSTEMS**

<https://biosens.it/>

**UAB ART21**

<https://www.art21.lt/>

**LUONNONVARAKESKUS**

<https://www.luke.fi/>

**MTECH DIGITAL SOLUTIONS OY**

<https://www.mtech.fi/>

**PROBOT OY**

<https://probot.fi/>

**INTERNATIONAL DATA SPACES EV**

<https://internationaldataspaces.org/>

**AGROSMART SIA**

<https://www.agrosmart.lt/>

**AgriFood Lithuania DIH**

<https://www.agrifood.lt/>

**COMPANY FOR TRADE AND SERVICES IN AGRICULTURE, ZELEN HIT DOO BEOGRAD (NOVI BEOGRAD)**

<https://zelenihit.rs/>

## FLEXIGROBOTS

**FLEXIBLE ROBOTS FOR INTELLIGENT AUTOMATION OF PRECISION AGRICULTURE OPERATIONS**

Call [H2020: ICT-10-2019-2020](https://www.flexigro-bots-h2020.eu/)

Duration [1 December 2019](https://www.flexigro-bots-h2020.eu/)

[>30 November 2023](https://www.flexigro-bots-h2020.eu/)

Project ID [871237](https://www.flexigro-bots-h2020.eu/)

## OBJECTIVES

FlexiGroBots goal is to make multi-robot systems cost-effective by i) employing multiple heterogeneous versatile (e.g. multi-task) robots, ii) which collaborate to accomplish complex missions; iii) ensuring scalable human oversight and intervention through adaptive mission control mechanisms (i.e. without information overload and/or an overwhelming effort for the farm operator); and iv) enabling an agricultural data economy for farmers to profit directly, by selling operational data gathered in their fields, and indirectly, by acquiring third-party datasets and/or machine learning (ML) models for infusing customised artificial intelligence (AI) into their systems from day one.

The specific objectives to be achieved within FlexiGroBots are:

- **Objective 1:** Define a reference architecture and implement enablers for building mission control of heterogeneous multi-robot systems for precision agriculture.
- **Objective 2:** Define a reference architecture and implement enablers for secure and sovereign data exchange across companies, domains and national borders in the agricultural domain.
- **Objective 3:** AI-driven robotics methods and services for advanced and near-real-time analytics, automated decisions and decision-support during precision agriculture operations.
- **Objective 4:** Trustworthy AI-driven heterogeneous multi-robot systems including transparency, human agency, privacy, data governance, technical robustness and safety.
- **Objective 5:** Large-scale industry

demonstration and validation of flexible heterogeneous multi-robot systems in the long term with varying levels of complexity regarding geographical regions, weather conditions, and national regulations.

- **Objective 6:** Reinforcement of AI4EU AI-on-demand-platform.
- **Objective 7:** Novel and sustainable business models in precision agriculture.
- **Objective 8:** Guidelines for the usage of robotics in Agri-Food considering ethics, regulations and trust requirements.
- **Objective 9:** Enable the network of robotics and agriculture Digital Innovation Hubs with the capability to demonstrate and pilot solutions based on flexible heterogeneous multi-robot systems solutions



## EXPECTED IMPACT

- The FlexiGroBots project expected impacts focuses on:
- **IMPACT 1:** Demonstrate the high capacity and versatility of robots to carry out different tasks, reducing the costs and thus, maximizing the return of investment of the farmers.
- **IMPACT 2:** Avoid the complex and expensive monitoring and control processes that are holding back the penetration of robotics technologies in the agricultural environment.
- **IMPACT 3:** Promote the development and implementation of new services related to robotics in the Agri-Food sector.
- **IMPACT 4:** Establish bridges with industry-led standardization efforts that guarantee interoperability between machines and automated systems and which allow exchanging of spatial and non-spatial data.
- **IMPACT 5:** Strengthening competitiveness of the European agricultural technology market by opening it to multi-vendor solutions and democratizing the development of robotics applications and solutions.
- **IMPACT 6:** Fostering the development, deployment and adoption of AI-driven robotic solutions that are developed under the European guidelines of trustworthy and human-centric AI.
- **IMPACT 7:** Favouring European inter-regional collaboration and reinforcing the role of the European network of Digital Innovation Hubs in Agri-Food robotics.
- **IMPACT 8:** Enabling the impact of AI-driven agricultural robotics operations on the Agri-Food value chain and network through agricultural operations transparency with data sharing and trustworthiness.

## COORDINATOR:

**Daniel Calvo**

[daniel.calvo@atos.net](mailto:daniel.calvo@atos.net)

**PROJECT WEB-SITE:**

<https://flexigro-bots-h2020.eu/>

[@FlexiGroBots](https://twitter.com/FlexiGroBots)

<https://www.linkedin.com/company/flexigro-bots/> Newsletter



## PARTNERS

**UNIVERSITY OF PATRAS –  
LABORATORY FOR MANUFACTURING  
SYSTEMS AND AUTOMATION**

<http://lms.mech.upatras.gr/>

**FUNDACION TECNALIA RESEARCH &  
INNOVATION**

<http://www.tecnalia.com/>

**KUNGLIGA TEKNISKA HOEGSKOLAN**

<http://www.kth.se/>

**TAMPEREEN KORKEAKOULUSAATIO  
SR**

<http://www.tuni.fi/>

**COMAU SPA**

<http://www.comau.com/>

**PILZ INDUSTRIELEKTRONIK S.L**

<http://www.pilz.com/>

**ROBOCEPTION GMBH**

<http://roboception.com/>

**VISUAL COMPONENTS OY**

<http://www.visualcomponents.com/>

**INTRASOFT INTERNATIONAL SA**

<http://www.intrasoft-intl.com/>

**GRUPO S21SEC GESTIÓN, S.A.**

<http://www.s21sec.com/>

**FUNDACION AIC AUTOMOTIVE  
INTELLIGENCE CENTER FUNDazioA**

<http://www.aicenter.eu/>

**DGH ROBOTICA, AUTOMATIZACION Y  
MANTENIMIENTO INDUSTRIAL SA**

<http://www.grupodgh.es/>

**PSA AUTOMOBILES S.A.**

<http://www.stellantis.com/>

**AEROTECNIC COMPOSITES SL. U.**

<http://www.aerotecnic.es/>

**WHIRLPOOL EMEA SPA**

<http://whirlpoolcorp.com/>

## COORDINATOR:

**Dr. Sotiris Makris**

[makris@lms.mech.upatras.gr](mailto:makris@lms.mech.upatras.gr)

**PROJECT WEB-SITE:**

<http://odin-h2020.eu/>

[@ODIN\\_EUproject](#)

## ODIN

**OPEN-DIGITAL-INDUSTRIAL AND  
NETWORKING PILOT LINES USING  
MODULAR COMPONENTS FOR  
SCALABLE PRODUCTION**

Call [H2020-ICT-2020-2](#)

Duration [1 January 2021 – 31 December 2024](#)

Project ID [101017141](#)

## OBJECTIVES

The vision of ODIN is to demonstrate that novel robot-based production systems are not only technically feasible, but also efficient and sustainable for immediate introduction at the shopfloor. This vision can be realized through the achievement of the ODIN core objectives:

- Enabling the introduction of mobile, autonomous, environmentally aware and collaborative robotics in industrial settings,
- Creating digital validation tools for these robotic systems to allow scalability with minimum complexity and integration risks,
- Commercializing an advanced robotics integration platform able to link the robotics design and development stage with the normal production conditions,
- Deploying full-scale demonstrators in different production sectors to serve as a token of the industrial-grade performance of the ODIN production systems,
- Create an innovation ecosystem to enable the sustainability of open Pilot Lines involving.



## EXPECTED IMPACT

The expected impact of ODIN is focused to:

- Allow European manufacturers to bring automation and improve their competitiveness, enabling them to deliver products of the best quality, at higher production rates and reducing costs to allow them to keep production in Europe.
- Allow scalability with minimum complexity and integration risks,
- Combine measures for the cross-fertilization between industry and academia to speed up the transfer of research results into EU application stakeholders,

- Build upon different use cases in order to offer demonstrations, education and training material through close collaboration with other ongoing international research activities as well as with the Digital Innovation Hub (DIH),
- Develop the eco-system around the prioritised application areas to stimulate deployment,
- Contribute to the development of open, industry-led or de facto standards



## PARTNERS

**Stichting Wageningen Research**  
wur.nl

**Giropoma**  
giropoma.com

**Pegasus**  
7grapes.gr

**Serrater**  
serrator.com

**Smart Agri Technology**  
smartagritechnology.com

**Terrena**  
terrena.fr

**Abemec**  
abemec.nl

**AGreenCulture**  
agreenculture.net

**AgroIntelli**  
agrointelli.com

**Foodscale Hub**  
foodscalehub.com

**Teyme**  
teyme.es

**Agricultural University of Athens**  
aua.gr

**Fundacio Eurecat**  
eurecat.org

**University of Copenhagen**  
ku.dk

**University of Hohenheim**  
uni-hohenheim.de

**University of Patras**  
upatras.gr

## COORDINATOR:

**Dr Frits van Evert**  
Senior Scientist at Wageningen  
University & Research  
frits.vanevert@wur.nl

**PROJECT WEB-SITE:**

robs4crops.eu

@robs4crops

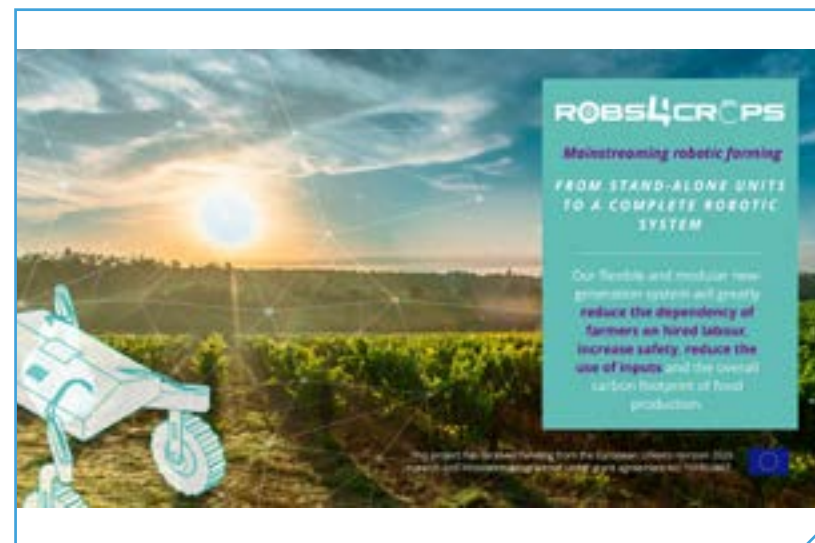
# ROBS4CROPS

## ROBOTS FOR PROTECTING CROPS

Call H2020-ICT-2018-20  
Duration 1 January 2021 – 31 December 2024  
Project ID 101016807

## OBJECTIVES

Agriculture is susceptible to the cost and scarcity of labour. And making cultivation practices more efficient and sustainable is critical. Robs4Crops is a vital catalyst in accelerating high-tech robotics and automated technologies in the European food and farm industry. Building upon the existing agricultural machinery, standards, and best practices, the 4-year project will shape and deliver a flexible and modular, fully autonomous system ready for large-scale commercial trials. The trials will be conducted in partnership with commercial farms and business leaders from France, Greece, Spain, and The Netherlands. Robs4Crops will significantly reduce farmers' dependency on hired labour, increase safety, reduce the use of inputs and the overall carbon footprint of food production.



## EXPECTED IMPACT

Mainstreaming robotic farming: from stand-alone units to a complete robotic system

Due to coronavirus, robotics and farm automation technologies have seen a significant spike in interest and investment, marking the start of a structural change in food and farming. But, for the most part, commercial robotics is still mainly unexploited.

Robs4Crops promises to bring a high-tech revolution to farms and offer a tremendous potential impact on productivity, efficiency, and environmental sustainability.

The focus is on the most demanding and repetitive field operations, specifically mechanical weed control and spraying against pests and diseases. Robs4Crops will provide a safe testing ground for iterative development and innovation through a network of collaborating partners.

Robs4Crops will also look at ethics, regulation and the socio-economic impact of robotic farming.



## **ICT-46-2020: COORDINATION AND SUPPORT ACTION (CSA) – ROBOTICS**







## PARTNERS

**Civitta Estonia**  
[www.civitta.com](http://www.civitta.com)

**Robotex**  
<https://robotex.international/>

**GLOBAZ SA**  
<https://www.loba.pt>

**Laboratoire national de métrologie et d'essais**  
<https://www.lne.fr>

**Danish Board of Technology Foundation**  
<https://tekno.dk/>

**AgriFood Lithuania DIH**  
[www.agrifood.lt](http://www.agrifood.lt)

**Norwegian University of Science and Technology**  
<https://www.ntnu.no/>



## COORDINATOR:

**Anneli Roose, Civitta Estonia**  
[info@robotics4eu.eu](mailto:info@robotics4eu.eu)

**PROJECT WEB-SITE:**  
<https://www.robotics4eu.eu/>  
 @Robotics4EU

Facebook: Robotics4EU

# ROBOTICS4EU

**ROBOTICS WITH AND FOR SOCIETY –  
 BOOSTING WIDESPREAD ADOPTION OF  
 ROBOTICS IN EUROPE**

Call H2020-ICT-46-2020  
 Duration 1 January 2021 – 31 December 2023  
 Project ID 101017283

## OBJECTIVES

Robotics4EU aims to ensure widespread adoption of robotics in healthcare, inspection and maintenance of infrastructure, agri-food, and agile production by ) rising awareness about non-technological aspects of robotics (ethics, legal, socio-economic, data, privacy, gender) by organising community building and co-creation events bringing together robotics community and citizens; 2) advocating for the responsible robotics among all stakeholder groups, incl. policy makers; 3) developing a responsible robotics maturity assessment model and bringing the project results to the standardization bodies.



## EXPECTED IMPACT

**IMPACT 1:** Effective dissemination of knowledge surrounding non-technical aspects of robot deployment.

**IMPACT 2:** Greater awareness of robotics among key stakeholders and policy makers.

**IMPACT 3:** Improved understanding of legal, socio-economic, and ethical issues and their impact on robotics deployment.

## **DT-ICT-12-2020: AI FOR THE SMART HOSPITAL OF THE FUTURE**





## PARTNERS

**Helsinki University Hospital (HUS)**  
[www.hus.fi](http://www.hus.fi)

**Oulu University Hospital (OYS)**  
[www.ppshp.fi](http://www.ppshp.fi)

**Chino Srls**  
<https://www.chino.io/>

**Symptoma GmbH**  
<https://www.symptoma.com/>

**Fundació Eurecat**  
<https://eurecat.org/>

**Fundació Sant Joan de Déu**  
<https://www.sjdhospitalbarcelona.org/>

**Nuromedia GmbH**  
<https://www.nuromedia.com/>

**NEC Laboratories Europe GmbH**  
<https://www.neclab.eu/>

**Ospedale Pediatrico Bambino Gesù**  
<http://www.ospedalebambinogesu.it/>

**SRDC Software Research & Development and Consultancy Corp.**  
<https://www.srdc.com.tr/>

**Evondos**  
<https://www.evondos.fi/>

**TICBioMed**  
<https://ticbiomed.org/>

**NeuroPath**  
<https://neuropath.eu/>

**Erasmus University Rotterdam**  
<https://www.eur.nl/>

**University of Padova**  
<https://www.unipd.it/>

**Innofactor Software Oy**  
<https://www.innofactor.com/>

## COORDINATOR:

**Ms. Tuuli Pajunen**  
[tuuli.pajunen@hus.fi](mailto:tuuli.pajunen@hus.fi)

**PROJECT WEB-SITE:**  
[www.aiccelerate.eu](http://www.aiccelerate.eu) [not live yet]

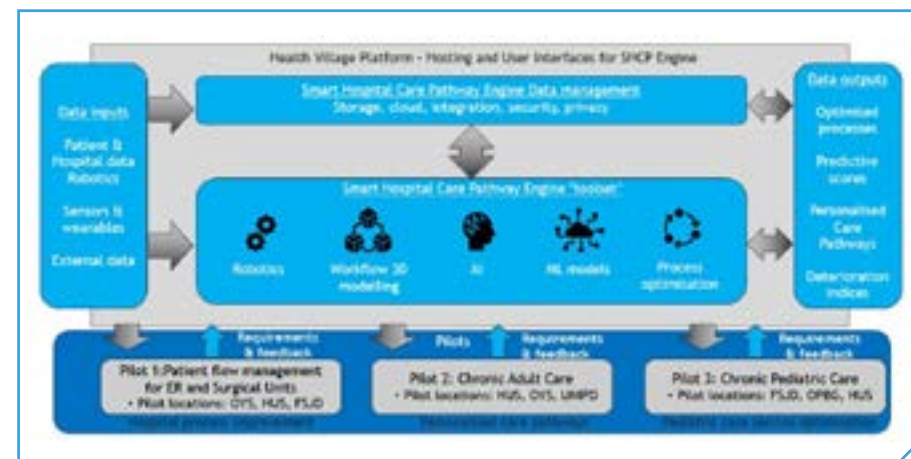
# AICCELERATE

## AI ACCELERATOR – A SMART HOSPITAL CARE PATHWAY ENGINE

Call H2020-DT-2020-1  
 Duration 1 January 2021 – 30 April 2024  
 Project ID 101016902

## OBJECTIVES

The goal of the project is to demonstrate scalability of AI solutions provided by the SHCP Engine for different types of healthcare applications. The SHCP Engine provides predictions based on machine learning utilizing robotics and multiple data input sources. From a patient perspective, solutions enhance digital care pathways to empower patients and allocate health care resources more efficiently. This will be piloted for Parkinson's disease, providing a holistic view of the patients' well-being, and enabling individualized treatment decisions. From the hospital perspective, the SHCP Engine provides AI solutions to optimise patient flow management systems, demonstrated in the project in elective and urgent surgical cases, and in paediatric neuro-oncological service delivery.



## EXPECTED IMPACT

Key expected impacts of AICCELERATE project:

- Develop a scalable and modular AI toolset for hospitals affecting efficiency, decision-making effectiveness, personalized care for patients, enable adding algorithms and predictions to different use cases and care processes.
- Use inputs from multiple of data sources efficiently, combine data from the existing registers to predict uncontrollable factors.
- Test the viability of the concept and explore usability in three European countries.
- Create a process for efficient algorithm development – identify decision points and modeling/prediction problems, provide a standard set of modeling tools.
- Establish evidence-based trust in artificial intelligence in health care.



## PARTNERS

### Fraunhofer

#### IPT

[www.ipt.fraunhofer.de](http://www.ipt.fraunhofer.de)

#### IZI

[www.izi.fraunhofer.de](http://www.izi.fraunhofer.de)

### UNIVERSITY COLLEGE LONDON

<https://www.ucl.ac.uk/biochemical-engineering/>

### FORTH

<https://www.forth.gr/>

### ELKH SZTAKI

[www.sztaki.hu](http://www.sztaki.hu)

### Universitätsklinikum Würzburg

[ukw.de](http://ukw.de)

### Aglaris Cell S.L.

[www.aglariscell.es](http://www.aglariscell.es)

### FUJIFILM Europe B.V.

<https://www.fujifilm.eu/eu/manufacturing-europe>

### FUNDACIÓ CLÍNICA PER A LA RECERCA BIOMÈDICA

<https://www.clinicbarcelona.org/en/idibaps>

### IRIS Technology Solutions S.L.

[www.iris-technologygroup.com](http://www.iris-technologygroup.com)

### Red Alert Labs

[www.redalertlabs.com](http://www.redalertlabs.com)

### PANAXEA

[www.panaxea.eu](http://www.panaxea.eu)

### ORTEC Optimization Technology

[www.ortec.com](http://www.ortec.com)

## COORDINATOR:

### Niels König (Project Manager Simon Hort)

[niels.koenig@ipt.fraunhofer.de](mailto:niels.koenig@ipt.fraunhofer.de) (Contact [simon.hort@ipt.fraunhofer.de](mailto:simon.hort@ipt.fraunhofer.de) with Niels König in cc)

[www.aidpath-project.eu](http://www.aidpath-project.eu) (in progress)

# AIDPATH

**ARTIFICIAL INTELLIGENCE-DRIVEN,  
DECENTRALIZED PRODUCTION  
FOR ADVANCED THERAPIES IN THE  
HOSPITAL**

Call *H2020-DT-2020-1*  
Duration *11 January 2021 – 31 December 2024*  
Project ID *101016909*

## OBJECTIVES

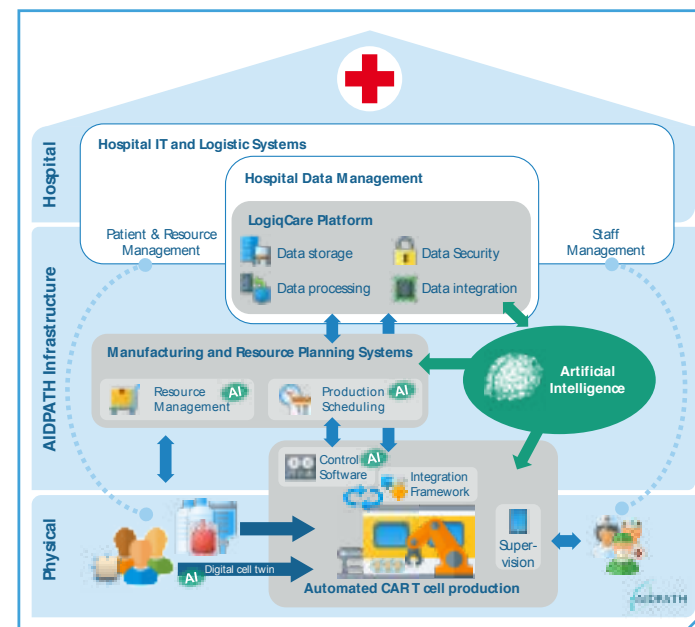
1. Define and develop an automated robotic, modular manufacturing platform for hospital-based production of multiple batches in parallel of engineered T-cell therapies that is (i) adaptable (ii) incorporates extensive fully automated at-line analytics and (iii) allows for GMP compliant production that is efficient and reliable;

2. Produce a set of artificial intelligence solutions capable of supporting the manufacturing process, as well as the resource and product management using the concept of 'digital twins' so that engineered cell therapies for cancer treatment are optimized and personalised for patient characteristics increasing therefore efficiency of hospital operations and ensuring viability.

3. Establish a data architecture to support the AI solutions and a continual learning and optimization process of automated engineered cell therapy manufacturing providing an end-to-end capability

4. Convene a stakeholder community to provide insights on stakeholder perspectives and to gather regulatory input to gain and understanding of how to make the adoption and regulatory approvals of AI-enhanced automated advanced therapy manufacturing system as efficient as possible;

5. Develop and implement a plan to sustain project assets by validating business models that take into consideration the health economics of engineered T-cell therapy.



## EXPECTED IMPACT

1. A big-data approach to characterise the cellular starting material by extract key and specific data with respect to age, gender, pre-existing conditions for donor and patient datasets to ensure the optimal bioprocess and manufacturing strategy is employed to yield a high-quality, efficacious therapy

2. Modelling solutions and real time analytics including mass spectrometry data will create an intelligent control solution ready to facilitate AI deployment within the bio-manufacturing sector, particularly for patient-specific cell therapies where each product batch is for an individual patient.

3. The Digital Twin (DT) will capture not only the biochemical, medical and engineering background knowledge about the cell production system and its environment but will also provide passages between the real and virtual (i.e., modelled) worlds of manufacturing.

4. Establish machine-learning algorithms for automated process models to facilitate a data-driven approach to optimisation and autonomous live process control.

5. AI solutions for production scheduling: Production scheduling will facilitate accurate planning of patients' therapies and cost effective exploitation of the pilot which will be enabled by an efficient relation of AI prediction and robust or stochastic scheduling techniques.

6. Automated clinical resource management: Clinical resource management will be centred on the patient. Beyond managing the essential equipment and materials, staff management is also of key importance.





## PARTNERS

**INTRASOFT INTERNATIONAL SA**  
[www.intrasoft-intl.com](http://www.intrasoft-intl.com)

**PHILIPS MEDICAL SYSTEMS  
 NEDERLAND BV**  
[www.philips.com](http://www.philips.com)

**VIMAR SPA**  
[www.vimar.com](http://www.vimar.com)

**GREEN COMMUNICATIONS SAS**  
[www.green-communications.fr](http://www.green-communications.fr)

**TELEMATIC MEDICAL APPLICATIONS  
 EMPORIA KAI ANAPTIXI PROIONTON  
 TILIATRIKIS MONOPROSOPIKI  
 ETAIRIA PERIORISMENIS EYTHINIS**  
[www.telemed.gr](http://www.telemed.gr)

**ECLEXYS SAGL**  
[www.eclexys.com](http://www.eclexys.com)

**F6S NETWORK IRELAND LIMITED**  
[www.f6s.com](http://www.f6s.com)

**PHARMECONS EASY ACCESS LTD**  
[www.pharmecons.com](http://www.pharmecons.com)

**TERAGLOBUS LATVIA SIA**  
[www.teraglobus.lt](http://www.teraglobus.lt)

**NINETY ONE GMBH**  
[www.91.life](http://www.91.life)

**EIT HEALTH GERMANY GMBH**  
[www.eithealth.eu](http://www.eithealth.eu)

**UNIVERZITETNI KLINICNI CENTER  
 MARIBOR**  
[www.ukc-mb.si](http://www.ukc-mb.si)

**SAN CAMILLO IRCCS SRL**  
[www.ospedalesancamillo.net](http://www.ospedalesancamillo.net)

**SERVICIO MADRILENO DE SALUD**  
[www.comunidad.madrid/servicios/salud](http://www.comunidad.madrid/servicios/salud)

**CENTRE HOSPITALIER UNIVERSITAIRE  
 DE LIEGE**  
[www.chuliege.be](http://www.chuliege.be)

**PANEPISTIMIAKO GENIKO  
 NOSOKOMEIO THESSALONIKIS  
 AXEPA**  
[www.ahepahosp.gr](http://www.ahepahosp.gr)

**VRIJE UNIVERSITEIT BRUSSEL**  
[www.vub.be](http://www.vub.be)

**ARISTOTELIO PANEPISTIMIO  
 THESSALONIKIS**  
[www.auth.gr](http://www.auth.gr)

## HOSMARTAI

### HOSPITAL SMART DEVELOPMENT BASED ON AI

Call [H2020-DT-ICT-12-2020](http://H2020-DT-ICT-12-2020)  
 Duration 1 January 2021 – 31 May 2024  
 Project ID 101016834

## OBJECTIVES

The main objective of HosmartAI is to promote an effective and efficient health-care system transformation, by the use of AI technological developments and robotics. To achieve this transformation, HosmartAI will introduce an AI-supported platform that will allow for core facilities to be shared and linked composing smart services for healthcare professionals, patients, information system managers, and health organisation administrations.

**EIDGENOESSISCHE TECHNISCHE HOCHSCHULE  
 ZUERICH**  
[www.ethz.ch](http://www.ethz.ch)

**UNIVERZA V MARIBORU**  
[www.um.si](http://www.um.si)

**INSTITUTO TECNOLÓGICO DE CASTILLA Y LEON**  
[www.itcl.es](http://www.itcl.es)

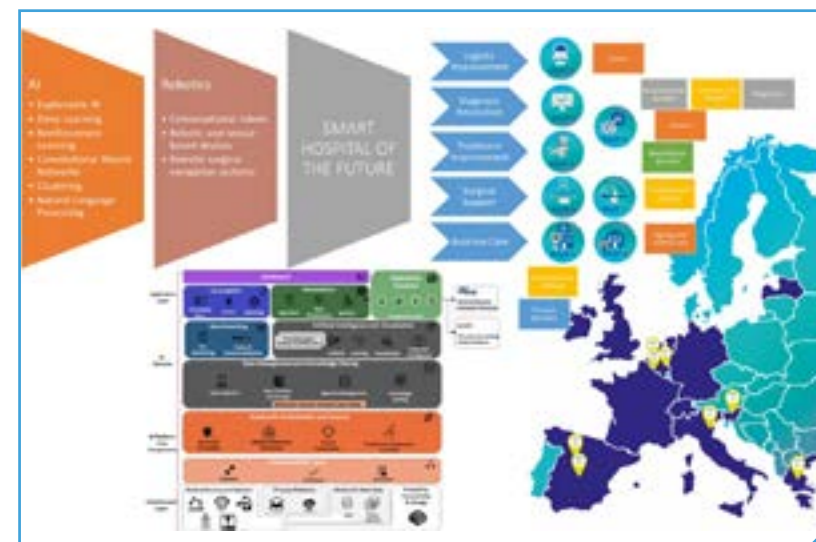
**FUNDACION INTRAS**  
[www.intras.es](http://www.intras.es)

**ASSOCIATION EUROPEAN FEDERATION FORMEDICAL  
 INFORMATICS**  
[www.efmi.org](http://www.efmi.org)

**FEDERATION EUROPEENNE DES HOPITAUX ET DES  
 SOINS DE SANTE**  
[www.hope.be](http://www.hope.be)

## COORDINATOR:

**Athanasios Poulakidas**  
[Athanasios.Poulakidas@intrasoft-intl.com](mailto:Athanasios.Poulakidas@intrasoft-intl.com)  
**PROJECT WEB-SITE:** [www.hosmartai.eu](http://www.hosmartai.eu)  
[@hosmartAI](https://twitter.com/hosmartAI)



## EXPECTED IMPACT

Pilots for the smart hospital of the future will emerge, enabled by open system platforms. The effectiveness of AI-based technologies, such as smart robots, will be demonstrated, in a range of health-care tasks, and an effective basis for developing deployable applications will be provided. HosmartAI will contribute to trust and acceptance building in AI technology among all healthcare stakeholders. Additional specific impact will stem from the pilots in the medical fields of cancer, gastrointestinal disorders, cardiovascular diseases, thoracic disorders, neurological diseases, ageing & elderly care, pregnancy





## PARTNERS

### Medtronic

<https://europe.medtronic.com/xd-en/about/medtronic-europe.html>

### Center for Research and Technology HELLAS (CERTH)

<https://www.certh.gr/root/en.aspx>

### Foundation for Research and Technology HELLAS (FORTH)

<https://www.forth.gr/>

### University of Warwick

<https://warwick.ac.uk/>

### Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna

<https://www.santannapisa.it/en>

### Robotnik

<https://robotnik.eu/>

### MYSOPHERA

<https://www.mysophera.com/>

### TWI-Hellas Astiki Mi Kerdoskopiki Etaireia

<https://www.twi-hellas.com/>

### Phillips Electronics Nederland B.V

<https://www.philips.com/>

### Universidad Politécnica de Madrid

<https://www.upm.es/internacional>

### IECISA Porgutal – GFI Group

<https://inetum.com.es/en/index.html>

### University Campus Biomedico of Rome

<http://www.unicampus.it/eng/>

### Universitair Medisch Centrum Utrecht

<https://www.umcutrecht.nl/en>

### Hospital Clínico San Carlos. Madrid

<http://www.idlssc.org/en/>

### Charité Universitätsmedizin Berlin

<https://www.charite.de/en/>

### Amiens UH

<https://www.reseau-chu.org/france-university-hospitals/amiens-university-hospital/>

### Medical University of Lodz

<https://studymed.umed.pl/>

## ODIN

*Leveraging AI based technology to transform the future of health care delivery in Leading Hospitals in Europe*

Call *H2020-DT-2020-1*

Duration *1 March 2021 – 31 August 2024*

Project ID *101017331*

## OBJECTIVES

ODIN envisions the Hospital of the Future empowered with advanced digital technologies improving safety, efficiency, and quality.

ODIN will use Robotics, Artificial Intelligence (AI) and IoT to build that vision across all operating areas, pursuing the enhancement of hospital's workers skills, automate hospital's process, hospital's logistics, infrastructure management, hospital's reconfigurations and patient's flows.

This aim will be based on the ODIN AI-Robotic-IoT ecosystem that will be deployed in 6 reference hospitals across Europe covering the following main areas of intervention: logistic support, clinical engineering and medical device management, AI support system for diagnosis, clinical task and patient experience, automation of clinical workflows, home hospitalisation, and disaster preparedness.

### MINDS&SPARKS

<https://www.mindsandsparks.org/>

### Legal, Regulatory – UDG Alliance

<https://www.udgalliance.org/>

### Università degli Studi di Firenze – MEDICT LAB

<https://www.unifi.it/changelang-eng.html>

## COORDINATOR:

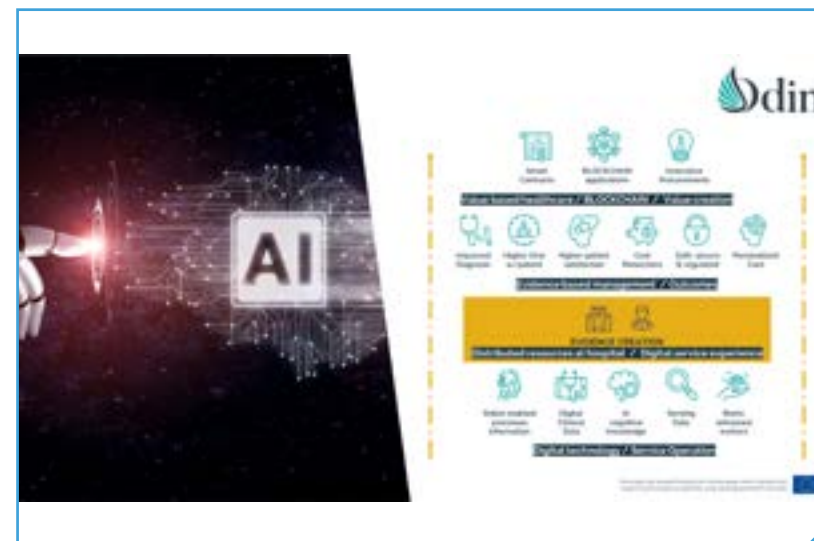
### Germán Gutiérrez Rubio

[german.gutierrez@medtronic.com](mailto:german.gutierrez@medtronic.com)

[coordination@odin-smarthospitals.eu](mailto:coordination@odin-smarthospitals.eu)

**PROJECT WEB-SITE:** [www.odin-smarthospitals.eu](http://www.odin-smarthospitals.eu)

**@ODIN\_H2020**



## EXPECTED IMPACT

In addition to the impact on hospital's services which will be measured through identified Key Performance Indicators, ODIN will roll out an ambitious communication and awareness creation campaign to disseminate the concept (our vision) of the Hospital of the Future, worldwide.

To maximise the impact, ODIN will build an innovative "Procurement Journey", a new business model that will facilitate the digital health care adoption, the market scale-up and investments, ensuring the self-sustainability of ODIN value proposition.

## **ICT-47-2020: RESEARCH AND INNOVATION BOOSTING PROMISING ROBOTICS APPLICATIONS**



## PARTNERS

### POLITECNICO DI MILANO

[www.polimi.it](http://www.polimi.it) [www.deib.polimi.it](http://www.deib.polimi.it)

### SCUOLA SUPERIORE DI STUDI UNIVERSITARI E DI PERFEZIONAMENTO S. ANNA

[www.santannapisa.it](http://www.santannapisa.it)

### KATHOLIEKE UNIVERSITEIT LEUVEN

[www.kuleuven.be](http://www.kuleuven.be)

### OSPEDALE SAN RAFFAELE SRL

[www.hsr.it](http://www.hsr.it)

### SV SWISSVORTEX AG

[www.swissvortex.com](http://www.swissvortex.com)

### ARTINESS SRL

[www.artinessreality.com](http://www.artinessreality.com)

### FBGS INTERNATIONAL

[www.fbgs.com](http://www.fbgs.com)

## COORDINATOR:

### Prof. Emiliano Votta

[Emiliano.votta@polimi.it](mailto:Emiliano.votta@polimi.it)

### PROJECT WEB-SITE:

[www.artery-project.eu](http://www.artery-project.eu)

 @artery\_eu

# ARTERY

## AUTONOMOUS ROBOTICS FOR TRANSCATHETER DELIVERY SYSTEMS

Call *H2020-H2020-ICT-2020-2*  
Duration *1 January 2021 – 31 March 2024*  
Project ID *101017140*

## OBJECTIVES

The ARTERY project is motivated by the tremendous burden of cardiovascular diseases and by the need to extend the life-saving surgical treatment to those who cannot undergo classic cardiac surgery.

To this aim, ARTERY will design, build, and benchmark a completely novel variable shared autonomy robotic platform to treat cardiac diseases by life-saving percutaneous procedures. The platform will allow for:

- intuitive human-robot interaction via augmented reality technology
- intuitive navigation of intraoperative ultrasound imaging via artificial intelligence
- superior safety and effectiveness via shared-autonomy robot control
- unprecedented operator awareness via catheter robotization and sensorization



## EXPECTED IMPACT

- make transcatheter interventions, which are the only alternative to cardiac surgery, accessible to potentially every clinical centre and every patient
- lower the societal and economical burden of cardiovascular diseases
- allow for a paradigm shift in shared-autonomous robot control
- boost the exploitation of robotics in the fast-growing area of transcatheter interventions



## PARTNERS

**Fondazione Istituto Italiano di Tecnologia**

<https://www.iit.it/web/humanoids-human-centered-mechatronics>

**Technische Universität München**

<https://www.in.tum.de/i06/home/>

**Fraunhofer Italia**

<https://www.fraunhofer.it/it/fraunhofer-italia.html>

**PROFACTOR GmbH**

<https://www.profactor.at/en/research/industrial-assistive-systems/visual-computing/>

**Central Institute for Labour Protection – National Research Institute**

<https://www.ciop.pl/en>

**Budimex S.A.**

<https://www.budimex.pl/en/site.html>

## COORDINATOR:

**Nikos Tsagarakis**

[nikos.tsagarakis@iit.it](mailto:nikos.tsagarakis@iit.it)

PROJECT WEB-SITE:

[www.concertproject.eu](http://www.concertproject.eu)

@EU\_Concert

# CONCERT

## CONFIGURABLE COLLABORATIVE ROBOT TECHNOLOGIES

Call H2020-ICT-47-2020

Duration 1 January 2021 – 31 December 2023

Project ID 101016007

## OBJECTIVES

The CONCERT research and development activities are steered by the following objectives (O).

- Realize a configurable collaborative robot with adaptable physical skills.
- Develop synthesis and automatic control and interface generation tools for configurable robots.
- Develop safety verification and human-robot interaction control tools.
- Implement methods to enhance the human and robot awareness and improve efficiency in human robot collaboration.
- Integrate the technologies into appropriate configurable robots to address the needs of interior construction task use-cases.
- Evaluate the impact of the developed robotics technologies in common construction tasks considering the efficiency, productivity and reduction of cost.



## EXPECTED IMPACT

**IMPACT 1:** Inspire the development of solutions for demanding applications featuring unstructured environments and tasks with high variability

**IMPACT 2:** Facilitate the entrance of collaborative robotics in new domains such as the construction industry

**IMPACT 3:** Improve the construction processes demonstrating better efficiency and quality, through time savings in intermediate processes and more precise operations with less defects.

**IMPACT 4:** Enhance the safety and reduce the risks of construction workers.

**IMPACT 5:** Bring Europe on the cutting edge of the new paradigm of quickly configurable robotics-making knowhow and technologies



## PARTNERS

**Deutsches Forschungszentrum für Künstliche Intelligenz DFKI**  
<https://www.dfki.de/robotics>

**Universidad de Girona**  
<https://cirs.udg.edu/>

**University of Haifa**  
<https://www.viseaon.haifa.ac.il/>

**KRAKEN Robotik GmbH**  
<https://krakenrobotik.de/>

**Technisches Hilfswerk**  
[https://www.thw.de/EN/Homepage/homepage\\_node.html](https://www.thw.de/EN/Homepage/homepage_node.html)

**Israel Nature and Natural Parks Protection Agency**  
<https://www.parks.org.il/en/>

**Tecnoambiente S.L.**  
<https://www.tecnoambiente.com/>

## COORDINATOR:

**Dr. Thomas Vögele**  
[Thomas.voegel@dfki.de](mailto:Thomas.voegel@dfki.de)

**PROJECT WEB-SITE:**  
[www.deepersense.eu](http://www.deepersense.eu)

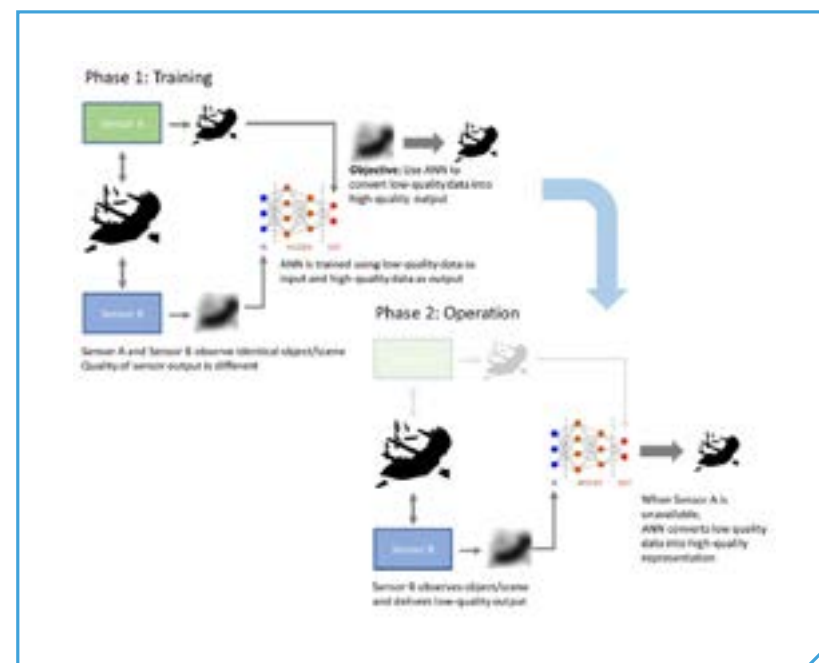
# DEEPERSENSE

## DEEP-LEARNING FOR MULTIMODAL SENSOR FUSION

Call H2020-ICT-47-2020  
 Duration 1 January 2021 – 31 December 2023  
 Project ID 101016958

## OBJECTIVES

The objective of DeeperSense is to significantly improve the environment perception capabilities of service robots, and in particular underwater robots. The project uses DeepLearning algorithms for “intersensoric learning”, in which one sensor modality “learns” from the other. Given the right sensor pairing, this approach promises to considerably improve sensor output and to extend the range of applications for sensors. DeeperSense will be tested and validated in real underwater environments, but can generally be applied to any domain of robotic activity. The project plans to make some of the algorithms and training data available to the scientific and robotics communities.



## EXPECTED IMPACT

DeeperSense develops an AI-based method for sensor enhancement that will be tested and validated in the underwater robotics domain in three societally relevant use cases. The outcome of DeeperSense, three algorithms tested and validated in real-world environments, will give a boost primarily to underwater

robotics and enable applications that were not possible so far. However, as the DeeperSense method is generic and intrinsically domain independent, it has a strong potential to create innovation in other robotics application domains, such as terrestrial, aerial and space robotics.





## PARTNERS

### KU Leuven (BE)

<https://www.kuleuven.be>

### Sorbonne University (FR)

<https://www.sorbonne-universite.fr>

### King's College London (UK)

<https://www.kcl.ac.uk/>

### University of Zurich (CH)

<https://www.uzh.ch>

## COORDINATOR:

### Prof. Emmanuel Vander Poorten

[emmanuel.vanderpoorten@kuleuven.be](mailto:emmanuel.vanderpoorten@kuleuven.be)

### PROJECT WEB-SITE:

<https://h2020faros.eu/>

[@H2020FAROS](#)

# FAROS

## FUNCTIONALLY ACCURATE ROBOTIC SURGERY

Call H2020-ICT-2020-2

Duration 1 January 2021 - 31 December 2023

Project ID 101016985

## OBJECTIVES

Modern robotic approaches target absolute geometric precision, but in the context of surgery, functional accuracy, i.e. relative to the target, anatomic and functional structures, is what matters. FAROS aims to produce a new branch of surgical robots that embed surgeon-like autonomous behaviour, behaviour that typically focuses on enhancing the 'functional outcome'. Rather than aiming at merely mimicking equivalent sensing, actuation and reasoning ability of a surgeon, FAROS will exploit a collection of non-conventional and non-visual sensors. Behaviour-based controllers developed on top of that will encode physical intelligence in a spine-surgical robotic system. Through its superhuman sensing and fast actuation capabilities, the FAROS robotic system aims to enhance functional accuracy in pedicle screw placement and endoscopic lumbar discectomy, two procedures facing large uncertainties and where inaccurate action could have dramatic consequences.



## EXPECTED IMPACT

The FAROS partners will deliver surgeon-like robotic autonomous behaviour through superhuman sensing and actuation coupled with fast adaptive control, thanks to various spectrum of non-visual sensing and physical intelligence. The developed robotic technology will endow surgical robots with surgeon-like autonomous behaviour while keeping conventional robotic strengths (such as local accuracy/stability/bandwidth/tirelessness) intact. In the longer term this will reflect in lower surgical error rates and improved quality of service which corresponds to an improved quality of life in this context.



## PARTNERS

**UNIVERSITÀ DI PISA**  
www.unipi.it

**IMPERIAL COLLEGE OF SCIENCE  
TECHNOLOGY AND MEDICINE**  
www.imperial.ac.uk

**EDGENOESSISCHE TECHNISCHE  
HOCHSCHULE ZUERICH**  
www.ethz.ch

**KINGSTON UNIVERSITY HIGHER  
EDUCATION CORPORATION**  
www.kingston.ac.uk

**TECHNISCHE UNIVERSITEIT DELFT**  
www.tudelft.nl

**AGENCIA ESTATAL CONSEJO  
SUPERIOR DE INVESTIGACIONES  
CIENTIFICAS**  
www.csic.es

**ISTITUTO SUPERIORE PER LA  
PROTEZIONE E LA RICERCA  
AMBIENTALE**  
www.isprambiente.gov.it

**QBROBOTICS SRL**  
www.qbrobotics.com

**UNIVERSITÀ DEGLI STUDI DI  
SASSARI - THIRD PARTY**  
www.uniss.it

**UNIVERSITÀ DEGLI STUDI DI MILANO  
- THIRD PARTY**  
www.unimi.it

**UNIVERSITÀ DEGLI STUDI DI SIENA -  
THIRD PARTY**  
www.unisi.it

**UNIVERSITÀ DEGLI STUDI DI  
PERUGIA - THIRD PARTY**  
www.unipg.it

## COORDINATOR:

**Prof. Manolo Garabini**  
manolo.garabini@unipi.it

**PROJECT WEB-SITE:**  
www.nih2020.eu

@naturalintelli8

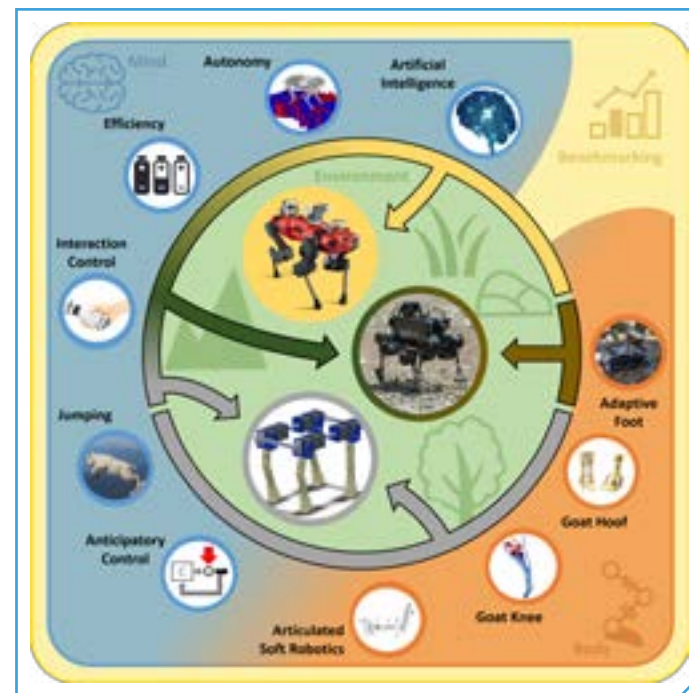
# NI

## NATURAL INTELLIGENCE FOR ROBOTIC MONITORING OF HABITATS

Call H2020-ICT- 47-2020  
Duration 1 January 2021 – 31 March 2024  
Project ID 101016970

## OBJECTIVES

Objective A large part of the European land in general and specifically the protected areas of the N2000N, requires repeatable, consistent, and affordable monitoring techniques to assess their conservation status in order to be able to take the right measures to ensure Nature preservation. NI project will provide as main outputs: the first examples of robotic workforce for monitoring natural habitats able to effectively move in dunes, grasslands, forests, and alpine terrains. NI robots will be empowered by Natural Intelligence, emerging by the interaction of environment, body and mind, leveraging on the fusion of artificial cognition and articulated soft-robotics bodies.



## EXPECTED IMPACT

NI will demonstrate robotic monitoring of natural habitats. This will directly and substantially impact the Civil Domain, which covers the use of robots within governmental and public agencies, and more specifically the Environment Sub-domain, and its increasing demand for monitoring's technological applications.

**IMPACT 1:** Strengthening European excellence in Robotics Science and Technology, focusing on the Operation in unstructured and dynamic environments technology target

**IMPACT 2:** Opening up new markets for Robotics & addressing issues related to the environment

**IMPACT 3:** Boosting the use of Robotics in environmental monitoring Applications

**IMPACT 4:** Lowering barriers in the deployment of robotic environmental monitoring



## PARTNERS

**SCUOLA SUPERIORE DI  
STUDI UNIVERSITARI E DI  
PERFEZIONAMENTO SANT'ANNA (I)**  
[www.santannapisa.it](http://www.santannapisa.it)

**INSTITUTE OF COMMUNICATION AND  
COMPUTER SYSTEMS (GR)**  
[www.iccs.gr](http://www.iccs.gr)

**UNIVERSITY OF ESSEX (GB)**  
[www.essex.ac.uk](http://www.essex.ac.uk)

**TWI ELLAS ASTIKI MI KERDOSKOPIKI  
ETAIREIA (GR)**  
[www.twi-hellas.com](http://www.twi-hellas.com)

**TEAGASC - AGRICULTURE AND FOOD  
DEVELOPMENT AUTHORITY (IRL)**  
[www.teagasc.ie](http://www.teagasc.ie)

**MITSUI CHEMICALS EUROPE GMBH  
(D)**  
[eu.mitsuichemicals.com](http://eu.mitsuichemicals.com)

## COORDINATOR:

**Dr. Matteo Cianchetti**  
[matteo.cianchetti@santannapisa.it](mailto:matteo.cianchetti@santannapisa.it)

**PROJECT WEB-SITE:**  
[www.softgrip-project.eu](http://www.softgrip-project.eu)  
@projectSoftGrip

## SOFTGRIP

**FUNCTIONALIZED SOFT ROBOTIC  
GRIPPER FOR DELICATE PRODUCE  
HARVESTING POWERED BY IMITATION  
LEARNING-BASED CONTROL**

Call H2020-ICT-2018-20 / H2020-ICT-2020-2  
Duration 1 January 2021 – 31 December 2023  
Project ID 101017054

## OBJECTIVES

The SoftGrip project will introduce a self-actuating soft gripper for the autonomous picking of delicate white button mushrooms. The versatility of the proposed solution will enable the adoption of the technology by other fresh-food industries experiencing similar stringent handling requirements. The project aims for low-cost, intelligent soft robotic grippers with embedded actuation, tactile sensing, recyclable materials and advanced fabrication techniques. It will develop a set of fast-computed modelling algorithms to enhance real-time model-based control schemes and advanced learning capabilities. SoftGrip will develop a learning-by-demonstration framework that will allow the robot to capture human picking skills, extensible to other similar tasks.



## EXPECTED IMPACT

Enable a step change in efficiency, helping mushroom growers cut down on costs by >30% and increase their yields by >20%;

Increase job quality through the work environment and safety improvement by reducing the strenuous part of mushroom harvesting;

Answer fundamental questions on skill transfer through meta-learning techniques;

New technologies for delicate yet effective manipulation;

In the long-term, it will lower the barriers of robotics deployment open-up new opportunities for adoption of robotic solutions in the agri-food sector.



## PARTNERS

**Uppsala University**

[www.materialvetenskap.uu.se/](http://www.materialvetenskap.uu.se/)

**EPFL**

[www.epfl.ch](http://www.epfl.ch)

**MAX-PLANCK-GESELLSCHAFT**

[www.mpg.de/en](http://www.mpg.de/en)

**UNIVERSITÄT LINZ**

[www.jku.at](http://www.jku.at)

**FUNDACION IMDEA NETWORKS**

[www.networks.imdea.org/](http://www.networks.imdea.org/)

**MYCRONIC AB**

[www.mycronic.com](http://www.mycronic.com)

**Riso Preciso**

[www.risopreciso.it](http://www.risopreciso.it)

**THE CIRCLE**

[www.thecircle.global](http://www.thecircle.global)

**Warrant Hub SpA**

[www.warranthub.it](http://www.warranthub.it)

## COORDINATOR:

**Prof. Klas Hjort**

[Klas.Hjort@angstrom.uu.se](mailto:Klas.Hjort@angstrom.uu.se)

**PROJECT WEB-SITE:**

[www.somiro.eu](http://www.somiro.eu)

[@somiroproject](https://twitter.com/somiroproject)

# SOMIRO

## SOFT MILLI-ROBOTS

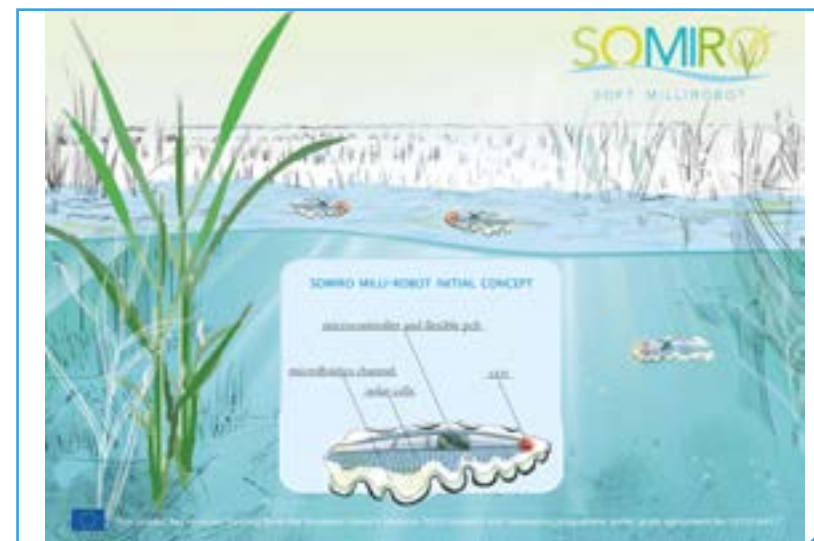
Call *H2020-ICT-2020-2*

Duration *1 January 2021 – 31 December 2023*

Project ID *101016411*

## OBJECTIVES

SOMIRO will develop and demonstrate the world's first energy-autonomous swimming milli-robot with the aim of reducing the environmental impact of farming in terms of carbon footprint, eutrophication, and excessive use of pesticides and feed. These swimming robots would cover a much larger area than stationary systems and could be rapidly deployed and self-redistribute where most needed. They may serve as a stand-alone monitoring solution for indoor farming or complement drone-based remote sensing outdoors. The goal is that the SOMIRO milli-robots should reach sizes down to 10 mm long, showing that soft and stretchable systems require much less energy for movement than other robots of comparable size. To power, they will not rely on any dedicated energy infrastructure but only on natural sunlight.



## EXPECTED IMPACT

**IMPACT 1:** Strengthening European excellence in Robotics Science & Technology.

**IMPACT 2:** Boosting the use of robotics in promising application areas.

**IMPACT 3:** Opening up new markets for robotics.

**IMPACT 4:** Opening up new markets for robotics.

## SPARC

SPARC, the public-private partnership (PPP) between the European Commission and euRobotics, is a European initiative to maintain and extend Europe's leadership in civilian robotics. Its aim is to strategically position European robotics in the world thereby securing major benefits for European economy and the society at large.

SPARC leads the driving strategy behind the largest civilian robotics research and innovation programme in the world, with €700 million in funding from the European Commission from 2014 to 2020 and triple that from European industry, to yield a total investment of €2.8 billion.

SPARC stimulates an ever more vibrant and effective robotics community that collaborates in the successful development of technical transfer and commercial exploitation.

SPARC also tackles ethical, legal, societal and economic issues raised by development and deployment of robotic systems.

euRobotics is a non-profit organisation based in Brussels with more than 250 members, representing the Robotics community in Europe.

