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AGROBOTICS-DITWINS

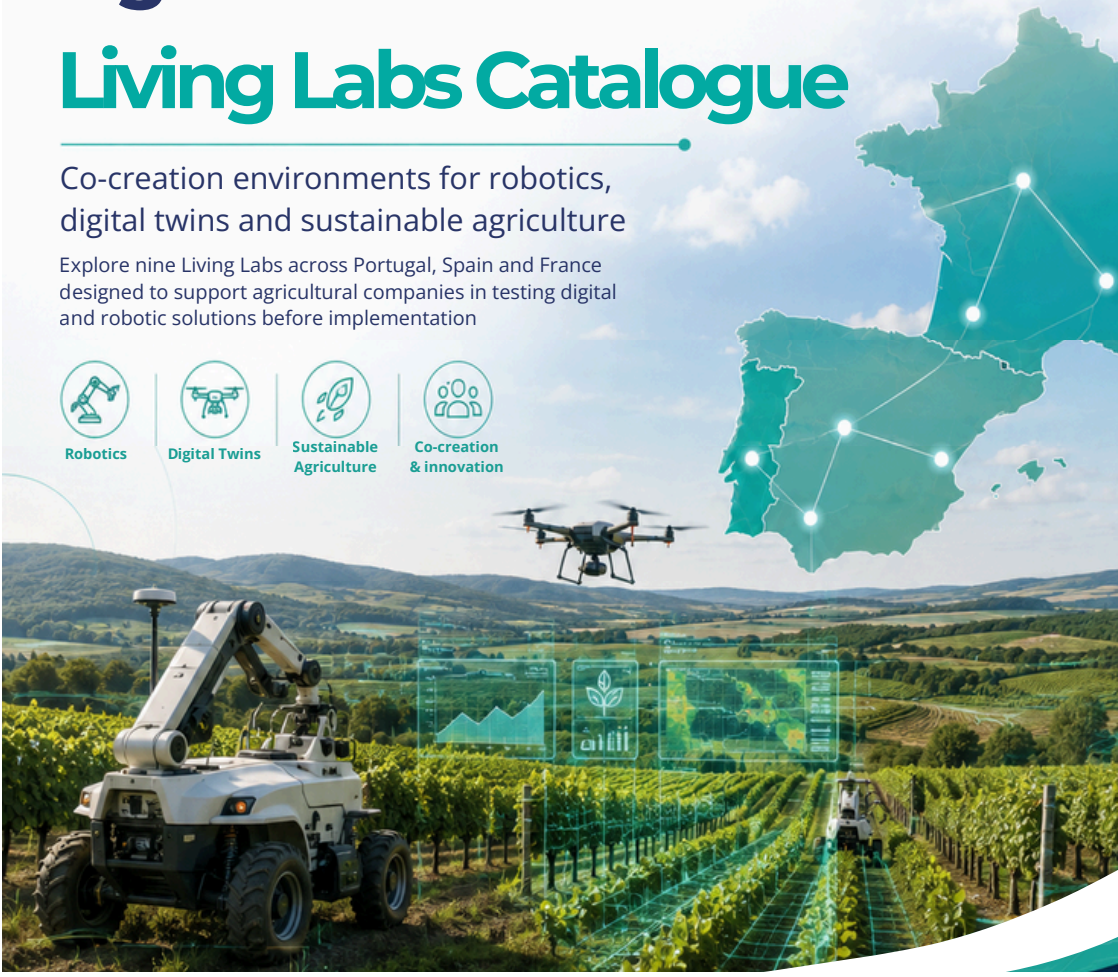
Agrobotics-DiTwins

Living Labs Catalogue

Co-creation environments for robotics, digital twins and sustainable agriculture

Explore nine Living Labs across Portugal, Spain and France designed to support agricultural companies in testing digital and robotic solutions before implementation

Robotics | Digital Twins | Sustainable Agriculture | Co-creation & innovation



THE PARTNERS

UNIVERSIDAD DE MÁLAGA · EHU · UNIVERSITAS Miguel Hernández · Universidad de Huelva · UAlg Universidade do Algarve · Université de Limoges

Málaga TechPark; Parque Tecnológico de Andalucía · DATA COLAB · nera Associação Empresarial da Região do Algarve · AQUITAINE ROBOTICS Robots that make sense · OSFAM · fi group · ELATEC

ASSOCIATED PARTNERS

ASAJA Andalucía · ALGARORANGE · CLUSTER MACHINISME

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About this catalogue

A practical guide to the Agrobotics-DiTwins Living Labs Network

Agrobotics-DiTwins supports agricultural companies in exploring digital and robotic solutions before implementation. Through collaborative Living Labs and digital twins, the project helps stakeholders analyse real needs, identify suitable technologies, test potential applications and assess expected benefits with expert support.

This catalogue presents the Agrobotics-DiTwins Living Labs Network: nine co-creation environments across Portugal, Spain and France focused on robotics, digital twins, data-driven tools and sustainable agricultural practices.

Each Living Lab provides specific technological capabilities and testing environments, covering areas such as UAV-based crop monitoring, precision irrigation, agricultural process simulation, multispectral data, soft robotics, autonomous agricultural robots and AI-driven perception.

What you will find

Network overview

A visual summary of the nine Living Labs, including their locations, managing entities and main areas of expertise.

Individual Living Lab profiles

Dedicated pages presenting each Living Lab's technologies and resources, what companies can obtain, application examples or ongoing use cases, deliverables and contact.

Participant information

A final section explaining how interested organisations can express their interest, identify the most relevant Living Lab and connect with the project team.

Who is it for?

This catalogue is intended for agricultural companies and farms, cooperatives, agricultural service providers, technology companies, clusters, associations, public authorities and innovation actors interested in digitalisation, robotics and sustainable agriculture.

Living Labs Network at a glance

Nine Living Labs across Portugal, Spain and France for robotics, digital twins and sustainable agriculture

1 DATA-COLAB Living Lab
PORTUGAL Viana do Castelo



Entity: Data CoLAB
Focus: UAV-based mapping, crop-health monitoring and pathology diagnosis.

UAV mapping · Crop health analytics · Digital twins

2 UALG Avocado Living Lab
PORTUGAL Algarve



Entity: University of Algarve
Focus: Low-cost plant monitoring for avocado irrigation management.

IoT sensors · Plant monitoring · Irrigation decisions

3 UALG Citrus Living Lab
PORTUGAL Algarve



Entity: University of Algarve
Focus: Low-cost plant monitoring for citrus irrigation management.

IoT sensors · Plant monitoring · Irrigation decisions

4 UMA Process Living Lab
SPAIN Málaga, Andalusia



Entity: University of Málaga
Focus: Simulation of agricultural processes enhanced by robotics technologies.

Process simulation · Technology comparison · Sustainability assessment

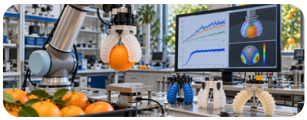
5 UMA UAV Living Lab
SPAIN Málaga, Andalusia



Entity: University of Málaga
Focus: Multisensor UAV data and analytics for precision agriculture.

UAV sensing · Multispectral mapping · Crop analytics

6 UMH Living Lab
SPAIN Elche, Alicante



Entity: Miguel Hernández University of Elche
Focus: Soft robotic handling and gripping solutions for agricultural produce.

Soft grippers · Force control · Prototype testing

7 EHU Robotics Living Lab
SPAIN Bilbao, Biscay



Entity: University of the Basque Country (EHU)
Focus: Autonomous and cooperative robotics for agricultural tasks.

Collaborative robotics · Digital twins · Simulation

8 UHU AgRoMap Living Lab
SPAIN Huelva, Andalusia



Entity: University of Huelva
Focus: 3D mapping, autonomous navigation and robotic sampling.

3D mapping · Autonomous navigation · Robotic Sampling

9 UNILIM–XLIM Living Lab
FRANCE Nouvelle Aquitaine



Entity: UNILIM–XLIM
Focus: AI-driven perception, ground and aerial robotics, and digital twins.

AI perception · Agricultural robotics · Digital twins

DATA-COLAB Living Lab

Data-oriented Crop Management

Location
Viana do Castelo, Portugal

Managing entity
Data CoLAB

Main focus
UAV-based multidimensional mapping, crop-health monitoring and pathology diagnosis.



Overview

The Data-oriented Crop Management Living Lab supports data-driven crop management through UAV-based mapping, monitoring and modelling. It combines multidimensional field data, digital twins and analytics to help companies better understand crop conditions, assess new management practices and validate solutions before wider implementation.

What companies can obtain

- Simulation of processes before investment.
- Analysis and optimisation of agricultural processes using field data.
- Assessment of the technical or environmental feasibility of new technologies and practices.
- Testing of vineyard management practices using UAV-based monitoring.
- In-field validation with technological and agronomic support.
- Reduced technological and investment risks.

Technologies & resources

- UAV platform.
- Multispectral sensors.
- Digital twin model development.
- Cartographic product generation and improvement.
- Simulation capabilities.
- Data analytics and input management tools.
- Training and demonstration environments.

Illustrative application example

UAV-assisted vineyard mapping for monitoring and diagnosis

Sustainable and prosperous viticulture requires knowing the land, the vine, the climate and their interactions and dependencies. Leveraging UAV-based 2D/3D and LiDAR mapping with data-supported modelling, abiotic factors can be better understood, crop health and vigour improved and pests and diseases managed. The participant can test and validate solutions to replicate elsewhere and reap benefits from data-oriented decisions.

Deliverable

The company will receive a report covering the initial challenge, the technology assessed and the conclusions reached. The baseline process will be modelled through a digital twin to support an optimised field-validation test. Training will also be provided on the relevant technologies and tools.

Contact

Virgílio Gouveia | open.innovation@datacolab.pt

UALG Avocado Living Lab

Avocado@Vila Nova de Cacela

Location
Vila Nova de Cacela, Algarve, Portugal

Managing entity
Universidade do Algarve – Instituto Superior de Engenharia

Main focus
Low-cost plant monitoring in avocado orchards to support irrigation decisions at individual-tree and orchard scales.



Overview

The Avocado@Vila Nova de Cacela Living Lab provides a real-field environment for developing and testing low-cost plant monitoring solutions in avocado orchards. Existing monitoring equipment and a more densely instrumented experimental area allow new sensing solutions to be evaluated under real operating conditions and compared with reference measurements.

What companies can obtain

- Field testing of sensing solutions under real orchard conditions.
- Comparison and validation against existing monitoring equipment.
- Assessment of sensor installation and deployment requirements.
- Evaluation of different monitoring granularities.
- Analysis of the usefulness of sensor data for irrigation decisions.
- Assessment of costs for scaling monitoring to additional trees or orchards.

Technologies & resources

- Working avocado orchard.
- Low-cost wireless sensing systems.
- Existing orchard monitoring sensors.
- Densely instrumented experimental area.
- IoT data collection and visualisation tools.
- On-site electricity and internet connectivity.

Illustrative application example

Low-cost sensing to support high-granularity avocado irrigation

Conditions vary within avocado orchards, so few sensors won't represent individual tree needs. This illustrative application will deploy low-cost wireless sensors on selected trees, evaluated against existing monitoring equipment for reliability and scaling costs. Results will help the company assess orchard variability, support irrigation decisions, and determine the economic viability of different monitoring granularities.

Deliverable

A field-installed, scalable IoT demonstrator for collecting and visualising sensor data, together with an assessment of orchard variability, sensor performance, deployment requirements and scaling costs. Recommendations will identify the value, requirements and limitations of different monitoring granularities for irrigation decision-making.

Contact

Jorge Filipe Leal Costa Semião | jsemiao@ualg.pt

UALG Citrus Living Lab

Frusoal-Citrus



Location
Vila Real de Santo António, Algarve, Portugal

Managing entity
Universidade do Algarve – Instituto Superior de Engenharia

Main focus
Low-cost plant monitoring in citrus orchards to support irrigation decisions at individual-tree and orchard scales.

Overview

The Frusoal-Citrus Living Lab provides a real citrus orchard environment for testing and validating low-cost plant monitoring solutions. Existing sensors and a densely instrumented experimental area allow new sensing technologies to be compared with established monitoring equipment under real field conditions.

What companies can obtain

- Field testing of sensing solutions under real orchard conditions.
- Comparison and validation against existing monitoring equipment.
- Assessment of sensor installation and deployment requirements.
- Evaluation of different monitoring granularities.
- Analysis of the usefulness of sensor data for irrigation decisions.
- Assessment of costs for scaling monitoring to additional trees or orchards.

Technologies & resources

- Working citrus orchard.
- Low-cost wireless sensor systems.
- Existing orchard monitoring sensors.
- Densely instrumented experimental area.
- IoT data collection and visualisation tools.
- On-site electricity and internet connectivity.

Illustrative application example

High-granularity irrigation decision support in citrus through low-cost sensing

Orchard and plant monitoring equipment is costly, limiting how densely it is deployed within citrus orchards. This illustrative application will evaluate low-cost wireless sensors against existing equipment in a densely monitored experimental area. Results will help assess what information can be reliably obtained at lower cost and whether wider deployment could support irrigation decisions across the orchard in an economically viable way.

Deliverable

A field-installed IoT demonstrator with low-cost wireless sensor nodes and tools for collecting and visualising plant-monitoring data. The company will also receive a comparison with existing equipment and recommendations covering deployment requirements, scaling costs, limitations and the potential value of wider sensor coverage for irrigation decisions.

Contact

Jorge Filipe Leal Costa Semião | jsemiao@ualg.pt

UMA Living Lab

UMA Agricultural Process Sustainability Simulator

Location
Málaga, Andalusia, Spain

Managing entity
University of Málaga

Main focus
Environmental impact simulation of agricultural processes enhanced by robotics-related technologies



Overview

This Living Lab uses process and production-system simulation to assess how robotics-related technologies could improve agricultural operations before implementation. The analysis considers environmental sustainability, technical feasibility and economic viability, helping companies compare alternatives and define appropriate implementation strategies.

What companies can obtain

- Tailored studies of agricultural processes.
- Comparison of technological alternatives.
- Environmental, technical and economic assessment.
- Guidance on the most appropriate implementation strategy.

Technologies & resources

- Process-flow simulation software.
- Machinery and production-system simulation tools.
- Dedicated server infrastructure for simulation software.
- Data-analysis tools.

Illustrative application example

Simulation of Selective Pesticide Application Using a Mobile Robot

This illustrative example aims to make pesticide application more sustainable by avoiding treatment of the whole field when only some areas are affected. The Living Lab will simulate a mobile robot that sprays only where needed and compare routes, speeds and tank capacities. The company will receive estimates of pesticide use, time, distance and energy consumption to assess environmental and economic benefits before investing.

Deliverable

A report assessing the technical feasibility, environmental impact and estimated economic cost of selective pesticide spraying with a mobile robot. It will compare the robotic solution with whole-field treatment and provide recommendations on whether further testing or investment is justified.

Contact

J. Ricardo Sánchez Ibáñez | ricardosan@uma.es

UMA Living Lab

UMA Multispectral Data for Precision Agriculture with UAVs

Location
Málaga, Andalusia, Spain

Managing entity
University of Málaga

Main focus
UAV-based high-resolution multisensor data acquisition and analytics for precision agriculture



Overview

This Living Lab applies UAV-based multisensor data acquisition, mapping and data analytics to precision agriculture. It supports the creation of virtual crop and parcel models and helps operators evaluate management strategies before implementation, enabling more proactive and data-informed agricultural decisions.

What companies can obtain

- Analysis of high-resolution agricultural data.
- Virtual representations of crops and parcels.
- Evaluation of alternative management strategies.
- Support for irrigation, fertilisation and crop-health decisions before field implementation.

Technologies & resources

- UAV-based data acquisition.
- Mapping software.
- Machine-learning capabilities.
- Data-analysis tools for predictive virtual models.
- Dedicated server infrastructure.

Illustrative application example

Crop Management using UAVs, Vision and Data Analysis

The illustrative example aims to support irrigation management using thermal and multispectral data to identify areas of water stress, support precision fertilisation by mapping soil properties, and assess crop health and vigour to detect early signs of pathogen infection or nutrient deficiencies. Companies will locate affected areas through the mapping process to plan field work and mitigate potential risks.

Deliverable

Reports with field data about crop variety and growth stage. The data include multispectral, thermal, and structural data to provide a comprehensive "enriched" view of the parcel. This report will provide information to the company for planning field work and crop-health monitoring.

Contact

Ricardo Vázquez Martín | rvmartin@uma.es

UMH Living Lab

AgroSoft Grip Living Lab
Design and Optimisation of Soft Gripping Solutions for Agricultural Produce.



Location
Elche, Alicante, Spain

Managing entity
Miguel Hernandez University of Elche

Main focus
Soft robotic handling of agricultural produce, with particular expertise in measuring end-effector forces

Overview

The AgroSoft Grip Living Lab specialises in soft robotic handling of agricultural produce, with particular expertise in measuring and optimising end-effector forces. Companies can simulate, prototype and physically test different gripping solutions to achieve secure handling while minimising damage to the product.

What companies can obtain

- Simulation and comparison of soft robotic end-effectors.
- Physical testing with agricultural produce.
- Optimisation of gripping forces.
- Selection of appropriate handling solutions.
- Evidence on grip stability and risk of product damage.

Technologies & resources

- Equipment and sensors
- Simulation tools
- Robotic systems
- Digital twin models
- Training or demonstration environments

Illustrative application example

Soft Robotic Harvesting and Crating of Citrus Fruit

Initial challenge: A company developing robotic citrus harvesting. Differences in fruit size, shape, ripeness and accessibility require adaptable gripping solutions and careful force control.
Proposed activity: Different soft end-effectors would be simulated and physically tested with citrus fruit.
Expected value for the company: The company would obtain comparative evidence to select an appropriate end-effector.

Deliverable

A technical report comparing the evaluated soft grippers in terms of gripping forces, grip stability and risk of fruit damage. It will include simulation and experimental results, recommended operating parameters and guidance on solution selection. Where appropriate, it may also include a proposed new or adapted gripper design.

Contact

José Maria Sabater Navarro | medicalrobotics@umh.es

EHU Living Lab

Robotic Living Lab for Autonomous and Cooperative Agricultural Tasks



Location
Bilbao, Biscay, Spain

Managing entity
University of the Basque Country (EHU)

Main focus
Collaborative robotic arms for cooperative agriculture tasks

Overview

The Living Lab provides an environment for testing autonomous and cooperative robotic solutions for agricultural operations. It combines robotic systems, sensing and simulation resources with digital twin models and demonstration environments, enabling companies to assess technical feasibility and compare alternative solutions before investment.

What companies can obtain

- Simulation of agricultural processes before investment.
- Comparison of alternative robotic solutions.
- Assessment of technical feasibility.
- Evidence to support future development and investment decisions.

Technologies & resources

- Equipment and sensors
- Simulation tools
- Robotic systems
- Digital twin models
- Training or demonstration environments

Ongoing Use Case

Low-Cost Robotics and Vision for Smart Greenhouse Operations

The use case combines low-cost robotics, computer vision and AI to automate harvesting, handling and storage of fruits and vegetables in horizontal and vertical greenhouses. Vision systems support crop detection, robotic manipulation and multi-robot cooperation. Companies can evaluate the feasibility, scalability and efficiency of these solutions under representative conditions before deployment.

Deliverable

A demonstration video showing how low-cost robotics, computer vision and AI can address the company's agricultural task under representative conditions. The demonstrator will provide tangible evidence of technical feasibility and potential benefits to support future development, investment and deployment decisions.

Contact

Aitziber Mancisidor | aitziber.mancisidor@ehu.eus

UHU AgRoMap Living Lab

Mapping techniques, robotics and interaction in agricultural environments



Location
Huelva, Andalusia, Spain

Managing entity
University of Huelva

Main focus
3D mapping and mobile robotics for agricultural environments, including perception, digital twins, autonomous navigation and robotic sampling of soil and vegetation.

Overview

The AgRoMap Living Lab develops and validates mobile robotic solutions for agricultural environments. It combines 3D mapping, autonomous navigation, digital twins and robotic interaction to support field data acquisition, environmental characterisation and sampling tasks.

What companies can obtain

- Mapping and characterisation of agricultural environments.
- Field data acquisition using mobile robots.
- Testing of autonomous navigation strategies.
- Robotic collection of soil and vegetation samples.
- Evaluation of robotic interaction and intervention strategies.
- Data for developing new agricultural applications and services.

Technologies & resources

- Experimental agricultural environments.
- Autonomous mobile robotic platforms.
- LiDAR, IMUs, cameras and perception sensors.
- 3D mapping, SLAM and point-cloud processing.
- Digital twins of agricultural environments.
- Navigation and robotic sampling tools.
- Training and demonstration environments.

Illustrative application example

Mapping, Navigation and Robotic Sampling in Agricultural Environments

A mobile robot navigates an agricultural environment to generate a 3D digital reconstruction and support the planning and validation of different navigation strategies and small-scale interventions. . During field trials, the robot can also collect soil, leaf or other environmental samples, associating each sample with its location and onboard sensor data.

Deliverable

A dataset containing 3D mapping and georeferenced information collected during field and sampling activities, together with technical reports assessing the feasibility and efficiency of the tested robotic operations and comparing alternative intervention strategies.

Contact

Fernando Gómez Bravo | fernando.gomez@diesia.uhu.es

UNILIM-XLIM Living Lab

AI-driven perception, robotics and digital twins for agriculture

Location
Nouvelle-Aquitaine, France

Managing entity
UNILIM-XLIM

Main focus
AI-driven perception, ground and aerial robotics, and digital twins



Overview

The UNILIM–XLIM Living Lab supports the evaluation of agricultural robotic technologies through AI-driven perception, robotic systems, digital twins and field validation. Its approach combines simulation and real-world experimentation so that organisations can assess a technology before committing to an investment.

Technologies & resources

- AI-driven perception.
- Ground and aerial robotic systems.
- Digital twin models.
- Simulation capabilities.
- Field validation and experimentation.

What companies can obtain

- Simulation of the intended agricultural process before investment.
- Evaluation of robotic technologies in representative environments.
- Field experimentation to complement simulation results.
- Technical evidence to support investment decisions.

Ongoing Use Case

Technology Validation for a French Agricultural High School

The ongoing use case addresses an organisation considering investment in agricultural technology. It combines environmental perception, localisation and field mapping, multi-robot coordination, digital twin simulation and field experimentation to demonstrate how the proposed technologies perform in the intended working environment.

Deliverable

A simulation of the working environment combined with results from field experiments, providing evidence that can be used to assess the relevance of the technologies before an investment decision.

Contact

Ouiddad Labbani | ouiddad.labbani-igbida@unilim.fr

How to apply to join the Living Labs

Express your interest and connect with the most relevant Living Lab

Interested organisations can apply to join the Agrobotics-DiTwins Living Labs through a short expression of interest questionnaire. This entry point helps connect agricultural and technological needs with the expertise available across the Living Labs Network.

How the process works

1 Submit your expression of interest

Complete a short form with your contact details, organisation and the Living Lab you are interested in. If you are not sure which Living Lab fits your needs, you can select "I am not sure yet / I would like guidance".

2 Review and guidance, if needed

The Agrobotics-DiTwins team will review the information provided and identify the most appropriate Living Lab or possible areas of collaboration.

3 Follow-up and next steps

The project team will contact your organisation to discuss your interest, provide further guidance and explain the next steps for exploring a potential collaboration.

Who can apply?

- agricultural companies and farms;
- cooperatives and producer organisations;
- agricultural service providers;
- technology providers;
- agri-food SMEs;
- clusters and business associations.

Ready to get started?

Complete the Agrobotics-DiTwins Living Labs questionnaire and select the Living Lab or service area most relevant to your organisation.

Join the Living Labs

Contact

Get in touch with the Agrobotics-DiTwins Living Labs Network

For further information about the Agrobotics-DiTwins Living Labs, the expression of interest questionnaire or opportunities to collaborate with the project, please contact the project team.

General project contact

University of Málaga
Project coordinator - Agrobotics-DiTwins

Email
agrobotics.ditwins@uma.es

Project website
https://interreg-sudoe.eu/proyecto-interreg/agrobotics-ditwins/

Stay connected

Follow Agrobotics-DiTwins updates, Living Lab activities and new resources through the project's official communication channels.

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Interested in joining the Living Labs?

Complete the short form and select the Living Lab or service area most relevant to your organisation.

Join the Living Labs

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