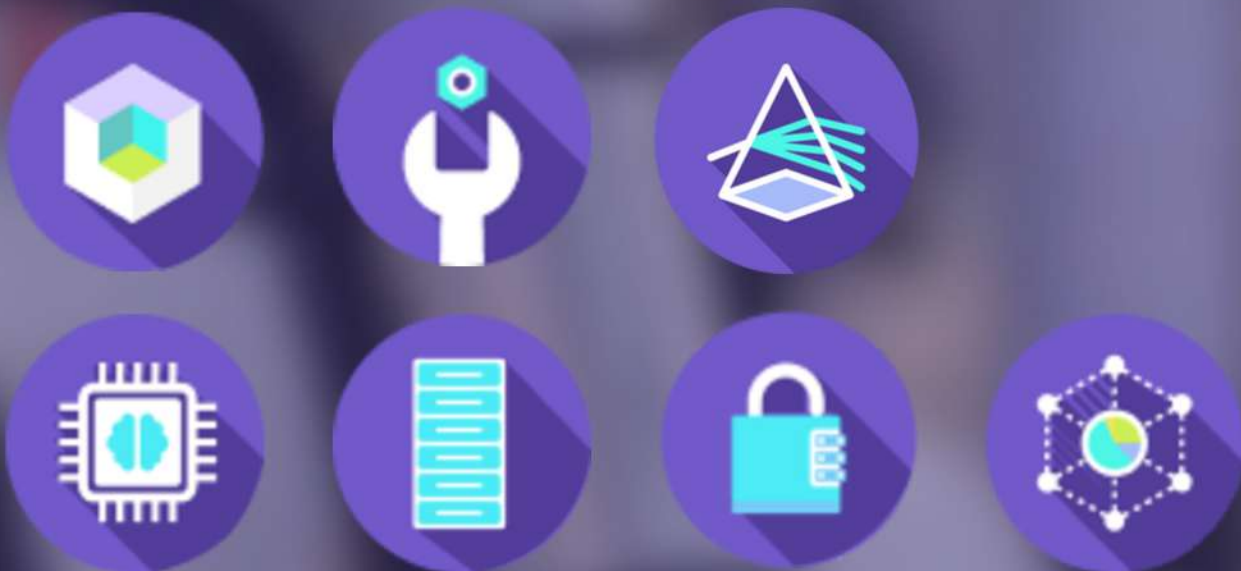




# Service Catalogue

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November 2024

# DIH4CAT



Non-profit **innovation ecosystem**, formed by the main digitization agents in **Catalonia (Spain)**, aimed at **driving technology transformation** for a more **green and digital industry**.

## MAIN TARGET



**SMEs**

(focus on industrial sector & technology providers)



**Technology start-ups**



**Public administration**

Due to national funding limitations, DIH4CAT is allocating part of its project budget to provide **Testing & Experimentation Services to International Companies**.

# Partners



Generalitat de Catalunya  
**ACCIÓ**  
Leader

Technology Partners

7

eurecat  
CVC  
Computer Vision Center  
Artificial Intelligence

eurecat  
Advanced Manufacturing

LEITAT  
managing technologies  
Additive Manufacturing

i2cat<sup>R</sup>  
Smart Connectivity

BSC  
High Performance Computing

UPC  
Cybersecurity

ICFO<sup>R</sup>  
Photonics

Support Partners

3

IESE  
Business School  
University of Navarra  
Business School

pimec  
Micro, petita i mitjana empresa de Catalunya  
Employers Association

Foment  
del Treball Nacional  
Employers Association



# Artificial Intelligence



Technology that combines data optimization, software algorithms, and computational power, enabling computers to learn and make decisions with a certain degree of autonomy.

Node coordinated by

eurecat



## About Eurecat & CVC

- **Eurecat & CVC** are leading R&D centers specialized in AI-driven innovation.
- **Eurecat** focuses on digital transformation and advanced manufacturing, while **CVC** excels in computer vision with applications in healthcare, mobility, and industry.

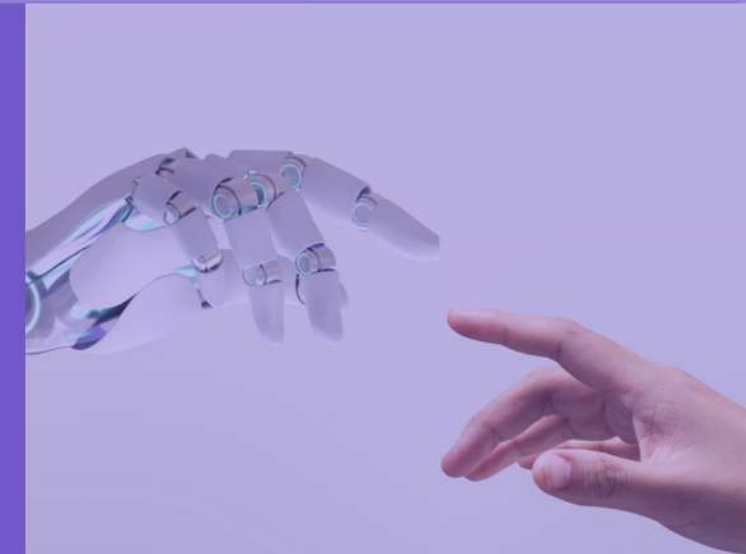


## Capacities and Infrastructure

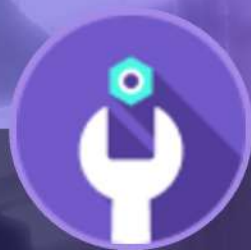
- **MareNostrum5**: Supercomputing facility.
- **CARLA**: Synthetic data generation platform to train autonomous models.
- **ChaLearn LAP Platform**: Platform for human behaviour analysis.
- **Robust Reading Competition Platform**: Evaluation platform for reading systems.
- **Living Lab Space**: Innovation hub for entities with exponential technologies.
- **Cognitive Robotics Laboratory**: Facility for Cognitive Robotics and Computer Vision.
- **Cybersecurity Laboratory**: Focused on Cybersecurity for industrial infrastructures.
- **Urban Testing Sandbox**: Testing site for innovation pilots in public spaces.

## Main Services

- Developing **vision-based systems** for autonomous vehicles.
- Automating **text recognition** from scanned documents.
- Extracting advanced information from **multi-wavelength images**.
- Analyzing **human movements and behaviors** via visual data.
- **Processing medical images** for diagnostics, treatment and research.
- **Integrating visual data with NLP** for descriptive content.
- Exploring **quantum computing applications** in visual machine learning.



# Advanced Manufacturing and Robotics



Technologies that leverage Industry 4.0 innovations, including sensing, AI, augmented reality, simulation, and machine vision, to enhance and optimize manufacturing processes and automation systems.

Node coordinated by

**eurecat**



## About Eurecat

- Center of expertise in **Advanced Manufacturing, Automation** and other key **industry 4.0 technologies**.
- Supports companies in the **digital transformation** of their manufacturing processes, operations, and intelligent product development.



## Capacities and Infrastructure

- Cognitive Robotics Laboratory.
- Advanced Transformation and industry 4.0 Laboratory.
- Printed Electronics and Surface Functionalization Laboratory.
- Perception and Manipulation Laboratory.
- Kinematics and Robot Design Laboratory.
- Virtual Reality Laboratory.
- Experimental Laboratory for Underwater Robots and Equipment.
- Testing and Simulation Laboratory for Mobile Robotic Systems.
- Advanced Electronics and Communications Laboratory.
- Intelligent Robotics and Computer Vision Group Laboratory (IRCV).

## Main Services

- **Advanced Manufacturing:** Sensors and Artificial Vision for Industrial Processes, AI applied to Manufacturing Processes, Plastronics, Virtual and Augmented Reality, Industrial 5G, Supply Chain Management Solutions.
- **Advanced Robotics:** Cognitive and Collaborative Robotics in Industrial Environments, Mobile Robotics (ground, aerial and marine), and Automation and Enhancement of Manual Processes with New Technologies.



# HPC High Performance Computing



Technological resource with substantial computational capacity to address complex challenges, consisting of two key components: Hardware (physical computer components) and Software (programs, instructions, and data enabling tasks).

Node coordinated by



**Barcelona  
Supercomputing  
Center**  
*Centro Nacional de Supercomputación*



## About the Barcelona Supercomputing Center (BSC)

- Supports business digital transformation of by offering **HPC-based solutions**.
- Addresses scientific fields including **Earth Sciences**, for climate and air quality forecasting, **Life Sciences**, to understand living organisms, and **Engineering**, to optimize software to fully leverage supercomputing capabilities.



## Capacities and Infrastructure

- **MareNostrum5**: Currently ranked as the 8th most powerful supercomputer in the world, with a computational capacity that exceeds 300 quadrillion operations per second and equipped with over 15,000 processors and 4,500 accelerator cards to enhance performance and efficiency.

## Main Services

- Developing **digital twins** for climate and health applications.
- **Aerodynamic optimization** within the transport sector.
- Optimizing **energy consumption**.
- Training of **Large Language Models (LLMs)**.
- **Other** forms of using Supercomputing to boost industrial productivity.



# Additive Manufacturing



Manufacturing method that builds parts by adding layers of material, enabling advanced functionalities through part customization, weight reduction techniques and cost savings, leading to significant industrial improvements.

Node coordinated by

**LEITAT**  
managing technologies



## About Leitat

- Technological center focused in industry adoption of **3D printing technologies**.
- Operates and manages the **International Advanced Manufacturing 3D Hub (IAM3DHUB)**, a consortium that brings together leading companies in the sector, with the mission to accelerate the adoption and development of 3D printing technologies for the industry and medicine.



## Capacities and Infrastructure



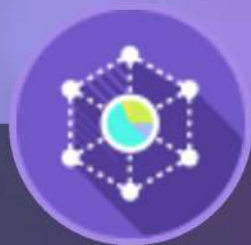
- **Laboratories for 3D Printing** of metals (powder), polymers (filaments, powders and resins), silicone and ceramics, material characterization, and post-processing equipment for mechanical polishing and dry electropolishing.
- **3DP Medical Lab** where hospitals and medical companies can test and experiment with all types of specialized additive manufacturing technologies for medical and health applications, developing innovative applications and projects together with professionals in the sector.

## Main Services

- **Design and Engineering** for AM, development of advanced applications.
- **Development and optimization** of AM materials processing and post processing strategies and parameters, and digitalization of AM process.
- **Training and Mentoring** in Additive Manufacturing.
- **Additive Manufacturing Adoption** support and consulting.



# Smart Connectivity



Technology that enables data exchange through digital networks by combining the Internet of Things (IoT) with 5G networks, aiming to facilitate interaction between people and devices.

Node coordinated by

**i2cat<sup>R</sup>**



## About i2CAT

- Technology center leading R&D in advanced digital technologies, including 5G/6G, IoT, immersive tech, cybersecurity, blockchain, AI, space communications, and digital social technologies.

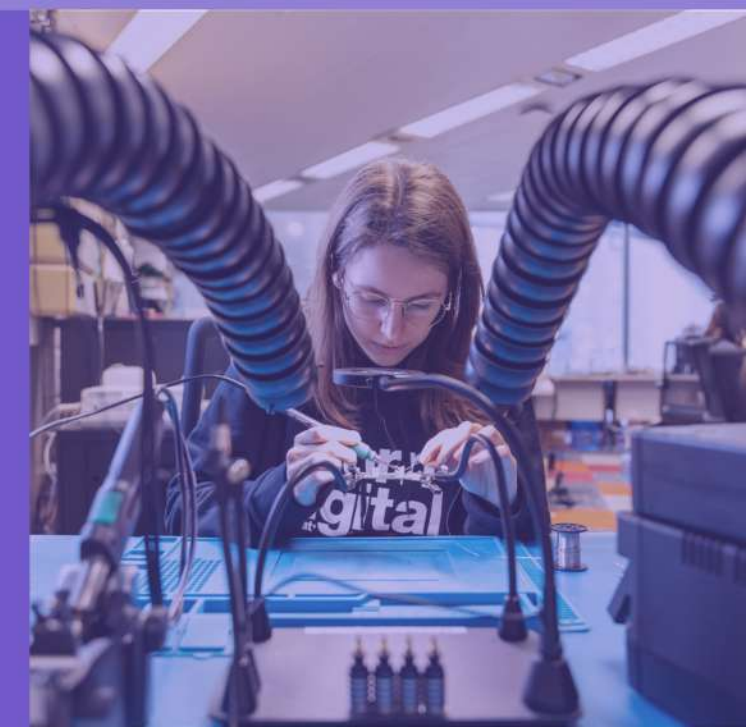


## Capacities and Infrastructure

- 5G/6G labs
- IoT lab
- **New Space Lab:** Testing for satellite communications applications.
- **Virtual Reality and Holopresence Lab**
- **Other capacities:** Cybersecurity and Blockchain, AI applied in the field of Connectivity and multimedia technologies (Virtual and Augmented Reality).

## Main Services

- **Viability Studies:** Design and definition of concept tests and pilot projects across technologies including 5G, IoT, Cybersecurity, Blockchain, AI for Smart Networks, and Space Communications.
- **Testing and Experimentation:** Development of proofs of concept and prototypes leveraging i2CAT's advanced laboratories and infrastructure.





# Cybersecurity



Practice of protecting equipment, networks, servers, software, critical systems, and data from digital threats, which is essential for organizations to maintain customer trust and comply with regulatory requirements.

## Node coordinated by



UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH



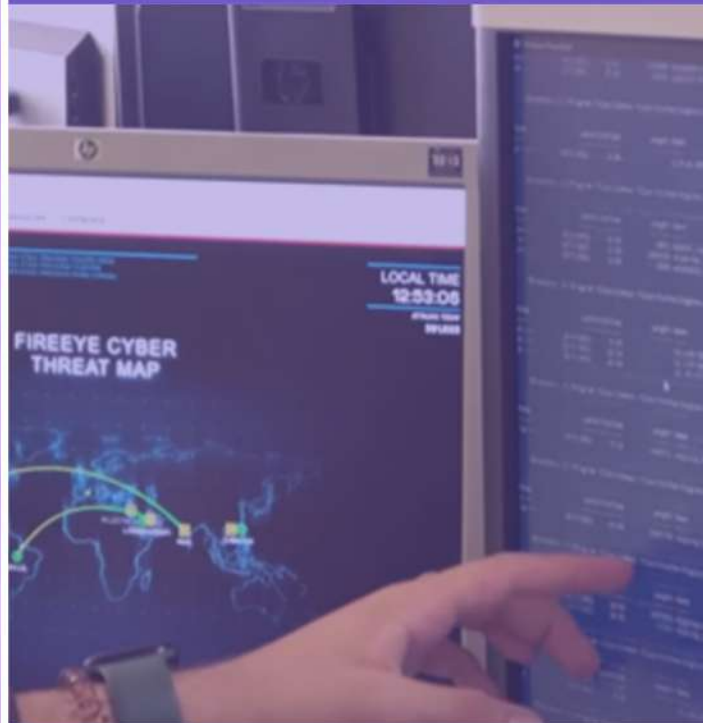
## About the Polytechnic University of Catalonia (UPC)

- **Public university** focused on engineering, architecture, and technology.
- **Leading institution** focused on advancing society through quality education, research excellence, and collaboration with industry.
- It coordinates the **Cybersecurity Node**, which also includes Eurecat, ICFO and i2CAT.



## Capacities and Infrastructure

- **inLab - FIB:** For solutions development in Cybersecurity, Data Science, AI and Software Engineering.
- **I4TECH Laboratories - MCIA:** For technology design and testing for Smart Manufacturing and Sustainable Industrial Processes.
- **SmartRoom2 (SR2) - IDEAI:** For applications development in Human-Computer Interfaces (HCI), Augmented Reality, Biometrics, and Activity Recognition.



## Main Services

- **Data Security Services:** Data analysis, visualization and encryption and, with a focus on industrial equipment.
- **Risk Assessment Services and Solutions:** Analysis and implementation of solutions to ensure compliance with regulations (LOPD, GDPR, LSSI).
- **Security Programming Language:** Training and development of code based on programming languages focused on security.
- **Search Engine Optimization (SEO)**



# Photonics



Study and application of photons, involving technologies like lasers, LEDs, sensors, fiber optics, and satellite communications. It is a technology that adds value across diverse fields, including healthcare, communications, environment, and aerospace.

Node coordinated by

**ICFO<sup>R</sup>**



## About ICFO

- Research center that focuses on the **science of light** and its applications
- Conducts advanced research in areas like **quantum optics, nanophotonics, biophotonics, and optoelectronics.**



## Capacities and Infrastructure

- **Super Resolution Light Microscopy and Nanoscopy Facility (SLN):** For advanced nanoscale imaging.
- **Nanofabrication Lab (NFL):** For creating nanometer-scale devices.
- **Nanocharacterization Lab (NCL):** For the characterization of nanomaterials and nanostructures.



## Main Services

- **Nanofabrication and Nanocharacterization.**
- **Super-resolution and Advanced Microscopy.**
- **Quantum Technologies**, including quantum cryptography, information, communication, simulation, and sensors.
- **Medical Applications**, including non-invasive monitoring and advanced bio-imaging.
- **Energy Applications**, including next-generation solar cells, green fuels and chemicals, energy efficiency, and storage.



