



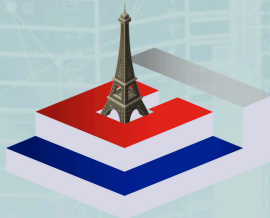
ISARC HACKATHON 2024

SUSTAINABLE INNOVATIONS IN CONSTRUCTION FROM ROBOTICS TO THE CLOUD

**Organised by
Centrale LILLE & EuraTechnologies**

From 5 to 7 June 2024
Organised at EuraTechnologies &
LILLIAD Learning center
Lille, Villeneuve D'Ascq, FRANCE





INSTITUT FRANÇAIS
DE LA CONSTRUCTION LEAN

Who are we ?

The International Symposium on Automation and Robotics in Construction (**ISARC**) is the annual meeting for the International Association for Automation and Robotics in Construction (**IAARC**). Since 1984, IAARC has stood as the sole global organization dedicated to the advancement of automation and robotics in construction, boasting members from across the globe.

ISARC 2024 is scheduled to take place from June 3rd to 7th, 2024, in Lille, France. This symposium, organized by École Centrale de Lille, in collaboration with the the Europeenne Metropole of Lille (**MEL**) and The French Intitute of Lean Construction (**IFCL**) The theme for ISARC 2024 focuses on the robotisation of renovation in construction.

The local organizing committee of ISARC 2024 is chaired by **Prof. Zoubeir LAFHAJ**, Ph.D. in Civil Engineering. Professor LAFHAJ is a distinguished faculty member at **Centrale Lille**, an elected member of the Board of Directors of the Institut **Centrale Lille** since 2019, the president and founder of the French Intitute of Lean Construction (**IFCL**) and a member in the Bureau Of Directors of the **IAARC** organization.

Pr. Dr. Zoubeir LAFHAJ, Chair of O&C ISARC 2024
Full Professor, Centrale Lille Institut



The ISARC 2024 hackathon is organized in collaboration between **Centrale Lille** and **EuraTechnologies**. Centrale Lille is a prestigious engineering school in France, known for its rigorous academic programs and strong focus on research and innovation in science and technology. **EuraTechnologies**, located in Lille, is a leading incubator and accelerator that supports tech and digital businesses through extensive coaching, networking, and funding opportunities, making it a vital center for entrepreneurship and technological advancement. Together, these institutions combine their expertise to foster innovation and development in the tech community.

Context of the ISARC Hackathon

The **ISARC2024 Hackathon** is a pivotal event within the broader **ISARC 2024 Symposium**, a significant gathering of professionals in construction, automation, and robotics. The symposium serves as a dynamic platform for exchanging innovative ideas, networking with industry experts, and discovering the latest advancements in technology and practices that are shaping **the future of construction** and related fields.

Set against the backdrop of the **ISARC Symposium**, the **hackathon** invites master's level students and emerging professionals to tackle pressing challenges in the construction sector. By integrating advanced technologies such as AI, robotics, and cloud computing, participants are charged with developing sustainable, efficient solutions that enhance safety, quality, and productivity.

KEYWORDS



*AI, Construction, Design,
Measurement, Automation, Robotics,
Software and Hardware Solutions,
Cloud Computing, Security, Quality,
Productivity, Servitization, Durability,
Efficiency, Environment, Waste
Management, IoT Sensors*

Hackathon subject description

Dive into the Ultimate Challenge of Sustainable Innovation at the ISARC2024 Hackathon

We are calling on the brightest minds among **master's level students** to embark on a transformative journey over three exhilarating days. The ISARC2024 Hackathon is not just an event; it's a mission to redefine the future of **construction, automation, and robotics**. Your challenge ? To forge revolutionary solutions that blend **AI, cloud computing, and robotics**, tackling the pressing issues of **safety, quality, productivity, and beyond in the construction sector**.

Envision creating robots that can autonomously sort waste, maintain cleanliness on sites, or monitor construction environments in real-time. Your goal is to synthesize technology and sustainability, crafting **prototypes** that pave the way for a more efficient and sustainable future. This is your chance to push the boundaries of what's possible, applying your knowledge to real-world problems and making tangible contributions to the future of construction.

Through this hackathon, you'll not only test your **skills and creativity** but also have the opportunity to contribute meaningfully to the sector's evolution. We're looking for solutions that are not just innovative but also viable and sustainable, with the potential to revolutionize how construction projects are approached and executed.

Are you ready to take on this challenge and make a lasting impact?

Join us at ISARC2024 to turn your visionary ideas into reality, shaping a future where construction is safer, more productive, and unequivocally sustainable.

The ISARC2024 Hackathon is an integral part of the ISARC 2024 Symposium, a leading event for construction, automation, and robotics professionals worldwide. The symposium is a hub for exchanging ideas, networking with experts, and discovering the latest industry innovations.

For registration or more information, please visit our website : www.isarc2024.fr/hackathon



Event Details :

- **Registration : Opens :** **April 5, 2024**, **Closes :** **May 25, 2024**.
- **Registration via the website :** www.isarc2024.fr/hackathon
- **Event Dates :** **June 5, 6, and 7, 2024 (3 Days)**.
- **Event location :**
 - **Semi finals :** June 5 from **9:00 AM** to June 7 at **12:00 PM**, at **EuraTechnologies, Lille**.
 - **Finals :** June 7 from **3:30 PM** to **6:30 PM**, at **Lilliad Learning Center, Villeneuve d'Ascq**. (Attendees are expected to travel via public transport, such as the metro).
- **Teams :** 20 teams, of 3 to 4 persons per team will participate in the hackathon.
- **Team registration:** Only **pre-formed teams** may register (no individual registrations).
- **Registration fee :** A nominal registration fee of **15 euros** per participant is applied if your team is selected.
- **Participation :**
 - Selection will be based on the evaluation of your team's application,
 - If your team is selected you will be contacted by one of the organisers and you will have 4 days to proceed to the payment in order to confirm your participation.
- **Hackathon phases :** semi finals and finals.
 - **Semi finals:** the semi finals will take place in EuraTechnologies, and the participants must present a functional prototype in front of a selected jury to advance to the finals. Please refer to the evaluation criteria below for more information, 7 teams will qualify for the finals.
 - **Finals :** The finals will take place in Lilliad learning center on the 7th of June starting from 3:30 PM, the finalists will have to pitch their project idea in front of a jury of professionals and a public, and the jury will decide who are the **5 winners** of this hackathon.
- **Presentation :** teams must deliver a clear and impactful pitch, lasting between **3 to 5 minutes** and maximum **5 slides**.
- **Winners :** There will be **5 winning teams** - the top 3, an audience choice award, and a free participation voucher for **ISARC2025**.
- **Prizes :** a total of **6000 euros** in prizes. (check below for more details)
- **Preparation :** Participants are **allowed to prepare for the hackathon in advance** and bring their prepared materials to use during the event (this includes software, algorithms, sensors, development boards, etc.).
- **Facilities :** Participants will have access to a fabrication laboratory (fab lab) «TechShop» equipped with 3D printers, CNC machines, and all necessary tools. The workshop supplies include various materials, screws, drill bits, wood, and metal. Essential tools available are drills, screwdrivers, pliers, hammers, saws, staplers, glue guns, and metal saws... Each team will receive the following items for their prototyping phase:
 - PLA for the 3D printers,
 - One laser-cut poplar plywood sheet (1000x600 mm) per team.

- **Important Note :** If your project/idea involves building a robot or something similar, please be aware that you will need to bring your own sensors and development boards for use in your creation. You will only have access to the machines ; we cannot provide sensors and boards for you.

Global objectives

- **Technological Integration:** Combine AI, robotics, and cloud computing to develop prototypes capable of optimizing construction processes, improving safety and quality, while supporting sustainability and efficiency.
- **Sustainable Innovation :** Focus on creating solutions that promote environmental sustainability and efficiency in the construction sector, from waste management to environmental monitoring and automated site cleaning.
- **Collaboration and Creativity:** Encourage interdisciplinary teamwork and creative thinking to tackle the complex challenges of the construction sector with innovative and practical approaches.

Expected outcomes of this Hackathon

At the conclusion of the ISARC2024 Hackathon, each team is required to present their project through a functional prototype, which could be either hardware or software, showcasing their innovative solution. Alongside this prototype, teams must deliver a clear and impactful pitch, lasting between **3 to 5 minutes**, in front of a jury of professionals during the semi-finals and finals.

This pitch is your opportunity to highlight the innovation, applicability, and feasibility of your solution, emphasizing its potential to contribute positively to the construction industry. It should succinctly encapsulate your project's core idea and business model within **a maximum of 5 slides**.

Key Points for Your Pitch :

- **Clearly State the Problem:** Begin by clearly defining the specific market need or problem your solution addresses.
- **Illustrate with Real-World Use Cases :** Offer clear examples of how your solution could be applied in actual construction settings, demonstrating its practical benefits.
- **Detail the Implementation Plan :** Outline how your solution can be realistically implemented in the industry, showing its feasibility.

Pitch Preparation Support :

- To assist you, a professional will host a 30-minute session during the hackathon to guide you on crafting an effective pitch, focusing on essential elements that make a pitch successful. This session is designed to enhance your ability to communicate your project's value effectively to the jury

Prerequisites for Participating in this Hackathon

To participate in the ISARC2024 Hackathon, candidates must have a minimum of knowledge in one or more of the following areas : **IT, artificial intelligence (AI), robotics, construction, data management (Data), the Internet of Things (IoT), and business.** This skill base will ensure that all participants can effectively contribute to the design and development of innovative solutions.

We strongly encourage the formation of heterogeneous teams, bringing together people with diverse profiles - **marketing, IT, robotics, business, and others** - to foster a complementary approach in project development. The diversity of perspectives and expertise within teams is a major asset for innovation, covering all aspects of a viable solution, from its technical design to market strategy.

A well-balanced team, combining technical, commercial, and communication skills, will be better able to create compelling prototypes and develop solid business plans, thereby increasing its chances of success. The aim is to stimulate collaboration among talents from different backgrounds, to draw the best from each discipline, and to encourage creativity, innovation, and entrepreneurship in the construction sector and related technologies.



Why participate in the ISARC2024 Hackathon ?

🚀 **Jumpstart Your Innovation Journey** – The ISARC2024 Hackathon is your ticket to dive into the heart of the construction industry's future. With a **nominal registration fee of 15 euros per participant.**, we're opening the doors for talents from all walks of life to bring their innovative ideas to the forefront. Over three intense days, you'll develop an innovative prototype, refine your pitch, and present a convincing business model, all while being supported by a network of experts and mentors.

💰 **Win Big While Making an Impact** – Not only do you stand a chance to win up to 3000€, but you also get the unique opportunity to make a tangible difference. Innovate for sustainability, push the boundaries of technology in construction, and contribute to a sector critical to our global economy and societal well-being. This is your chance to see your ideas come to life and potentially transform the industry.

🌍 **Showcase in Front of the Global Elite** – Pitch your groundbreaking ideas in front of a jury of internationally recognized professionals and an audience of approximately 200 people. This unparalleled opportunity offers valuable feedback, expands your professional network, and generates interest in your project. You'll meet and collaborate with talented students, entrepreneurs, researchers, and experts from around the world, making connections that could shape the trajectory of your career.

💡 **Challenge Yourself and Grow** – Test your entrepreneurial skills, innovate, and collaborate on complex projects. This event isn't just about winning; it's about growing, learning, and being part of something larger than yourself. Are you ready for the adventure?

Join us at ISARC2024 and be part of shaping the future of construction.



Awards for your Excellence

Prizes for the top-performing teams :

- 🏆 **First Place: €3,000** - Lead the change with your innovative solution.
- 🏆 **Second Place: €2,000** - Your impactful idea earns a significant reward.
- 🏆 **Third Place: €1,000** - Recognition for your creative and practical approach.
- 🏆 **Audience Choice Award:** A special accolade for the team that captures the audience's imagination.
- 🏆 **IAARC Award :** A voucher to cover one (1) full ISARC registration for the following ISARC2025 to the winning team.

High-Quality Support :

This hackathon also serves as your gateway to the entrepreneurial world. If the winning team is interested in further developing their project idea, we are offering the following support :

- 🚀 Assistance with the creation and acceleration of the startup by EuraTechnologies, along with support from École Centrale de Lille and construction industry experts to further develop your project.
- 🏢 Access to the EuraTechnologies coworking space throughout the support period.

Recognition for All Participants :

- 📄 **Participation Certificate:** Every participant will be acknowledged with a certificate, celebrating their dedication and innovation.
- 📢 **Media Spotlight:** The participants will enjoy promotion and visibility across various media platforms, shining a light on their exceptional contributions to the field.



Rules for participating in this Hackathon

To ensure a rewarding and organized experience at the ISARC2024 Hackathon, we have established a set of simple rules :

- **Team Composition** : Participants must register as a team of 3 or 4 people. Interdisciplinarity is encouraged to foster innovative and comprehensive approaches.
- **Registration Deadline** : Registrations will close one week before the hackathon date, i.e., Wednesday, May 25, 2024. Make sure to submit your application on time.
- **Advance Preparation**: Teams are allowed to prepare certain elements of their project in advance, whether software or hardware. However, note that any equipment brought must be able to fit easily into an elevator (haha) to ensure easy transportation to the workspace.
- **Semi-Final on Friday 07/06/2024 Morning** : On the morning of June 7, 2024, teams will present their idea (pitch) in front of a jury for validation. This step is crucial for advancing to the final, with 7 teams selected to move on.
- **Final on Friday 07/06/2024 Afternoon** : The 7 selected teams will have the opportunity to present their projects during the ISARC2024 event's closing ceremony, on Friday, June 7, 2024 starting at 15h30, in front of an estimated audience of 200 people, including professionals from around the world.
- **Awards** : A jury will designate the winners, ranking the top three teams and also awarding a special "audience choice" prize.



Inspirations

- **Eco-Tech** : Development of an integrated robotic system that uses artificial intelligence to identify, sort, and manage waste on construction sites. The system could include modular robotic arms equipped with sensors to recognize and separate recyclable materials from non-recyclable and organic waste. The key innovation would be the application of deep learning algorithms to improve sorting efficiency and reduce the amount of waste destined for landfill. This project underscores the importance of sustainability and efficiency in resource and waste management.
- **RoboCleanConstruct** : Development of autonomous robots capable of independently navigating construction sites to perform cleaning and tidying tasks. These robots would use advanced detection and navigation technologies to avoid obstacles and maintain site cleanliness, thereby contributing to operational safety and efficiency. The focus would be on integrating innovative propulsion systems and waste collection mechanisms, allowing the robots to operate across various terrains and construction conditions. This project aims to automate repetitive tasks and reduce risks to human workers.
- **EcoMonitorBuild** : Design of an integrated solution using IoT sensors and a cloud platform to monitor key environmental parameters on construction sites in real-time, such as air quality, noise levels, and temperature. This solution would ensure compliance with environmental standards and improve working conditions. The innovation lies in the use of real-time data analysis to provide early warnings and recommendations for mitigating environmental impacts. This system would promote proactive decision-making and improve the sustainability of construction projects.
- **Your Innovation** : In addition to addressing the proposed challenges, you are also strongly encouraged to demonstrate your innovation and creativity by proposing your own project topics. If you have a revolutionary idea that addresses the challenges of construction, automation, sustainability, or any other issue related to the hackathon's keywords, we invite you to develop it. All proposals aimed at pushing the boundaries of technology and efficiency in the construction sector are welcome.

EVALUATION CRITERIA :

INNOVATION – SUSTAINABILITY – TECHNICALITY

- **Innovation and Technical Vision** : Assessment of the originality and innovation of the proposed solution, especially its use of AI, robotics, and cloud computing in the construction sector. The vision must demonstrate a deep understanding of the current and future challenges of the industry and propose a novel way to address them.
- **Relevance and Impact on Sustainability** : Importance given to solutions that not only meet a clear need in the construction sector but also contribute significantly to environmental sustainability. This includes energy efficiency, waste reduction, and the reduction of the carbon footprint.
- **Technical Feasibility and Team Execution Potential** : The team's ability to implement the proposed solution, evaluated through their technical skills, experience, and ability to work effectively together. The evaluation will also consider the presentation of a functional prototype demonstrating the solution's feasibility.
- **Functional Prototype** : To advance to the finals from the semi-finals, participants must present a functional prototype. Judging will be based on the functionality and quality of the prototype.
- **Scalability of the Business Model** : Viability and growth potential of the business model associated with the solution. This includes analysis of cost structure, revenue sources, and the ability to adapt and expand in different markets or regions.
- **Marketing Strategy and Competitive Advantage** : Clarity and relevance of the go-to-market strategy, including understanding of the target audience, distribution channels, and promotion strategies. The solution's competitive advantage, what distinguishes it from existing market offerings, will also be a key criterion.
- **Presentation and Pitch** : Quality of the final presentation and pitch, assessing the team's ability to effectively communicate their vision, the added value of their solution, and their business plan in a clear, concise, and persuasive manner in front of the jury and potential investors.

Hackathon facilities



June 5th, 6th All day and 7th Morning

EuraTechnologies

Place de Saintignon, 165 Av. de Bretagne,
59000 Lille



June 5th Afternoon and 6th All day

TechShop

30 Rue Henri Regnault,
59000 Lille



June 7th Afternoon 3:30 - 6:30 pm

LILLIAD Learning Center,

2 Av. Jean Perrin,
59650 Villeneuve-d'Ascq

Contact Info

Registration and more details available on our website :

www.isarc2024.fr/hackathon

For any inquiries or questions, please feel free to contact us at:

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