



INDUSTRY 5.0 E A.I.

NEW TECHNOLOGIES TO SUPPORT PRODUCT AND PROCESS DESIGN

Introduction

The Alumni Association of the University of Padua has, among its main objectives, the promotion of the cultural and professional growth of its members, facilitating their entry into the job market.

In an era of rapid technological evolution, the Association focuses particularly on skills that can support local businesses in the challenge of digital transformation. This includes preparing young people to understand and manage new complexities and particularly aims to encourage the presence of women in engineering and scientific fields.

In this context, the **Alumni Association**, in collaboration with **Lafert Group SpA** and within the **STEM Byte project – Gender Balance in Scientific and Technological Knowledge** of **Confindustria Veneto SIAV srl**, of which it is a partner, promotes the first edition of

“Industry 5.0 and A.I. New technologies to support product and process design”

Lafert S.p.A. is a European leader in the design and production of custom electric motors and drives, particularly in the fields of industrial automation, energy saving, and renewable energies. It is part of the Power Transmission & Control Division of the Sumitomo Group, a Japanese multinational and world leader. The company is committed to using all its experience to build a more productive and sustainable future and to creating electric motors that improve efficiency in terms of reliability, performance, and compactness. This stems from investing in research and people and the willingness to always propose innovative solutions.

The headquarters are located in San Donà di Piave (Venice), with production plants in Italy and abroad in Slovenia and China, with commercial partners in Europe, North America, and Asia. Each Lafert plant has specialized production but shares the skills and tools to develop innovative projects. The company's Technical Office combines consolidated know-how in electric motors and specific applications with a strong market approach, creating highly customized solutions. The product is characterized by robustness, high quality, reliability, flexibility, and attention to design.

To ensure maximum product quality, the production process is highly internalized. The vertical production allows the flexibility needed to create custom motors for any specific application, as well as to design integrated products in synergy with other companies in the Sumitomo Group. All production processes have been renewed and optimized, inspired by the lean philosophy and the 5S method to design plants and production processes that ensure maximum efficiency and attention to detail.

Lafert is innovation evolving in technological skills, integrated and automated industrial processes, and human resources always motivated and ready to take on new challenges. This has led us to always develop innovative products with very high energy efficiency and to invest in automated and efficient production processes with the latest generation interconnected information systems.

Confindustria Veneto SIAV Srl is the training and services company of Confindustria Veneto, is a regional Digital Innovation Hub, and since 2024 has been part of the ConfIN Hub - Confindustria Innovation Hub - as one of the national Digital Innovation Hubs identified by MIMIT, for the delivery of digital maturity assessments of companies and supply chains and on orientation towards technology transfer. It is a partner of Enterprise Europe Network, the largest European network that helps SMEs grow, innovate, and internationalize, and of EDIH, the new European Digital Innovation Hub network which, with one-stop-shops, aims to support companies in responding dynamically to digital challenges and becoming more competitive by providing access to technical skills and experimental innovations. SIAV has also developed its own trajectories in recent years on the topics of 4.0 technologies, Cybersecurity, Artificial Intelligence, and Industry 5.0, participating in various Research, Innovation, and Training Projects (FSE, Erasmus+, Interreg, Horizon, Digital Europe).

Among these is the **STEM Byte Gender Balance in Scientific and Technological Knowledge project**, which starts from the assumption that companies and service companies operating particularly in the manufacturing, chemical environmental, and port logistics sectors and experiencing industrial transformations from a 5.0 perspective are increasingly aware of the added value that women could bring to organizations both in terms of technological knowledge and soft skills, but despite their demand, these are difficult to find in the market. The project aims to experiment in the province of Venice with a model of accompanying, training, and informative actions aimed at strengthening and implementing the offer, acting transversally on the cultural side to counter gender stereotypes, encouraging STEM study and career paths, and enhancing digital skills that can be spent in the market.

Objectives

The initiative "**Industry 5.0 and A.I. – New technologies to support product and process design**" aims to expand female knowledge and employability in STEM fields by exploring the opportunities of using new technologies in "Industry 5.0" for a company like Lafert Group spa, which designs and produces high-efficiency electric motors with applications in automation/robotics, with a specific focus on the use of Artificial Intelligence (AI) as a tool to optimize product and process design, as well as promoting the inclusion of young female students in the engineering and scientific job market.

The objective of this initiative is to support merit, **rewarding young female students enrolled in master's degree courses at the School of Engineering of the University of Padua**, offering them the opportunity to experiment with and deepen their understanding of innovative technologies and the impact these can have on the socio-economic system of the territory, as well as getting to know an important company that represents it.

Target Audience

Participation in the **initiative** is reserved for a maximum of **15 female students enrolled in master's or single-cycle master's degree courses at the School of Engineering of the University of Padua**.

Individual or group participation of up to three members is allowed.

Although maintaining priority for the participation of female students, **the group may also include students** who meet the same requirements as above, as follows:

- Group of 3 people: **two female students and one student**
- Group of 2 people: **one female student and one student**

The Project

Participating students (individually or in groups) will have to prepare and present a **project work that explores one or more of the following themes proposed by Lafert Group Spa**:

- Design Area
Identify solutions to support product design using simulation models that integrate artificial intelligence and allow design times to be optimized. AI assistance allows for the analysis of vast amounts of data, different parameters, and the creation of innovative and efficient virtual prototypes.
- Production Area
Design solutions that include the use of intelligent systems to facilitate human/machine interfacing, improving quality, safety, efficiency, and ergonomics, with a particular focus on sustainability, aiming for production processes that reduce waste and environmental impact, promoting the adoption of renewable resources and the circular economy. Analyze the qualitative and quantitative transformation of work organization with the introduction of Industry 5.0.

The initiative includes the following phases:

- Presentation meeting at Lafert Group SpA with a company visit and in-depth exploration of the proposed project work themes on 29/10/2024;
- Confirmation of project participation by November 4, 2024;
- Independent work by participants with remote monitoring and accompanying meetings on Zoom on November 13 and 27, 2024;

- Submission of project work by December 6, 2024;
- Presentation of completed project work to the evaluation committee on December 10, 2024;
- Project conclusion and award ceremony at Lafert Group SpA on December 17, 2024.

The activities related to the presentation meeting and company visit at Lafert Group SpA on 29/10/2024 and the award ceremony at Lafert Group SpA on 17/12/2024 are part of the STEM Byte – Gender Balance in Scientific and Technological Knowledge project No. 1075-0001-1522-2022, lead organization Confindustria Veneto SIAV Srl - Regional Program 2021-2027 co-financed by FSE+ and the Veneto Region - DGR n. 1522 of 29/11/2022 P.A.R.I. Innovative network projects and actions for gender parity and balance.

The best Project Work will be awarded a prize worth €1,500.00 in vouchers.

Lafert Group spa may offer the winner(s) the opportunity to implement their project idea with a 4 or 6-month internship experience at the company, also for the realization of their thesis work.

Requirements and methods for participation

Participation is reserved for a maximum of **15 female students enrolled in master's or single-cycle master's degree courses at the School of Engineering of the University of Padua.**

The application can be completed and submitted online at this link: <https://www.cognitofirms.com/AssociazioneAlumniDellUniversita%20DegliStudiDiPadova/Industria50EAI>, by 12:00 pm on November 4, 2024.

In the application, candidates must declare:

- Surname and first name,
- Place and date of birth,
- Gender,
- Tax code,
- Personal email address,
- Unipd email address,
- Mobile phone number,
- University ID number,
- Master's or single-cycle master's degree course attended,
- Number of CFUs achieved at the project adherence date,
- Motivation for participating in the project (max 2500 characters, including spaces),
- Proposed group composition (all candidates must individually submit a regular application).

The career plan must be attached to the application, which can be uploaded directly online through the application form.

Participation is reserved for a maximum of 15 female students.

If the maximum number of applications is exceeded, admission will be based on:

- The highest number of CFUs achieved in the master's/single-cycle master's degree course attended,
- The chronological order of application submission.

Candidates will receive admission notifications by November 6, 2024, at the email address provided during the application.

Participants (individually or in groups) must attend the accompanying and monitoring meetings scheduled for November 13 and 27 on the Zoom platform, under penalty of exclusion from the project.

Participants will have until midnight on December 6, 2024, to submit their project proposal (project work), which they will present to the committee at the meeting scheduled for December 10, which they are required to attend.

The final award ceremony will be held on December 17, 2024, at the headquarters of Lafert Group spa.

Participation in the project entails the full acceptance of these regulations. Applications received after the deadline will not be accepted.

Awards and Delivery Methods

The best Project Work will be awarded a prize worth **€1,500.00 in vouchers**, thanks to the contribution of Lafert Group SpA.

Lafert Group spa may offer the winner(s) the opportunity to implement their project idea with a 4 or 6-month internship experience at the company, also for the realization of their thesis work.

Award Assignment Procedure

The award will be assigned based on the unquestionable judgment of a committee composed of at least 3 members representing the School of Engineering of the University of Padua, Lafert Group spa, and the Alumni Association of the University of Padua.

The Committee will evaluate the project works based on the following criteria:

- The content of the work in relation to its consistency with the project themes;
- The degree of innovation and impact of the project on the socio-economic system of the territory;
- Prospects and economic, social, cultural, and scientific repercussions.

For information

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