Curriculum Vitae

CRISTIAN CAFARELLA

Postdoctoral Researcher

Department of Industrial Engineering (DIN)

University of Bologna, Italy

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

PERSONAL INFO

Date and place of birth	15 Nov 1993, Patti (ME), Italy
Nationality	Italian
Phone	+39 320 0456454
e-mail	cristian.cafarella2@unibo.it
Website	www.unibo.it/sitoweb/cristian.cafarella2/en

CURRENT ACADEMIC POSITION

Jan 2025 – present

Postdoctoral Researcher
Department of Industrial Engineering (DIN), University of Bologna, Italy
Research topic: "Design and validation of industrial systems methods and decision-making tools to support solar and wind renewable sources"

OTHER ACADEMIC POSITIONS

Nov 2021 – Dec 2021

Research Fellow
Department of Industrial Engineering (DIN), University of Bologna, Italy
Research topic: "Design and validation of industrial systems methods and decision-making tools to support solar and wind renewable sources"

EDUCATION AND TRAINING

Jan 2022 – present

Ph.D. student
Mechanics and Advanced Engineering Sciences (DIMSAI), University of Bologna, Italy
Research project: *"Strategies, models and methods for energy system expansion planning and industrial energy efficiency"*

Nov 2022

State Exam for the Industrial Sector
Qualification for the Profession of Industrial Engineer, Section A
University of Bologna, Italy
Final score: *60/60*

Sept 2018 – Mar 2021

Master's Degree in Management Engineering
University of Bologna, Italy
Thesis: *"Study, development and application of an algorithm for simulating the performance of offshore wind farms"*
Final score: *109/110*

Sept 2013 – Mar 2018

Bachelor's Degree in Management Engineering
University of Bologna, Italy
Thesis: *"Distribution logistics in the new Industry 4.0 context"*
Final score: *101/110*

RESEARCH ABROAD

IN ACADEMIA

Sept 2023 – Dec 2023 **KU Leuven University**
Leuven, Belgium
Focus: *"Balancing long-term and short-term decisions in energy system planning models to support decision-making in low-carbon energy systems"*
Supervisor: Prof. Erik Delarue

IN INDUSTRY

Jul 2024 **Philip Morris Brazil (Brazil) & Philip Morris Products S.A. (Switzerland)**
Jul 2022 – Sept 2022 **State of Goiás, Brazil**
Focus: *"Innovative solutions for tobacco curing"*
On-site data acquisition campaigns to enhance the energy efficiency of the tobacco curing process.

INDUSTRIAL COLLABORATIONS

Dec 2023 – Dec 2024 **Philip Morris Products S.A. (Switzerland)**
Mar 2022 – Jan 2023 Focus: "*Innovative solutions for tobacco curing"*
Optimizing the tobacco curing process by reducing energy consumption, curing time and environmental impact while maintaining high product quality.

Nov 2023 – Oct 2024 **Automobili Lamborghini S.p.A (Italy)**
Focus*: "Study, develop, and implement a ready-to-use tool for optimizing automatic vertical warehouses"*
Optimizing material placement, efficiently managing the entry and removal of materials, and enabling automatic real-time performance evaluation.

TEACHING - ACADEMIC CLASSES

Since A.Y. 2021/2022 **Teaching Tutor for Industrial Systems T-AB**
School of Engineering and Architecture, Bachelor Class in Management Engineering, University of Bologna, Italy

OTHER TEACHING ACTIVITIES

Feb 2024 **AGER - Coldiretti (Italy)**
Training for Tobacco Companies Affiliated with ONT Italia
Focus*: "Optimization of energy consumption in the curing phase of Virginia Bright tobacco: the importance of monitoring for an efficient curing cycle"*

Since 2023 **Fondazione Aldini Valeriani (FAV), Italy**
Teaching activities for classes on production planning, management, supply chain, and inbound/outbound logistics within financed professional learning courses

LANGUAGES

ITALIAN NATIVE LANGUAGE

ENGLISH PROFESSIONAL LEVEL

SKILLS AND COMPETENCES

Multi-objective optimization Developing and applying models to solve problems involving multiple conflicting objectives, such as cost minimization and environmental impact reduction.

Heuristic algorithms	Designing and implementing heuristic and metaheuristic approaches like genetic algorithms for solving complex optimization problems.
AMPL, CPLEX, Gurobi	Formulating and solving linear and nonlinear optimization problems using mathematical programming languages and solvers.
Python	Using Python with frameworks like PyPSA (Python for Power System Analysis) to model and optimize complex energy systems.
Geographical Information System	Utilizing software like QGIS for spatial analysis, mapping, and modeling of geographic data, crucial for analyzing renewable energy potential and optimizing logistics networks.
MATLAB	Performing advanced numerical computations and developing custom algorithms for engineering applications, including simulation and optimization tasks.
Visual Basic for Applications (VBA)	Programming and automating tasks in Excel, such as creating customized tools and dashboards for data analysis and process automation.
Life Cycle Assessment (LCA)	Analyzing the environmental impacts of products and processes throughout their life cycle, from raw material extraction to disposal.
AutoMod	Simulating and modeling complex manufacturing and logistics systems to evaluate and optimize operational performance and layout design.
Power BI	Creating interactive data visualizations and business intelligence reports to facilitate data-driven decision-making and effectively present complex data insights in a user-friendly format.
Microsoft Office	Advanced proficiency in Excel, Word, and PowerPoint for data analysis, report writing, and creating professional presentations for academic and industrial purposes.

MAIN SCIENTIFIC INTERESTS

Design and control of renewable plants	Developing models and simulations for the planning, optimization, and operational control of renewable energy systems to ensure maximum efficiency and reliability.
Energy efficiency in production and logistics processes	Implementing strategies and tools to optimize energy consumption in manufacturing and supply chain operations through real-world industrial collaborations.
High-resolution analysis of renewable energy potential	Analyze spatial and time-series data, assessing the potential for renewable energy generation based on geographic and climatic conditions.
Managing complexity and uncertainty in low-carbon energy systems	Developing robust optimization and scenario analysis methods to account for the variability of renewable energy sources, market fluctuations, and regulatory changes.

DISSEMINATION ACTIVITIES

11-13 Sept 2024	**Speaker** at the XXIX AIDI Summer School “Francesco Turco” - Sustainability and resilience in industrial systems across the era of digitalization. Otranto (Italy)
6-8 Sept 2023	**Speaker** at the XXVIII AIDI Summer School “Francesco Turco” - Blue, Resilient & Sustainable Supply Chains: The Role of Industrial Plants in Procurement, Production, and Distribution. Genova (Italy).
20-23 June 2023	**Organizer and speaker** at the 9th Changeable, Agile, Reconfigurable, and Virtual Production Conference and 11th World Mass Customization & Personalization Conference (CARV – MCPC 2023). Bologna (Italy).
7-9 June 2023	**Speaker** at the X edition of the Doctoral Workshop “Ph.D. on the go Marco Garetti”. Cagliari (Italy).