PERSONAL INFORMATION

Emanuela Marzi

- Via Francesco Bacone 49/1, 42122, Reggio nell'Emilia
- +39 3318458951
- emanuela.marzi@unipr.it
- emanuelamarzi95@gmail.com

Date of birth 03/01/1995 | Nationality Italian

WORK EXPERIENCE

November 2020 – Ongoing

PhD in Industrial Engineering with scholarship (Dottorato con borsa da 26 mesi)

Department of Engineering and Architecture, University of Parma

- Development of innovative tools and algorithms for the optimization and control of multi-energy systems with the integration of Power-to-Gas solutions.
- Collaborations in the activities of the projects:
  - Ifaistos international project (https://www.ifaistos.eu): collaboration in the development of an optimization algorithm for the management of a multi-energy system with the integration of Power-to-Gas solutions [6][7].
  - CoACh national project (https://coachproject.it/): collaboration in the development of a MPC controller for a refrigeration plant and application in a Model-in-the-Loop configuration [4][5].
  - Distrheat international project (https://www.distrheat.eu/): collaboration in the development of an MPC controller for district heating networks and application in a Model-in-the-Loop configuration [3].
  - Energynius national project (https://www.energynius.it/): collaboration in the development of an MPC controller for district heating networks and application in a Model-in-the-Loop configuration [3].
  - Alight international project (https://alight-aviation.eu/): collaboration through a research activity aimed at studying projects financed under the Horizon 2020 Programme concerning the production of e-fuels, with a focus on aviation [2].
- Courses attended:
  - operational research
  - programming and data management in python

March 2022 – July 2022

Visiting PhD period

Future Energy Center, Mälardalen University (Sweden)

- Development of an algorithm for the optimization of multi-energy systems with the integration of Power-to-Gas solutions, formulated as a Mixed-Integer Linear Programming (MILP), which considers the uncertain nature of future disturbances through two-stage stochastic programming.
- The activity carried out led to the drafting of a journal paper to be submitted [6].
- Among the activities, participation as a speaker in Future Energy Center seminar on 'Control and optimization for the energy systems of the future - advanced solutions for highly integrated systems'.

October 2019 – March 2020

Master Thesis Internship

Montecuccolino Laboratories, faculty of Engineering, University of Bologna

- Elements of finite element calculation, study of C ++ object programming language and of Salome platform, introduction to the FEMuS code for Fluid-Structure interaction simulations

April 2019 – May 2019

Curricular internship

Energy Way S.r.l. (now Ammagamma)

- Creation of energy diagnoses for service industry companies

July 2017

Curricular internship

Cooperativa Architetti e Ingegneri di Reggio Emilia

- Energy, economic and environmental assessment of the energy efficiency project in the Sant'Orsola-Malpighi hospital, focused on the trigeneration plant

2013 – 2017

Private lessons

- Private lessons of mathematics, physics and chemistry

EDUCATION AND TRAINING

19th – 23rd July 2021

PhD-Level Short Course on Advanced Modelling of DER-Rich Active Distribution Networks

Course delivered by the Power and Energy Systems Group and the Melbourne Energy Institute.

The course covered fundamental and advanced modelling of active distribution networks with deep penetration of distributed energy resources (DER).

September 2017 – March 2020

Master degree in Energy Engineering (LM-30)   Grade: 110/110 with honours

University of Bologna

Thesis: Optimal control of multiscale fluid-structure interaction problems through finite element simulations
Based on the results obtained with the master thesis, a conference article was published [1].

September 2018 – February 2019

Erasmus +

Instituto Superior Técnico, Lisbon (Portugal)

Study period abroad at a Portuguese university with the Erasmus project

September 2014 – October 2017

Degree in Energy Engineering (L-9)   Grade: 110/110 with honours

University of Bologna

Thesis: Analysis of a co-trigeneration plant: energy and economic assessments of the Sant'Orsola-Malpighi hospital plant

September 2016 – February 2017

Erasmus +

University of Applied Sciences, Munich (Germany)

Study period abroad at a German university with the Erasmus project

July 2014

Scientific high school diploma   Grade: 84/100

Liceo Scientifico Spallanzani, Reggio nell'Emilia, with two foreign languages (English, German)

PERSONAL SKILLS

Mother tongue   Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	B2	B2	C1
	IELTS academic, C1				
German	B1	B1	B1	B1	B1
	Goethe Institut, B1				
Portuguese	C1	C1	B2	B1	B2
	OLS (Online Linguistic Support), C1				

Organizational and managerial skills

Excellent organizational skills, order, punctuality and respect of deadlines, acquired in high school, during university and subsequently consolidated during the PhD. Organizational and managerial skills gained thanks to years of volunteering in various associations.

Adaptability, ability to work in a group and interest in managing interpersonal relationships, acquired in the various experiences of studying and working abroad, internships and collaborations with different research groups, also international.

Good communication and public speaking skills acquired during the presentation of research and papers in conferences and seminars.

Job-related skills	▪ Good skills in the use of Python, MATLAB and Simulink, acquired during the PhD at the University of Parma. ▪ Good skills in the use of software like SALOME, FEMuS, Paraview, acquired during the internship in the Montecuccolino Laboratories. ▪ Basic knowledge of C and C++ languages. ▪ Good skills in the use of Office suite (Word, Excel, PowerPoint) and of LaTeX. ▪ Discrete skills in the use of Adobe suite, in particular Photoshop.
Driving license	European driving license, category B, released on the 06/05/2013

PUBLICATIONS

[1] *Conference paper:* Chierici, A., Chirco, L., Giovacchini, V., Manservisi, S., <u>Marzi, E.</u>, Optimal pressure boundary control of steady multiscale fluid-structure interaction shell model derived from koiter equations. World Congress in Computational Mechanics and ECCOMAS Congress, 2021, 2000, pp. 1–10. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85122071522&doi=10.23967%2fwccm-eccomas.2020.265&partnerID=40&md5=adc4bd0962bd28d953ebd1608fa3d101

[2] *Journal paper:* <u>Marzi, E.</u>, Morini, M., & Gambarotta, A. (2022). Analysis of the Status of Research and Innovation Actions on Electrofuels under Horizon 2020. Energies, 15(2), 618. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85122998818&doi=10.3390%2fen15020618&partnerID=40&md5=ab3753d4197a52f98b3f6d2d7816a636

[3] *Journal paper:* De Lorenzi, A., Gambarotta, A., <u>Marzi, E.</u>, Morini, M., & Saletti, C. (2022). Predictive control of a combined heat and power plant for grid flexibility under demand uncertainty. Applied Energy, 314, 118934. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85126586752&doi=10.1016%2fj.apenergy.2022.118934&partnerID=40&md5=b5d512f45585f697a4680abc3a0ce016

[4] *Conference paper:* Di Mattia, E.; Gambarotta, A.; <u>Marzi, E.</u>; Morini, M.; Saletti, C. (2022). Development of a predictive controller for the optimal energy management of a vapour-compression refrigeration system. 7th IIR International Conference on Sustainability and the Cold Chain doi:10.18462/iir.iccc2022.1154.

[5] *Journal paper:* Di Mattia, E., Gambarotta, A., <u>Marzi, E.</u>, Morini, M., & Saletti, C. (2022). Predictive Controller for Refrigeration Systems Aimed to Electrical Load Shifting and Energy Storage. Energies, 15(19), 7125. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85139921020&doi=10.3390%2fen15197125&partnerID=40&md5=ecdc0eee94b338bc2a4140cd2e5724b8

[6] *To be submitted journal paper*: Gambarotta, A., Kyprianidis, K., <u>Marzi, E.</u>, Morini, M., Saletti, C., Vouros, S., Zaccaria, V. Assessment of Power-to-Gas integration on energy system flexibility accounting for forecast uncertainties.

[7] *To be submitted conference paper*: Gambarotta, A.; Ghionda, F., <u>Marzi, E.</u>; Morini, M.; Saletti, C. Optimal integration of Power-to-Gas and district heating through waste heat recovery from electrofuel production.

Parma, 19/01/2023