

Mattia Cottés

School Address

Politechnic Department of Engineering and Architecture
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Udine, Italy 33100

Permanent Address

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GENERAL INFORMATION, OTHER WORKING EXPERIENCES

Date and place of birth: September 13, 1993; Udine (Italy)
Citizenship: Italian
Email: mattia.cottes@uniud.it

OTHER WORKING EXPERIENCES:

<i>EXPO Milano 2015</i> Milano, Italy • visitors assistance	4 - 10 October 2015 (Volunteer)
<i>Danieli INDE</i> Pradamano (UD), Italy • CAD drawing	12 - 23 March 2012 (Traineeship)
<i>Nogva Motorfabrikk</i> Shipyard, Sovik, Norway • Tests of naval engines. Assembling of gear boxes.	4 - 18 September 2011 (Traineeship)

EDUCATION

<i>Doctor of Philosophy</i> , Energy and Environmental Engineering Science University of Udine, Udine, Italy THESIS - Decision support methodology for sustainable smart energy systems integration	June 2022
<i>Master of Science</i> , Mechanical Engineering University of Udine, Udine, Italy THESIS - Thermal wiring of the city of Udine through a district heating network GPA 110/110	March 2018
<i>Bachelor of Science</i> , Mechanical Engineering University of Udine, Udine, Italy THESIS - Design and experimental analysis of a Savonius vertical axis wind turbine GPA 99/110	March 2016

PROFESSIONAL EXPERIENCE

Assistant professor (RTDa)

February 2023 – on going

University of Udine, Udine, Italy

- Research field is focusing on smart energy systems, circular economy and urban industrial symbiosis for energy efficiency and renewable energy implementation, and logistic systems considering renewable and innovative fuels (CH_4 , H_2);
- Teaching activity for the course Environmental compatibility of industrial plants.

Post doctoral research collaborator

University of Udine, Udine, Italy

August – December 2022

- Collaboration for research support activities in the field of sustainable logistics:
 - Application of the realized model to the industrial ecosystem of the Udine south area in order to identify sources, causes and effects of emissions deriving from the integration of further renewable sources with respect to those already considered (e.g.: photovoltaic, cells and storage) with the aim to optimize the production-logistics activities on site;
 - Application of the realized model for the evaluation of different management strategies of goods internal logistics in the area from the point of view of industrial metabolism, i.e. analysing traditionally separate industrial production-logistics activities in an integrated way by evaluating servitization activities to promote competitive advantages through the exchange of materials and energy.

Post doctoral research collaborator

University of Udine, Udine, Italy

March – July 2022

- Collaboration for research support activities within the S3UNICA project for the application of Smart Readiness Indicators to the University Campus:
 - Comparisons with other performance indicators in literature or currently used by the University;
 - Application of DSS to university facilities for the identification of SRIs;
 - Prioritisation through the use of SRIs of interventions to increase Campus performance.

Research fellowship

University of Udine, Udine, Italy

June – October 2018

- "Special waste recovery for the development of circular economy models in the regional context"

RESEARCH ACTIVITY

RESEARCH ACTIVITY:

- August - November 2021 Visiting Researcher, Lappeenranta University of Technology (LUT), Lappeenranta, Finland
- Collaboration with Departments of Electrical Engineering and Sustainable Solution. Prof. Samuli Honkapuro, Dr. Ville tikka, prof. Jouni Havukainen.
- October 2017 - January 2018 Trainee, Von Karman Institute for Fluid Dynamics, Rhode Saint Genese, Belgium
- Developing of Matlab model representing the behavior of a constant temperature hot wire anemometer. Supervised by Fabrizio Fontaneto and Elissavet Boufidi.

RESEARCH TOPICS:

- Decision support methodologies for multi-criteria decisions applied to smart energy systems;
- Circular economy, waste recovery and urban-industrial symbiosis;
- Logistic systems, renewable and innovative fuels.

CONFERENCES

- Participation as a speaker at the XXIV edition of the Summer School "Francesco Turco", 11-13 September 2019, Brescia (Italy). "A decision support system for industrial waste heat recovery: the CEHEAT project", Proceedings of the XXIV edition of the Summer School "Francesco Turco".
- Participation as speaker in the exchange of experience of the Interreg Europe project "S3UNICA". 24 June 2021, Trieste (online). Presentation of the development and implementation of an SRI-based DSS for the prioritisation of efficiency measures in university campuses.
- Participation as a speaker at the "Citycircle final conference" of the Interreg Central Europe project "Citycircle", 24 March 2022, Varaždin (Croatia, online).

TEACHING ACTIVITY

Note: unless otherwise indicated all the courses listed below were delivered at the Politechnic Department of Engineering and Architecture of the University of Udine.

- Academic year 2022-2023: Environmental compatibility of industrial plants (Compatibilità ambientale degli impianti industriali), 6 ECTS, M.S. Mechanical Engineering, 60h:
- Sustainable development, waste treatment legislation, waste collection logistic, mechanical and biological treatment of waste, emission reduction systems;
 - risk and uncertainty analysis,
 - AHP method, led AHP method exercises
 - multi-objective and multi-criteria analysis,
 - pareto analysis,
 - model optimization exercises
- Academic year 2021-2022: Teaching assistant for the course Environmental compatibility of industrial plants (Compatibilità ambientale degli impianti industriali), 6 ECTS, M.S. Mechanical Engineering, 10h:
- risk and uncertainty analysis,
 - AHP method, led AHP method exercises
 - multi-objective and multi-criteria analysis,
 - pareto analysis,
 - model optimization exercises
- Academic year 2020-2021: Teaching assistant for the course Environmental compatibility of industrial plants (Compatibilità ambientale degli impianti industriali), 6 ECTS, M.S. Mechanical Engineering, 2h:
- multi-objective and multi-criteria analysis,
 - pareto analysis,
 - model optimization exercises
- Academic year 2019-2020: Teaching assistant for the course Environmental compatibility of industrial plants (Compatibilità ambientale degli impianti industriali), 6 ECTS, M.S. Mechanical Engineering, 2h:
- multi-objective and multi-criteria analysis,
 - pareto analysis,
 - model optimization exercises
- Academic year 2018-2019: Teaching assistant for the course Environmental compatibility of industrial plants (Compatibilità ambientale degli impianti industriali), 6 ECTS, M.S. Mechanical Engineering, 1h:
- model optimization exercises

SUPERVISED THESES

Master theses

Co-advisor of 2 M.S. theses (Mechanical Engineering)

- "Logistic management applied to industrial districts: models and applications" (Gestione logistica integrata nei distretti industriali: modelli e applicazioni), Lorenzo Bit, academic year 2021/2022, Mechanical Engineering;
- "University campuses sustainability: models and application to University of Udine case study" (La sostenibilità nei campus universitari: sviluppo di modelli e applicazione al caso dell'università di Udine), Cecilia Venturini, academic year 2020/2021, Mechanical Engineering.

Bachelor theses

Co-advisor of 1 B.S. theses (Environment and Nature Sciences)

- "Waste management ecology footprint: waste collection models comparison" (L'impronta ecologica della gestione dei rifiuti: modelli di raccolta a confronto), Luigi Stanic, academic year 2021/2022, Environment and Nature Sciences.

INTERNATIONAL COLLABORATIONS

- Mälardalen University - School of Business, Society & Engineering (see [4j] in PUBLICATIONS)
- Lappeenranta University of Technology (LUT), Finland – Departments of Electrical engineering and Sustainable solutions: urban waste collection energy-economic analysis (on-going)

REVIEWER FOR SCIENTIFIC JOURNALS

Since 2020 reviewer for international scientific journals like Designs, Energy Conversion and Management, Entropy, Journal of Environmental Management, Sustainability, Utilities policy, Water policy.

RESEARCH PROJECTS

- 2019 - 2023 **S3UNICA - Interreg Europe Programm**
Scope: provide innovative products, processes and solutions for energy efficient university campuses and identify quadruple helix approaches for innovation policies development.
Other academic partners: Malaga University, Lappeenranta University of Technology, University of Trieste.
- 2020 - 2022 **CiTyCircle - winner of competitive call under the Interreg Central Europe Programme**
Scope: Identification of innovative business models for industrial symbiosis project in the field of energy.
Other academic partners: Technical University of Kosice, FH Vorarberger university of applied sciences.

2017 - 2019 **CE-HEAT** - winner of a competitive call under the **Interreg Central Europe Programme**
Scope: Design and development of a decision support system for the selection of optimal technological solutions for the recovery of waste heat from industrial plants.
Other academic partners: Univerzita Jana Evangelisty Purkyně v ústí nad labem
(Univerzita J.E. Purkyně)

OTHER COURSES

- Course* 18 - 20 March 2019
Cineca, Milan
- C programming course: "Introduction to Scientific and Technical Computing in C". 24h
- Course* 27 - 29 May 2019
Cineca, Rome
- C programming course: "Introduction to Parallel Computing with MPI and OpenMP". 24h
- Summer School* 1 - 12 July 2019
Cineca, Rome
- Summer School on Parallel Computing, 80h
- Summer School* 26 - 30 August 2019
Technical University of Denmark (DTU)
- Summer School on 3D printing of Functional Materials for Energy Systems, 40h.
- Summer School* 11 - 13 September 2019
University of Brescia
- XXIV AIDI Summer School "Francesco Turco": AUGMENTED KNOWLEDGE: A new era of industrial systems engineering. "Best Team Award" during team game activity;
- Summer School* 9 - 11 September 2020
University of Bergamo (online)
- XXV AIDI Summer School "Francesco Turco";
- Workshop* 10 November 2020
Mathworks (online)
- "Connect to and Build Raspberry Pi/Arduino projects using high-level programming and block diagrams". 1.25h
- Course* 23 - 24 November 2020
Enginsoft S.p.A.
- modeFRONTIER base course: multi-objective optimization. 16h
- Course* 17 - 18 December 2020
Enginsoft S.p.A.
- modeFRONTIER advanced course: multi-objective optimization. 16h
- Workshop* 16 February 2021
Mathworks (online)
- "Introduction to Mapping: Import, Transform and Display Geographical Data". 1h
- Workshop* 19 November 2021

Mathworks (online)

- Workshop on parallel computing with Matlab. 1.5h

COMPUTER SKILLS

Experienced in MATLAB and C programming, parallel computing with MPI and openMP, multi-criteria decision making with modeFrontier utilization, good knowledge of Windows environment and Microsoft Office, basic knowledge of Linux environment, good knowledge of LATEX editor, basic knowledge of software version control system Git.

LANGUAGE SKILLS

Italian Mother tongue
English Professional

AWARDS

- SDEWES Best Paper Award for an outstanding manuscript at the conference submission for the paper “Integrating industrial waste heat recovery into future sustainable Smart Energy Systems”, by Simeoni P., Ciotti G., Cottes M., Meneghetti A., Nardin G at the SDEWES 2018: 13th Conference on Sustainable Development of Energy, Water and Environment Systems.

PUBLICATIONS

CITATION REPORT	Source:	SCOPUS
H-index		5
Citations		112

Publications on international journal in inverse chronological order [j]:

1. [5j] Mainardis, M., Buttazzoni, M., Cottes, M., Moretti, A. & Goi, D. 2021, "Respirometry tests in wastewater treatment: Why and how? A critical review", Science of the Total Environment, vol. 793.
2. [4j] Campana, P.E., Mainardis, M., Moretti, A. & Cottes, M. 2021, "100% renewable wastewater treatment plants: Techno-economic assessment using a modelling and optimization approach", Energy Conversion and Management, vol. 239.
3. [3j] Cottes M.; Mainardis M.; Goi D., Simeoni P., (2020) "Demand-Response Application in Wastewater Treatment Plants Using Compressed Air Storage System: A Modelling Approach" Energies, Vol. 13(18),4780, 2020, <https://doi.org/10.3390/en13184780>, WOS:000580109800001, Scopus:2-s2.0-85092445857, IF:2,702

4. [2j] Plazzotta S.; Cottes M.; Simeoni P.; Manzocco L., (2020) “Evaluating the environmental and economic impact of fruit and vegetable waste valorisation: The lettuce waste study-case”, *Journal of cleaner production*, Volume 262, 2020, <https://doi.org/10.1016/j.jclepro.2020.121435>, WOS:00053687580000, Scopus:2-s2.0- 85082999666 , IF: 7.246
5. [1j] Simeoni, P., Ciotti, G., Cottes, M., Meneghetti, A., (2019) “Integrating industrial waste heat recovery into sustainable smart energy systems”, *Energy*, Vol. 175, 2019, pp 941-951, doi: <https://doi.org/10.1016/j.energy>, WOS:000466999400076 Scopus: S0360544219305080, I.F: 6,082

Publications on international conferences in inverse chronological order [w]:

6. [3w] Ciotti G, Cottes M, Mazzolini M, Sappa A, Simeoni P., (2019) “A decision support system for industrial waste heat recovery: the CE-HEAT project”, *Proceedings of the 24th Summer school “Francesco Turco”*. Sept. 11-13, 2019; Brescia (AIDI2019.71) Scopus: 2-s2.0- 85081588612
7. [2w] Simeoni, P., Meneghetti, A., Nardin, G., Ciotti, G., Cottes, M., (2018). “Integrating industrial waste heat recovery into sustainable Smart Energy Systems”, *Conference Proceedings of 13th SDEWES*. Sept. 30- Oct. 4, 2018, Palermo. hdl:11390/1140455
Award: “Best Paper Award for an outstanding manuscript at the conference submission”;
<https://www.sdewes.org/awards.php>
8. [1w] Boufidi, E., Cottes M., Fontaneto F.,. CTHWA dynamic response effects on turbulence measurements in turbomachinery flows, in: *XXIV Biannual Symposium on Measuring Techniques in Turbomachinery*. Aug. 29 – 31 2018, Prague, Czech Republic.

PhD Thesis:

9. Cottes M., “Decision support methodology for sustainable smart energy systems integration”, PhD Thesis, Environmental and Energy Engineering Science, University of Udine, 31 August 2022.