Francesca Da Ros

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RESEARCH INTERESTS

Combinatorial Optimization, Local Search Metaheuristics, Benchmarking, and Scheduling.

EDUCATION

University of Udine, Udine, Italy — November 2022 — Today
Ph.D. in Computer Science and Artificial Intelligence
Focus: Optimization, Computational Intelligence, Metaheuristics, and Benchmarking.
Supervisor: Prof. L. Di Gaspero.
Expected Graduation Date: November 2025.

University of Udine, Udine, Italy — October 2019 — October 2021
MS, Industrial Engineering — Final Grade: 110 cum Laude/110
Thesis: Big Data Technologies in Industry 4.0: Case Study in Re-engineering Data Flow in Steel and Metal Industry.
Supervisor: Prof. L. Di Gaspero.
Notes: Joint Degree with FH Joanneum.

FH Joanneum, Kapfenberg, Austria — October 2019 — October 2021
MS, International Industrial Mangement — Final Grade: 1.2/1
Supervisor: Dr. B. Ormsby.
Notes: Joint Degree with the University of Udine.

University of Udine, Udine, Italy — October 2016 — September 2019
BS, Industrial Engineering — Final Grade: 105/110
Thesis: Risk Management & Cyber Security.
Supervisor: Prof. M. Sartor.

RESEARCH VISITS

Technische Universität Wien, Vienna, Austria — September 2024 — December 2024, November 2023 — February 2024
Visiting Ph.D. Student
Project: Automated Algorithm Selection and Instance Space Analysis for the Oven Scheduling Problem.
Supervisor: Prof. Nysret Musliu.
Grant by SPECIES Society for the period November 2023 – February 2024.
Allowance from the University of Udine for both periods.

ACADEMIC EMPLOYEMENT

Azienda Sanitaria Universitaria Friuli Centrale, Udine, Italy — February 2022 — October 2022
Research Assistant
Project: Audit and feedback in emergency situations: data analytics on emergency response
Project code (Italian Ministry of Health reference): NET-2016-02364191).
Principal Investigator: Laura Deroma.

INDUSTRIAL EMPLOYEMENT

beanTech srl, Udine, Italy — March 2021 — January 2022
Data Analyst
Development ETL and ELT through traditional technologies (e.g., SSIS, SSAS), cloud technologies (e.g., Azure Data Factory) and big data technologies (e.g., Apache Spark, Apache Hive, Databricks). Creation of dashboards via Power BI.

Vignaioli Veneto Friulani sca, Fontanelle, Italy — August 2016 — October 2016
Secretary
Seasonal job.

TEACHING & TUTORING ACTIVITIES

Academic Year 2024–2025

- **Data Science & Laboratory**. Role: Teaching assistant. Teaching hours: 8. Main instructor: E. Maddalena. Detail: Bachelor course for the Bachelor Degree in Internet of Things, Big Data, & Machine Learning at the University of Udine.

Academic Year 2023–2024

- **Data Science & Laboratory**. Role: Teaching assistant. Teaching hours: 8. Main instructor: E. Maddalena. Detail: Bachelor course for the Bachelor Degree in Internet of Things, Big Data, & Machine Learning at the University of Udine.
- **Computer Science Campus 2024**. Role: Main instructor. Teaching hours: 1. Organizer: V. Della Mea. Detail: Summer course for high school students on the topic of combinatorial optimization organized by the University of Udine.

Academic Year 2022–2023

- **SMACT Data Analytics for Human Resources**. Role: Main Instructor, together with L. Di Gaspero. Teaching hours: 8. Detail: Course on the topic of data analytics within human resources topics organized by SMACT Competence Center (Padua).
- **Computer Science Campus 2024**. Role: Main instructor. Teaching hours: 1. Organizer: V. Della Mea. Detail: Summer course for high school students on the topic of combinatorial optimization organized by the University of Udine.
- **Programming in C & Algorithms and Data Structure**. Role: Tutor. Tutoring hours: 90. Main instructors: L. Di Gaspero, P.L. Montessoro. Detail: Bachelor course for the Bachelor Degree in Industrial Engineering at the University of Udine.

OTHER RELEVANT ACADEMIC ACTIVITIES

Conferences & Workshop

Participation at the following national and international conferences and workshops:

- **IIR 2024**. Italian Information Retrieval Workshop. Udine, Italy. September 2024.
- **GECCO 2024**. Genetic and Evolutionary Computation Conference. Melbourne, Australia. July 2024. Presentation of the paper titled *Reducing Energy Consumption in Electronic Component Manufacturing through Large Neighborhood Search*.
- **MIC 2024**. Metaheuristic International Conference. Lorient, France. June 2024. Presentation of the paper titled *An Empirical Analysis of Tabu Lists*. .
- **GECCO 2023**. Genetic and Evolutionary Computation Conference. Lisbon, Portugal. July 2023.
- **AYW 2023**. Airo Young Workshop. Milan, Italy. February 2023. Presentation of the abstract titled *JuLeS: A Julia Framework for White-box Metaheuristic Design*.
- **AIxIA 2022** International Conference of the Italian Association for Artificial Intelligence. Udine, Italy. November-December 2022. Presentation of the abstract titled *A research proposal toward metaheuristics explainability and comparability*.
- **ORAHS 2022**. Annual Meeting of the Euro Working Group on Operational Research Applied to Health Services. Bergamo, Italy. July 2022. Presentation of the abstract titled *Simheuristic approach to the ambulance location problem*.
- **MIC 2022**. Metaheuristic International Conference. Ortigia, Italy. July 2022. Presentation of the short paper titled *A Multi-objective Biased Random-Key Genetic Algorithm for the Siting of Emergency Vehicles*.
- **AIE 2022**. Convegno dell'Associazione Italiana di Epidemiologia. Padua, Italy. June 2022.

Invited Talks

- Invited talk at DBAI Research Seminars on the topic of *Instance Space Analysis for a Parallel Batch Scheduling Problem*. November 21, 2024. Technische Universität Wien, Vienna, Austria.

Organizational Roles in Conferences

- Local organization chair for 14th Italian Information Retrieval Workshop (IIR2024). Udine, Italy.
- Local arrangement committee for the 21st International Conference of the Italian Association for Artificial Intelligence (AIxIA2022). Udine, Italy.

Review Activity

- **Scientific Journals:** Operations Research for Health Care (Elsevier). Discover Mechanical Engineering (Springer).

Affiliations

- 2022 – Today. DMIF, University of Udine. Udine, Italy.
- 2022 – Today. DPIA, University of Udine. Udine, Italy.
- 2022 – Today. Intelligent Optimization Laboratory (IOLab). University of Udine. Udine, Italy.
- February 2022 – October 2022. Udine University Hospital. Udine, Italy.

Research Projects

- Member of the Working Group 1 of Randomised Optimisation Algorithms Research Network – Cost Action. 2024 – 2025.
- Member of the research group of the *Sustainability analysis of live events: the impact of concerts* within the Department Of Economics and Statistics of the University of Udine. October 2024.
- Member of the research group of the project *Audit and feedback in emergency situations* within the EASY-NET network program. Italian Ministry of Health (NET-2016-02364191). 2022 – 2023.

Grants & Prizes

- Allowance to visit Technische Universität Wien, AU. Provided by the University of Udine (2023, 2024).
- SPECIES Scholarship 2023 for visiting Technische Universität Wien, AU (2023).
- Scholarship for the Ph.D. program of the University of Udine. Provided by the University of Udine (2022-2025).
- Work titled *Analisi di dati e algoritmi di ottimizzazione per la locazione delle stazioni delle ambulanze: un caso studio* selected as one of the best visual abstract at XLVI Convegno dell'Associazione Italiana di Epidemiologia (2022)
- Full scholarship by the University of Ferrara to attend the Advanced School in Artificial Intelligence (2022).
- Allowance to visit FH Joanneum, AU. Provided by the University of Udine and the ERASMUS Project (2019).

OTHER RELEVANT EDUCATIONAL EXPERIENCES

- **SPECIES Summer School**, Moraira, Spain, September 2023, `https://species-society.org/summer-school-2023/`.
- **SIGEVO Summer School**, Lisbon, Portugal, 13–14 July 2023, `https://gecco-2023.sigevo.org/Summer-School`.
- **Summer School on Automatic Algorithm Design (SSAAD 2023)**, University of Lille, Villeneuve d'Ascq, France, 12–16 June 2023, `https://ssaad2023.sciencesconf.org/`.
- **Percorso Formativo 24 CFU - DM 616/2017**, University of Udine, Udine, Italy, March – September 2022.
- **Advanced Course of Data Science & Machine Learning**, ICAS, Siena, Italy, August 2022, `https://acdl2022.icas.cc/`.
- **Advanced School in Artificial Intelligence**, University of Ferrara, Ferrara, Italy, June 2022.

SKILLS

- **Languages:** Italian (native), English (C1), German (B2).
- **Programming Skills:** Python, Julia, C, C++, R.
- **Technical Tools:** MiniZinc, Apache Hive, Apache Spark, MinIO, Mongo DB, Microsoft SQL Server Tools (SSIS, SSAS, SSMS), Azure, Data Factory, Databricks, Delta, GitHub, Power BI, SQL (T-SQL, Spark SQL, HQL).
- **Management Tools:** DevOps, Bizagi, Project Libre, Slack.
- **General Purpose Tools:** Latex, Microsoft Office, Canva, Notion.
- **Personal interests:** Eager reader, cello player, decent runner, yogini, knitter.

PUBLICATIONS

Journal Articles

1. F. Da Ros, M. Soprano, L. Di Gaspero, and K. Roitero. Large Language Models for Combinatorial Optimization: A Systematic Review. **Under review at ACM Computing Surveys (CSUR).**
2. F. Da Ros, L. Di Gaspero, M.-L. Lackner, N. Musliu, and F. Winter. Multi-neighborhood Simulated Annealing for the Oven Scheduling Problem. **Accepted for publication at Computers and Operations Research (COR).**
3. F. Da Ros, L. Di Gaspero, K. Roitero, D. La Barbera, S. Mizzaro, V. Della Mea, F. Valent, and L. Deroma. Supporting Fair and Efficient Emergency Medical Services in a Large Heterogeneous Region. *Journal of Healthcare Informatics Research*, vol. 8, no. 2, pp. 400–437, June 2024. DOI: 10.1007/s41666-023-00154-1.

Conference & Workshop Papers

1. F. Da Ros, L. Di Gaspero, M.-L. Lackner, and N. Musliu. Instance Space Analysis and Algorithm Selection for a Parallel Batch Scheduling Problem. **Accepted at EvoCOP 2025.**
2. F. Da Ros, L. Di Gaspero, and K. Roitero. Probing LLMs on Optimization Problems: Can They Recall and Interpret Problem Features? **Accepted at EvoApp 2025.**
3. F. Da Ros, L. Di Gaspero, M.-L. Lackner, N. Musliu, and M. Soprano. Search Trajectory Networks Applied to a Real-world Parallel Batch Scheduling Problem **Accepted at EvoApp 2025.**
4. M. Soprano, E. Maddalena, F. Da Ros, M.E. Zuliani, and S. Mizzaro. Evaluation of Crowdsourced Peer Review using Synthetic Data and Simulations. **Accepted at IRCDL 2025.**
5. S. Ceschia, F. Da Ros, L. Di Gaspero, and A. Schaerf. EasyLocal++ a 25-year Perspective on Local Search Frameworks: The Evolution of a Tool for the Design of Local Search Algorithm. In *Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '24 Companion)*, pages 1658–1667, Melbourne, VIC, Australia, 2024. Association for Computing Machinery, New York, NY, USA. DOI: 10.1145/3638530.3664140. ISBN: 9798400704956.
6. F. Da Ros, L. Di Gaspero, M.-L. Lackner, N. Musliu, and F. Winter. Local Search Algorithms for the Oven Scheduling Problem. In *Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '24 Companion)*, pages 191–194, Melbourne, VIC, Australia, 2024. Association for Computing Machinery, New York, NY, USA. DOI: 10.1145/3638530.3654158. ISBN: 9798400704956.
7. F. Da Ros, L. Di Gaspero, M.-L. Lackner, and N. Musliu. Reducing Energy Consumption in Electronic Component Manufacturing through Large Neighborhood Search. In *Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '24 Companion)*, pages 1706–1714, Melbourne, VIC, Australia, 2024. Association for Computing Machinery, New York, NY, USA. DOI: 10.1145/3638530.3664132. ISBN: 9798400704956.
8. F. Da Ros and L. Di Gaspero. An Empirical Analysis of Tabu Lists. In *Metaheuristics*, edited by M. Sevaux, A.-L. Olteanu, E. G. Pardo, A. Sifaleras, and S. Makboul, pages 50–64, Cham: Springer Nature Switzerland, 2024. ISBN: 978-3-031-62922-8.
9. F. Da Ros and L. Di Gaspero. Exploring the Potential of JuLeS: A White Box Framework for Local Search Metaheuristics. In *Proceedings of the Companion Conference on Genetic and Evolutionary Computation (GECCO '23 Companion)*, pages 191–194, Lisbon, Portugal, 2023. Association for Computing Machinery, New York, NY, USA. DOI: 10.1145/3583133.3590676. ISBN: 9798400701207.
10. F. Da Ros and L. Di Gaspero. Local Search Strategies for Multi-Objective Flowshop Scheduling: Introducing Pareto Late Acceptance Hill Climbing. In *Proceedings of the Companion Conference on Genetic and Evolutionary Computation (GECCO '23 Companion)*, pages 61–62, Lisbon, Portugal, 2023. Association for Computing Machinery, New York, NY, USA. DOI: 10.1145/3583133.3596428. ISBN: 9798400701207.
11. F. Da Ros, L. Di Gaspero, D. La Barbera, V. Della Mea, K. Roitero, L. Deroma, S. Licata, and F. Valent. A Multi-objective Biased Random-Key Genetic Algorithm for the Siting of Emergency Vehicles. In *Metaheuristics*, edited by L. Di Gaspero, P. Festa, A. Nakib, and M. Pavone, pages 449–456, Cham: Springer International Publishing, 2023. ISBN: 978-3-031-26504-4.

Abstracts

1. F. Da Ros and L. Di Gaspero. JuLeS: A Julia Framework for White-box Metaheuristic Design. In *7th AIROYoung Workshop (AYW 2023)*, 2023.
2. F. Da Ros. A research proposal toward metaheuristics explainability and comparability. Proceedings of the 21st International Conference of the Italian Association for Artificial Intelligence (AIxIA 2022)
3. F. Da Ros, L. Di Gaspero, D. La Barbera, V. Della Mea, K. Roitero, L. Deroma, S. Licata, and F. Valent. Simheuristic approach to the ambulance location problem. In *48th Annual Meeting of the Euro Working Group on Operational Research Applied to the Health Services (ORAHS 2022)*, 2022.

4. F. Da Ros, D. La Barbera, L. Deroma, L. Di Gaspero, S. Licata, and F. Valent. Analisi di dati e algoritmi di ottimizzazione per la locazione delle stazioni delle ambulanze: un caso studio. In *Abstract del XLVI Convegno Associazione Italiana di Epidemiologia*, page 16, 2022. **(Selected as one of the best contributions)**

REFERENCES

Available on request.