

Michele Urbani, Ph.D.

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"Leave the World better than you found it."

Skills

- Languages** 📖 Strong reading, writing and speaking competencies in English. Italian native speaker.
- Coding** 📖 Python, Git, PyTorch, Docker, Jupyter/Colab, HPC, SQL, C/C++
- Technicals** 📖 Optimization models and algorithms, Learning algorithms, Mathematical modeling (MILP), Discrete event simulations, Statistical analysis, Single- and multi-objective optimization, Heuristics and exact algorithms
- Web Dev** 📖 Basic knowledge of Python Flask, Django, and Dash for data viz. and dashboarding.
- Misc.** 📖 Academic research, teaching, training, consultation, \LaTeX typesetting and publishing.

Employment History

- 2024 – Present 📖 **Rresearcher.** Bruno Kessler Foundation (Italy).
 - Multi-objective optimization of energy systems for the integration of renewable energy sources.
 - Model order reduction of hydrogen systems simulations (FEM/FEA/CFD) for Digital Twins.
 - Participation in European projects (North Adriatic Hydrogen Valley, HyManthovalley) and consultancies.
- 2022 – 2024 📖 **Postdoctoral researcher.** University of Trento (Italy).
 - Workforce routing optimization: mathematical modeling and algorithm development for logistics optimization in the e-commerce and the service maintenance provisioning
 - Projects with companies (Indaco s.r.l., CNP Energia, Trentino Trasporti S.p.A.)
 - Participation in the European-funded project HelpFood 4.0
 - Participation in international scientific conferences (EURO, ESREL, GECCO)
 - Supervision of master's thesis projects
- 2019 – 2024 📖 **Lecturer.** Course in Optimization Models and Algorithms (20 h./year), Department of Industrial Engineering, University of Trento (Italy).

Projects

- 2022 – 2023 📖 **Indaco:** Development of a novel algorithm for three-objective (economic, social, and environmental) optimization. Routing optimization for a fleet of workers to deliver/pick up parcels. In collaboration with Indaco s.r.l.
- 📖 **CNP d-Optimizer:** Development of an optimization solution for routing maintenance technicians in an Energy Saving Company (ESCO). Customer relationship management for data collection, and product testing and validation. In collaboration with CNP Energia.

Education

- 2018 – 2021
- Ph.D., **University of Trento (Italy)** in Materials, Mechatronics, and System Engineering.
 - D.Sc., **Lappeenranta Univ. of Technology (Finland)** in Economics and Business Administration.
Thesis title: *Maintenance Policies Optimization in the Industry 4.0 Paradigm*

Research Publications

Journal Articles

- 1 A. Bendazzoli, **M. Urbani**, M. Brunelli, and F. Pilati, “A cooperative team orienteering optimisation model and a customised resolution metaheuristic,” *Computers & Operations Research*, vol. 163, p. 106 488, 2024, ISSN: 0305-0548. [DOI: 10.1016/j.cor.2023.106488](#).
- 2 S. Favargiotti, G. Zantedeschi, A. Pianegonda, M. Brunelli, and **M. Urbani**, “Designing food hubs for territories of proximity: Assessing the spatial, ecological, and cultural potentials of places through multi-criteria decision support systems,” *Land*, vol. 13, no. 8, 2024, ISSN: 2073-445X. [DOI: 10.3390/Land13081131](#).
- 3 **M. Urbani** and F. Pilati, “Multi-objective hyper-heuristics with multi-policy learning for the many-to-many vehicle routing,” *Under review*, 2024.
- 4 **M. Urbani**, M. Brunelli, and A. Punkka, “An approach for bi-objective maintenance scheduling on a networked system with limited resources,” *European Journal of Operational Research*, vol. 305, no. 1, pp. 101–113, 2023, ISSN: 0377-2217. [DOI: 10.1016/j.ejor.2022.05.024](#).
- 5 **M. Urbani**, G. Gasparini, and M. Brunelli, “A numerical comparative study of uncertainty measures in the Dempster–Shafer evidence theory,” *Information Sciences*, vol. 639, p. 119 027, 2023, ISSN: 0020-0255. [DOI: 10.1016/j.ins.2023.119027](#).
- 6 J. Savolainen and **M. Urbani**, “Maintenance optimization for a multi-unit system with digital twin simulation: Example from the mining industry,” *Journal of Intelligent Manufacturing*, vol. 32, no. 7, pp. 1953–1973, 2021. [DOI: 10.1007/s10845-021-01740-z](#).
- 7 **M. Urbani**, M. Brunelli, and M. Collan, “A comparison of maintenance policies for multi-component systems through discrete event simulation of faults,” *IEEE Access*, vol. 8, pp. 143 654–143 664, 2020. [DOI: 10.1109/ACCESS.2020.3014147](#).

Conference Proceedings

- 1 **M. Urbani** and F. Pilati, “A multi-policy sequence-based selection hyper-heuristic for multi-objective optimization,” in *Proceedings of the Companion Conference on Genetic and Evolutionary Computation*, ser. GECCO '23 Companion, Lisbon, Portugal: Association for Computing Machinery, 2023, pp. 415–418, ISBN: 9798400701207. [DOI: 10.1145/3583133.3590663](#).

Books and Chapters

- 1 **M. Urbani** and M. Collan, “Additive manufacturing cases and a vision for a predictive analytics and additive manufacturing based maintenance business model,” in Springer International Publishing, 2020, pp. 131–148.
- 2 **M. Urbani**, D. Petri, M. Brunelli, and M. Collan, “Maintenance-management in light of manufacturing 4.0,” in Springer International Publishing, 2020, pp. 97–111.