Curriculum Vitae

Luca Mencarelli

September 5, 2025

Research Fellow at:

Dipartimento di Informatica
Università di Pisa
Largo Bruno Pontecorvo, 3
56127 Pisa, Italy

personal e-mail address: luca.mencarelli.university@google.com
web page: https://luca-mencarelli.github.io/
Google Scholar profile: Luca Mencarelli
ResearchGate profile: Luca_Mencarelli
Linkedin profile: luca-mencarelli
GitHub profile: Luca-Mencarelli
Skype contact: l_mencarelli
Twitter account: @l_mencarelli

Education

April 2024: **visiting researcher scholar** at **KTH Royal Institute of Technology** (Stockholm) invited by Prof. Jan Kronqvist.

From February 2015 to March 2015 and June 2015: **visiting researcher scholar** at CORE, Center for Operations Research and Econometrics, **Université Catholique de Louvain** (Belgium) under the supervision of Prof. Mathieu Van Vyve.

From September 2013 to December 2017: **PhD student** in "Operations Research" at LIX, Laboratoire d'Informatique de l'**École Polytechnique**, Paris (France). Thesis: "The Multiplicative Weights Update Algorithm for Mixed Integer NonLinear Programming: Theory, Applications, and Limitations", advisor Prof. Leo Liberti, co-advisor Prof. Claudia D'Ambrosio, founded by the European Project (FP7 Marie Curie Initial Training Network) "MINO: Mixed Integer Nonlinear Optimization" (http://www.mino-itn.unibo.it/).

From January 2013 to July 2014: **attending** the following **courses** from the second-level Master in "Scientific Computation" at the Dipartimento "Guido Castelnuovo", La Sapienza, **University of Rome** (Italy): Operating Systems, Partial Differential Equations, Data Visualization, Numerical Analysis, Probabilistic Numerical Methods, Object-oriented Programming in C++, Advanced Programming, Parallel Computing, Numerical Methods for Image Processing, Numerical Methods for Time Series, Numerical Methods for Partial Differential Equations, Control Theory, and Financial Mathematics.

January 2013: **Master** degree in Industrial Engineering and Management Science at La Sapienza, **University of Rome** (Italy). Thesis: "Optimization Methods for Norm-1 Problems", advisor Prof. Ste-

fano Lucidi, co-advisor Prof. Francesco Rinaldi. Final grade 110/110 cum laude.

December 2010: **Bachelor** degree in Industrial Engineering and Management Science at La Sapienza, **University of Rome** (Italy). Thesis: "An Algorithm for the Solution of Standard Quadratic Problems", advisor Prof. Laura Palagi. Final grade 110/110 cum laude.

July 2007: Classical **High School** diploma at the Liceo Ginnasio "Torquato Tasso", **Rome** (Italy). Final grade 100/100.

Professional Experience

From 2023: 3-years **Assistant Professor** (RTDA) in "Operations Research" at Department of Computer Science, **University of Pisa**, Pisa (Italy).

From 2021-2023: 2-years **Post Doc** in "Machine Learning boosts MINLP QP/NLP-based Branch-and-Bound Framework" at UMA, **ENSTA Paris** (Institut Polytechnique de Paris), Palaiseau (France) founded by Labex Mathématiques Hadamard (LMH) (https://www.fondation-hadamard.fr/en/our-programs/transversal-programs/postdoc-fellowships/thematic-post-docs/laureates-post-doc-archives/).

From 2019 to 2021: 1.5-years **Post Doc** in "Machine learning and optimization methods for long tail products supply chain" at **École des Ponts ParisTech**, Paris (France).

From 2018 to 2019: 1.5-years **Post Doc** in "Process synthesis and optimization: development and evaluation of approaches coupling simulation and optimization techniques" at **IFP Energies Nouvelles**, Lyon (France).

From 2013 to 2017: **PhD student** in "Operations Research" at LIX, Laboratoire d'Informatique de l'**École Polytechnique**, Paris (France).

Publications

International Journals

1. L. Mencarelli, J. Floquet. Decomposition-based heuristic approaches for the satellite constellation design problem. **Engineering Optimization** (accepted), 2024

2. L. Mencarelli, J. Floquet, F. Georges. Matheuristics Approaches for the Satellite Constellation Design Problem. **Optimization and Engineering**, pp. 1–17, 2023.

3. L. Mencarelli, J. Floquet, F. Georges, D. Grenier. Mixed Integer (Non)Linear Approaches for the Satellite Constellation Design Problem. **Optimization and Engineering**, pp. 1–22, 2022.

4. P. Duchêne, L. Mencarelli, A. Pagot. Optimization Approaches to the Integrated System of Catalytic Reforming and Isomerization Processes in Petroleum Refinery. **Computers & Chemical Engineering**, 141, 2020.

5. L. Mencarelli, Q. Chen, A. Pagot, I.E. Grossmann. A Review on Superstructure Optimization Approaches in Process System Engineering. **Computers & Chemical Engineering**, 136, 2020.

6. L. Mencarelli, A. Pagot, P. Duchêne. Surrogate-based Modeling Techniques with Application to Catalytic Reforming and Isomerization Processes. **Computers & Chemical Engineering**, 135, 2020.

7. L. Mencarelli, C. D'Ambrosio. Complex Portfolio Selection via Convex Mixed-Integer Quadratic Programming: A Survey. **International Transactions in Operational Research**, 26(2), pp. 389–414, 2019. (Top 20 downloaded ITOR papers in 2017-2018)

8. L. Mencarelli. The Multiplicative Weights Update Algorithm for Mixed Integer NonLinear Programming: Theory, Applications, and Limitations. **A Quarterly Journal of Operations Research**, 16(3), pp. 341–342, 2018.

9. C. D'Ambrosio, S. Martello, L. Mencarelli. Relaxations and Heuristics for the General Multiple Non-linear Knapsack Problem. **Computer & Operations Research**, 93, pp. 79–89, 2018.

10. L. Mencarelli, Y. Sahraoui, L. Liberti. A Multiplicative Weights Update Algorithm for MINLP. **EURO Journal of Computational Optimization**, 5 (1–2), pp. 31–86, 2017.

Short papers in Conference (refereed)

11. G. Lanza, L. Mencarelli. Continuous-Time Scheduled Service Network Design with Piecewise Linear Costs. **AIRO-ODS 2025** (accepted), 2025.

12. D. Fioriti, A. Pampado, C. Scarpelli, G. Pasini, G. Lutzemberger, S. Barsali, D. Poli, D. Meoli, L. Mencarelli, A. Frangioni. Enhancing Energy System Modelling with advanced mathematical decomposition techniques: feasibility of coupling SMS++ and PyPSA. **IEEE EEEIC 2025** (accepted), 2025

13. A. Frangioni, L. Galli, L. Mencarelli. Delay Constrained Routing: the Multi-Flow Single-Path Case. **AIRO-ODS 2024** (accepted), 2024.

14. L. Mencarelli. MWU 2.0 with Approximation Guarantee for the Distance Geometry Problem. **Optimization and Decision Science: Operations Research, Inclusion and Equity**, AIRO Series 9, pp. 71–81, Springer, Cham, 2023.

15. L. Mencarelli, A. Pagot. A Mixed Integer Nonlinear Approach for the Automated Superstructure Generation Problem. **Computer Aided Chemical Engineering**, 40, pp. 727–732, 2020.

16. L. Mencarelli, C. D'Ambrosio, A. Di Zio, S. Martello, Heuristics for the General Multiple Nonlinear Knapsack Problem. **Electronic Notes in Discrete Mathematics**, 55, pp. 69–72, 2016.

Technical Reports and Working Papers

17. Y. De Castro, L. Mencarelli. Forecasting Nonnegative Time Series via Sliding MaskMethod (SMM) and Latent Clustered Forecast (LCF), working paper, https://arxiv.org/abs/2102.05314.

18. L. Mencarelli, A. Pagot. An Integrated Mixed Integer Programming Approach for the Automated Superstructure Generation and Process Operating Condition Optimization Problems, working paper.

19. C. D'Ambrosio, A. Di Zio, S. Martello, L. Mencarelli. A Heuristic Algorithm for the General Multiple Nonlinear Knapsack Problem. Technical report, DEI, University of Bologna, Italy and LIX, École Polytechnique, Palaiseau, France, 2015.

Theses

20. L. Mencarelli. The Multiplicative Weights Update Algorithm for Mixed Integer NonLinear Programming: Theory, Applications, and Limitations. PhD Thesis (December 2017).
21. L. Mencarelli. Optimization Methods for Norm-1 Problems (in Italian). Master Thesis (January 2013).
22. L. Mencarelli. An Algorithm for the Solution of Standard Quadratic Problems (in Italian). Bachelor Thesis (December 2010).

Seminars

1. L. Mencarelli. QP/NLP-based Branch-and-Bound algorithm for MINLP: It could work!, Department of Mathematics, KTH Royal Institute of Technology, Stockholm, Sweden, April 2024.
2. L. Mencarelli. MWU 2.0 with Approximation Guarantee for Non-convex (Structured) MINLPs, Department of Computer Science, University of Pisa, Pisa, Italy, May 2023.
3. L. Mencarelli. QP/NLP-based Branch-and-Bound algorithm for MINLP: It could work!, LIPN, Université Paris XIII, Villetaneuse, France, February 2023.
4. L. Mencarelli. To Quadratic Outer Approximation for Convex MINLP and Beyond, LIX, École Polytechnique, Palaiseau, France, January 2022.
5. L. Mencarelli. An Overview of Mixed Optimization Applied to System of Systems, Onera, The French Aerospace Lab, Palaiseau, France, October 2020.
6. L. Mencarelli. Matrix Factorisation Approaches for Time Series Reconstruction, LIX, École Polytechnique, Palaiseau, France, February 2020.
7. L. Mencarelli. The Multiplicative Weights Update Algorithm for Mixed Integer NonLinear Programming: Theory, Applications, and Limitations, IFP Energies nouvelles, Solaize, France, June 2018.
8. L. Mencarelli. A Multiplicative Weights Update Algorithm for Polynomial MINLP, CORE, Center for Operations Research and Econometrics, Université Catholique de Louvain. Louvain-la-Neuve, Belgium, February 2015.
9. L. Mencarelli. Introduction to Mixed Integer Non-Linear Programming (MINLP), GdR Mascot-Num Working Meeting on "Handling Categorical and Continuous Data". Paris, France, May 2014.

Conference Talks

1. L. Mencarelli. On the Lagrangian Relaxation for the Satellite Constellation Design Problem, ODS 2025. Milan, Italy, September 2025.
2. A. Frangioni, L. Galli, L. Mencarelli. Delay Constrained Routing: the Multi-Flow Single-Path Case, ODS 2024. Badesi, Italy, September 2024.
3. L. Mencarelli. MWU 2.0 with approximation guarantee for non-convex separable problems, 25th ISMP 2024. Montreal, Canada, July 2024. (Invited Session organized by M. De Santis)
4. G. Mastroeni, L. Mencarelli. A dual decomposition approach for convex problems with linear complementarity constraints, EURO 2024. Copenhagen, Denmark, July 2024. (Invited Session organized by J. Kronqvist)

5. L. Mencarelli. MWU 2.0 with approximation guarantee for the Distance Geometry Problem, ODS 2023. Ischia Island, Italy, September 2023

6. L. Mencarelli, S. Elloumi. Polynomial Approximation for Binary Nonlinear Programming, Cologne-Twente Workshop. Garmisch-Partenkirchen, Germany, June 2023.

7. L. Mencarelli, J. Floquet, F. Georges. Operations Research Approaches for the Satellite Constellation Design Problem, Roadef 2023. Rennes, France, February 2023.

8. L. Mencarelli, J. Floquet, F. Georges. The Satellite Constellation Design Problem via MI(N)LP Boosted with a Genetic Algorithm, PGMO Days 2022. Palaiseau, France, November 2022.

9. L. Mencarelli. An Outer Approximation Algorithm for 0-1 Polynomial Programming, HUGO 2022. Szeged, Hungary, September 2022.

10. L. Mencarelli. Outer Approximation Algorithms for Binary Nonlinear Optimization Programming, EUROPT 2022. Lisbon, Portugal, July 2022.

11. L. Mencarelli, J. Floquet, F. Georges. Mixed Integer Nonlinear Approaches for the Satellite Constellation Design Problem, PGMO Days 2021. Palaiseau, France, December 2021.

12. L. Mencarelli. A Multiplicative Weights Update Algorithm for Portfolio Selection Problems, 23rd ISMP 2018. Bordeaux, France, July 2018.

13. L. Mencarelli. A Multiplicative Weights Update Algorithm for a Class of Pooling Problems, Cologne-Twente Workshop. Paris, France, June 2018.

14. C. D'Ambrosio, S. Martello, L. Mencarelli. A Heuristic Algorithm for the General Multiple Nonlinear Knapsack Problem, INFORMS Annual Meeting 2015. Philadelphia, USA, November 2015. (Invited Session organized by J. Linderoth)

15. L. Liberti, L. Mencarelli, Y. Sahraoui. A Multiplicative Weights Update Algorithm for MINLP, Mixed-integer Nonlinear Optimization: A Hatchery for Modern Mathematics. Oberwolfach, Germany, October 2015.

16. L. Liberti, L. Mencarelli, Y. Sahraoui. A Multiplicative Weights Update Algorithm for Real-world Nonconvex MINLPs, AIRO 2015. Pisa, Italy, September 2015. (Invited Session organized by A. Frangioni)

17. L. Liberti, L. Mencarelli, Y. Sahraoui. A Multiplicative Weights Update Algorithm for Quadratic MINLP, 22nd ISMP 2015. Pittsburgh, USA, July 2015. (Invited Session organized by G. Nannicini)

18. C. D'Ambrosio, L. Mencarelli. Collateral Selection and Management via Mixed Integer Nonlinear Approaches, Roadef 2015. Marseille, France, February 2015.

19. L. Liberti, L. Mencarelli, Y. Sahraoui. A Multiplicative Weights Update Algorithm for Mixed-Integer Nonlinear Programming, 19th Combinatorial Optimization Workshop. Aussois, France, January 2015.

20. C. D'Ambrosio, A. Di Zio, S. Martello, L. Mencarelli. A Heuristic Algorithm for the General Multiple Nonlinear Knapsack Problem, Optimization 2014. Guimarães, Portugal, July 2014. (Invited Session organized by L. Palagi).

Posters

1. L. Mencarelli, A. Pagot. A Mixed Integer Nonlinear Approach for the Automated Superstructure Generation Problem, ESCAPE 30. Milan, Italy, August 2020.

2. L. Liberti, L. Mencarelli, Y. Sahraoui. A Multiplicative Weights Update Algorithm for Quadratic MINLP, Second Sevilla MINLP Workshop. Seville, Spain, March 2015.

3. C. D'Ambrosio, A. Di Zio, S. Martello, L. Mencarelli. A Heuristic Algorithm for the General Multiple Nonlinear Knapsack Problem, IPCO XVII. Bonn, Germany, June 2014.

4. C. D'Ambrosio, A. Di Zio, S. Martello, L. Mencarelli. A Heuristic Algorithm for the General Multiple Nonlinear Knapsack Problem, MINLP 2014 Workshop. Pittsburgh, USA, June 2014.

5. L. Mencarelli. Optimization Methods for Norm-1 Problems, COST Workshop on Mixed Integer Nonlinear Programming (CWMINLP). Paris, France, September 2013.

Grants

1. Travel grant, Oberwolfach Leibniz Graduate Students (OWLG), November 2014.

Referee Activities

I am a reviewer for the following international journals: A Quarterly Journal of Operations Research (4OR), EURO Journal on Computational Optimization (EJCO), European Journal of Operational Research (EJOR), Operations Research Letters (ORL), European Journal on Computational Optimization (EJCO), Chemical Engineering Research and Design (CHERD), Discrete Optimization (DICOPT), Networks (NET), Journal of Global Optimization (JOGO).

Teaching Experience

Teacher for the course: **Operations Research**, University of Pisa, Pisa (Italy) for the academic years 2023-2024 and 2024-2025 (48 hours).

Teacher for the course: **Discrete Optimization**, ENSTA Paris, Palaiseau (France) for the academic year 2022-2023 (20 hours).

Tutor for the course: **Initialisation to Operational Research** (RO201) with Professor Sourour Elloumi at the ENSTA Paris, Palaiseau (France) for the academic year 2022-2023 (12 hours).

Tutor for the course: **Differentiable Optimization** (OPT201) with Professor Sorin-Mihai Grad at the ENSTA Paris, Palaiseau (France) for the academic year 2022-2023 (12 hours).

Tutor for the course: **Data Statistic** with Professor Ali Jaghdam at the ESiLV, École d'Ingénieurs Paris-La Défense, Paris (France) for the academic year 2019-2020 (30 hours).

Tutor for the course: **Numerical Analysis** with Professor He Song at the ESiLV, École d'Ingénieurs Paris-La Défense, Paris (France) for the academic year 2019-2020 (54 hours).

Tutor for the course: **Integral Calculus** with Professor Marie-Noémie Thai at the ESiLV, École d'Ingénieurs Paris-La Défense, Paris (France) for the academic year 2019-2020 (30 hours).

Languages

Italian: mother tongue.

English: good knowledge.

French: professional knowledge.

Computer Skills

Operating Systems: Linux, Mac OS X, Windows.

Programming Languages: Python, Fortran90, C, C++, Java, Bash.

Parallelization Tools: OpenMP, MPI.

Softwares for Optimization: Ampl, GAMS, Pyomo.

Mathematical Softwares: Matlab, Gnuplot, LaTeX.

References

Prof. Leo Liberti
Full Professor
LIX, Laboratoire d'Informatique de l'École Polytechnique
91128 Palaiseau CEDEX, France
E-mail address: liberti@lix.polytechnique.fr

Prof. Claudia D'Ambrosio
CNRS Chargée de Recherche and Chargée d'Enseignement
LIX, Laboratoire d'Informatique de l'École Polytechnique
91128 Palaiseau CEDEX, France
E-mail address: dambrosio@lix.polytechnique.fr

Alexandre Pagot
Process Engineer / Project Leader
IFP Energies nouvelles, Direction Conception Modélisation Procédés
Etablissement de Lyon
Rond-point de l'Èchangeur de Solaize – BP 3
69360 Solaize, France
E-mail address: alexandre.pagot@ifpen.fr

Prof. Yohann De Castro
Full Professor
Institut Camille Jordan, École Centrale Lyon
36 avenue Guy de Collongue
69134 Ecully CEDEX, France
E-mail address: yohann.de-castro@ec-lyon.fr