Curriculum Vitae

Luca Mencarelli

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Postdoctoral Researcher at:

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Education

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. Stefano 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 2019: 1.5-year **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-year **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. 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.

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

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

4. 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 paper in 2017-2018)

5. 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.

6. 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.

7. 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)

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

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

Technical Reports and Working Papers

10. Y. De Castro, L. Mencarelli. Denoising, Clustering and Dimension Reduction in TimeSeries Analysis via Matrix Factorization, working paper.

11. Y. De Castro, L. Mencarelli. Forecasting Time Series via Matrix Factorisation, working paper.

12. 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

13. L. Mencarelli. The Multiplicative Weights Update Algorithm for Mixed Integer NonLinear Programming: Theory, Applications, and Limitations. PhD Thesis (December 2017).

14. L. Mencarelli. Optimization Methods for Norm-1 Problems (in Italian). Master Thesis (January 2013).

15. L. Mencarelli. An Algorithm for the Solution of Standard Quadratic Problems (in Italian). Bachelor Thesis (December 2010).

Seminars

1. L. Mencarelli. An Overview of Mixed Optimization Applied to System of Systems, Onera, The French Aerospace Lab, Palaiseau, France, October 2020.

2. L. Mencarelli. Matrix Factorisation Approaches for Time Series Reconstruction, LIX, École Polytechnique, Palaiseau, France, February 2020.

3. L. Mencarelli. The Multiplicative Weights Update Algorithm for Mixed Integer NonLinear Programming: Theory, Applications, and Limitations, IFP Energies nouvelles, Solaize, France, June 2018.

4. 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.

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

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

3. 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)

4. 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.

5. 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)

6. 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)

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

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

9. 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), € 200, November 2014.

Referee Activities

I am 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).

Teaching Experience

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

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