

# Martina Cerulli

## Curriculum Vitae



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### Research interests

- Modeling using Mathematical Programming real world problems
- Bilevel Programming
- Semidefinite Programming
- Semi-infinite Programming
- Developing and implementing new solution algorithms for Bilevel Nonlinear Optimization and their application to: ACOPF, aircraft conflict resolution, power network design, city logistics

### Personal information

Date of birth 24/03/1995

Nationality Italian

### Professional Experience

01/2022– Present **Postdoctoral Researcher**, *Department of Information Systems, Decision Sciences and Statistics, ESSEC Business School of Paris*, Cergy Pontoise Cedex, France.  
Current research involves Bilevel Optimization for city logistics

### Education

11/2018– **Marie Curie ITN MINOA PhD**, *LIX, CNRS - École Polytechnique*, Palaiseau, France.

12/2021 **Supervisors:** Prof. Leo Liberti and Prof. Claudia D'Ambrosio

**PhD Thesis:** Bilevel Optimization and Applications

09/2020– 11/2020 **Guest Scientist**, *Department of Corporate Research and Technology, Siemens AG*, Munich, Germany.

*3 months working on a combined dispatch and market bidding MILP*

01/2020– **Visiting PhD**, *Department of Mathematics, Trier University*, Trier, Germany.

03/2020 *3 months working with Prof. Martin Schmidt on bilevel programming with ACOPF constraints at the lower level*

10/2016– 23/07/2018 **Master's Degree in Management Engineering**, *La Sapienza University*, Rome,  
*Final mark: 110 cum Laude.*

**Master's Thesis** (*under the supervision of Professor Marianna De Santis*): ADMM to solve DNN-SDP relaxations of the Stable Set Problem

10/2013– 28/09/2016 **Bachelor's Degree in Logistic and Production Management Engineering**, *University Federico II*, Napoli,  
*Final mark: 110 cum Laude.*

10/2008– 07/2013 **High school diploma**, *Liceo Scientifico Cristoforo Colombo*, Marigliano (NA),  
*Final mark: 100 cum Laude.*

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## Awards

- 2022 **IDIA Best Thesis.**  
awarded by [IP Paris Department of Computer Science, Data and Artificial Intelligence](#)
- 2021 **EURO YoungWomen4OR 2021-2022.**  
awarded by [EURO WISDOM Forum](#)
- 2016 **Wanted the best Scholarship.**  
Scholarship for students who have completed their bachelor's degree in Italian universities different from La Sapienza with a mark between 105/110 and 110/110 cum laude.  
Grading in list: 12 out of 30
- 2013 Candidate for the "Alfieri del lavoro" national award as the best student of the C. Colombo high school

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## Computer skills

- Basic MATLAB
- Intermediate C++, Microsoft Office
- Advanced PYTHON, AMPL,  $\LaTeX$

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## Languages

- Italian **Mother tongue**
- English **Advanced** *Cambridge ESOL First Certificate of English (FCE) GRADE A*
- French **Intermediate** *Étudier en France: French Intermediate course B1-B2 by Coursera*
- Spanish **Basic** *Basic words and phrases only*

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## Publications

- PhD Thesis M. Cerulli, **Bilevel Optimization and Applications**, 2021 - <https://www.theses.fr/2021IPPAX108>
- International journals M. Pelegrin, M. Cerulli, **Aircraft conflict resolution: A benchmark generator** to appear - *INFORMS Journal on Computing*
- M. Cerulli, A. Oustry, C. D'Ambrosio, L. Liberti, **Convergent algorithms for a class of convex semi-infinite programs**, *SIAM Journal on Optimization*, 2022 <https://doi.org/10.1137/21M1431047>
- M. Cerulli, L. Liberti, **Polynomial programming prevents aircraft (and other) conflicts**, *Operations Research Letters*, 2021 - <https://doi.org/10.1016/j.orl.2021.05.001>
- M. Cerulli, C. D'Ambrosio, L. Liberti, M. Pelegrin, **Detecting and solving aircraft conflicts using bilevel programming**, *Journal of Global Optimization*, 2021 - <https://doi.org/10.1007/s10898-021-00997-1>
- M. Cerulli, M. De Santis, E. Gaar, A. Wiegele, **Improving ADMMs for Solving Doubly Non-negative Programs through Dual Factorization**, *4OR*, 2020 - <https://doi.org/10.1007/s10288-020-00454-x>
- Encyclopedia entries M. Cerulli, M. Pelegrin, S. Cafieri, C. D'Ambrosio, D. Rey, **Aircraft Conflict Resolution**, in P. Pardalos and O. Prokopyev (eds.) *Encyclopedia of Optimization*, Springer, to appear
- M. Cerulli, D. Delle Donne, M. Escobar, L. Liberti, A. Oustry, **Optimal power flow**, in P. Pardalos and O. Prokopyev (eds.) *Encyclopedia of Optimization*, Springer, to appear
- Conferences D. Bienstock, M. Cerulli, M. Escobar, L. Liberti, **Power network design with line activity**, in L. Amorosi et al. (eds), *Optimization in Artificial Intelligence and Data Sciences, 1st ed. 2022 (Chap.17)*, AIRO Springer Series, 2022 - [https://doi.org/10.1007/978-3-030-95380-5\\_17](https://doi.org/10.1007/978-3-030-95380-5_17)

M. Cerulli, C. D'Ambrosio, L. Liberti, **Flying safely by bilevel programming**, in M. Paolucci et al. (eds), *Advances in Optimization and Decision Science for Society, Services and Enterprises, AIRO-ODS19 (Chap.18)*, AIRO Springer Series, 2020 - [https://doi.org/10.1007/978-3-030-34960-8\\_18](https://doi.org/10.1007/978-3-030-34960-8_18)

M. Cerulli, C. D'Ambrosio, L. Liberti, **On aircraft deconfliction by bilevel programming** on *CTW conference proceedings*, in J. Hurink et al. (eds), *Proceedings of CTW19*, Univ. of Twente, 2019 - <https://www.ctw.ewi.utwente.nl/CTW2019ProceedingsFinal.pdf>

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## Papers in preparation

M. Cerulli, C. D'Ambrosio, L. Liberti, M. Schmidt, **ACOPF in one retailer and several prosumers scenario**

C. Archetti, M. Cerulli, E. Fernández, I. Ljubic **A pricing and routing problem for last-mile delivery**

C. Archetti, M. Cerulli, I. Ljubic, D. Serra, C. Sorgente **The collapsed  $k$ -core problem**

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## Organized workshops and conference sessions

### 2023

20.02–23.02 “**Optimisation bi-niveaux et applications**” session within the ROADEF2023 conference (24ème édition du congrès annuel de la Société Française de Recherche Opérationnelle et d’Aide à la Décision ROADEF 2023) held at Rennes School of Business, France

### 2021

04.03–05.03 **MINOA ESR days 2.0** — a two days workshop on *Mixed-Integer Nonlinear Programming and Applications*, held online — [https://minoa-itn.fau.de/?page\\_id=1157](https://minoa-itn.fau.de/?page_id=1157)

### 2020

23.11–24.11 **MINOA ESR days** — a two days workshop on *Mixed-Integer Nonlinear Programming and Applications*, held online — [https://minoa-itn.fau.de/?page\\_id=1157](https://minoa-itn.fau.de/?page_id=1157)

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## Invited seminars

28.11.2022 Department of Mathematics, Trier University: “**On the dualization of the inner problems of Semi-Infinite programs**”

18.11.2022 Laboratoire d’Informatique de Paris Nord: “**On the solution of convex Semi-Infinite Problems**”

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## Invitation-only workshops participations

### 2023

07.01–13.01 25th Combinatorial Optimization Workshop, *CNRS Centre Paul Langevin*, Aussois, France

### 2022

30.10–04.11 Dagstuhl Seminar 22441 “Optimization at the Second Level”, *Schloss Dagstuhl – Leibniz-Zentrum für Informatik*, Wadern, Germany

### 2020

06.01–10.01 24th Combinatorial Optimization Workshop, *CNRS Centre Paul Langevin*, Aussois, France

### 2019

03.06–08.06 (With the “Oberwolfach Leibniz Graduate Student” grant) Mixed-integer Nonlinear Optimization: a hatchery for modern mathematics, *MFO Oberwolfach Research Institute for Mathematics*, Oberwolfach, Germany

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## Presentations (talk, poster..) at conferences and workshops

### 2022

- 30.10–04.11 Dagstuhl Seminar 22441 “Optimization at the Second Level”, *Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Wadern, Germany*, Talk: **“A pricing and routing problem for last-mile delivery” – extended version**
- 06.10 Workshop on Pricing Algorithms organized by Digital Aquitaine association, *Institut de Mathématiques de Bordeaux and INRIA in Bordeaux, France*, Talk: **“A pricing and routing problem for last-mile delivery”**
- 30.08–02.09 ODS 2022 - 51th AIRO International Conference on Optimization and Decision Science, *Florence, Italy*, Talk: **“The collapsed  $k$ -core problem”**
- 03.07–06.07 EURO 2022 - 32nd European Conference on Operational Research, *Aalto University, Espoo, Finland*  
Talk: **“Convergent algorithms to solve a class of bilevel programs with quadratic lower level”**
- 27.05 EURO WISDOM Forum YoungWomen4OR Online Webinar *“Bilevel optimization”*, Talk: **“A pricing and routing problem for last-mile delivery”**

### 2021

- 14.09–17.09 ODS 2021 - 50th AIRO International Conference on Optimization and Decision Science, *La Sapienza University of Rome, Italy*, Talk: **“Solving a class of bilevel programs with quadratic lower level”**
- 11.07–14.07 EURO 2021 - 31st European Conference on Operational Research, *hybrid conference*, Talk: **“ACOPF in one retailer and several prosumers scenario”**
- 02.03 Trends in Mathematical Modelling, Simulation and Optimisation: Theory and Applications, *online-conference organized by the CRC TRR154-2, MINOA, and the ADA Lovelace Center*, Talk: **“Re-formulating particular bilevel programs with quadratic lower level”**

### 2020

- 15.12 POC “hors les murs”, *Seminaire du groupe POC “Polyèdres et optimisation combinatoire”*, Short talk: **“Two approaches to solve a particular bilevel problem”**
- 12.10 ALOP Online Autumn School on Bilevel Optimization, *Trier University*, Elevator Pitch: **“Aircraft Deconfliction via Bilevel programming”**
- 09.10 Half-day of online optimization seminars, *LIX - École Polytechnique*, Talk: **“Aircraft Deconfliction Problem”**

### 2019

- 04.09–07.09 49th Annual Conference of the Italian Operations Research Society ODS 2019, *Genova*, Talk: **“Flying safely by bilevel programming”**
- 15.07–18.07 Mixed integer programming workshop 2019, *Massachusetts Institute of Technology*, Poster: **“Aircraft deconfliction by bilevel programming”**
- 01.07–03.07 17th Cologne-Twente Workshop on Graphs and Combinatorial Optimization, *University of Twente*, Talk: **“On aircraft deconfliction by bilevel Programming”**
- 03.06–08.06 Mixed-integer Nonlinear Optimization: a hatchery for modern mathematics, *MFO Oberwolfach Research Institute for Mathematics*, Short talk: **“Flying safely on two levels”**
- 16.01–17.01 pid19: PhD and Industry Days 2019, *LIX - École Polytechnique*, Talk: **“ADMM to solve DNN-SDP problems”**

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## Schools and workshops attended

### 2022

- 21.06–22.06 2nd EUROYoung workshop held at *INESC TEC and FEUP* in Porto, Portugal

### 2021

- 08.02–12.02 AIRO PhD School 2021 and 5th AIROYoung Workshop on the topic “Optimization and Data Science: Trends and Applications” organized by *Operations Research Group of University “Federico II” of Naples*

## 2020

12.10–14.10 ALOP Autumn School on Bilevel Optimization organized by *ALOP Research Training Group at Trier University*

## 2019

07.10–10.10 CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming at *Université de Montréal*

24.06–28.06 1st MINOA Summer School “Mixed-Integer Nonlinear Optimization meets Data Science”

07.01–11.01 23rd Workshop on Combinatorial Optimization in *Aussois*

## Editorial activity

Referee for:

- Mathematical Programming Journal
- Operations Research Letters
- Journal of Global Optimization
- 4OR - A Quarterly Journal of Operations Research
- Soft Computing Journal
- Asia-Pacific Journal of Operational Research