Sonia Cafieri

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Academic Positions

July 2013 - present	**Professor**, École Nationale de l'Aviation Civile (ENAC), Department of Air Navigation Engineering and Sciences, Toulouse, France.
Dec 2009 - Jun 2013	**Assistant Professor** [1], École Nationale de l'Aviation Civile (ENAC), Department of Air Navigation Engineering and Sciences, Toulouse, France.
Mar 2008 -Nov 2009	**Post-doctoral Researcher**, Laboratoire d'Informatique (LIX), École Polytechnique, Paris, France.
Jun 2007 - Feb 2008	**Post-doctoral Researcher**, Research Center Bioagromed, University of Foggia, Italy.
Sep 2006 - May 2007	**Research Fellow**, Depart. of Mathematics, Second University of Naples, Italy.

Education

December 2012	**Habilitation à Diriger des Recherches**, Université Paul Sabatier, Toulouse, France. Title: *From Local to Global and back: A closed walk in Mathematical Programming and its Applications.* Jury: E. Carrizosa, Ph. Mahey, P. Pardalos (referees), J-B. Hiriart-Urruty, B. Jouve, F. Messine, M. Mongeau.
January 2006	**Ph.D. in Mathematical Sciences**, University of Naples "Federico II", Italy. Thesis title: *On the application of iterative solvers to KKT systems in Interior Point methods for Large-Scale Quadratic Programming problems.*
October 2001	**Laurea (MSc) in Mathematics**, Second University of Naples, Italy. (110/110 cum Laude) Thesis title: *Quadratic Optimization: Algorithms and Software for sparse problems.*

2013 and *2018*: On the French National University Council (CNU) **qualification** lists for "Professeur des Universités" in **section 26** (applied mathematics) and **27** (computer science).

[1] *Enseignant-Chercheur (HDR since Dec.2012)*, equivalent to *Maître de Conférence* in France.

Main research interests

- Nonlinear and Mixed-Integer Nonlinear Programming (MINLP).
- Global optimization.
- Operations Research. Applications in aeronautics, air traffic management, engineering.
- Network Clustering.
- Optimal Control (application to air traffic management).
- Interior point algorithms for nonlinear programming and numerical linear algebra issues.

Awards

- **Prix for scientific excellence (highest level) at ENAC**, since 2013.
- Prix for the best student, Second University of Naples, 1998-99 and 1999-00.

Academic Professional Activities

- Responsible of the research group "Mathematics of Optimization and Operations Research" (MORO) within the OPTIM research team at ENAC.
- Member (elected) of the Rechearch Council of ENAC, since 2019.
- Member of the Doctoral Council ENAC, since 2021.
- **Editorial responsibilities**
  - **Associate Editor** for *International Transactions in Operational Research* (ITOR) since September 2011.
  - **Guest Editor** with P.A. Amaral, M. Anjos, and G. Bigi of a special issue of *Journal of Optimization Theory and Applications* dedicated to the EUROPT 2022 conference, expected in 2023.
  - **Guest Editor** with N. Couellan, S. Jan, F. Messine, and G. Bigi of a special issue of *Optimization Methods and Software* dedicated to the EUROPT 2021 conference, expected in 2023.
  - **Guest Editor** with L. Liberti and F. Messine of a special issue of *Journal of Global Optimization* dedicated to the Toulouse Global Optimization workshop 2010, Volume 56 (3), July 2013.
  - **Guest Editor** with U. Faigle and L. Liberti of a special issue of *Discrete Applied Mathematics* dedicated to the CTW09 conference, Volume 159 (16), pages 1659-1914, September 2011.

- **Conference and Seminar organization**

Seminars

Member of the organizing committee of SPOT: Pluridisciplinary Optimization Seminar in Toulouse, since June 2013. This is a monltly seminar, with two speakers per session.

Conferences

- Program committee member, LION 17 - Learning and Intelligent Optimization Conference, Nice, France, June 2023.
- Scientific committee member, ROADEF 2023 (French Conference on Operations Research), Rennes, France, February 2023.
- **Co-Chair** of the Program Committee, EUROPT 2022 - 19th EUROPT Workshop on Advances in Continuous Optimization, Lisbon, Portugal, July 2022.
- Scientific committee member, ROADEF 2022 (French Conference on Operations Research), Lyon, France, February 2022.
- **Chair** of the Program Committee and of the Organizing Committee, EUROPT 2021 - 18th EUROPT Workshop on Advances in Continuous Optimization, Toulouse, France, July 2021 (postponed from July 2020).
- Scientific committee member, ROADEF 2021 (French Conference on Operations Research), Mulhouse, France (virtual format), Avril 2021.
- Program committee member, LION 14 - Learning and Intelligent Optimization Conference, Athens, Greece, May 2020.
- Scientific committee member, ROADEF 2020 (French Conference on Operations Research), Montpellier, France, February 2020.
- Program committee member, EUROPT 2019 - 17th EUROPT Workshop on Advances in Continuous Optimization, Glasgow, UK, June 2019.
- Program committee member, LION 13 - Learning and Intelligent Optimization Conference, Chania, Greece, May 2019.
- Scientific committee member, ROADEF 2019 (French Conference on Operations Research), Le Havre, France, February 2019.
- Scientific committee member, ISMP 2018 - 23th International Symposium on Mathematical Programming, track leader for "Science" in Cluster: Problem Specific Models, Algorithm Implementations, and Software, Bordeaux, July 2018.
- Program committee member, EUROPT 2018 - 16th EUROPT Workshop on Advances in Continuous Optimization, Almeria, Spain, July 2018.
- Program committee member, LION 12, Learning and Intelligent Optimization Conference, Kalamata, Greece, June 2018.
- Scientific committee member, *journées SMAI-MODE* (Mathematics of Optimization and DEcision) 2018, Grenoble, March 2018.

- Program committee member, EUROPT 2017 - 15th EUROPT Workshop on Advances in Continuous Optimization, Montreal, Canada, July 2017.
- Program committee member, LION 11, Learning and Intelligent Optimization Conference, Nizhny Novgorod, Russia, June 2017.
- Program committee member, ROADEF 2017 (French Conference on Operations Research), Metz, France, February 2017.
- Program committee member, EUROPT 2016 - 14th EUROPT Workshop on Advances in Continuous OptimizationContinuous Optimization, Warsaw, Poland, July 2016.
- Scientific committee member, NUMTA 2016: Numerical Computations: Theory and Algorithms, Calabre, Italy, June 2016.
- Local organizing committee member, *journées SMAI-MODE* (Mathematics of Optimization and DEcision) 2016, Toulouse, March 2016.
- Organizing chair of the *Mixed-Integer Nonlinear Programming* stream (3 sessions) at EURO 2015 Conference (European Conference on Operations Research), Glasgow, UK, July 2015.
- Scientific committee member of the 2nd day of the *Working group on Mathematical Programming of the French Operations Research Group*, Dijon, France, June 2015.
- Co-chair, with Ph. Mahey and F. Messine, of the first days of the *Working group on Mathematical Programming of the French Operations Research Group*, Toulouse, France, June 2014.
- Organizing co-chair of the stream *Logistique, localisation, transport et contrôle aérien*, with D. Feillet, C. Prins and R. Wolfer-Calvo, at ROADEF 2014 (French Conference on Operations Research), Bordeaux, France, February 2014.
- Organizing co-chair of the *Mixed-Integer Nonlinear Programming* stream (8 sessions) at EURO-INFORMS 2013 Conference (European Conference on Operations Research), Rome, Italy, July 2013.
- Local organizing committee member in ISIATM 2013 - Interdisciplinary Science for Innovative Air Traffic Management, Toulouse, France, July 2013.
- Session co-chair at ROADEF 2013 (French Conference on Operations Research), Troyes, France, February 2013. Session title "Trafic Aérien et Transport Aérien".
- Organizing co-chair of the *Mixed-Integer Nonlinear Programming* stream (7 sessions) at EURO 2012 Conference (European Conference on Operations Research), Vilnius, Lithuania, July 2012.
- Scientific committee member in Global Optimization Workshop (GOW'12), Natal, Brasil, June 2012.
- Local organizing committee member in JFPC 2012 (French Conference on Constraint Programming), Toulouse, France, May 2012.
- Session co-chair at ROADEF 2012 (French Conference on Operations Research), Angers, France, April 2012. Session title "Transport et Controle Aérien".
- Session chair at OR 2011 (International Conference on Operations Research), Zurich, Switzerland, Sept 2011. Session title "Airline, airport and air traffic management".
- Session co-chair at ROADEF 2011 (French Conference on Operations Research), Saint Etienne, France, March 2011. Session title "Transport et Controle Aérien".

- Scientific and local organizing committee member in Toulouse Global Optimization workshop (TOGO10), Toulouse, France, August-September 2010. Co-editor of the Conference Proceedings.
- Session chair within the stream *Mixed-Integer Nonlinear Programming* at EURO 2010 Conference (European Conference on Operations Research), Lisbon, Portugal, July 2010.
- Local organizing committee member, CTW09 international workshop on Graphs and Combinatorial Optimization, Paris, France, June 2009. Co-editor of the Conference Proceedings.

- **Referee** for
  - international journals:
    Journal Of Global Optimization, Optimization Letters, Computational Optimization and Applications, Journal Of Control, Journal of Computer Mathematics, Information Processing Letters, Discrete Applied Mathematics, SIAM Journal on Optimization, TOPR, Annals of Operations Research, Optimization and Engineering, Optimization, Operations Research, European Journal of Operational Research, European Journal on Computational Optimization, Transportation Science, Physica A.
  - international conferences:
    CTW09, TOGO10, SEA2012, GOW'12, GOW'16, LION'11, LION'12, LION'13, LION'14.
  - grant applications to Natural Sciences and Engineering Research Council of Canada (NSERC).

- **Membership**
  - ROADEF (French Operations Research Society) since 2009
  - MOS (Mathematical Optimization Society, previously Mathematical Programming Society)
  - EUROPT (The Continuous Optimization Working Group of EURO), since 2014.
    Member of the **Managing Board** 2014-2016, 2016-2018, 2018-2020, 2020-present .
    Editor of the Newsletter.
  - SMAI (French Society of Industrial and Applied Mathematics), since 2014.
    Member of the **leading committee of the group MODE** 2014-2017, 2017-2020.
  - Member and scientific advisor of the Working Group "Mathematical Programming : nonlinear optimization with continuous and discrete variables" of the national research group on Operations Research (GdR- RO).
  - Member of the Working Group GdR MOA (Mathematics of Optimization and Applications).
  - Member of the research group TORO - Toulouse Operations Research and Optimization - which gathers people working on Operation Research and Optimization in research laboratories and Universities in Toulouse, France, since its foundation in 2011: `www.toro-toulouse.fr`

Grants and Projects

- **Funded projects (as principal investigator)**
  - *ATOMIC: Air Traffic Optimization via Mixed-Integer Computation*, ANR JCJC Project, funded by ANR (Agence Nationale de la Recherche).
    Principal Investigator (PI), 189 KEUR, 3 years, started Jan 2013.
  - *PhD fellowship funding*, awarded by PRES University of Toulouse.
    PI, 88 KEUR, 3 years, started 2011.
- **Partecipation in scientific projects**
  - *2015-2016*
    ToCoNet - Toulouse Complex Network, project "Transversality" - IDEX Toulouse.
  - *2012-2013*
    ORGE - Optimisation Robuste de dispositifs magnétiques à Grands Entrefers, BQR project funded by INPT-INSA-ISAE.
  - *2009-2012*
    RMNCCO (project on Reformulations in Mathematical Programming), funded by Digiteo.
  - *2008-2009*
    ARS - Automatic Reformulations Search, ANR JCJC Project, funded by French 'Agence Nationale de la Recherche' (ANR), (post-doc research activity).
  - *2005- 2007*
    Innovative Problems and Methods in Nonlinear Optimization, PRIN Project, funded by Italian Ministry of University and Research (MIUR).
  - *2003- 2006*
    Large Scale Nonlinear Optimization, FIRB Project, funded by Italian MIUR.

Publications

- **International Journals**
  1. S. Cafieri, A. Conn, M. Mongeau, *The continuous quadrant penalty formulation of logical constraints*, under minor revision, preprint HAL hal-03623407.
  2. S. Cafieri, A. Conn, M. Mongeau, *MINLP and continuous optimization formulations for aircraft conflict avoidance via heading and speed deviations*, **European Journal on Operational Reserach**, in press, 2023.
  3. P. Dieumegard, S. Cafieri, D. Delahaye, R.J. Hansman, *Rotorcraft low-noise trajectories design: black-box optimization using surrogates*, **Optimization and Engineering**, in press, 2023.
  4. S. Cafieri, T. Tchemisova, G.-W. Weber, *Twenty years of EUROPT, the EURO working group on Continuous Optimization*, **EURO Journal on Computational Optimization**, 10, pp.100039, 2022.

5. A. Kassiba, S. Cafieri, F. Bastin, M. Mongeau, B. Gendron, *Two-stage stochastic programming models for the extended aircraft arrival management problem with multiple pre-scheduling points*, **Transportation research. Part C, Emerging technologies**, 142, pp.103769, 2022.
6. S. Cafieri, P. Hansen, F. Messine, *Global exact optimization for covering a rectangle with 6 circles.* **Journal of Global Optimization**, 83, pp.163-185, 2022.
7. F. Mitjana, S. Cafieri, F. Bugarin, S. Segonds, F. Castanie, P. Duysinx, *Topological gradient in structural optimization under stress and buckling constraints.* **Applied Mathematics and Computation**, 409, 2021.
8. A. Kassiba, F. Bastin, S. Cafieri, B. Gendron, M. Mongeau, *Two-stage stochastic mixed-integer programming with chance constraints for extended aircraft arrival management.* **Transportation Science**, INFORMS, 54 (4), pp. 897-919, 2020.
9. A. Kassiba, F. Bastin, B. Gendron, S. Cafieri, M. Mongeau, *Extended Aircraft Arrival Management under Uncertainty: A Computational Study.* **Journal of Air Transportation, AIAA**, 27 (3), pp.131-143, 2019.
10. F. Mitjana, S. Cafieri, F. Bugarin, C. Gogu, F. Castanié. *Optimization of structures under buckling constraints using frame elements.* **Engineering Optimization**, 51 (1), pp.140-159, 2019.
11. I. Hamaz, L. Houssin, S. Cafieri. *Robust Basic Cyclic Scheduling Problem.* **EURO Journal on Computational Optimization**, 6 (3), pp.291-313, 2018.
12. S. Cafieri, C. D'Ambrosio, *Feasibility Pump for aircraft deconfliction with speed regulation.* **Journal of Global Optimization**, 71 (3), pp 501-515, 2018.
13. S. Cafieri, L. Cellier, F. Messine, *Combination of optimal control approaches for aircraft conflict avoidance via velocity regulation.* **Optimal Control, Applications and Methods**, 39 (1), pp.181-203, 2018.
14. S. Cafieri, D. Rey, *Maximizing the number of conflict-free aircraft using mixed-integer nonlinear programming*, **Computers & Operations Research**, 80, pp.147-158, 2017.
15. J. Zhou, S. Cafieri, D. Delahaye, M. Sbihi, *Optimization-Based Design of Departure and Arrival Routes in Terminal Maneuvering Area.* **Journal of Guidance, Control and Dynamics**, 40 (11), pp. 2889-2904, 2017.
16. F. Monies, I. Danis, C. Bes, S. Cafieri, M. Mongeau. *A new machining strategy for roughing deep pockets of magnesium-rare earth alloys.* **International Journal of Advanced Manufacturing Technology**, Volume 92, issue 9-12, pp. 3883-3901, 2017.
17. S. Cafieri, R. Omheni, *Mixed-Integer Nonlinear Programming for Aircraft Conflict Avoidance by sequentially applying velocity and heading angle changes*, **European Journal of Operational Research**, Volume 260, issue 1, pp. 283-290, 2017.
18. S. Cafieri, F. Monies, M. Mongeau, C. Bes, *Plunge milling time optimization via mixed-integer nonlinear programming*, **Computers & Industrial Engineering**, 98: 434-445, 2016.
19. S. Cafieri, A. Costa, P. Hansen, *Adding cohesion constraints to models for modularity maximization in networks*, **Journal of Complex Networks**, 3 (3): 388-410, 2015.
20. S. Cafieri, P. Hansen, N. Mladenović, *Edge-ratio network clustering by Variable Neighborhood Search*, **European Physical Journal B**, 87:116, 2014.

21. S. Cafieri, N. Durand, *Aircraft deconfliction with speed regulation: new models from mixed-integer optimization*, **Journal of Global Optimization**, 58(4):613-629, 2014.
22. S. Cafieri, A. Costa, P. Hansen, *Reformulation of a model for hierarchical divisive graph modularity maximization*, **Annals of Operations Research**, 222 (1): 213-226, 2014.
23. S. Cafieri, P. Hansen, L. Liberti, *Improving heuristics for network modularity maximization using an exact algorithm*, **Discrete Applied Mathematics**, special issue on Matheuristics 2010, 163(1):65-72, 2014.
24. S. Cafieri, L. Liberti, F. Messine, B. Nogarede, *Optimal Design of Electrical Machines: Mathematical Programming Formulations*, **COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Engineering**, 32(3):977-996, 2013.
25. S. Cafieri, G. Caporossi, P. Hansen, S. Perron, A. Costa, *Finding communities in networks in the strong and almost-strong sense*, **Physical Review E**, 85(4):046113, 2012.
26. S. Cafieri, P. Hansen, L. Liberti, *Locally optimal heuristic for modularity maximization of networks*, **Physical Review E**, 83(5):056105, 2011.
27. D. Aloise, S. Cafieri, G. Caporossi, P. Hansen, L. Liberti, S. Perron, *Column generation algorithms for exact modularity maximization in networks*, **Physical Review E**, 82(4):046112, 2010.
28. S. Cafieri, P. Hansen, L. Liberti, *Loops and multiple edges in modularity maximization of networks*, **Physical Review E**, 81(4):046102, 2010.
29. S. Cafieri, P. Hansen, L. Liberti, *Edge ratio and community structure in networks*, **Physical Review E**, 81(2):026105, 2010.
30. S. Cafieri, J. Lee, L. Liberti, *On convex relaxations of quadrilinear terms*, **Journal of Global Optimization**, 47:661–685, 2010.
31. S. Cafieri, M. Mastromatteo, S. Chillo, M.A. Del Nobile, *Modeling the mechanical properties of pasta cooked at different times*, **Journal of Food Engineering**, 100: 336–342, 2010.
32. S. Cafieri, S. Chillo, M. Mastromatteo, N. Suriano, M.A. Del Nobile, *A mathematical model to predict the effect of shape on pasta hydration kinetic during cooking and overcooking*, **Journal of Cereal Science**, 48 (3): 857–862, 2008.
33. S. Cafieri, M. D'Apuzzo, V. De Simone, D. di Serafino, G. Toraldo, *Convergence Analysis of an Inexact Potential Reduction Method for Convex Quadratic Programming*, **Journal of Optimization Theory and Applications**, 135: 355–366, 2007.
34. S. Cafieri, M. D'Apuzzo, V. De Simone, D. di Serafino, *Stopping criteria for inner iterations in inexact Potential Reduction methods: a computational study*, **Computational Optimization and Applications**, special issue on Linear Algebra issues arising in Interior Point methods, J. Gondzio and G. Toraldo eds., 36 (2): 165-193, 2007.
35. S. Cafieri, M. D'Apuzzo, V. De Simone, D. di Serafino, *On the Iterative Solution of KKT Systems in Potential Reduction Software for Large Scale Quadratic Problems*, **Computational Optimization and Applications**, special issue on High Performance Algorithms and Software for Nonlinear Optimization, A. Murli and G. Toraldo eds, 38: 27–45, 2007.
36. S. Cafieri, M. D'Apuzzo, M. Marino, A. Mucherino, G. Toraldo, *Interior Point Solver for Large-Scale Quadratic Programming Problems with Bound Constraints*, **Journal of Optimization Theory and Applications**, 129 (1): 55–75, 2006.

- **Edited volumes and journal issues**

37. S. Cafieri, L. Liberti, F. Messine (eds.), *Toulouse Global Optimization Workshop 2010*, **special issue of the Journal of Global Optimization** dedicated to the TOGO10 Conference, Volume 56 (3), 2013.
38. S. Cafieri, U. Faigle, L. Liberti (eds.), *Graphs and Combinatorial Optimization*, **special issue of Discrete Applied Mathematics** dedicated to the CTW09 Conference, Volume 159 (16), pages 1659-1914, 2011.
39. S. Cafieri, B.G. Tóth, E.M.T. Hendrix, L. Liberti, F. Messine (eds.), *Proceedings of the Toulouse Global Optimization workshop* (TOGO10), Toulouse, 2010.
40. S. Cafieri, A. Mucherino, G. Nannicini, F. Tarissan, L. Liberti (eds.), *Proceedings of CTW09 Conference on Graphs and Combinatorial Optimization*, Paris, 2009.

- **Book chapters (refereed)**

41. S. Cafieri, *MINLP in Air Traffic Management: Aircraft conflict avoidance*, in Terlaky, T., Anjos, M., Ahmed, S. (Eds.), Advances and Trends in Optimization with Engineering Applications. **MOS-SIAM Series on Optimization**. SIAM, Philadelphia, 2017.
print ISBN: 9781611974676, ebook ISBN: 9781611974683.
42. S. Cafieri, P. Hansen, *Using mathematical programming to refine heuristic solutions for network clustering*, in P. Pardalos, M. Batsyn, V. Kalyagin (Eds.), Proceedings of the Third International Conference on Network Analysis, **Series : Springer Proceedings in Mathematics & Statistics**, Vol 104, pp. 9-20, 2014.
43. S. Cafieri, P. Hansen, N. Mladenović, *Variable Neighborhood Search for Edge-Ratio Network Clustering*, in S. Butenko, L. Pasiliao, V.Shylo (Eds.), Examining Robustness and Vulnerability of Networked Systems, **NATO Science for Peace and Security Series - D:Information and Communication Security**, Vol 37, pp. 51-64, IOS press, 2014.
44. P. Belotti, S. Cafieri, J. Lee, L. Liberti, A. Miller, *On the composition of convex envelopes for quadrilinear terms*, in A. Chinchuluun, P.M. Pardalos, R. Enkhbat and E.N. Pistikopoulos (eds.), Optimization, Simulation and Control, **Series : Springer Optimization and its Applications**, Vol. 76, Springer, 2013.
45. L. Liberti, S. Cafieri, F. Tarissan, *Reformulations in Mathematical Programming: a Computational Approach*, in A. Abraham, A.-E. Hassanien, P. Siarry, and A. Engelbrecht (eds.), Foundations of Computational Intelligence Vol. 3 (Global Optimization: Theoretical Foundations and Applications), **Series: Studies in Computational Intelligence**, 203:153-234, Springer, Berlin, 2009.

- **International Conference publications (refereed)**

46. D. Bereziat, S. Cafieri, A. Vidosvaljevic, *Metropolis II: Centralised and strategical separation management of UAS in urban environment*, Sesar Innovation Days (**SID 2022**)), Budapest, Hungary, 2022.
47. S. Cafieri, F. Messine, *A numerical proof by reliable Global Optimization for a problem of covering a rectangle with circles*, In: HUGO 2022 - XV Workshop on Global Optimization (**GOW'22**), Szeged, Hungary, 2022.

48. P. Dieumegard, F. Guntzer, J. Caillet, S. Cafieri, *A Realistic Rotorcraft Noise Footprint Computation for Low-Noise Trajectory Optimization*, In: 78th Vertical Flight Society Annual Forum (**VFS 2022**), Fort Worth, United States, 2022.
49. I. Hamaz, L. Houssin, S. Cafieri, *A Branch-and-Bound Procedure for the Robust Cyclic Job Shop Problem*. In: Lee J., Rinaldi G., Mahjoub A. (eds) Combinatorial Optimization. ISCO 2018. **Lecture Notes in Computer Science**, vol 10856, 2018.
50. S. Cafieri, P. Hansen, F. Messine. *Covering a square with six circles by deterministic global optimization*. In: LeGO 2018: 14th International Workshop on Global Optimization (**GOW'18**), Leiden, Netherlands, pp.020024, 2018.
51. I. Hamaz, L. Houssin, S. Cafieri. *The Cyclic Job Shop Problem with uncertain processing times*. In: 16th International Conference on Project Management and Scheduling (**PMS 2018**), Rome, Italy, 2018.
52. S. Cafieri, E. Carrizosa, *A clustering-based algorithm for aircraft conflict avoidance*, in Proceedings of Global Optimization Workshop (**GOW'16**), Braga, Portugal, 2016.
53. S. Cafieri, F. Messine, A. Touhami, *On solving Aircraft Conflict Avoidance using Deterministic Global Optimization (sBB) Codes*, in Proceedings of Global Optimization Workshop (**GOW'16**), Braga, Portugal, 2016.
54. J. Zhou, S. Cafieri, D. Delahaye, M. Sbihi, *Optimizing the Design of a Route in Terminal Maneuvering Area Using Branch and Bound*, in Air Traffic Management and Systems II, **Lecture Notes in Electrical Engineering**, Springer, to appear.
55. D. Delahaye, S. Pierre, S. Cafieri, *Aircraft Trajectory Planning with Dynamical Obstacles by Artificial Evolution and Convex Hull Generations*, in Air Traffic Management and Systems II, **Lecture Notes in Electrical Engineering**, Springer, to appear.
56. J. Zhou, S. Cafieri, D. Delahaye, M. Sbihi, *Optimal Design of SIDs/STARs in TMA Using Simulated Annealing*, in Proceedings of **DASC 2016**, 35th Digital Avionics Systems Conference, Sacramento, 2016.
57. L. Houssin, I. Hamaz, S. Cafieri, *The time varying cyclic job shop problem*, in Proceedings of the 15^{th} International Conference on Project Management and Scheduling (**PMS 2016**), Valencia, Spain, 2016.
58. S. Cafieri. *Maximizing the number of solved aircraft conflicts through velocity regulation*, in Proceedings of Mathematical and Applied Global Optimization (**MAGO-GOW'14**), Global Optimization Workshop 2014, Malaga, Spain, pp. 129-132, 2014.
59. J. Zhou, S. Cafieri, D. Delahaye, M. Sbihi, *Optimization of Arrival and Departure Routes in Terminal Maneuvering Area*, in Proceedings of **ICRAT 2014** - 6th International Conference on Research in Air Transportation, Istambul, Turkey, May 2014.
60. L. Cellier, S. Cafieri, F. Messine, *Optimal Control Approaches for Aircraft Conflict Avoidance using Speed Regulation: a Numerical Study*, in Proceedings of the 2nd International Conference on Interdisciplinary Science for Innovative Air Traffic Management (**ISIATM 2013**), Toulouse, 2013.
61. L. Cellier, S. Cafieri, F. Messine, *A Decomposition-based Optimal Control Approach for Aircraft Conflict Avoidance Performed by Velocity Regulation*, in G. Brat et al. (eds.), Proceedings of the 3rd International Conference on Application and Theory of Automation in Command and Control Systems (**ATACCS 2013**), pp. 129-131, Naples, Italy, 2013. ISBN: 978-2-917490-24-2

62. L. Cellier, S. Cafieri, F. Messine, *Hybridizing direct and indirect optimal control approaches for aircraft conflict avoidance*, in Proceedings of the sixth international conference on Advanced Engineering Computing and Applications in Sciences (**ADVCOMP 2012**), pp. 42-45, Barcelone, 2012.
63. S. Cafieri, *Aircraft conflict avoidance: a mixed-integer nonlinear optimization approach*, in Proceedings of Global Optimization Workshop (**GOW'12**), pp. 43-46, Natal, 2012.
64. S. Cafieri, P. Hansen, L. Létocart, L. Liberti, F. Messine, *Compact relaxations for polynomial programming problems*, in R. Klasing (eds.), Experimental Algorithms (Proceedings of **SEA 2012**), **Lecture Notes in Computer Science** 7276:75-86, Springer, Berlin, 2012.
65. P. Belotti, S. Cafieri, L. Liberti, J. Lee, *Feasibility-based bounds tightening via fixed points*, in W. Wu and O. Daescu (eds.), Proceedings of Conference on Combinatorial Optimization and Applications (**COCOA 2010**), **Lecture Notes in Computer Science**, 6508:65-76, 2010.
66. S. Cafieri, L. Liberti, F. Messine, B. Nogarede, *Discussion about formulations and resolution techniques of electrical machine design problems*, in Proceedings of XIX International Conference on Electrical Machines (**ICEM 2010**), **IEEE Xplore**, 2010.
67. S. Cafieri, P. Brisset, N. Durand, *A mixed-integer optimization model for Air Traffic Deconfliction*, in Proceedings of Toulouse Global Optimization workshop (**TOGO 2010**), pp. 27-30, Toulouse, 2010.
68. L. Liberti, S. Cafieri, D. Savourey, *The Reformulation-Optimization Software Engine*, in Komei Fukuda et al. (eds.), International Congress of Mathematical Software (**ICMS 2010**), **Lecture Notes in Computer Science**, 6327:303-314, 2010.
69. S. Cafieri, P. Hansen, L. Liberti, *Improving heuristics for network modularity maximization using an exact algorithm*, **MatHeuristics 2010**, pp. 130-139, Vienna, 2010.
70. P. Belotti, S. Cafieri, J. Lee, L. Liberti, *On the convergence of feasibility based bounds tightening*, in U. Faigle, R. Schrader, D. Herrmann (eds.), Proceedings of **CTW 2010**, 21-24, Köln 2010.
71. S. Cafieri, P. Hansen, L. Létocart, L. Liberti, F. Messine, *Reduced RLT constraints for polynomial programming*, in P. Bonami, L. Liberti, A. Miller, A. Sartenaer, Proceedings of European Workshop on MINLP 2010 (**EWMINLP 2010**), Marseille, 2010.
72. S. Cafieri, J. Lee, L. Liberti, *Comparison of convex relaxations of quadrilinear terms*, World Congress on Global Optimization, in C. Ma, L. Yu, D. Zhang, Z. Zhou (eds.), Global Optimization: Theory, Methods and Applications I, **Lecture Notes in Decision Sciences**, 12(B):999-1005, Global-Link Publishers, Hong Kong 2009.
73. S. Cafieri, M. D'Apuzzo, V. De Simone, D. di Serafino, *On the Use of an Approximate Constraint Preconditioner in a Potential Reduction Algorithm for Quadratic Programming*, **SIMAI 2007**, in V. Cutello, G. Fotia and L. Puccio (eds.), Applied and Industrial Mathematics in Italy II, **Series on Advances in Mathematics for Applied Sciences** Vol. 75, World Scientific, 2007.

- **Theses**
  - S. Cafieri, *From Local to Global and back: A closed walk in Mathematical Programming and its Applications*, Habilitation à Diriger des Recherches, Université Paul Sabatier de Toulouse, 2012.
  - S. Cafieri, *On the application of iterative solvers to KKT systems in Interior Point methods for Large-Scale Quadratic Programming problems*, Ph.D. Thesis, University of Naples "Federico II", 2006.

– S. Cafieri, *Ottimizzazione quadratica: algoritmi e software per problemi sparsi* (in Italian), Tesi di Laurea, Second University of Naples, 2001.

Conferences and Workshops presentations

- HUGO 2022 - Global Optimization Workshop, Szeged, Hungary, September 2022
  "A numerical proof by reliable Global Optimization for a problem of covering a rectangle with circles".
- EUROPT 2022 - Workshop on Advances in Continuous Optimization, Lisbon, Portugal, June 2022
  "Handling logical constraints by continuous optimization".
- Journée ROADEF - ORBEL 2021, "Travelling with MINLP through some of its (very) different applications" (**Invited speaker**).
- EUROPT 2019 - Workshop on Advances in Continuous Optimization, Glasgow, UK, June 2019
  "Covering a rectangle with 6 circles: a Mathematical Programming approach".
- EURO 2019 -*European conference on Operations Research*, Dublin, Ireland, June 2019
  "A Mathematical Programming approach for conflict avoidance in air traffic management"
- LeGO 2018 - Global Optimization Workshop, Leiden, The Netherlands, September 2018
  "Covering a Square with Six Circles by Deterministic Global Optimization ".
- EUROPT 2018 - Workshop on Advances in Continuous Optimization, Almeria, Spain, July 2018
  "A continuous optimization approach for aircraft conflict avoidance via speed and heading angle deviations".
- ISMP 2018 - 23^{th} International Symposium on Mathematical Programming, Bordeaux, July 2018
  "MINLP for aircraft conflict avoidance via speed and heading angle deviations"
- GOW'16 - Global Optimization Workshop, Braga, Portugal, September 1-4, 2016.
  "A clustering-based algorithm for aircraft conflict avoidance."
- EUROPT 2016 - Workshop on Advances in Continuous Optimization, Warsaw, July 1-2, 2016.
  "Solving aircraft conflicts by continuous optimization".
- NUMTA 2016 - *Numerical Computations: Theory and Algorithms*, Pizzo Calabro, Italy, June 19-25, 2016.
  "Solving aircraft conflicts by continuous optimization and mixed-integer nonlinear programming".
- Workshop Advanced Mathematics for Network Analysis, Luchon, France, May 1-4 2016.
  "Optimization of Network Clustering".(**Invited speaker**).
- EIWAC 2015 - The 4^{th} ENRI International Workshop on ATM/CNS, Tokyo, Japan, November 17-19, 2015. "Optimizing the Design of a Route in Terminal Maneuvering Area Using Branch and Bound" (speaker: J. Zhou).

- EURO XXVIII - *European conference on Operations Research*, Glasgow, UK, July 12-15, 2015.
  "Maximizing the number of conflict-free aircraft using Mixed-Integer Nonlinear Programming".
- EUROPT 2015 - Workshop on Advances in Continuous Optimization, Edinburgh, UK, July 8-10, 2015.
  "Modularity maximization clustering with cohesion conditions".
- MINLP 2015 - *Mixed-Integer Nonlinear Programming 2015*, Universidad de Sevilla, Spain, March 30-April 1, 2015. (**Invited speaker**).
  "MINLP in Air Traffic Management".
- ROADEF'15, Marseille, France, Feb 2015.
  "Clustering dans les réseaux par maximisation de modularité avec des contraintes de cohésion".
- ROADEF'15, Marseille, France, Feb 2015.
  "Optimisation des routes de départ et d'arrivée dans la TMA" (speaker: J. Zhou).
- Workshop on Clustering and Search techniques in large scale networks, Nizhny Novgorod, Russia, November 3-8, 2014. (**Plenary speaker**).
  "On Network Clustering by Modularity Maximization with Cohesion Conditions".
- MAGO-GOW'14 - *Mathematical and Applied Global Optimization 2014*, Malaga, Spain, Sept 1-4, 2014.
  "Maximizing the number of solved aircraft conflicts through velocity regulation".
- MINLP 2014 - *Mixed-Integer Nonlinear Programming 2014*, Carnegie Mellon University, Pittsburgh, USA, June 2-5, 2014. (**Invited speaker**).
  "MINLP emerging applications in Air Traffic Management".
- ROADEF'14, Bordeaux, France, Feb 2014.
  "Régulation en vitesse pour un problème d'évitement de conflit aérien : combinaison des résolutions directe et indirecte de contrôle optimal" (speaker: L. Cellier).
- CWMINLP 2013 - *COST Workshop on Mixed Integer Nonlinear Programming*, Paris, France, Sept 30 - Oct 2, 2013 (**Invited speaker**).
  "MINLP formulations for the Aircraft Conflict Avoidance problem".
- ICCOPT 2013 - *4th International Conference on Continuous Optimization*, Lisbon, Portugal, July 27-Auig 1, 2013.
  "Aircraft conflict avoidance by mixed-integer nonlinear optimization models combining turn and velocity change maneuvers".
  "Combining direct and indirect methods to solve aircraft conflict avoidance problems" (speaker: L. Cellier).
- ISIATM 2013 - *2nd International Conference on Interdisciplinary Science for Innovative Air Traffic Management*, Toulouse, France, July 8-11, 2013.
  "Optimal control approaches for aircraft conflict avoidance using speed regulation : a numerical study" (speaker: L. Cellier).
- EURO XXVI - *European conference on Operations Research*, Rome, Italy, July 1-4, 2013.
  "Optimal Design of Electrical Machines: Mathematical Programming Formulations".

- NET 2013 - *3rd International Conference on Network Analysis*, Nizhny Novgorod, Russia, May 20-22, 2013 (**Plenary speaker**).
  "On exact methods for network clustering".

- Summer School on Operational Research and Applications, Nizhny Novgorod, Russia, May 15-18, 2013 (**Invited speaker**).
  "Network clustering: from models to methods".

- EUROmC-VNS - *EURO Mini Conference XXVIII on Variable Neighbourhood Search*, Herceg Novi, Montenegro, Oct. 4-7, 2012.
  "Variable Neighborhood Search for edge-ratio network clustering".

- EURO XXV - *European conference on Operations Research*, Vilnius, Lithuania, July 8-11, 2012.
  "Aircraft conflict avoidance: a mixed-integer nonlinear optimization approach".

- GOW'12 - *Global Optimization Workshop*, Natal, Brazil, June 25-29, 2012.
  "Aircraft conflict avoidance: a mixed-integer nonlinear optimization approach".

- ROADEF'12, Angers, France, avril 2012.
  "Modularity Clustering on Trees".
  "Reformulation of a locally optimal heuristic for modularity maximization" (speaker: A. Costa).
  "Résolution de conflit aérien par contrôle optimal basé sur la régulation en vitesse" (speaker: L. Cellier).
  "Un algorithme mémétique pour construire des trajectoires d'aéronefs robustes aux aléas météorologiques (speaker: A. Gondran).

- AFG'11 -*15th Austrian-French-German conference on Optimization*, Toulouse, France, Sept 19-23, 2011.
  "Reduced RLT compact relaxations for polynomial programming".

- OR 2011 - *International Conference on Operations Research*, Zurich, Switzerland, Aug 30-Sept 2, 2011.
  "Aircraft deconfliction: a heuristic based on local exact solutions".

- IFORS 2011 - *Conference of the International Federation of Operations Research Societies*, Melbourne, Australia, July 10-15, 2011.
  "Hierarchical Network Clustering".

- ROADEF'11, Saint Etienne, France, March 2011.
  "Hierarchical clustering for the identification of communities in networks".

- ICEM 2010 - *XIX International Conference on Electrical Machines*, Rome, Italy, Sept 6-8, 2010.
  "Discussion about formulations and resolution techniques of electrical machine design problems".

- TOGO10 - *TOulouse Global Optimization workshop*, Toulouse, France, Aug 31-Sept 3, 2010.
  "A mixed-integer optimization model for Air Traffic Deconfliction".

- COSC10 - *International Conference on Optimization, Simulation and Control*, Ulan Baatar, July 25-28, 2010.
  "On the composition of convex envelopes for quadrilinear terms".

- EURO XXIV - *European conference on Operations Research*, Lisbon, Portugal, July 11-14, 2010.
  "Reduced Reformulation-Linearization Technique for Polynomial Programs".

- *MatHeuristics 2010*, Vienna, Austria, June 27-30, 2010.
  "Improving heuristics for network modularity maximization using an exact algorithm".
- EWMINLP - *European Workshop on MINLP*, Marseille, France, March 2010.
  "Reduced RLT constraints for polynomial programming".
- ROADEF10, Toulouse, France, February 2010.
  "Algorithms for network modularity maximization".
- Colloque ANR STIC, Paris, France, January 2010.
  "Automatic Reformulation Search".
- ISMP09 - *The 20th International Symposium of Mathematical Programming*, Chicago, USA, August 2009.
  "Comparing convex relaxations of quadrilinear terms".
- WCGO09 - *1st World Congress on Global Optimization in Engineering and Science*, Hunan, China, June 2009. "Comparison of convex relaxations of quadrilinear terms".
- CIMINLP - *Computational Issues in MINLP*, Bordeaux, France, March 19-20, 2009 (**Invited speaker**).
  "Comparing convex relaxations of quadrilinear terms".
- ROADEF09, Nancy, France, Feb 10-12 2009.
  "Convex relaxations for quadrilinear terms".
- ARS08 - *first ANR Automatic Reformulation Search Project Workshop*, École Polytechnique, Palaiseau, France, Oct 31st 2008.
  "Rose: Reformulation/Optimization Software Engine"; "Convex relaxations for quadrilinear terms".
- *Journeé Optimeo*, Versailles, France, June 11 2008.
  "Linear Algebra issues in Interior Point solvers for Quadratic Programming".
- *IMA Conference on Numerical Linear Algebra and Optimisation*, Birmingham, UK, Sept 13-15 2007.
  "Approximate Constraint Preconditioners for KKT Systems arising in Interior Point Methods".
- *Conference of the Italian MIUR FIRB project "Large Scale Nonlinear Optimization"*, Capri, Italy, Apr 19-20 2007.
  "Sviluppo di software Interior Point per problemi di Ottimizzazione Quadratica".
- SIMAI06 - *8th Congress of the Italian Society for Applied and Industrial Mathematics*, Ragusa, Italy, May 22-26 2006.
  "On the use of Constraint Preconditioners in Potential Reduction methods".
- IFIP TC 7 *Conference on System Modeling and Optimization*, Torino, Italy, July 18-22 2005.
  "A Potential Reduction Solver for Large-Scale Quadratic Programming Problems".
- AIRO04 - *35th Annual Conference of the Italian Operations Research Society*, Lecce, Italy, Sept 7-10 2004.
  "On Linear Algebra Solvers in Potential Reduction Software for Large Scale Quadratic Problems".

- *Large Scale Nonlinear Optimization*, Erice, Italy, June 22-July 1 2004.
  "Linear Algebra Issues in Developing Potential Reduction Software for Large Scale Quadratic Programs".

- *Numerical Methods for Local and Global Optimization: Sequential and Parallel Algorithms*, Cortona, Italy, July 14-20 2003.
  "An Interior Point Solver for Large-Scale Quadratic Programs".

Visiting terms and seminars

- MIT (Massachusetts Institute of Technology), Cambridge, MA, USA.
  Visiting R.J. Hansman, Dept. AeroAstro, 1 week, September 2022.

- SKEMA Business School, Nice, France, January 2022. Invited by D. Rey.
  Seminar: *A journey through mixed-integer nonlinear optimization and some of its very different applications.*

- ONERA Toulouse, France, June 2015. Invited by F. Boniol.
  Seminar: *Mixed-Integer Nonlinear Programming for Aircraft Conflict Avoidance (ATOMIC).*

- Université de Limoges, France, December 2013. Invited by equipe MOD.
  Seminar: *MINLP formulations for the Aircraft Conflict Avoidance problem.*
  Lectures pour le Master2 ACSYON : *Mixed Integer Nonlinear Programming and Applications.* Invited by P. Armand.

- LAAS-CNRS, Toulouse, November 2013. Invited by equipe ROC.
  Seminar: *Modéles d'optimisation mixte en nombres entiers pour des problèmes d'évitement des conflits d'aéronefs.*

- Summer School on Operational Research and Applications, Nizhny Novgorod, Russia, May 2013.
  Lectures: *Network clustering: from models to methods*
  Seminar: *Mathematical Programming reformulations in modularity maximizing graph clustering.*
  Invited by Laboratory of Algorithms and Technologies for Networks Analysis.

- Universidad Rey Juan Carlos, Madrid. Visiting professor (4 days), February 2013.
  Invited by L.F. Escudero.

- Séminaire Pluridisciplinaire d'Optimisation de Toulouse (SPOT)/ Pluridisciplinary Optimization Seminar in Toulouse, 7 January 2013.
  Seminar: *Deterministic conflict resolution for air traffic management.*

- INRA (French Institute for Agricultural Research) Toulouse. March 2012.
  Invited by unité de Biométrie et Intelligence Artificielle.
  Seminar: *Clustering dans les réseaux basé sur la maximisation de la modularité.*

- Institut de Mathématiques de Toulouse. May 2011.
  Invited by equipe MIP (Mathématiques pour l'Industrie et la Physique).
  Seminar: *Résoudre les conflits aériens par l'optimisation non-linéaire en variables mixtes.*

- GERAD, HEC Montréal. March 2011. Visiting Researcher, 2 weeks, 1 seminar.
  Invited by P. Hansen.
  Seminar: *Mixed-Integer Optimization for Air Traffic Deconfliction.*
- GERAD, HEC Montréal. July 2009. Visiting Researcher, 1 month, 1 seminar.
  Invited by P. Hansen.
  Seminar: *Convex relaxations in Branch and Bound global optimization methods: quadrilinear terms.*
- LRI, Université Paris XI. 2009, invited by A. Lisser.
  Seminar: *Convex relaxations in Branch and Bound global optimization methods: quadrilinear terms.*
- Lamsade, Université Paris Dauphine. 2009, invited by R. Mahjoub.
  Seminar: *Convex relaxations in Branch and Bound global optimization methods: quadrilinear terms.*
- Center for Applied Optimization, University of Florida, Gainesville. March 2007. Visiting Scholar, 3 weeks. 1 seminar. Invited by P.M. Pardalos.
  Seminar: *On the development of Interior Point Software for Quadratic Programming.*

Teaching

- **Numerical Analysis**.
  ENAC, since 2014. Course level: first year engineers ENAC.
- **Deterministic Global Optimisation**.
  ENAC, since 2014.
  Toulousian research Master (IMT-IRIT-LAAS-ENAC-ISAE) on Operations Research (M2RIT-RO).
  Cours level: Master 2
- **Combinatorial Optimisation**.
  ENAC, since 2014.
  Course level: first year engineers ENAC.
- **Operations Research for Air Transportation**.
  ENAC, since 2017.
  Course level: third year engineers ENAC.
- **Operations Research for Air Transportation**.
  ENAC, since 2018.
  Course level: second year Master of Science IATOM.

Past courses

- **Decision support for air operations**.
  ENAC, 2015/2016.
  Course level: second year engineers ENAC.
- **Operations Research**.
  ENAC, 2013/2014.
  Course level: first year engineers ENAC.

- **Differential Calculus and Optimization**.
  ENAC, 2011/12 to 2013/14.
  Course level: first year engineers ENAC.

- **Discrete Optimization**.
  ENSEEIHT (École Nationale Supérieure d'Electrotechnique, Electronique, Informatique, Hydraulique et Télécommunications).
  2011/12 to 2018/19.
  Course level: third year engineers ENSEEIHT.

- Short course: **Mixed Integer Nonlinear Programming and Applications**,
  University of Limoges, France, in Master 2 ACSYON (module: Combinatorial Optimization).
  2013 to 2015.
  Cours level: Master 2.

- Short course: **Network clustering: from models to methods**,
  in Summer School on Operational Research and Applications,
  Laboratory of Algorithms and Technologies for Networks Analysis (LATNA), Nizhny Novgorod, Russia.
  6 h lectures, May 2013.

- **Programming and Algorithms**
  ENAC, 2009/10 to 2012/13.
  Course level: first year engineers ENAC.

- **Constraint Programming**.
  ENAC, 2010/11.
  Course level: third year engineers ENAC.

- **Operations Research: Modelling and Software**.
  École Polytechnique, 2008/09 and 2009/10.
  Course level: M.Sc.

- **Introduction to C++**.
  École Polytechnique, 2009/2010.
  Course level: M.Sc.

- **Informatics**.
  Second University of Naples (Italy), for students of *Biology*, 2002/03 to 2005/06 (Responsible of the cours in 2005/06).
  Course level: B.Sc.

- **Introduction to Numerical Methods for Optimization**.
  Second University of Naples (Italy), for students of *Mathematics* and *Mathematics and Informatics*, 2nd semester 2005/2006.
  Course level: M.Sc.

- **Parallel Computing**.
  Second University of Naples (Italy), for students of *Mathematics* and *Mathematics and Informatics*, from 2002/03 to 2005/06,
  Course level: B.Sc.

- **Numerical Computations**.
  Second University of Naples, for students of *Mathematics* and *Mathematics and Informatics*, from 2002/03 to 2005/06.
  Course level: B.Sc.

- **Introduction to Programming**.
  Second University of Naples, for students of *Mathematics* and *Mathematics and Informatics*, from 2002/03 to 2005/06.
  Course level: B.Sc.

- **Introduction to Informatics**.
  Second University of Naples, for students of *Mathematics* and *Mathematics and Informatics*, 2002/03 to 2005/06,
  Course level: B.Sc.

- **Introduction to HTML**.
  Second University of Naples, 2003/04 to 2005/06.

- **Computational Mathematics**.
  Second University of Naples, for students of *Mathematics*, 2002/03 and 2003/04.
  Course level: M.Sc.

- **Programming and Numerical Computations**.
  Second University of Naples, for students of *Mathematics*, 2002/03 and 2003/04.
  Course level: M.Sc.

- **Numerical Analysis**.
  Second University of Naples, for students of *Mathematics*, from 2002/03 to 2004/05.
  Course level: M.Sc.

- Presentation of the organization of undergraduated courses of the Second University of Naples (2002 to 2006).

Supervisioning and tutoring

- **Post-doctoral Researchers**
  - Jan 2015 - Jan 2016 : Riadh Omheni
    Topic: mixed-integer nonlinear optimisation applied to Air Traffic Management problems (within ATOMIC project).
  - Aug 2014 - Feb 2015 & Sept 2013 - Feb 2014: Ahmed Touhami
    Topic: Deterministic Global Optimization applied to Air Traffic Management problems (within ATOMIC project).
- **Doctoral Students**
  - Oct 2021 - : Denis Bereziat, PhD student in Appl. Mathematics and Computer Science.
    Topic: Design of drone trajectories in presence of uncertainties.
    (co-supervision with A. Vidosvaljevic, ENAC).
  - Apr 2020 - : Pierre Dieumegard, PhD student in Aeronautics.
    Topic: Design of rotorcraft trajectories minimizing the noise footprint.
    (co-supervision with J. Hansman, MIT).
  - Oct 2015 - Feb 2020: Ahmed Khassiba, PhD student in Appl. Mathematics and Computer Science.
    Topic: Aircraft sequencing under uncertainty.
    (co-supervision with Marcel Mongeau, ENAC, and Fabian Bastin, Bernard Gendron, University of Montreal).
  - Oct 2015 - Dec 2018: Idir Hamaz, PhD student in Conception, Analysis, Control and Organization of Systems.
    Topic: Optimization methods for robust cyclical scheduling problems.
    (co-supervision with L. Houssin, LAAS-CNRS).
  - Feb 2015 - June 2018: Florian Mitjana, PhD student in Applied Mathematics and Computer Science.
    Topic: Topology Optimization for the design of aeronautical structures.
    "CIFRE" PhD, funded by Avantis Group. (co-supervision with Florian Bugarin).
  - Oct. 2013 - Apr. 2017: Jun Zhou, PhD student in Applied Mathematics and Computer Science.
    Topic: Optimal design of departure and arrival SID/STAR routes in Terminal Maneuvering Areas.
    (co-supervision with Mohammed Sbihi).
  - Oct. 2011 - Sept. 2015: Loïc Cellier, PhD student in Applied Mathematics and Computer Science.
    Topic: Optimal Control approaches for Aircraft Conflict avoidance.
    (co-supervision with Frédéric Messine).
- **Undergraduate Students (internships and engineering students**
  - Jan - March 2015: supervision of an engineering industrial-like project by 5 students, 3rd year engineers ENSEEIHT.
    Topic: Column generation and applications.
    (co-supervision with Sandrine Mouysset).

  - Dec. 2013 - Jun 2014: supervision of the internship of Emmanuel Bigeon, 3rd year engineering student at ENSEEIHT.
    Topic: Development of an AMPL-like interface for a deterministic global optimization solver.
    (co-supervision with Frédéric Messine and Ahmed Touhami).
  - 2011: Supervision of 2 mini-projects on development of C and Caml code by 4 students (each project is developed by 2 students), 1st year engineers ENAC.
  - 2010: Supervision of a mini-project (implementation in Java) by 4 students, second year engineers ENAC. Topic: Analysis of air traffic network.
  - 2010: Supervision of 4 mini-projects on development of C code by 8 students (each project is developed by 2 students), 1st year engineers ENAC.

- **(past) Master Students, up to 2006**
  - 2006: Co-supervision (with M. D'Apuzzo) of the M.Sc. thesis of A. Aldanese.
    Second University of Naples. Topic: Software for linear programming problems.
  - 2006: Co-supervision (with D. di Serafino) of the M.Sc. thesis of E. Giannelevigna.
    Second University of Naples. Topic: A Potential Reduction method for quadratic optimization.
  - 2004: Co-supervision (with M. D'Apuzzo) of the M.Sc. thesis of L. Minicucci.
    Second University of Naples. Topic: Interior Point methods for quadratic optimization.

- **Other**
  - Personal tutor for students of Second University of Naples, Italy, every academic year from 2003/2004 to 2005/2006.

Developed Software

- PRQP (*Potential Reduction for Quadratic Programming*)
  solves convex quadratic problems with linear constraints
  - primal-dual infeasible PR method, feasible whenever possible;
  - different solvers for the KKT system: direct, CG, SQMR;
  - exact and reused constraint preconditioner, limited-memory ICF for bound constrained problems;
  - MA27 routine by the HSL library for sparse LDL^T computation;
  - custom SQMR and sparse matrix-vector products;
  - AMPL and SIF interfaces;
  - Fortran77, C drivers.
- PR-BCQP
  solves convex quadratic problems with only bounds on the variables; it is currently part of PRQP, but can be used as stand-alone software.
- ROSE (*Reformulation/Optimization Software Engine*)
  software framework for automatic reformulations of mathematical programming problems.
  Co-developer, mainly working on

  - reformulators able to automatically provide convex relaxations of non-convex nonlinear problems.
  - data format translators.

  in COIN-OR: `https://projects.coin-or.org/ROSE`

- Contribution to COUENNE,
  an exact solver for nonconvex MINLPs, in COIN-OR: `https://projects.coin-or.org/Couenne`