# CURRICULUM VITAE ET STUDIORUM
# Francesco Rinaldi

## PERSONAL INFORMATION

**Current position:**  Associate Professor
Department of Mathematics
University of Padua

## RESEARCH INTERESTS

- *Nonlinear programming:* Study and development of algorithms for large-scale unconstrained and constrained nonlinear programming problems.

- *Mixed Integer Nonlinear Programming:* Study and development of algorithms for mixed integer nonlinear. programming problems (e.g. derivative-free algorithms). Study of continuous reformulations of integer nonlinear programming problems.

- *Global Optimization:* Development of new approaches for constrained global optimization (e.g. exact penalty approaches).

- *Machine Learning and Feature Selection:* Development of optimization methods for Machine Learning and Feature Selection.

- *Applications:* Applications in Medicine, Biology, Telecommunications, Engineering and Economics.

## EDUCATION

- *July 2017:* Italian abilitation as full professor in Operations Research.

- *May 2009:* Ph.D. in Operations Research at Sapienza University of Rome. Thesis title: Mathematical Programming Methods for minimizing the zero norm over polyhedral sets".

- *June 2007:* Licensed Professional Engineer

- *March 2005:* Master Degree in Computer Engineering (summa cum laude) at Sapienza University of Rome. Thesis title: Neural Networks and SVMs for postal envelopes classification".

## WORK EXPERIENCE

- September 2015- now: Associate Professor at Department of Mathematics, University of Padua

- May 2012-September 2015: Assistant Professor at Department of Mathematics, University of Padua

- May 2009-May 2012: Post doctoral Fellow at Department of Computer and System Sciences, Sapienza University of Rome

- November 2008-April 2009: Contract Researcher at Department of Computer and System Sciences, Sapienza University of Rome - APICE project.

- January 2008-June 2008: Contract Researcher at IASI, CNR, Rome - ADONET project.

- January 2006-June 2006: Visiting Scholar at Computer Science Department, Brown University, Providence, Rhode Island. Hosted by Prof. F. P. Preparata

- January 2006-March 2006: Contract Researcher at IASI, CNR, Rome - Marie Curie Research Training Network/ADONET project.

- July 2005-October 2005: Contract Researcher at IASI, CNR, Rome - HEARTS project.

## ORGANIZATION OF WORKSHOP AND MINISYMPOSIA

- Member of organizing committee of EUROPT 2013, 11th EUROPT Workshop on Advances in Continuous Optimization, Firenze, 26-28 June, 2013

- Organizer of a session in the cluster Nonlinear Optimization at ICCOPT 2013 , Lisbon 28 July - 2 August, 2013

- Organizer of two sessions at the conference Optimization 2014, Guimaraes 28-30 July, 2014

- Organizer of one session in the cluster Derivative Free Optimization at CORS/INFORMS 2015 , Montreal, 14-17 June, 2015

- Organizer of one session in the cluster Derivative Free Optimization at ISMP 2015 , Pittsburgh 12-17 July , 2015

- Co-organizer (with Z. Zhang) of the cluster "Derivative-free and Simulation-based Optimization", ICCOPT 2016, Tokyo, 6-11 August, 2016

- Organizer of one session in the cluster "Nonlinear Optimization", ICCOPT 2016, Tokyo, 6-11 August, 2016

- Co-organizer (with M. Porcelli) of the Minisymposium "Derivative-Free and Simulation-Based Optimization ", SIMAI 2016, Milano, 13-16 September, 2016

- Member of program committee conference ICORES 2017, International Conference on Operations Research and Enterprise Systems, Porto, 23-25 February 2017

- Member of program committee conference EUROPT 2017, 15th EUROPT Workshop on Advances in Continuous Optimization, Montréal, 12-14 July 2017

- Member of program committee conference EUROPT 2019, 19th EUROPT Workshop on Advances in Continuous Optimization, Glasgow, June 28-29, 2019

- Co-organizer (with A. Custodio) of the cluster "Derivative-free and Simulation-based Optimization", ICCOPT 2019, Berlin, 3-8 August, 2019

## VISITS TO OTHER RESEARCH INSTITUTES

- February 2014: TU Dortmund (Germany), invited by Prof. C. Buchheim

- November 2014: TU Dortmund (Germany), invited by Prof. C. Buchheim

- January 2016: LIPN Paris 13 (France), invited by Prof. L. Létocart

- May 2017: LIPN Paris 13 (France), invited by Prof. L. Létocart

- July 2017: Waterloo (Canada), invited by Prof. B. Ghaddar

- May 2018: ISOR Vienna (Austria), invited by prof. I. M. Bomze

- September 2018: LIPN Paris 13 (France), invited by Prof. L. Létocart

- March 2019: ISOR Vienna (Austria), invited by prof. I. M. Bomze

**REVIEWING ACTIVITY**

Reviewer for many international journals (like e.g. Discrete Optimization, Journal of Optimization Theory and Applications, Journal of Global Optimization, Computational Optimization and Applications, SIAM Journal on Imaging Sciences, Optimization Methods and Software)

**PROJECTS**

- From 2016: member of PRAT project: "Cut generation for mixed integer linear and convex programming".

- From 2016: member of project PRIN 2016: 'Nonlinear and Combinatorial Aspects of Complex Networks"

- From 2016: leader of the research project: "Mixed Integer Nonlinear Programming: Relaxation and Constraint Enforcement."

- 2014-2016: member of PRAT project: "A geometric perspecti ve on split cuts in integer programming: theoretical and computational analysis."

- 2010-2012: member of project VIGONI 2010: Metodi esatti per problemi non lineari e interi

- 2007-2009: member of project PRIN 2007: Ottimizzazione Nonlineare e Problemi Quasi-Variazionali

**PAPERS PUBLISHED ON INTERNATIONAL JOURNALS**

1. F. RINALDI, F. SCHOEN, M. SCIANDRONE. Concave programming for minimizing the zero-norm over polyhedral sets. *Computational Optimization and Applications*, Springer New York (USA), Volume 46, Number 3, 467-486, July 2010.

2. F. RINALDI. New results on the equivalence between zero-one programming and continuous concave programming. *Optimization Letters*, Springer Berlin/Heidelberg (Germany), Volume 3, Pages 377-386, July 2009.

3. F. RINALDI, M. SCIANDRONE. Feature selection combining linear support vector machines and concave optimization. *Optimization Methods and Software*, Taylor and Francis, London (UK), Volume 25, Issue 1, pages 117-128, February 2010.

4. A. DE GAETANO, S. PANUNZI, F. RINALDI, A. RISI, M. SCIANDRONE. A Patient Adaptable ECG Beat Classifier Based on Neural Networks, *Applied Mathematics and Computation*, Elsevier Ocean Isle Beach, NC (USA), Volume 213, Issue 1, Pages 243-249, July 2009.

5. S. LUCIDI, F. RINALDI. Exact Penalty Functions for Nonlinear Integer Programming Problems, *Journal of Optimization Theory and Applications*, Springer New York (USA), Volume 145, Number 3, 479-488, June 2010.

6. M. PIACENTINI, F. RINALDI. Path Loss Prediction in Urban Environment Using Learning Machines and Dimensionality Reduction Techniques, *Computational and Management Science*, Volume 8, Number 4, 371-385, November 2011.

7. F. RINALDI. Concave programming for finding sparse solutions to problems with convex constraints, *Optimization Methods and Software*, Taylor and Francis, London (UK), Volume 26, Issue 6, October 2011.

8. G. DI PILLO, S. LUCIDI, F. RINALDI. An approach to constrained global optimization based on exact penalty functions, *Journal of Global Optimization*, 54(2), pp. 251-260, 2012.

9. G. Liuzzi, S. Lucidi, F. Rinaldi, Derivative-free methods for bound constrained mixed-integer optimization, *Computational Optimization and Applications*, 53(2), pp. 505-526, 2012.

10. D. Di Lorenzo, G. Liuzzi, F. Rinaldi, F. Schoen, M. Sciandrone. A concave optimization-based approach to sparse portfolio selection, *Optimization Methods and Software*, 27(6), pp. 983-1000, 2012.

11. S. Lucidi, F. Parasiliti, F. Rinaldi, M. Villani. A Finite Element Based Multi-Objective Design Optimization Procedure of Interior Permanent Magnet Synchronous Motors for Wide Constant-Power Region Operation, *IEEE Transactions on Industrial Electronics*, 59(6), pp. 2503-2514, 2012.

12. M. De Santis, F. Rinaldi. Continuous reformulations for zero-one programming problems, *Journal of Optimization Theory and Applications*, 153(1), pp. 75-84, 2012.

13. S. Lucidi, F. Rinaldi. An Exact Penalty Global Optimization Approach for Mixed-Integer Programming Problems, *Optimization Letters*, 7(2), pp. 297-307, 2013.

14. M. De Santis, S. Lucidi, F. Rinaldi. A new class of functions for measuring solution integrality in the Feasibility Pump approach, *SIAM Journal on Optimization*, Vol. 23, No. 3, pp. 1575-1606, 2013.

15. M. De Santis, S. Lucidi, F. Rinaldi. Feasibility Pump-like heuristics for mixed integer problems, *Discrete Applied Mathematics*, Vol. 165 pp. 152 - 167 , 2013.

16. M. De Santis, F. Rinaldi, E. Falcone, S. Lucidi, G. Piaggio, A. Gurtner, L. Farina. Combining optimization and machine learning techniques for genome wide prediction of human cell cycle-regulated genes, *Bioinformatics*, Vol. 30(2) pp. 228-233, 2014.

17. M. Porcelli, F. Rinaldi. A variable fixing version of the two-block nonlinear constrained Gauss-Seidel algorithm for l1-regularized least-squares, *Computational Optimization and Applications*, Vol. 59, No. 3, pp. 565-589, 2014.

18. G. Liuzzi, F. Rinaldi, Solving l0 Penalized Problems with Simple Constraints via the Frank-Wolfe Reduced Dimension Method, *Optimization Letters*, Vol. 9, No. 1, pp. 57-74, 2015.

19. G. Fasano, G. Liuzzi, S. Lucidi, F. Rinaldi, A Linesearch-based Derivative-free Approach for Nonsmooth Constrained Optimization, *SIAM Journal on Optimization*, Vol. 24, No. 3, pp. 959-992, 2014.

20. L. Grippo, F. Rinaldi, A class of derivative-free nonmonotone optimization algorithms employing coordinate rotations and gradient approximations, *Computational Optimization and Applications*, Vol. 60, No. 1, pp. 1-33, 2015.

21. G. Di Pillo, S. Lucidi, F. Rinaldi. A Derivative-free Algorithm for Constrained Global Optimization based on Exact Penalty Functions, *Journal of Optimization Theory and Applications*, Vol. 164, No. 3, pp 862-882, 2015.

22. A Ciccazzo, V. Ltorre, G. Liuzzi, S. Lucidi, F. Rinaldi. Derivative-Free Robust Optimization for Circuit Design, *Journal of Optimization Theory and Applications*, Vol. 164, No. 3, pp 842-861, 2015.

23. G. Liuzzi, S. Lucidi, F. Rinaldi, Derivative-free methods for constrained mixed-integer optimization, *Journal of Optimization Theory and Applications*, Vol. 164, No. 3, pp 933-965, 2015.

24. S. LUCIDI, M. MAURICI, L. PAULON, F. RINALDI, M. ROMA, A derivative-free approach for a simulation-based optimization problem in healthcare, Optimization Letters, Vol. 10, No. 2, pp. 219-235, 2016.

25. E. F. CAMPANA, M. DIEZ, A. SERANI, U. IEMMA, G. LIUZZI, S. LUCIDI, F. RINALDI, Global/local hybridization of the DIRECT algorithm for derivative-free global optimization in ship design, Optimization and Engineering, Vol. 17, No. 1, pp. 127-156, 2016.

26. M. DE SANTIS, P. FESTA, G. LIUZZI, S. LUCIDI, F. RINALDI, Nomonotone Grasp, Mathematical Programming Computation, Vol. 8, No. 3, pp. 271-309, 2016.

27. C. BUCHHEIM, M. DE SANTIS, S. LUCIDI, F. RINALDI, L. TRIEU, A Feasible Active Set Method with Reoptimization for Convex Quadratic Mixed-Integer Programming, SIAM Journal on Optimization, Vol. 26, No. 1, pp. 1695-1714, 2016.

28. M. DE SANTIS, S. LUCIDI, F. RINALDI, A Fast Active Set Block Coordinate Descent Algorithm for l1-regularized least squares, SIAM Journal on Optimization, Vol. 26, No. 1, pp. 781-809, 2016.

29. STEFANO LUCIDI, MASSIMO MAURICI, LUCA PAULON, FRANCESCO RINALDI, MASSIMO ROMA, A simulation-based multiobjective optimization approach for health care services management . IEEE Transactions on Automation Science and Engineering, Vol. 13, No. 4, pp. 1480-1491, 2016.

30. G. DI PILLO, G. LIUZZI, S. LUCIDI, F. RINALDI, V. PICCIALLI, A DIRECT-type approach for derivative-free constrained global optimization, Computational Optimization and Applications,Vol. 65, No. 2, pp. 361-397, 2016.

31. G. LIUZZI, S. LUCIDI, F. RINALDI, A Derivative-free Approach to Constrained Multiobjective Nonsmooth Optimization, SIAM Journal on Optimization, Number 26(4), pp 2744–2774, 2016.

32. A. CRISTOFARI, M. DE SANTIS, S. LUCIDI, F. RINALDI, A two-stage active-set algorithm for minimization problems with bound constraints, Accettato per la pubblicazione su Journal of Optimization Theory and Applications, Volume 172, Issue 2, pp 369-401, 2017.

33. C. BUCHHEIM, M. DE SANTIS, F. RINALDI, L. TRIEU A Frank-Wolfe Based Branch-and-Bound Algorithm for Mean-Risk Optimization . Journal of Global Optimization, Volume 70, Issue 3, pp 625–644, 2018.

34. E.F. CAMPANA, M. DIEZ, G. LIUZZI, S. LUCIDI, R. PELLEGRINI, V. PICCIALLI, F. RINALDI, A. SERANI A Multi-objective DIRECT algorithm for ship hull optimization. Computational Optimization and Applications, Volume 71, Issue 1, pp 53–72, 2018.

35. I. M. BOMZE, F. RINALDI, S. ROTA BULÒ, Pure infection-immunization dynamics for partnership games: A correction. Games and Economic Behavior, Volume 114, Pages 315-317, 2019.

36. J. T. HUNGERFORD, F. RINALDI, A General Regularized Continuous Formulation for the Maximum Clique Problem. Mathematics of Operations Research, 2019.

## CONFERENCE PROCEEDINGS

1. FRANCESCO PARASILITI, MARCO VILLANI, STEFANO LUCIDI, FRANCESCO RINALDI, A new optimization approach for the design of IPM synchronous motor with wide constant-power region. In: The XIX International Conference on Electrical Machines - ICEM 2010. p. 1-7, 2010.

2. M. DE SANTIS, S. LUCIDI, F. RINALDI, A new feasibility pump-like heuristic for mixed integer problems, In: 10th Cologne-Twente Workshop on Graphs and Combinatorial Optimization, CTW 2011 - Proceedings of the Conference, 2011.

3. M. DE SANTIS, S. LUCIDI, F. RINALDI, Continuous reformulations for zero-one programming problems, In: 10th Cologne-Twente Workshop on Graphs and Combinatorial Optimization, CTW 2011 - Proceedings of the Conference, 2011.

4. R. PELLEGRINI, E.F. CAMPANA, M. DIEZ, A. SERANI, F. RINALDI, G. FASANO, U. IEMMA, G. LIUZZI, S. LUCIDI, F. STERN, Application of derivative-free multi-objective algorithms to reliability-based robust design optimization of a high-speed catamaran in real ocean environment, In: Engineering and Optimization IV, 2014.

5. R. PELLEGRINI, A. SERANI, G. LIUZZI, F. RINALDI, S. LUCIDI, E.F. CAMPANA, U. IEMMA, M. DIEZ, Hybrid Global/Local Derivative-Free Multi-objective Optimization via Deterministic Particle Swarm with Local Linesearch In: International Workshop on Machine Learning, Optimization, and Big Data, Pages 198–209, 2017.

## PAPERS SUBMITTED FOR PUBLICATION

1. E. BETTIOL, L. LÉTOCART, F. RINALDI, E. TRAVERSI, A conjugate direction based simplicial decomposition framework for solving a specific class of dense convex quadratic programs, Submitted 2018.

2. M. CONFORTI, M. DE SANTIS, M. DI SUMMA, F. RINALDI, Scanning integer points with lex-cuts: A finite cutting plane algorithm for integer programming with linear objective, Submitted 2018.

3. I. M. BOMZE, F. RINALDI, S. ROTA BULÒ, First-order methods for the impatient: support identification in finite time with convergent Frank-Wolfe variants, Submitted 2018.

4. G. LIUZZI, S. LUCIDI, F. RINALDI, An algorithmic framework based on primitive directions and nonmonotone line searches for black box problems with integer variables, Submitted 2018.

5. A. CRISTOFARI, M. DE SANTIS, S. LUCIDI, F. RINALDI, An Active-Set Algorithmic Framework for Non-Convex Optimization Problems over the Simplex, Submitted 2018.

## OTHER PUBLICATIONS

1. F. RINALDI. Mathematical Programming Methods for minimizing the zero norm over polyhedral sets. *Dipartimento di Statistica, Probabilità e Statistiche Applicate, Sapienza, Università di Roma*, 2009 (Ph.D. Thesis)