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| CONTACT INFORMATION | DEI - Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi"<br>University of Bologna<br>Viale Risorgimento, 2<br>40136 Bologna, IT  | Ph. +39 0512093646<br><br>enrico.malaguti@unibo.it<br><br>Citizenship: Italian |
| APPOINTMENTS        | 2023, November - <i>present</i> Professor of Operations Research, DEI, University of Bologna.<br>2014, September - 2023, October Associate Professor of Operations Research, DEI, University of Bologna.<br>2010, December - 2014, September Assistant Professor of Operations Research (Ricercatore), DEI (formerly DEIS), University of Bologna.<br>2012, July Visiting Professor, Universidad de Buenos Aires, Argentina.<br>2014, January Visiting Professor, Université Paris Dauphine, France.  |  |
| EDUCATION           | 2007, January - 2010, November Post Doctoral Fellow (Assegnista di Ricerca) at DEIS, University of Bologna.<br>2007, October - December Visiting Scholar at the Graduate School of Business, Columbia University, New York, US.<br>2007, May Ph.D. in Control System Engineering and Operational Research, University of Bologna, advisor: Prof. Paolo Toth.<br>2006, August - December Visiting Scholar at the Industrial Engineering and Operations Research Department and the Graduate School of Business, Columbia University, New York, US.<br>2003, March 19th M.Sc. in Industrial Engineering (laurea quinquennale).  |  |
| RESEARCH PROJECTS   | 2005 - 2007 UE REORIENT: Implementing change in the European railway system. Member of the research team.<br>2007 - 2008 PRIN 2005: Routing a packing nell'ottimizzazione dei sistemi di trasporto. Member of the research team.<br>2006 - 2009 UE ARRIVAL: Algorithms for robust and online railway optimization: improving the validity and reliability of large scale systems. Member of the research team.<br>2012 - 2014 UE EPTA: European model for public transport authority as a key factor leading to transport sustainability. Member of the research team.<br>2014 - 2017 UE E4-SHARE: Models for ecological, economical, efficient, electric car-sharing. Member of the research team.<br>2017 - 2018 PRIN 2015: Nonlinear and combinatorial aspects of complex networks. Member of the research team.<br>2018 - 2021 Marie Skłodowska-Curie Innovative Training Network MINOA: Mixed-Integer Nonlinear Optimisation Applications. Scientist-in-Charge for the University of Bologna.<br>2020 - 2023 AFOSR: Network protection, interdiction and design under uncertainty. Principal Investigator. |  |
| EDITORIAL ACTIVITY  | 2017 - <i>present</i> <i>INFORMS Journal on Computing</i> - Associate Editor.<br>2018 <i>Electronic Notes in Discrete Mathematics 69, Joint EURO/ALIO International Conference 2018 on Applied Combinatorial Optimization</i> - Editor.<br>2019 <i>European Journal of Operational Research, Feature Cluster: New trends in Applied Combinatorial Optimization</i> - Guest Editor.  |  |
| TEACHING            | 2010 - 2013 and 2022 - <i>present</i> Laboratorio Di Strumenti di Ottimizzazione TA, Bachelor in Engineering Management, University of Bologna, Italy.  |  |

- 2013 - 2022 Algorithms for Decision Making M (in English), Master in Engineering Management, University of Bologna, Italy.  
 2014 - *present* Fondamenti di Ricerca Operativa T-A, Bachelor in Engineering Management, University of Bologna, Italy.  
 2022 - *present* Algorithms for Combinatorial Optimization Problems M (in English), Master in Computer Engineering, University of Bologna, Italy.  
 2011 - *present* Supervisor of several master and bachelor thesis in Engineering Management.

PH.D. STUDENTS *Supervised*

- Dimitri Thomopoulos 2013 - 2016.  
 Paolo Paronuzzi 2016 - 2020.  
 Naga Venkata Chaitanya Gudapati 2018 - 2021.  
 Cristiano Fabbri 2019 - 2023.  
 Andrea Eusebi 2022 - *present*.  
 Luca Zattoni 2022 - *present*.

*Co-supervised*

- Henri Lefebvre 2019 - 2022.

PUBLICATIONS

*International journal papers*

1. E. Malaguti, M. Monaci, and P. Toth. A metaheuristic approach for the vertex coloring problem. *INFORMS Journal on Computing*, 20:302–316, 2008.
2. E. Malaguti and P. Toth. An evolutionary approach for bandwidth multicoloring problems. *European Journal of Operational Research*, 189:638–651, 2008.
3. E. Malaguti, M. Monaci, and P. Toth. Models and heuristic algorithms for a weighted vertex coloring problem. *Journal of Heuristics*, 15:503–526, 2009.
4. E. Malaguti. The vertex coloring problem and its generalizations. *4OR*, 7:101–104, 2009.
5. A. E. Fernandes-Muritiba, M. Iori, E. Malaguti, and P. Toth. Algorithms for the bin packing problem with conflicts. *INFORMS Journal on Computing*, 22(3):401–415, 2010.
6. E. Malaguti and P. Toth. A survey on vertex coloring problems. *International Transactions in Operational Research*, 17:1–34, 2010.
7. A. Lodi, E. Malaguti, N.E. Stier-Moses. Efficient and fair routing for mesh networks. *Mathematical Programming*, 124:285–316, 2010.
8. A. Caprara, E. Malaguti, P. Toth. A freight service design problem for a railway corridor. *Transportation Science*, 45:147–162, 2011.
9. E. Malaguti, M. Monaci, and P. Toth. An exact approach for the vertex coloring problem. *Discrete Optimization*, 8:174–190, 2011.
10. F. Furini, E. Malaguti, R. Medina Durán, A. Persiani, P. Toth. A column generation heuristic for the two-dimensional cutting stock problem with multiple stock size. *European Journal of Operational Research*, 218:251–260, 2012.
11. F. Furini and E. Malaguti. Exact weighted vertex coloring via branch-and-price. *Discrete Optimization*, 9:130–136, 2012.
12. F. Furini and E. Malaguti. Models for the two-dimensional two-stage cutting stock problem with multiple stock size. *Computers & Operations Research*, 40:1953–1962, 2013.
13. J. Duives, A. Lodi, E. Malaguti. Test-assignment: A quadratic coloring problem. *Journal of Heuristics*, 19:549–564, 2013.
14. A. Caprara, F. Furini, E. Malaguti. Uncommon Dantzig-Wolfe reformulation for temporal knapsack. *INFORMS Journal on Computing*, 25:560–571, 2013.
15. E. Malaguti, R. Medina Durán, and P. Toth. Approaches to real world two-dimensional cutting problems. *Omega*, 47:99–115, 2014.

16. E. Malaguti, I. Méndez-Díaz, J.J. Miranda-Bront, P. Zabala. A branch-and-price algorithm for the  $(k, c)$  - coloring problem. *Networks*, 65:353–366, 2015.
17. M. Bergner, A. Caprara, A. Ceselli, F. Furini, M. Lübbecke, E. Malaguti, E. Traversi. Automatic Dantzig-Wolfe reformulation of mixed integer programs. *Mathematical Programming*, 149:391–424, 2015.
18. A. Lodi, E. Malaguti, N.E. Stier-Moses, T. Bonino. Design and control of public-service contracts and an application to public transportation systems. *Management Science*, 62:1165–1187, 2016.
19. E. Malaguti, R. Medina Durán, P. Toth. A metaheuristic framework for nonlinear capacitated covering problems. *Optimization Letters*, 10:169–180, 2016.
20. A. Caprara, F. Furini, E. Malaguti, E. Traversi. Solving MIPs via multilevel Dantzig-Wolfe reformulation: an application to the temporal knapsack problem. *Information Processing Letters*, 116:379–386, 2016.
21. F. Furini, E. Malaguti, D. Thomopulos. Modeling two-dimensional guillotine cutting problems via integer programming. *INFORMS Journal on Computing*, 28:736–751, 2016.
22. D. Cornaz, F. Furini, E. Malaguti. Solving coloring problems as maximum weight stable set problems. *Discrete Applied Mathematics*, 217:151–162, 2017.
23. A. Bettinelli, V. Cacchiani, E. Malaguti. A branch-and-bound algorithm for the knapsack problem with conflict graph. *INFORMS Journal on Computing*, 29:457–473, 2017.
24. G. Costa, M. Delorme, M. Iori, E. Malaguti, S. Martello. Training software for orthogonal packing problems. *Computers & Industrial Engineering*, 111:139–147, 2017.
25. E. Malaguti, S. Martello, A. Santini. The traveling salesman problem with pickups, deliveries, and draft limits. *Omega*, 74:50–58, 2018.
26. F. Furini, E. Malaguti, A. Santini. An exact algorithm for the partition coloring problem. *Computers & Operations Research*, 92:170–181, 2018.
27. C. Gambella, E. Malaguti, F. Masini, D. Vigo. Optimizing relocation operations in electric car-sharing. *Omega*, 81:234–245, 2018.
28. D. Cornaz, F. Furini, M. Lacroix, E. Malaguti, A.R. Mahjoub, S. Martin. The vertex  $k$ -cut problem. *Discrete Optimization*, 31:8–28, 2019.
29. E. Malaguti, M. Monaci, P. Paronuzzi, U. Pferschy. Integer optimization with penalized fractional values: the knapsack case. *European Journal of Operational Research*, 273:874–888, 2019.
30. E. Malaguti, R. Medina Durán. Computing  $k$  different solutions to the Assignment Problem. *Computers & Industrial Engineering*, 135:528–536, 2019.
31. D. Cornaz, F. Furini, E. Malaguti, A. Santini. A note on selective line-graphs and partition colorings. *Operations Research Letters*, 47:565–568, 2019.
32. F. Furini, I. Ljubić, E. Malaguti, P. Paronuzzi. On integer and bilevel formulations for the  $k$ -vertex cut problem. *Mathematical Programming Computation*, 12:133–164, 2020.
33. S. Callegari, F. Bizzarri, E. Malaguti. Discrete programming entailing circulant quadratic forms: refinement of a heuristic approach based on  $\Delta\Sigma$  modulation. *IEEE Transactions on Circuits and Systems II: Express Briefs*, 67:926–930, 2020.
34. D. Delle Donne, F. Furini, E. Malaguti, R. Wolfer Calvo. A branch-and-price algorithm for the minimum sum coloring problem. *Discrete Applied Mathematics*, 303:39–56, 2021.
35. T. Kollsker, E. Malaguti. Models and algorithms for optimising two-dimensional LEGO constructions. *European Journal of Operational Research*, 289:270–284, 2021.
36. V. Bo, M. Bortolini, E. Malaguti, M. Monaci, C. Mora, P. Paronuzzi. Models and algorithms for integrated production and distribution problems. *Computers & Industrial Engineering*, 154:107003, 2021.

37. N.V.C. Gudapati, E. Malaguti, M. Monaci. In search of dense subgraphs: how good is greedy peeling? *Networks*, 77:572-586, 2021.
38. A. Lodi, E. Malaguti, G. Nannicini, D. Thomopulos. Nonlinear chance-constrained problems with applications to hydro scheduling. *Mathematical Programming*, 191:405-444, 2022.
39. F. Furini, I. Ljubić, E. Malaguti, P. Paronuzzi. Casting light on the hidden bilevel combinatorial structure of the k-vertex separator problem. *Operations Research*, 70:2399-2420, 2022.
40. N.V.C. Gudapati, E. Malaguti, M. Monaci. Network design with service requirements: scaling-up the size of solvable problems. *INFORMS Journal on Computing*, 34:2571-2582, 2022.
41. E. Malaguti, M. Monaci, J. Prunte. K-adaptability in stochastic optimization. *Mathematical Programming*, 196:567-595, 2022.
42. G. Campana, E. Malaguti, M. Mele, P. Paronuzzi. Scheduling of semi-automatic carousels with fixed production sequences. *International Journal of Production Research*, 61:1252-1267, 2023.
43. E. Malaguti, V. Pedrotti. Models and algorithms for the weighted safe set problem. *Discrete Applied Mathematics*, 329:23-34, 2023.
44. C. Fabbri, P. Ghedini, M. Leonessi, E. Malaguti, P. Tubertini. A decision support system for scheduling a vaccination campaign during a pandemic emergency: the COVID-19 case. *Computers & Industrial Engineering*, 177:109068, 2023.
45. H. Lefebvre, E. Malaguti, M. Monaci. Adjustable robust optimization with discrete uncertainty. *INFORMS Journal on Computing*, 36:78-96, 2024.
46. A. Lodi, E. Malaguti, M. Monaci, G. Nannicini, P. Paronuzzi. A solution algorithm for chance-constrained problems with integer second-stage recourse decisions. *Mathematical Programming*, 205:269-301, 2024.
47. B. Detienne, H. Lefebvre, E. Malaguti, M. Monaci. Solving adjustable robust convex optimization problems under objective uncertainty. *European Journal of Operational Research*, 312:373-384, 2024.
48. A. Santini, E. Malaguti. The min-knapsack problem with compactness constraints and applications in statistics. *European Journal of Operational Research*, 312:385-397, 2024.
49. C. Fabbri, M. Lombardi, E. Malaguti, M. Monaci. On-line strategy selection for reducing overcrowding in an emergency department. *Omega*, 127:103098, 2024.
50. D. Laganà, E. Malaguti, M. Monaci, R. Musmanno, P. Paronuzzi. An iterated local search matheuristic approach for the multi-vehicle inventory routing problem. *Computers & Operations Research*, 169:106717, 2024.
51. M. Barkel, M. Delorme, E. Malaguti, M. Monaci. Bounds and heuristic algorithms for the bin packing problem with minimum color fragmentation. *European Journal of Operational Research*, 320:57-68, 2025.
52. N.V.C. Gudapati, E. Malaguti, M. Monaci, P. Paronuzzi. A computational study on integer programming formulations for hop-constrained survivable network design. *Discrete Applied Mathematics*, (forthcoming).

*Book chapter*

53. G. Brandstätter, C. Gambella, M. Leitner, E. Malaguti, F. Masini, J. Puchinger, M. Ruthmair, D. Vigo. Overview of optimization problems in electric car-sharing system design and management. H. Dawid, K.F. Doerner, G. Feichtinger, P.M. Kort, A. Seidl (eds.). *Dynamic Perspectives on Managerial Decision Making*, pages 441–471, Springer, 2016.

*Proceedings of refereed conferences*

54. A. Caprara, E. Malaguti, P. Toth, A service design problem for a railway network. *Proceedings of the 4th International Network Optimization Conference (INOC2009)*, 2009.
55. M. Bergner, A. Caprara, F. Furini, M. Lübbecke, E. Malaguti, E. Traversi. Partial convexification of general MIPs by Dantzig-Wolfe reformulation. *Proceedings of the 15th International Conference on Integer Programming and Combinatorial Optimization (IPCO 2011)*. LNCS 6655, pages 39–51, Springer-Verlag, 2011.
56. E. Malaguti, I. Méndez-Díaz, J.J.Miranda-Bront, P.Zabala. (k, c) - coloring via column generation. *Proceedings of the 6th International Network Optimization Conference (INOC20013)*, ENDM 41, pages 447–454, 2013.
57. D. Cornaz, F. Furini, M. Lacroix, E. Malaguti, A. R. Mahjoub, S. Martin. Mathematical formulations for the balanced vertex k-separator problem. *Proceedings of the 2nd International Conference on Control, Decision and Information Technologies (CODIT14)*, IEEE, pages 176–181, 2014.
58. F. Furini and E. Malaguti. A pseudo-polynomial size formulation for 2-stage 2-dimensional knapsack problems. *Proceedings of the 45th International Conference on Computers & Industrial Engineering (CIE 45)*, pages 833–840, Curran Associates, Inc., 2016.
59. E. Malaguti, G. Nannicini, D. Thomopulos. Optimizing allocation in a warehouse network. *Proceedings of the 8th International Network Optimization Conference (INOC20017)*, ENDM 64, pages 195–204, 2018.
60. F. Furini, E. Malaguti, S. Martin, I.C. Ternier. ILP models and column generation for the minimum sum coloring problem. *Proceedings of the 8th International Network Optimization Conference (INOC20017)*, ENDM 64, pages 215–224, 2018.
61. E. Malaguti, V. Pedrotti. A new formulation for the weighted safe set problem. *Proceedings of the 11th Latin and American Algorithms, Graphs, and Optimization (LAGOS2021)*, *Procedia Computer Science* 195, pages 508-515, 2021.
62. P. Folco, E. Malaguti, A. Sahli, S. Belmokhtar-Berraf, L. Bouillaut. A flow formulation for the rolling stock maintenance scheduling problem. *Proceedings of the 18th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 2024)*, *IFAC-PapersOnLine* 58(19), pages 516-521, 2024.

*Ph.D. Thesis*

63. E. Malaguti. The vertex coloring problem and its generalizations. *University of Bologna*, 2007.

*Technical reports*

64. V.C. Arcot, A. Caprara, C. D’Ambrosio, J. Dong, A. Kozuki, A. Kuo, C.C. Lu, H.S. Mahmasani, E. Malaguti, S. Martello, E. Miller-Hooks, R. Nair, P. Toth, K. Zhang. Modelling corridor freight transport for demonstration of seamless international rail freight services. *Technical Report, University of Maryland*, 2007.
65. H. Lefebvre, E. Malaguti, M. Monaci. An Exact Approach for Convex Adjustable Robust Optimization *Optimization Online*, 2022.

SELECTED TALKS

- E. Malaguti, M. Monaci, P. Toth. Models and heuristic approaches for a weighted vertex coloring problem. XI Workshop on Combinatorial Optimization, 7-12 January 2007, Aussois, France.
- A.E. Fernandes-Muritiba, M. Iori, E. Malaguti, P. Toth. Algorithms for the bin packing problem with conflicts. XIII Workshop on Combinatorial Optimization, 11-16 January 2009, Aussois, France.
- A. Caprara, E. Malaguti, P. Toth, A service design problem for a railway network. INOC2009, 26-29 April 2009, Pisa, Italy.

- A. Lodi, E. Malaguti, N.E. Stier-Moses. Efficient and fair routing for mesh networks. ISMP2009, 23-28 August 2009, Chicago, US.
- A. Caprara, F. Furini, E. Malaguti. Column generation for models with a pseudo-compact reformulation. XIV Workshop on Combinatorial Optimization, 3-8 January 2010, Aussois, France.
- M. Bergner, A. Caprara, F. Furini, M. Lübbecke, E. Malaguti, E. Traversi. Dantzig-Wolfe reformulations of general mixed integer programs. SIAM Conference on Optimization, 16-19 May, 2011, Darmstadt, Germany.
- A. Lodi, E. Malaguti, N.E. Stier-Moses, T. Bonino. Control of the contract of a public transport service. XVI Workshop on Combinatorial Optimization, 9-13 January 2012, Aussois, France.
- F. Furini, E. Malaguti. Algorithms for 2-dimensional 2-staged guillotine cutting stock problems. ISMP2012, 19-24 August 2012, Berlin, Germany.
- E. Malaguti, I. Méndez-Díaz, J.J. Miranda-Bront, P. Zabala.  $(k, c)$  - coloring via column generation. INOC2013, 20-22 May 2013, Tenerife, Spain.
- A. Lodi, E. Malaguti, G. Nannicini, D. Thomopulos. Nonlinear chance-constrained problems with applications to hydro scheduling. XVIII Workshop on Combinatorial Optimization, 4-9 January 2015, Aussois, France.
- D. Cornaz, F. Furini, E. Malaguti. Solving vertex coloring problems as maximum weighted stable set problems. ISMP2015, 12-17 July 2015, Pittsburgh, US.
- E. Malaguti, G. Nannicini, D. Thomopulos. Optimizing allocation in a warehouse network. INOC2017, 26-28 February 2017, Lisbon, Portugal.
- A. Lodi, E. Malaguti, G. Nannicini, D. Thomopulos. Chance-constrained formulation and solution of hydro scheduling. CMS17, 30 May - 1 June 2017, Bergamo, Italy.
- E. Malaguti, M. Monaci, P. Paronuzzi, U. Pferschy. Integer optimization with penalized fractional values: the knapsack case. MIP2018, 18 - 21 June 2018, Greenville, US.
- E. Malaguti, M. Monaci, P. Paronuzzi, U. Pferschy. The fractional knapsack problem with penalties. ISMP2018, 1 - 6 July 2018, Bordeaux, France.
- A. Lodi, E. Malaguti, N.E. Stier-Moses, T. Bonino. Design and control of a public contract with an approach combining game theory and optimization. SPOC18 “Machine Learning, Networks and Combinatorial Optimization”, 13th December 2018, Université Paris Dauphine, Paris, France.
- E. Malaguti, V. Pedrotti. A new formulation and a branch-and-cut algorithm for the (weighted connected) Safe Set Problem. EURO2022, 3 - 6 July 2022, Espoo, Finland.
- C. Buchheim, E. Malaguti, M. Monaci, P. Paronuzzi. Bulk Optimization approaches to Graph Problems. ISMP2024, 21 - 26 July 2024, Montréal, Canada.

LANGUAGES

Italian: mother tongue.  
 French: fluent.  
 English: fluent.