

LUCA BERTAZZI - CURRICULUM VITAE

Full Professor of Operations Research
University of Brescia, Italy
Department of Economics and Management

PERSONAL

Place of birth: Italy

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EDUCATION

1994-1997: PhD in *Computational Methods for Economical and Financial Forecasting and Decisions*, University of Bergamo (Italy). Doctoral Thesis: Models and Methods to Optimize Logistic Networks, Advisor: Prof. M. Grazia Speranza.

1995/96: Visiting scholar at *Massachusetts Institute of Technology* (MIT) under the supervision of Prof. Dimitri P. Bertsekas.

1993: Graduation in Economics at the University of Brescia (Italy). Final Grade: 110/110 cum Laude.

PROFESSIONAL CAREER

1999-2002: Assistant Professor of Mathematics for Economics, University of Brescia, Italy.

2002-2016: Associate Professor of Operations Research, University of Brescia, Italy.

2016-: Full Professor of Operations Research, University of Brescia, Italy.

RESEARCH INTERESTS

1. Supply Chain Optimization
2. Inventory Routing Problems
3. Routing Problems
4. Worst-case Analysis
5. Stochastic Dynamic Programming
6. Stochastic Programming
7. Integration of Optimization and Simulation
8. Machine Learning in Optimization.

EDITORIAL ACTIVITIES

1. Associate Editor in *IIE Transactions* (2009-), now *IIE Transactions*
2. Associate Editor in *INFORMS Journal on Computing* (2013-)
3. Associate Editor in *Networks* (2014-)
4. He has been Associate Editor in *Asia Pacific Journal of Operational Research* (2008-2019).
5. Co-Editor (with J. van Nunen e M.G. Speranza) of the volume "*Innovations in Distribution Logistics*", Lecture Notes in Economics and Mathematical Systems, Volume 619, Springer-Verlag (2009)
6. Guest Editor of the special issue "*GO IX*" in *Discrete Applied Mathematics* 234, 2018.
7. Referee, among the others, for *4OR*, *Annals of Operations Research*, *Central European Journal of Operations Research*, *Computers & Industrial Engineering*, *Computers and Operations Research*, *European Journal of Operational Research*, *IIE Transactions*, *International Journal of Production Economics*, *International Journal of Production Research*, *International Transactions in Operational Research*, *Journal of Heuristics*, *Journal of Optimization Theory and Applications*, *Journal of Sustainable Transportation*, *Naval Research Logistics*, *Operations Research*, *Transportation Research*, *Transportation Science*.

MEMBERSHIPS

1. *AIRO* (Italian Association of Operations Research)
2. *INFORMS* (Institute of Operations Research and Management Science)

TEACHING

He is currently teaching the following courses:

1. *Production and Warehouse Management*, Graduate Course
2. *Distribution Logistics*, Graduate Course
3. *Laboratory for Production and Logistics*, Graduate Course
4. *Stochastic Dynamic Programming*, PhD Course
5. *Models and Algorithms for Logistics*, PhD Course.

He has also taught several courses in Optimization Methods, Mathematical Methods for Economics, Operations Research, Information Technologies.

He has been supervisor of more than 240 undergraduate and graduate theses.

SERVICE TO UNIVERSITY OF BRESCIA

1. Head of teaching programs, Department of Economics and Management (2020-)
2. Member of the Scientific Committee of the laboratory B+LabNet (2015-)
3. Coordinator of the PhD program in "Analytics for Economics and Management – AEM" (2017-2023)
4. Head of research, Department of Economics and Management (2016-2019)
5. Member of the Audit Committee (2016-2019)

INVITED SEMINARS

He has been invited to give the following seminars:

Inventory Routing Problems with Direct Shipping, Carnegie Mellon, Tepper School of Business, Pittsburgh, 19 October 2012.

Worst-Case Analysis in Logistics, PhD Program in Analytics for Economics and Business, University of Bergamo, 2014.

Inventory Routing, EURO PhD School on Routing and Logistics, Brescia, 30 giugno 2015.

PUBLICATIONS

A) Refereed International Journals

1. Minimization of Logistic Costs with Given Frequencies, *Transportation Research B* 31, 327-340, 1997 (with M.G. Speranza and W. Ukovich).
2. Minimizing Logistic Costs in Multistage Supply Chains, *Naval Research Logistics* 46, 399-417, 1999 (with M.G. Speranza).
3. Inventory Control on Sequences of Links with Given Transportation Frequencies, *International Journal of Production Economics* 59, 261-270, 1999 (with M.G. Speranza).
4. Exact and Heuristic Solutions for a Shipment Problem with Given Frequencies, *Management Science* 46, 973-988, 2000 (with M.G. Speranza and W. Ukovich).
5. Rounding Procedures for the Discrete Version of the Capacitated Economic Order Quantity Problem, *Annals of Operations Research* 107, 33-49, 2001 (with M.G. Speranza).
6. Deterministic Order-up-to Level Policies in an Inventory Routing Problem, *Transportation Science* 36, 119-132, 2002 (with G. Paletta and M.G. Speranza).
7. Continuous and Discrete Shipping Strategies for the Single Link Problem, *Transportation Science* 36, 314-325, 2002 (with M.G. Speranza).
8. Rounding off the Optimal Solution of the Economic Lot Size Problem, *International Journal of Production Economics* 81-82, 385-392, 2003.
9. Reoptimizing the Traveling Salesman Problem, *Networks* 42, 154-159, 2003 (with C. Archetti and M.G. Speranza).
10. An Improved Heuristic for the Period Traveling Salesman Problem, *Computers & Operations Research* 31, 1215-1222, 2004 (with G. Paletta and M.G. Speranza).
11. Worst-case Analysis of the Full Load Policy in the Single Link Shipping Problem, *International Journal of Production Economics*, 93-94C, 217-224, 2005 (with M.G. Speranza).

12. Improved Rounding Procedures for the Discrete Version of the Capacitated EOQ Problem, *European Journal of Operational Research* 166/1, 25-34, 2005 (with M.G. Speranza).
13. Minimizing the Total Cost in an Integrated Vendor-Managed Inventory System, *Journal of Heuristics* 11, 393-419, 2005 (with G. Paletta and M.G. Speranza).
14. Analysis of Practical Policies for a Single Link Distribution System, *Naval Research Logistics* 54, 497-509, 2007 (with L.M.A. Chan and M.G. Speranza).
15. A Branch-and-Cut Algorithm for a Vendor-Managed Inventory-Routing Problem, *Transportation Science* 41, 382-391, 2007 (with C. Archetti, G. Laporte and M.G. Speranza).
16. Analysis of Direct Shipping Policies in an Inventory Routing Problem with Discrete Shipping Times, *Management Science* 54, 748-762, 2008.
17. Stochastic Optimization Models for a Single-Sink Transportation Problem, *Computational Management Science* 6, 251-267, 2009 (with F. Maggioni and M. Kaut).
18. Reoptimizing the 0-1 Knapsack Problem, *Discrete Applied Mathematics* 158, 1879-1887, 2010 (with C. Archetti and M.G. Speranza).
19. Determining the Optimal Dimension of a Work-in-Process Storage Area, *International Journal of Production Economics*, 131, 483-489, 2011.
20. Analysis of the Maximum Level Policy in a Production-Distribution System, *Computers & Operations Research*, 38, 1731-1746, 2011 (with C. Archetti, G. Paletta and M.G. Speranza).
21. Integrating Transportation and Production: an International Study Case, *Journal of the Operational Research Society* 2012, 920-930. (with O. Zappa).
22. Minimum and Worst-Case Performance Ratios of Rollout Algorithms, *Journal of Optimization Theory and Applications*, 152, 378-393, 2012.
23. A Hybrid Heuristic for an Inventory-Routing Problem, *INFORMS Journal on Computing* 24, 101-116, 2012 (with C. Archetti, A. Hertz and M.G. Speranza).
24. Inventory Routing Problems: An introduction, *EURO Journal on Transportation and Logistics* 1, 307-326, 2012 (with M.G. Speranza).
25. An Intermodal Inventory-Transportation System with Stochastic Demand, *Computational Management Science* 10, 1-20, 2013 (with S.S.M. Cherubini).
26. Optimization of an Order-up-to Level Policy in an Inventory Routing Problem with Stock-Out, *Transportation Research C* 27, 89-107, 2013 (with A. Bosco, F. Guerriero and D. Laganà).
27. Inventory Routing with Multiple Customers, *EURO Journal on Transportation and Logistics* 2, 255-275, 2013 (with M.G. Speranza).
28. Analysis of Practical Policies for an Inventory Routing Problem with Minimum Intershipment Time, *Naval Research Logistics* 60, 525-540, 2013 (with L.M.A. Chan and M.G. Speranza).

29. Analysis of the Best Double Frequency Policy in the Single Link Problem with Discrete Shipping Times, *Journal of Optimization Theory and Applications* 163, 286-309, 2014, (with L.M.A. Chan).
30. Polynomial Cases of the Economic Lot Sizing Problem with Cost Discounts, *European Journal of Operational Research* 237, 519-527, 2014. (with C. Archetti and M.G. Speranza).
31. Solution Approaches for the Stochastic Capacitated Traveling Salesmen Location Problem with Recourse, *Journal of Optimization Theory and Applications*, 2014, 10.1007/s10957-014-0638-z (with F. Maggioni).
32. Managing Stochastic Demand in an Inventory Routing Problem with Transportation Procurement, *Omega* 56, 112-121, 2015 (with A. Bosco and D. Laganà).
33. Min-Max vs. Min-Sum Vehicle Routing: A Worst-Case Analysis, *European Journal of Operational Research* 240, 372-381, 2015 (with B. Golden and X. Wang)
34. Min–Max Exact and Heuristic Policies for a Two-Echelon Supply Chain with Inventory and Transportation Procurement Decisions, *Transportation Research Part E: Logistics and Transportation Review* 93, 57-70, 2016 (with A. Bosco and D. Laganà).
35. The Undirected Capacitated General Routing Problem with Profits, *European Journal of Operational Research* 257, 822-833, 2017 (with C. Archetti, D. Laganà and F. Vocaturo).
36. Dynamic expediting of an urgent order with uncertain progress, *European Journal of Operational Research* 267.1, 78-85, 2018 (with R. Mogre).
37. A stochastic multi-stage fixed charge transportation problem: Worst-case analysis of the rolling horizon approach, *European Journal of Operational Research* 267.2, 555-569, 2018 (with F. Maggioni).
38. Faster rollout search for the vehicle routing problem with stochastic demands and restocking", *European Journal of Operational Research* 270.2, 487-497, 2018 (with N. Secomandi).
39. The Bin Packing Problem with Item Fragmentation: A Worst-Case Analysis, *Discrete Applied Mathematics* 261, 63-77, 2019 (with B. Golden and X. Wang).
40. Environmental exposure and health effects in a highly polluted area of Northern Italy: a narrative review. *Environmental Science and Pollution Research*, 1-15, 2019 (with C. Alias, L. Benassi, U. Gelatti, S. Sorlini, M.L. Volta).
41. A matheuristic algorithm for the multi-depot inventory routing problem, *Transportation Research Part E: Logistics and Transportation Review*, 122, 524-544, 2019 (with L. Coelho, A. De Maio, D. Laganà).
42. Stochastic optimization models for a bike-sharing problem with transshipment, *European Journal of Operational Research*, 276(1), 272-283, 2019 (with F. Maggioni, M. Cagnolari, S.W. Wallace).

43. The Value of the Right Distribution in Stochastic Programming with Application to a Newsvendor Problem, *Computational Management Science*, 16, 739-758, 2019 (with M. Cagnolari and F. Maggioni).
44. Worst-Case Benefit of Restocking for the Vehicle Routing Problem with Stochastic Demands, *Operations Research* 68, 671-675, 2020 (with N. Secomandi).
45. An Exact Approach for Cyclic Inbound Inventory Routing in a Lean Production System, *European Journal of Operational Research*, 283, 915-928, 2020 (with D. Laganà, J. Ohlmann and R. Paradiso).
46. Optimizing the Distribution Planning Process in Supply Chain with Distribution Strategy Choice, *Journal of the Operational Research Society*, 1-14, 2021 (with A. Bacchetti and M. Zanardini).
47. Direct k-routing versus cross-docking: worst-case results. *Optimization Letters*, 1-8, 2021 (with J. Ohlmann)
48. Recent challenges in routing and inventory routing: e-commerce and last-mile delivery, *Networks* 77, 255-268, 2021 (with C. Archetti).
49. The value of integration of full container load, less than container load and air freight shipments in vendor-managed inventory systems, *International Journal of Production Economics*, 2021, 241, (with S. Deilami Moezi and F. Maggioni).
50. A rolling horizon approach for a multi-stage stochastic fixed-charge transportation problem with transshipment, *European Journal of Operational Research* 301 (3), 912-922 (con R. Cavagnini e F. Maggioni).
51. Analysis of effective sets of routes for the split-delivery periodic inventory routing problem, *European Journal of Operational Research* 298 (2), 463-477, 2022 (with D. Laganà, G. Chua, R. Paradiso).
52. Matheuristics with performance guarantee for the unsplit and split delivery capacitated vehicle routing problem, *Networks* 80 (4), 482-501, 2022 (with X. Wang).
53. La valutazione del capitale economico in presenza di partecipazioni reciproche, *Economia aziendale online*, 2023 (with P. Bogarelli).
54. The Inventory Routing Problem with Split Deliveries, *Networks* 82 (4), 400-413, 2023 (with C. Archetti and N.M Dinh).
55. Dynamic Project Expediting: A Stochastic Shortest-Path Approach, *Management Science* 70 (6), 3381-4165, 2023 (with R. Mogre and N. Trichakis).
56. A two-stage stochastic programming model for bike-sharing systems with rebalancing, *EURO Journal on Transportation and Logistics* 13, 100140, 2024 (with R. Cavagnini, F. Maggioni and M. Hewitt).
57. An improved model for estimating optimal VRP solution values, *Optimization Letters* 18 (3), 697-703, 2024 (with S. Kou and B. Golden).

58. Estimating Optimal split delivery vehicle routing problem solution values, *Computers & Operations Research*, 106714, 2024 (with S. Kou and B. Golden).
59. Competitive Analysis of Algorithms for an Online Distribution Problem, *Algorithms* 17 (6), 237, 2024 (with A. Barba and B. Golden).
60. Online Algorithms for the Multi-vehicle Inventory-routing Problem with Real-time Demands, *Transportation Research E*, 2024 (accepted) (with G.O. Chagas, L.C. Coelho, D. Laganà and F. Vocaturo).

Articoli sottoposti per pubblicazione:

61. Robust Dynamic Media Selection with Yield Uncertainty: Max-Min Policies and Dual Bounds, 2024 (with J.C. Goodson).
62. Some Worst-Case Results Relating to the Asymmetric Traveling Salesman Problem, 2024 (with B. Golden and S. Kou).
63. Matheuristic Algorithms for the Inventory Routing Problem with Unsplit and Split Deliveries, 2024 (with C. Archetti and N.M. Dinh).

B) Refereed Chapters

1. The Minimization of the Logistic Costs on Sequences of Links with Given Shipping Frequencies, in *Advances in Distribution Logistics*, (Fleischmann, B., van Nunen, J.A.E.E., Speranza, M.G. e Staehly, P., eds.), *Lecture Notes in Economics and Mathematical Systems*, 460, Springer-Verlag, 289-304, 1998 (with M.G. Speranza).
2. Periodic Shipping Strategies for the Minimization of the Logistic Costs, in *Transportation Networks: Recent Methodological Advances*, (Bell, M.G.H., ed.), Pergamon, 223-237, 1998 (with M.G. Speranza).
3. Models and Algorithms for the Minimization of Inventory and Transportation Costs: A Survey, in *New Trends in Distribution Logistics*, *Lecture Notes in Economics and Mathematical Systems*, Speranza, M.G. and Staehly, P. (eds.), Springer-Verlag, Vol. 480, 137-158, 1999 (with M.G. Speranza).
4. Deterministic Order-up-to Level Strategies for the Minimization of the Logistic Costs in Distribution Systems, in *New Trends in Distribution Logistics*, *Lecture Notes in Economics and Mathematical Systems*, Speranza, M.G. and Staehly, P. (eds.), Springer-Verlag, Vol. 480, 179-193, 1999 (with G. Paletta and M.G. Speranza).
5. Optimal and Neuro-Dynamic Programming Solutions for a Stochastic Inventory Transportation Problem, in *Models, Methods and Decision Support for Management*, (Kischka, P., Leopold-Wildburger, U., Moehring, R.H., Radermacher, F.J., eds.), Physica-Verlag, 65-78, 2001 (with D.P. Bertsekas and M.G. Speranza).
6. Inventory Routing, *The Vehicle Routing Problem: Latest Advances and New Challenges*, (Bruce Golden, Raghu Raghavan and Ed Wasil, eds.), 49-72, Springer, 2008 (with M. Savelsbergh and M.G. Speranza).

7. Optimizing the Storage Area Dimension in a Production System, in *Innovations in Distribution Logistics*, (L. Bertazzi, J. van Nunen and M.G. Speranza, eds), Springer, 17-28, 2009.
8. Matheuristics for Inventory Routing Problems, in *Hybrid Algorithms for Service, Computing and Manufacturing Systems: Routing, Scheduling and Availability Solutions*, IGI Global, 2011 (with M.G. Speranza).
9. Natural Disaster Management in Italy, in *Handbook of Disaster Risk Reduction and Management*, (C.N. Madu e C.H. Kuei, eds), World Scientific, 523-537, 2017 (with S.S.M. Cherubini).
10. Inventory routing problems, *Handbook on Transport Modeling*, 2024 (under second review) (with K. Doerner and D. Laganà).

C) Refereed Proceeding

10. An Algorithm for the Transportation Problem with Given Frequencies, in *System Modelling and Optimization*, (Dolezal, J. and Fidler, J., eds.), Chapman & Hall, 535-542, 1996 (with M.G. Speranza and W. Ukovich).
11. The Stochastic Capacitated Traveling Salesmen Location Problem: A computational comparison for a United States instance, in *Procedia - Social and Behavioral Sciences* 108, 2014, 47-56 (with F. Maggioni).
12. Determining Transportation Mode Choice to Minimize Distribution Cost: Direct Shipping, Transit Point and 2-Routing, *Proceedings 28th European Conference on Modeling and Simulation ECMS* (F. Squazzoni, F. Baronio, C. Archetti, M. Castellani, eds.), ISBN 978-0-9564944-8-1, 448-453, 2014 (with J. Ohlmann).
13. The Impact of a Clustering Approach on Solving the Multi-depot IRP, in *International Conference on Optimization and Decision Science*, Springer, 501-515, 2017 (with A. De Maio and D. Laganà).
14. A Two-Stage Stochastic Model for Distribution Logistics with Transshipment and Backordering: Stochastic Versus Deterministic Solutions, In *New Trends in Emerging Complex Real Life Problems*, Springer, 131-140, 2018 (with R. Cavagnini, F. Maggioni).

D) Other Publications

Proceedings:

1. Minimization of Transportation and Inventory Costs in a Logistic Network, *Proceedings of the II Convegno Nazionale Progetto Finalizzato Trasporti 2*, 2213-2226, Genova, 29-31 May 1995 (with M.G. Speranza and W. Ukovich).
2. Minimization of Logistic Costs with Given Frequencies, *Proceedings of the Second International Workshop on Distribution Logistics*, 70-74, Oegstgeest, 15-18 October 1995 (with M.G. Speranza and W. Ukovich).

3. Minimization of Logistic Costs with Given Frequencies, in World Transport Research, (Hensher, D., King, J. and Oum, T.H., eds.), Proceedings of the 7th World Conference on Transport Research, Pergamon, Vol. 4, 45-56, 1996 (with M.G. Speranza and W. Ukovich).
4. Minimization of Logistics Costs on Sequences of Links, Proceedings of the 4th IFIP WG7.6 Working Conference, 5.1-5.4, Noisy-le-Grand, 28-30 May 1996 (with M.G. Speranza).
5. Programmazione dinamica neurale in Logistica: il single link problem con offerta e domanda stocastiche, Proceedings of the XX Convegno Annuale A.M.A.S.E.S., 647-650, Urbino, 5-7 September 1996 (with M.G. Speranza).
6. Optimal and Heuristic Solutions of the Single Link Shipping Problem with Given Frequencies, Proceedings of the Giornate di lavoro A.I.R.O. '96, 347-350, Perugia, 16-20 September 1996 (with M.G. Speranza and W. Ukovich).
7. Strategie periodiche di minimizzazione del costo logistico fra due nodi, Proceedings of the XXI Convegno Annuale A.M.A.S.E.S., 798-801, Roma, 10-13 september 1997 (with M.G. Speranza).
8. Optimal Periodic Shipping Strategies for the Single Link Problem, Proceedings of the Giornate di lavoro A.I.R.O. '97, 42, Saint Vincent, 16-19 september 1997 (with M.G. Speranza).
9. Algoritmi euristici per sequenze di links con frequenze di spedizione date, Proceedings of the Terzo Convegno Nazionale del Progetto Finalizzato Trasporti Due, Taormina, 12-14 november 1997 (with M.G. Speranza).
10. Models and Algorithms for the Minimization of Inventory and Transportation Costs: A Survey, Proceedings of the Symposium on Mathematical Models of Inventories, Aarhus (Danimarca), 20-21 august 1998 (with M.G. Speranza).
11. Models and Algorithms for the Optimization of Logistic Networks, Proceedings of the Convegno A.I.R.O. '98, 337-340, Treviso, 23-25 september 1998 (with M.G. Speranza).
12. Approximation Algorithms for a Periodic Shipping Problem with Time Discretization, Proceedings of the Convegno A.I.R.O. '98, 57-58, Treviso, 23-25 september 1998 (with M.G. Speranza).
13. A Worst-Case Analysis of EOQ-Based Solutions for Logistic Problems with Time Discretization, in Simulation and Optimisation in Operations Management, Proceedings of the Convegno A.I.R.O. 99, 243-244, Napoli, 21-24 september 1999 (with M.G. Speranza).
14. Worst-case Analysis of Frequency-based Algorithms for the Single Link Shipping Problem, Proceedings of the XXIV Convegno Annuale A.M.A.S.E.S., 233-240, Padenghe sul Garda, 6-9 september 2000 (with M.G. Speranza).
15. Approximation Algorithms for the Minimization of the Transportation and Inventory Costs on a Single Link, Proceedings of the 8th Meeting of the Euro Working Group Transportation EWGT, Roma, 127-129, 11-14 september 2000 (with M.G. Speranza).
16. A Worst-case Analysis of Rounding Procedures for the Economic Lot Size Problem with Time Discretization, Proceedings of the XXV Convegno Annuale A.M.A.S.E.S., 55-58, Firenze, 5-8 september 2001 (with M.G. Speranza).

Technical Reports (not submitted):

17. Approximation Algorithms for the Minimization of the Transportation and Inventory Costs, Technical Report n. 159, Department of Quantitative Methods, University of Brescia, 1999 (with M.G. Speranza).
18. Frequency-based Algorithms for the Minimization of the Transportation and Inventory Costs on a Single Link, Technical Report n. 180, Department of Quantitative Methods, University of Brescia, 2000 (with M.G. Speranza).
19. Periodic Strategies for the Single Link Shipping Problem, Technical Report n. 189, Department of Quantitative Methods, University of Brescia, 2001 (with M.G. Speranza).
20. Optimization of an Integrated Production-Distribution System, Technical Report n. 287, Department of Quantitative Methods, University of Brescia, 2007 (with C. Archetti, G. Paletta, M.G. Speranza).
21. On the Value of Expediting Policies for Managing Operational Risks, Technical Report n. 371, Department of Quantitative Methods, University of Brescia, 2012 (con R. Mogre).

Applications:

22. Forecasting Methods and Optimization Models for the Inventory Management of Perishable Products: the Case of "La Centrale del Latte di Vicenza SpA", in *A View of Operations Research Applications in Italy*, 2018, 87-98, Springer (with F. Maggioni).