Valentina Cacchiani

Contact Information

Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi"
Università di Bologna
Viale Risorgimento 2, 40136 Bologna, Italy
valentina.cacchiani@unibo.it
Phone +39 0512093151
Fax +39 0512086272

ACADEMIC POSITION

- 2019, November - *present*: *Associate Professor*, Operations Research (MAT/09), Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi" - DEI University of Bologna, Bologna

National Scientific Qualification

- 2018, September: Italian academic qualification for Full Professor in Operations Research (MAT/09)

PREVIOUS ACADEMIC POSITIONS

- 2016, November - 2019, October: *Senior Assistant Professor* (Ricercatore a Tempo Determinato Senior), Operations Research (MAT/09), Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi" - DEI University of Bologna, Bologna
- 2013, November - 2016, October: *Assistant Professor* (Ricercatore a Tempo Determinato Junior), Operations Research (MAT/09), Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi" - DEI, University of Bologna, Bologna

EDUCATION

- 2002, December: *Laurea (Master Degree) in Computer Science Engineering*
  Alma Mater Studiorum - Università di Bologna, Bologna
  Grade: 100/100
- 2003, April-December: *Scholarship* at the University of Bologna
- 2003, November: *Engineering Licence*
- 2004-2006: *Ph.D. student in Control System Engineering and Operational Research* at Dipartimento di Elettronica, Informatica e Sistemistica (DEIS), University of Bologna, Advisors Prof. Paolo Toth and Prof. Alberto Caprara
- 2007, May: *Ph.D. in Automatic Control Systems and Operational Research*
  Dipartimento di Elettronica, Informatica e Sistemistica - DEIS
  Alma Mater Studiorum - Università di Bologna, Bologna
  Thesis: Models and Algorithms for Combinatorial Optimization Problems arising in Railway Applications, Advisors: Prof. Paolo Toth and Prof. Alberto Caprara

POST-DOCTORAL FELLOWSHIPS (Assegni di Ricerca)

- 2007-2012: *Post Doctoral Fellow (Assegnista di Ricerca)*, Dipartimento di Elettronica, Informatica e Sistemistica (DEIS), University of Bologna
- 2013, March - 2013, October: *Post Doctoral Fellow (Assegnista di Ricerca)*, Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi" (DEI), University of Bologna

VISITING PERIODS

- 2006, August-December: *Visiting Scholar* at MIT, Cambridge, USA
- 2007, July-August: *Visiting Scholar* at the Harvard Medical School Massachusetts General Hospital, Boston, USA
- 2008, February: *Visiting researcher* at the Department of Production and Operations Management, Universitaet Wien, Vienna, Austria
- 2008, August: *Visiting Scholar* at the Harvard Medical School, Massachusetts General Hospital, Boston, USA
- 2010, July: *Visiting researcher* at the Department of Production and Operations Management, Universitaet Wien, Vienna, Austria
- 2011, May: *Visiting researcher* at the Institut fuer Informatik, Universitaet zu Koeln, Cologne, Germany
- 2012, March: *Visiting researcher* at the Institut fuer Informatik, Universitaet zu Koeln, Cologne, Germany
- 2012, October: *Visiting Researcher* at Universidad de La Laguna, Tenerife, Spain
- 2013, October: *Visiting Researcher* in COST-Action TD1207 at LIX, École polytechnique, Palaiseau, CEDEX, France
- 2014, May: *Visiting Researcher* in COST-Action TD1207 at LIX, École polytechnique, Palaiseau, CEDEX, France
- 2016, September: *Visiting Researcher* at Beijing Jaotong University, Beijing, China
- 2017, May: *Visiting Researcher* at the Institute for Transport and Logistics Management, Wirtschafts Universitaet Wien, Vienna, Austria
- 2017, November: *Visiting Researcher* at Universidad de La Laguna, Tenerife, Spain
- 2019, April: *Visiting Researcher* at Universidad de La Laguna, Tenerife, Spain
- 2022, May: *Visiting Researcher* at the Institute for Transport and Logistics Management, Wirtschafts Universitaet Wien, Vienna, Austria

RESEARCH PROJECTS

- 2003-2009 Traffic Control Management research project in cooperation with RFI (member of the research team)
- 2003-2004 UE PARTNER: Path Allocation Re-engineering of Timetable Network for European Railways (member of the research team)
- 2004 Algoritmi di Schedulazione Ottima di Turni Macchina nelle Aziende Ferroviarie, Research Project in cooperation with MAIOR (member of the research team)
- 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)
- 2007-2008 PRIN 2005: Problemi di Routing e Packing nell'Ottimizzazione dei Sistemi di Trasporto (member of the research team)

- 2010-2011 PRIN 2008: Modelli e Algoritmi per Problemi di Ottimizzazione Combinatoria della Gestione di Sistemi di Trasporto (member of the research team)
- 2011-2012 Programme Vigoni: (Italian-German Exchange, Bologna-Colonia) Exact algorithms for robust network design problems (member of the research team)
- 2013 Macroscopic level conflict solution in cooperation with OPTIT and ALSTOM (member of the research team)
- 2011-2014 UE ON-TIME: Optimal Networks for Train Integration Management across Europe (member of the research team)
- 2016 - 2018: SwIFt (Sistemi Intelligenti per la gestione del traffico Ferroviario) POR-FESR 2014-2020 ASSE 1 "Ricerca e Innovazione" with ALSTOM (member of the research team)
- 2017-2018 PRIN 2015: Nonlinear and combinatorial aspects of complex networks (member of the research team)
- 2016 - 2019 (principal investigator): Exact algorithms for the (A)symmetric Traveling Salesman Problem with order dependent constraints and objective function, funded by the Air Force Office of Scientific Research (Project FA9550-17-1-0025)
- 2020 - 2023 Network protection, interdiction and design under uncertainty, funded by the Air Force Office of Scientific Research (Project FA8655-20-1-7019) (member of the research team)

AWARDS

- Premio di Laurea Camerini-Carraresi (award for the best Operations Research Master Degree Thesis in the year 2002-2003), assigned by the Italian Association of Operations Research (AIRO)
- Co-author of the paper *A macroscopic railway timetable rescheduling approach for handling large scale disruptions* 3rd place awarded by INFORMS Railway Application Section 2013
- Honorable mention at 2013 OPTL Best Paper Award for the paper *Finding Cliques of Maximum Weight on a Generalization of Permutation Graphs*, Optimization Letters, 7(2), 289-296, 2013
- Co-author of the paper *Micro-Macro Approach to Robust Timetabling* selected in the top 10 papers at RailTokyo2015
- 2021 Winner (with D. Pettinari and E. Tresoldi) of the UE Project MINOA (Mixed-Integer Non-Linear Optimisation: Algorithms and Application) Research Challenge on *Non-Periodic Integrated Timetabling and Vehicle Scheduling Problem* - professional category, organized by M.A.I.O.R. company

EDITORIAL ACTIVITY

- 01/2016 - 12/2018: Member of the Editorial Advisory Board of Transportation Research Part B
- 2018: Editor (with E. Malaguti, A. Mauttone, P. Toth) of Electronic Notes in Discrete Mathematics 69, Joint EURO/ALIO International Conference 2018 on Applied Combinatorial Optimization
- 2019: Guest Editor (with E. Malaguti, P. Toth) of European Journal of Operational Research 289(3), 807-808, 2021, Feature Cluster: New trends in Applied Combinatorial Optimization
- 2019 - *present*: Associate Editor of Urban Rail Transit
- 2019 - *present*: Associate Editor of SN Operations Research Forum
- 2021 - *present*: Associate Editor of Transportation Science
- 01/2022 - *present*: Member of the Editorial Advisory Board of Transportation Research Part E

SEMINARS

- 2005, May: Capacity Planning, UE PARTNER, Rome
- 2007, April: Seminar on Railway Practice, UE ARRIVAL, Erasmus Center for Optimization in Public Transport, Utrecht
- 2008, February: The Train Unit Assignment Problem, Production and Operations Management, Universitaet Wien, Wien
- 2009, June: A Hybrid Approach to Beam Angle Optimization in Intensity-Modulated Radiation Therapy, Université de Liege, Liegi
- 2009, August: Railway Optimization, RUTCOR, Rutgers University, New Jersey
- 2010, July: A Lagrangian Heuristic for Robust Train Timetabling, Production and Operations Management, Universitaet Wien, Wien
- 2011, May: Nominal and Robust Train Timetabling Problems, Universitaet zu Koeln, Cologne
- 2012, May: Models and Algorithms for Robust Network Design with Several Traffic Scenarios, ETH, Zurich
- 2012, October: A Peak-Period based Heuristic Algorithm for the Train Unit Assignment Problem, Universidad de La Laguna, Tenerife
- 2013, October: Models and Algorithms for an Integrated Fleet-Assignment, Aircraft-Routing and Crew-Pairing Problem, LIX, École polytechnique, Palaiseau, CEDEX, France
- 2014, July: The Train Timetabling Problem, Università di Udine
- 2017, May: Models and Algorithms for the Train Timetabling Problem, Wirtschafts Universitaet Wien, Vienna
- 2018, April: Train Timetabling in Highly Congested Lines, Erasmus University Rotterdam, Rotterdam
- 2018, May: Optimizing an Integrated Airline Scheduling Problem, Wirtschafts Universitaet Wien, Vienna
- 2018, October: Recent Variants of the Traveling Salesman Problem, Universidad de La Laguna, Tenerife
- 2018, November: Robust Optimization Models for Integrated Train Stop Planning and Timetabling with Passenger Demand Uncertainty, IFSTTAR, Lille
- 2020, May: On mathematical models, methods, and algorithms for train timetabling, Roma Tre University (online)
- 2021, April: Models and algorithms for the train timetabling problem, Roma Tre University (online)
- 2022, May: Integrated Timetabling and Electric Vehicle Scheduling in Public Transport, WU, Vienna
- 2022, June: Advanced Topics on Train Timetabling, Roma Tre University

DIDACTIC ACTIVITY

Teaching

- A.A. 2019 - *present*: Teacher of the course Optimization Models and Algorithms M, School of Engineering, University of Bologna
- A.A. 2022 - *present*: Teacher of the course Algorithms for Decision Making M, School of Engineering, University of Bologna
- 2022, May: Teacher of the course Sustainable Logistics (10 hours), Business Administration - Supply Networks and Services, WU Vienna University of Economics and Business, Research Institute in Supply Chain Management, Vienna
- A.A. 2013 - 2022: Teacher of the course Laboratorio di Strumenti di Ottimizzazione TA, School of Engineering, University of Bologna
- A.A. 2019 - 2021: Teacher of a 15-hours module of the course Ricerca Operativa M, School of Engineering, University of Bologna
- A.A. 2018-2019: Teacher of a 10-hours module of the course Ricerca Operativa M, School of Engineering, University of Bologna
- A.A. 2018-2019: Supervisor of Project Work For Operations Research, School of Engineering, University of Bologna
- A.A. 2015-2016: Teacher of a 10-hours module of the course Algorithms for Decision Making M, School of Engineering, University of Bologna
- A.A. 2011-2013: Teacher of the course: Ottimizzazione dei processi gestionali in Sanità, Master in Ingegneria Clinica, COFIMP, Bologna (together with Prof. Enrico Malaguti)
- 2016, September: Teacher of the PhD course The Train Timetabling Problem (6 hours), Beijing Jaotong University, Beijing
- 2017, November: Teacher of the master course Train Scheduling: challenges in planning and real-time (4 hours), Universidad de La Laguna, Tenerife
- 2018, May: Teacher of the master course Optimized Train Scheduling in Planning and in Real-Time (10.5 hours), Supply Chain Management Master Program, WU Vienna University of Economics and Business, Research Institute in Supply Chain Management, Vienna
- 2018 (September), 2020 (February), 2021 (February), 2022 (February): Teacher at Scuola di Alta Formazione in Ingegneria dei Sistemi per la Mobilità Integrata, University of Bologna: Optimized Train Scheduling in Planning and Real-Time (3 hours)
- Teacher at FS Mobility Academy, University of Naples Federico II: Train Timetabling (3 hours)
- Supervisor of several master and bachelor theses in Computer Science and Industrial Engineering at the University of Bologna

Tutoring

- A.A. 2004-2006: Tutor of the course Algoritmi di Ottimizzazione LS, Faculty of Engineering, University of Bologna, Prof. Paolo Toth
- A.A. 2004-2006: Tutor of the course Fondamenti di Ricerca Operativa LA, Faculty of Engineering, University of Bologna, Prof. Alberto Caprara
- A.A. 2004-2007: Tutor of the course Fondamenti di Ricerca Operativa LA, Faculty of Engineering, University of Bologna, Prof. Paolo Toth
- A.A. 2007-2009: Tutor of the course Metodi e Modelli per il Supporto alle Decisioni LS, Faculty of Engineering, University of Bologna, Prof. Alberto Caprara

- A.A. 2009-2011: Tutor of the course Fondamenti di Ricerca Operativa TA-AK, Faculty of Engineering, University of Bologna, Prof. Alberto Caprara
- A.A. 2008-2011: Tutor of the course Ricerca Operativa A, Teledidattico, University of Parma, Prof. Alberto Caprara
- A.A. 2011-2013/2015-2018: Tutor of the course Ricerca Operativa M, Faculty of Engineering, University of Bologna, Prof. Silvano Martello
- A.A. 2015-2022: Tutor of the course Ottimizzazione su Reti M, Faculty of Engineering, University of Bologna, Prof. Silvano Martello

DUTIES

- Referee of PhD research proposals at Erasmus Research Institute of Management, Rotterdam
- 2016: Member of the Scientific Review Committee of TRISTAN 2016
- June 2016: Member of the PhD Assessment Committee of Simon H. Bull ("Efficiency and Robustness in Railway Operations") at DTU, Copenhagen
- 2017: Member of the Program Committee of Clausthal-Göttingen International Workshop on Simulation Science 2017
- 2017: Member of the Program Committee of ATMOS 2017
- April 2017: Member of the PhD Assessment Committee of Niels-Christian Fink Bagger ("Mathematical Programming Approaches for Optimal University Timetabling") at DTU, Copenhagen
- September 2017 - *present*: Coordinator, with Prof. Andrea D'Ariano, of the AIRO (Italian Association of Operations Research) Chapter "Optimization in Public Transport and Shared Mobility"
- March 2018: Member of the PhD Assessment Committee of "Dottorato di Ricerca in Ingegneria dell'Innovazione Industriale, XXX ciclo", University of Modena and Reggio Emilia
- 2018: Co-chair of the Organizing Committee of the Joint EURO/ALIO International Conference 2018 on Applied Combinatorial Optimization, Bologna
- 2018 - *present*: Member of Consiglio Direttivo AIRO (Italian Association of Operations Research)
- November 2018: Member of the PhD Assessment Committee of Lucille Brethomé ("Passenger-Oriented Modelline and Optimization of the Railway Transportation Plan in a Mass Transit System") at IFSTTAR, Lille
- April 2019: Member of the PhD Assessment Committee of Federico Farina ("Optimization of Operations in Public Transportation") at DTU, Copenhagen
- 2019: Member of the Program Committee of Clausthal-Göttingen International Workshop on Simulation Science 2019
- 2019: Member of the Program Committee of RailNorrköping 2019
- 2019: Co-chair of the Program Committee of ATMOS 2019 (with Prof. Alberto Marchetti Spaccamela)
- 2020: Member of the Program Committee of ATMOS 2020
- 2020 - *present*: Member of the Transport Panel of the University of Bologna
- 2020: Member of the Program Committee of ODS 2020
- December 2020: Member of the PhD Assessment Committee of Gert-Jaap Polinder ("New models and applications for railway timetabling") at Erasums Rotterdam University, Rotterdam (online)
- 2021: Member of the Department Team at DEI (University of Bologna) for VQR (Valutazione della Qualità della Ricerca) 2015-2019 (MAT/09)
- 2021: Member of the Program Committee of ATMOS 2021
- 2021: Member of the Program Committee of ODS 2021

- 2021: Member of the panel of RAS (Railway Applications Section) INFORMS Competition for the Best Student Paper Award
- October 2021: Member of the PhD Assessment Committee of Rowan Hoogervorst ("Improving the scheduling and rescheduling of rolling stock: solution methods and extensions") at Erasums Rotterdam University, Rotterdam (online)
- October 2021: Member of the Scientific Advisory Committee of RailBeijing
- 2022: Member of the Program Committee of ATMOS 2022
- 2022: Member of the Program Committee of ODS 2022
- March 2022: Member of the PhD Assessment Committee of Agustín Ismael Montero ("Modelos y algoritmos basados en programación lineal entera para problemas de ruteo de vehículos ") at Universidad de Buenos Aires (online)
- 2022: Member of the Scientific Committee and of the Organizing Committee of the EURO Summer Institute on Location Science (ESI2022), Edinburgh, 11-24, June 2022

PHD STUDENTS

- September 2015 - September 2016: co-Advisor of Feng Jiang (visiting PhD student) of the Southwest Jiaotong University, Chengdu, China, on "Development of effective exact and heuristic algorithms for the solution of real-world Railway Optimization Problems" (with Prof. P. Toth)
- Settembre 2016 - Dicembre 2016: co-Advisor of Luis Miguel Escobar Falcon (visiting PhD student) of the Technological University of Pereira, Colombia, on "Exact and heuristic algorithms for the solution of the Pollution Routing Problem" (with Prof. P. Toth)
- September 2017 - September 2018: co-Advisor of Jianguo Qi (visiting PhD student) of the Beijing Jiaotong University, Beijing, China, on "Collaborative optimization for robust train timetable and stop plan" (with Prof. L. Yang)
- November 2015 - Ottobre 2018: co-Advisor of Carlos Contreras-Bolton (PhD student), thesis "Algorithms for Variants of Routing Problems" (with Professors P. Toth and D. Vigo)
- December 2017 - April 2018: external Advisor of Gert-Jaap Polinder (visiting PhD student) of the Erasums University Rotterdam, The Netherlands, on "An iterative heuristic for passenger-centric train timetabling with integrated adaption times" (with Professors D. Huisman and M. Schmidt)
- November 2019 - *present*: co-Advisor of Alberto Locatelli (PhD student) of the University of Modena and Reggio Emilia with Prof. Manuel Iori
- November 2020 - August 2021: Advisor of Daniele Pettinari (PhD student) of the University of Bologna

PUBLICATIONS

International Journal Papers

[1] V. Cacchiani, A. Caprara, P. Toth. A Column Generation Approach to Train Timetabling on a Corridor. *4OR A Quarterly Journal of Operations Research*, 6 (2), 125-142, 2008.

[2] V. Cacchiani. Models and Algorithms for Combinatorial Optimization Problems arising in Railway Applications. *4OR A Quarterly Journal of Operations Research*, 7 (1), 109-112, 2009.

[3] V. Cacchiani, A. Caprara, P. Toth. Scheduling Extra Freight Trains on Railway Networks. *Transportation Research Part B*, 44(2), 215-231, 2010.

[4] V. Cacchiani, A. Caprara, P. Toth. Non-Cyclic Train Timetabling and Comparability Graphs. *Operations Research Letters*, 38 (3), 179-184, 2010.

[5] V. Cacchiani, A. Caprara, P. Toth. Solving a Real-World Train Unit Assignment Problem. *Mathematical Programming Series B*, 124, 207-231, 2010.

[6] V. Cacchiani, A. E. Fernandes Muritiba, M. Negreiros, P. Toth. A Multi-start Heuristic Algorithm for the Equality Generalized Traveling Salesman Problem. *Networks*, 57 (3), 231-239, 2011.

[7] V. Cacchiani, A. Caprara, M. Fischetti. A Lagrangian Heuristic for Robustness, with an Application to Train Timetabling. *Transportation Science*, 46(1), 124-133, 2012.

[8] V. Cacchiani, P. Toth. Nominal and Robust Train Timetabling Problems. *European Journal of Operational Research*, 219 (3), 727-737, 2012.

[9] V. Cacchiani, A. Caprara, L. Galli, L. Kroon, G. Maroti, P. Toth. Railway Rolling Stock Planning: Robustness Against Large Disruptions. *Transportation Science*, 46(2), 217-232, 2012.

[10] V. Cacchiani, A. Caprara, G. Maroti, P. Toth. On Integer Polytopes with Few Nonzero Vertices. *Operations Research Letters*, 41, 74-77, 2013.

[11] V. Cacchiani, A. Caprara, P. Toth. Finding Cliques of Maximum Weight on a Generalization of Permutation Graphs. *Optimization Letters*, 7(2), 289-296, 2013.

[12] V. Cacchiani, A. Caprara, P. Toth. A Lagrangian Heuristic for a Train-Unit Assignment Problem. *Discrete Applied Mathematics*, 161(12), 1707-1718, 2013.

[13] D. Bertsimas, V. Cacchiani, D. Craft, O. Nohadani. A Hybrid Approach to Beam Angle Optimization in Intensity-Modulated Radiation Therapy. *Computers & Operations Research*, 40(9), 2187-2197, 2013.

[14] V. Cacchiani, A. Caprara, R. Roberti, P. Toth. A New Lower Bound for Curriculum-based Course Timetabling. *Computers & Operations Research*, 40(10), 2466-2477, 2013.

[15] V. Cacchiani, V. C. Hemmelmayr, F. Tricoire. A Set Covering based Heuristic Algorithm for the Periodic Vehicle Routing Problem. *Discrete Applied Mathematics*, 163(1), 53-64, 2014.

[16] V. Cacchiani, D. Huisman, M. Kidd, L. Kroon, P. Toth, L. Veelenturf, J. Wagenaar. An Overview of Recovery Models and Algorithms for Real-time Railway Rescheduling. *Transportation Research Part B*, 63, 15-37, 2014

[17] S. Garcia, V. Cacchiani, L. Vanhaverbeke, M. Bischoff. The Table Placement Problem: a research challenge at the EWI 2007. *TOP*, 22(1), 208-226, 2014.

[18] E. Álvarez-Miranda, V. Cacchiani, A. Lodi, T. Parriani, D. R. Schmidt. Single-commodity Robust Network Design Problem: Complexity, Instances and Heuristic Solutions. *European Journal of Operational Research*, 238(3), 711-723, 2014

[19] V. Cacchiani, L. Galli, P. Toth. A Tutorial on Non-Periodic Train Timetabling and Train Platforming Problems. *EURO Journal on Transportation and Logistics*, 4(3), 285-320, 2015.

[20] A. Bettinelli, V. Cacchiani, R. Roberti, P. Toth. An overview of Curriculum-Based Course Timetabling. *TOP*, 23(2), 313-349, 2015.

[21] A. Bettinelli, V. Cacchiani, R. Roberti, P. Toth. Rejoinder on: an overview of Curriculum-Based Course Timetabling. *TOP*, 23(2), 366-368, 2015.

[22] L.P. Veelenturf, M.P. Kidd, V. Cacchiani, L.G. Kroon, P. Toth. A railway timetable rescheduling approach for handling large scale disruptions. *Transportation Science*, 50(3), 841-862, 2015.

[23] V. Cacchiani, F. Furini, M.P. Kidd. Approaches to a real-world train timetabling problem in a railway node. *Omega*, 58, 97-110, 2016.

[24] R.M.P. Goverde, N. Besinovic, A. Binder, V. Cacchiani, E. Quaglietta, R. Roberti, P. Toth. A Three-Level Framework for Performance-Based Railway Timetabling. *Transportation Research Part C*, 67, 62-83, 2016.

[25] V. Cacchiani, M. Juenger, F. Liers, A. Lodi, D.R. Schmidt. Single-Commodity Robust Network Design with Finite and Hose Demand Sets. *Mathematical Programming Series B*, 157(1), 297-342, 2016.

[26] V. Cacchiani, C. D'Ambrosio. A Branch-and-Bound based Heuristic Algorithm for Convex Multi-Objective MINLPs. *European Journal of Operational Research*, 260(3), 920-933, 2017.

[27] V. Cacchiani, J.J. Salazar-Gonzalez. Optimal Solutions to a Real-World Integrated Airline Scheduling Problem. *Transportation Science*, 51(1), 250-268, 2017.

[28] A. Bettinelli, V. Cacchiani, E. Malaguti. A Branch-and-Bound Algorithm for the Knapsack Problem with Conflict Graph. *INFORMS Journal on Computing*, 29(3), 457-473, 2017.

[29] F. Jiang, V. Cacchiani, P. Toth. Train Timetabling by Skip-Stop Planning in Highly Congested Lines. *Transportation Research Part B*, 104, 149-174, 2017.

[30] V. Cacchiani, A. Caprara, P. Toth. An Effective Peak Period Heuristic for Railway Rolling Stock Planning. *Transportation Science*, 53(3), 746-762, 2019.

[31] A. Bettinelli, V. Cacchiani, T. Crainic, D. Vigo. A Branch-and-Cut-and-Price Algorithm for the Multi-trip Separate Pickup and Delivery Problem with Time Windows at Customers and Facilities. *European Journal of Operational Research*, 279(3), 824-839, 2019.

[32] V. Cacchiani, J.J. Salazar-Gonzalez. Heuristic Approaches for Flight Retiming in an Integrated Airline Scheduling Problem of a Regional Carrier. *Omega*, 91, 102028, 2020.

[33] V. Cacchiani, J. Qi, L. Yang. Robust optimization models for integrated train stop planning and timetabling with passenger demand uncertainty. *Transportation Research Part B*, 136, 1-29, 2020.

[34] V. Cacchiani, C. Contreras-Bolton, P. Toth. Models and algorithms for the Traveling Salesman Problem with Time-dependent Service times. *European Journal of Operational Research*, 283(3), 825-843, 2020.

[35] V. Cacchiani, C. Contreras-Bolton, J. W. Escobar-Falcón, P. Toth. A matheuristic algorithm for the pollution and energy minimization traveling salesman problems. *International Transactions in Operational Research*, forthcoming DOI: 10.1111/itor.12991.

[36] J. Qi, V. Cacchiani, L. Yang, C. Zhang, Z. Di. An Integer Linear Programming model for integrated train stop planning and timetabling with time-dependent passenger demand. *Computers & Operations Research*, 136, 105484, 2021.

[37] G.J. Polinder, V. Cacchiani, M.E. Schmidt, D. Huisman. An iterative heuristic for passenger-centric train timetabling with integrated adaption times. *Computers & Operations Research*, 142, 105740, 2022.

[38] V. Cacchiani, M. Iori, A. Locatelli, S. Martello. Knapsack problems - An Overview of Recent Advances. Part I: Single Knapsack Problems. *Computers & Operations Research*, 143, 105692, 2022.

[39] V. Cacchiani, M. Iori, A. Locatelli, S. Martello. Knapsack problems - An Overview of Recent Advances. Part II: Multiple, Multidimensional, and Quadratic Knapsack Problems. *Computers & Operations Research*, 143, 105693, 2022.

Book Chapters

[40] V. Cacchiani, P. Toth P. Robust Train Timetabling. In: Borndörfer R., Klug T., Lamorgese L., Mannino C., Reuther M., Schlechte T. (eds) *Handbook of Optimization in the Railway Industry.* International Series in Operations Research & Management Science, vol 268, 93-115, Springer, 2018.

Proceedings of Refereed Conferences

[41] V. Cacchiani, A. Caprara, P.Toth. Freight Transportation in Railway Networks. *EURO Winter Institute on Location and Logistics*, A. Paias and F. Saldanha da Gama Eds. 62-80, 2007.

[42] V. Cacchiani, A. Caprara, P. Toth. Solving a Real-World Train Unit Assignment Problem. *ATMOS 2007*, C. Liebchen, R. K. Ahuja and J.A. Mesa Eds., 79-95, 2007.

[43] V. Cacchiani, A. Caprara, L. Galli, L. Kroon, G. Maroti, P. Toth. Recoverable Robustness for Railway Rolling Stock Planning. *ATMOS 2008*, M. Fischetti and P. Widmayer Eds., 2008.

[44] V. Cacchiani, A. E. Fernandes Muritiba, M. Negreiros, P. Toth. A Multi-start Heuristic Algorithm for the Generalized Traveling Salesman Problem. *Cologne-Twente Workshop 2008*, 136-138, 2008.

[45] V. Cacchiani, A. Caprara, P. Toth. Non-Cyclic Train Timetabling and Comparability Graphs. *INOC 2009*, 2009.

[46] V. Cacchiani, A. Caprara, M. Fischetti. Robustness in Train Timetabling. *Cologne-Twente Workshop 2009*, 171-174, 2009.

[47] V. Cacchiani, A. Caprara, P. Toth. Heuristic Algorithms for the Train Unit Assignment Problem. *Cologne-Twente Workshop 2010*, 33-36, 2010.

[48] E. Álvarez-Miranda, V. Cacchiani, T. Dorneth, M. Juenger, F. Liers, A. Lodi, T. Parriani, D. R. Schmidt. Models and Algorithms for Robust Network Design with Several Traffic Scenarios. ISCO 2012, A. R. Mahjoub et al. Eds. *LNCS 7422*, 261-272, 2012.

[49] V. Cacchiani, A. Caprara, P. Toth. Models and Algorithms for the Train Unit Assignment Problem. ISCO 2012, A. R. Mahjoub et al. Eds. *LNCS 7422*, 24-35, 2012.

[50] V. Cacchiani, A. Caprara, P. Toth. A Fast Heuristic Algorithm for the Train Unit Assignment Problem. *ATMOS 2012*, D. Delling and L. Liberti Eds., 1-9, 2012.

[51] V. Cacchiani, J.J. Salazar-Gonzalez. A Heuristic Approach for an Integrated Fleet-Assignment, Aircraft-Routing and Crew-Pairing Problem. INOC 2013, *Electronic Notes in Discrete Mathematics*, 41, 391-398, 2013.

[52] L.P. Veelenturf, M.P. Kidd, V. Cacchiani, L.G. Kroon, P. Toth. A macroscopic railway timetable rescheduling approach for handling large scale disruptions. *INFORMS Railway Applications Section*, 2013.

[53] A. Bettinelli, S. Bosio, V. Cacchiani. Heuristic Solutions to a Mailroom Inserting Machine Planning Problem. *Cologne-Twente Workshop 2015*, 2015.

[54] N. Besinovic, V. Cacchiani, T. Dollevoet, R.M.P. Goverde, D. Huisman, M. P. Kidd, L.G. Kroon, E. Quaglietta, J. Rodriguez, P. Toth, L. Veelenturf, J. Wagenaar. Integrated Decision Support Tools for Disruption Management. *Proceedings 6th International Conference on Railway Operations Modelling and Analysis (RailTokyo2015)*, Narashino, Japan, March 23-26, 2015.

[55] N. Besinovic, R. Roberti, E. Quaglietta, V. Cacchiani, P. Toth, R.M.P Goverde. Micro-Macro Approach to Robust Timetabling. *Proceedings 6th International Conference on Railway Operations Modelling and Analysis (RailTokyo2015)*, Narashino, Japan, March 23-26, 2015.

[56] R.M.P. Goverde, N. Besinovic, A. Binder, V. Cacchiani, E. Quaglietta, R. Roberti, P. Toth. A Three-Level Framework for Performance-Based Railway Timetabling. *Proceedings 6th International Conference on Railway Operations Modelling and Analysis (RailTokyo2015)*, Narashino, Japan, March 23-26, 2015.

[57] V. Cacchiani, F. Jiang, P. Toth. Timetable Optimization for High-Speed Trains at Chinese Railways. Cologne-Twente Workshop 2016, *Electronic Notes in Discrete Mathematics*, 55, 29-32, 2016.

[58] V. Cacchiani, J.J. Salazar-Gonzalez. Flight Retiming in an Integrated Airline Scheduling Problem. *TRISTAN 2016*, 2016.

[59] J. Qi, V. Cacchiani, L. Yang. Robust Train Timetabling and Stop Planning with Uncertain Passenger Demand. *Electronic Notes in Discrete Mathematics*, 69, 213-220, 2018.

[60] V. Cacchiani, C. Contreras-Bolton, J. W. Escobar, L. M. Escobar-Falcon, R. Linfati, P. Toth. An Iterated Local Search Algorithm for the Pollution Traveling Salesman Problem. In: Daniele P., Scrimali L. (eds) *New Trends in Emerging Complex Real Life Problems.* AIRO Springer Series, vol 1. Springer, 83-91, Cham, 2018.

[61] V. Cacchiani, C. Malandri, L. Mantecchini, F. Paganelli. A study on the optimal aircraft location for human organ transportation activities. *Transportation Research Procedia*, 30, 314-323, 2018.

[62] S. Mignardi, C. Buratti, V. Cacchiani, R. Verdone. Path Optimization for Unmanned Aerial Base Stations with Limited Radio Resources. *2018 IEEE 29th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, 328-332, 2018.

[63] V. Cacchiani, A. di Carmine, G. Lanza, M. Monaci, F. Naldini, L. Prezioso, R. Suffritti, D. Vigo, Energy-Efficient Train Control. In: Paolucci M., Sciomachen A., Uberti P. (eds) *Advances in Optimization and Decision Science for Society, Services and Enterprises.* AIRO Springer Series, vol 3. Springer, 57-68, Cham, 2019.

[64] S. Mignardi, K. Mikhaylov, V. Cacchiani, R. Verdone, C. Buratti. Unmanned Aerial Base Stations for NB-IoT: Trajectory Design and Performance Analysis. *2020 IEEE 31st Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, 1-6, 2020.

[65] N. Di Cicco, V. Cacchiani, C. Raffaelli. Scalable Multi-objective Optimization of Reliable Latency-constrained Optical Transport Networks. *2021 17th International Conference on the Design of Reliable Communication Networks (DRCN)*, 1-6, 2021.

[66] V. Cacchiani, S. Ceschia, S. Mignardi, C. Buratti. Metaheuristic algorithms for UAV trajectory optimization in mobile networks. *MIC 2022*, 1-15, 2022.

PhD Thesis

[67] V. Cacchiani. Models and Algorithms for Combinatorial Optimization Problems arising in Railway Applications. *PhD Thesis*, DEIS, University of Bologna, 2007.

Technical Reports

[68] A. Bettinelli, S. Bosio, V. Cacchiani. Solving a Real-World Mailroom Inserting Machine Planning Problem. *Technical Report OR-16-7, DEI, University of Bologna.*

Conference Talks

- V. Cacchiani, A. Caprara, P. Toth. A linear programming approach to the train timetabling problem. *XXXV AIRO Annual Conference*, Lecce, September 2004.
- V. Cacchiani, A. Caprara, P. Toth. A linear programming approach to the train timetabling problem. *IFORS 2005, Honolulu*, July 2005.
- V. Cacchiani, A. Caprara, P. Toth. An Integer Linear Programming Approach to a Traction Unit Assignment Problem. *XXXVI AIRO Annual Conference*, Camerino, September 2005.

- V. Cacchiani, A. Caprara, P. Toth. Solving a Real-World Train Unit Assignment Problem. *Informs Annual Meeting*, Pittsburgh, November 2006.
- V. Cacchiani, A. Caprara, P. Toth. Solving a Real-World Train Unit Assignment Problem. *11th Combinatorial Optimization Workshop*, Aussois, January 2007.
- V. Cacchiani, A. Caprara, P.Toth. Freight Transportation in Railway Networks. *EURO Winter Institute on Location and Logistics*, Estoril, February 2007.
- V. Cacchiani, A. Caprara, P. Toth. Freight transportation in railway networks. *XXXVIII AIRO Annual Conference*, Genova, September 2007.
- V. Cacchiani. Models and algorithms for combinatorial optimization problems arising in railway applications. *XXXVIII AIRO Annual Conference*, Genova, September 2007.
- V. Cacchiani, A. Caprara, P. Toth. Solving a Real-World Train Unit Assignment Problem. *ATMOS 2007 - 7th Workshop on Algorithmic Approaches for Transportation Modeling, Optimization, and Systems*, Seville, November 2007.
- V. Cacchiani, A. E. Fernandes Muritiba, M. Negreiros, P. Toth. A Multi-start Heuristic Algorithm for the Generalized Traveling Salesman Problem. *Cologne-Twente Workshop 2008*, Gargnano, May 2008.
- V. Cacchiani, A. Caprara, P. Toth. Non-cyclic Train Timetabling and Comparability Graphs. *XXXIX AIRO Annual Conference*, Ischia, September 2008.
- V. Cacchiani, A.E. Fernandes Muritiba, M. Negreiros, P. Toth. A Multi-start Heuristic Algorithm for the Generalized Traveling Salesman Problem. *AIRO Winter 2009*, Cortina, January 2009.
- V. Cacchiani, A. Caprara, P.Toth. Non-Cyclic Train Timetabling and Comparability Graphs. *INOC 2009 - International Network Optimization Conference 2009*, Pisa, April 2009.
- V. Cacchiani, A. Caprara, M. Fischetti. Robustness in Train Timetabling. *Cologne-Twente Workshop 2009*, Paris, June 2009.
- D. Bertsimas, V. Cacchiani, D. Craft, O. Nohadani. A Hybrid Approach to Beam Angle Optimization in Intensity-Modulated Radiation Therapy. *20th International Symposium on Mathematical Programming*, Chicago, August 2009.
- V. Cacchiani, A. Caprara, M. Fischetti. Robustness in Train Timetabling. *XL AIRO Annual Conference*, Siena, September 2009.
- V. Cacchiani, A. Caprara, M. Fischetti. A Lagrangian Heuristic for Robust Train Timetabling. *14th Combinatorial Optimization Workshop*, Aussois, January 2010.
- V. Cacchiani, A. Caprara, P. Toth. Heuristic Algorithms for the Train Unit Assignment Problem. *Cologne-Twente Workshop 2010*, Cologne, May 2010.
- V. Cacchiani, A. Caprara, M. Fischetti. A Lagrangian Heuristic for Robust Train Timetabling. *EURO XXIV*, Lisbon, July 2010.
- V. Cacchiani, A. Caprara, P. Toth. Heuristic Algorithms for the Train-Unit Assignment Problem. *IFORS 2011*, Melbourne, July 2011.
- V. Cacchiani, A. Caprara, P. Toth. A Fast Heuristic Algorithm for the Train-Unit Assignment Problem. *AIRO 2011*, Brescia, September 2011.
- V. Cacchiani, A. Caprara, P. Toth. Fixed Task Scheduling on Single-thread Processors, with Application to Train-Unit Assignment. *16th Combinatorial Optimization Workshop*, Aussois, January 2012.
- V. Cacchiani, A. Caprara, P. Toth. A Heuristic Algorithm for a Train-Unit Assignment Problem. *VeRoLog 2012*, Bologna, June 2012.
- V. Cacchiani, A. Caprara, P. Toth. Fixed Job Scheduling with Resource Constraints. *21th International Symposium on Mathematical Programming*, Berlin, August 2012.
- V. Cacchiani, A. Caprara, P. Toth. A Peak-Period based Heuristic Algorithm for the Train Unit Assignment Problem. *AIRO 2012*, Vietri sul Mare, September 2012.

- V. Cacchiani, A. Caprara, R. Roberti, P. Toth. A New Lower Bound for Curriculum-based Course Timetabling. *17th Combinatorial Optimization Workshop*, Aussois, January 2013.
- E. Álvarez-Miranda, V. Cacchiani, A. Lodi, T. Parriani, D. R. Schmidt. A Heuristic Algorithm for Single-Commodity Network Design with Uncertain Demands. *Optimization Tools for Next Generation Telecommunication Networks*, Vienna, March 2013.
- V. Cacchiani, J.J. Salazar-Gonzalez. A Heuristic Approach for an Integrated Fleet-Assignment, Aircraft-Routing and Crew-Pairing Problem. *INOC 2013*, Tenerife, May 2013.
- V. Cacchiani, J.J. Salazar-Gonzalez. Models and heuristic algorithms for an integrated fleet-assignment, aircraft-routing and crew-pairing problem. *EURO-INFORMS 2013*, Rome, July 2013.
- E. Álvarez-Miranda, V. Cacchiani, A. Lodi, T. Parriani, D. R. Schmidt. Single-Commodity Network Design Problem: Complexity, Instances and Heuristic Solutions. *IFORS 2014*, Barcelona, July 2014.
- A. Bettinelli, V. Cacchiani, E. Malaguti. Bounds and algorithms for the knapsack problem with conflict graph. *AIRO 2014*, Como, September 2014.
- V. Cacchiani, C. D'Ambrosio. A branch-and-bound algorithm for convex multi-objective Mixed Integer Non-Linear Programming Problems. *Recent Advances in Multi-Objective Optimization*, Vienna, September 2014.
- A. Bettinelli, S. Bosio, V. Cacchiani. Heuristic Solutions to a Mailroom Inserting Machine Planning Problem. *Cologne-Twente Workshop 2015*, Istanbul, May 2015.
- A. Bettinelli, S. Bosio, V. Cacchiani. Solving a Mailroom Inserting Machine Planning Problem. *EURO 2015*, Glasgow, July 2015.
- L.P. Veelenturf, M.P. Kidd, V. Cacchiani, L.G. Kroon, P. Toth. A railway timetable rescheduling approach for handling large scale disruptions. *AIRO 2015*, Pisa, September 2015.
- V. Cacchiani, F. Jiang, P. Toth. Timetable Planning of a High-Speed Chinese Railway Corridor. *Algorithmic Methods for Optimization in Public Transport 2016*, Dagstuhl, April 2016.
- V. Cacchiani, F. Jiang, P. Toth. Timetable Optimization for High-Speed Trains at Chinese Railways. *Cologne-Twente Workshop 2016*, Gargnano, June 2016.
- V. Cacchiani, J.J. Salazar-Gonzalez. Flight Retiming in an Integrated Airline Scheduling Problem. *TRISTAN 2016*, Aruba, June 2016.
- V. Cacchiani, F. Jiang, P. Toth. High Speed Train Timetable Planning for the Chinese Railways. *EURO 2016*, Poznan, July 2016.
- V. Cacchiani, J.J. Salazar-Gonzalez. Flight Retiming in an Integrated Airline Scheduling Problem. *AIRO 2016*, Trieste, September 2016.
- V. Cacchiani, C. Contreras-Bolton, P. Toth. Exact Algorithms for the Traveling Salesman Problem with Time-dependent Service Times. *VeRoLog 2017*, Amsterdam, July 2017.
- V. Cacchiani, F. Jiang, P. Toth. Train Timetabling and Stop Planning. *ODS 2017*, Sorrento, September 2017.
- V. Cacchiani, C. Contreras-Bolton, P. Toth. Algorithms for the Traveling Salesman Problem with Time-Dependent Service Times. *Odysseus 2018*, Cagliari, June 2018.
- V. Cacchiani, G.-J. Polinder, M. Schmidt, D. Huisman. Line planning and train timetabling using passenger demand data. *EURO 2018*, Valencia, July 2018.
- V. Cacchiani, G.-J. Polinder, M. Schmidt, D. Huisman. Line planning and train timetabling using passenger demand data. *ODS 2018*, Taormina, September 2018.
- V. Cacchiani, C. Contreras-Bolton, L. M. Escobar-Falcon, P. Toth. Algorithms for the Pollution Traveling Salesman Problem. *VeRoLog 2019*, Seville, June 2019.
- V. Cacchiani, J. Qi, L. Yang. Light Robustness for Handling Passenger Demand Uncertainty in Integrated Train Stop Planning and Timetabling. *EURO 2019*, Dublin, June 2019.

- V. Cacchiani, J. Qi, L. Yang. Light Robustness in Train Stop Planning and Timetabling with Uncertain Demand. *ODS 2019*, Genoa, September 2019.
- V. Cacchiani, P. Toth. A Fixed Job Schedule problem arising in Train-Unit assignment. *ECCO 2021*, Madrid (online), June 2021.
- V. Cacchiani, P. Toth. A Fixed Job Schedule Application in Train-unit Assignment. *ODS 2021*, Rome (online), September 2021.
- V. Cacchiani, D. Pettinari, E. Tresoldi. Public Transport Optimization: The MINOA Challenge (DEV Team). *Lange Nacht der Wissenschaften 2022*, Erlangen (online), May 2022.

Poster Sessions

- V. Cacchiani, A. Caprara, P. Toth. Non-Cyclic Train Timetabling and Comparability Graphs. *MIP 2006 Workshop on Mixed Integer Programming*, Miami, June 2006.
- V. Cacchiani, A. Caprara, P. Toth. An LP-based approach to the Train Unit Assignment Problem. *MIP 2007 Workshop on Mixed Integer Programming*, Montreal, July 2007.
- D. Bertsimas, T. Bortfeld, V. Cacchiani, D. Craft, O. Nohadani. A Hybrid Approach to Beam Angle Optimization in Intensity-Modulated Radiation Therapy. *MIP 2008 Workshop on Mixed Integer Programming*, New York, August 2008.
- V. Cacchiani, A. Caprara, P. Toth. Fixed task scheduling on single-thread processors, with application to train-unit assignment. *MIP 2012 Workshop on Mixed Integer Programming*, Davis, July 2012.

Languages

- Italian: mother tongue
- English: fluent: Cambridge Assessment English Level C1 Advanced

Updated June 2022