

# Ivana LJUBIC

Professeur

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## RESEARCH INTERESTS

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Operations Research, Scheduling, Queueing and Location Optimization, Mathematics, Supply

## EDUCATION

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| 2013 | Habilitation in Operations Research, University of Vienna, Austria   |
| 2004 | Ph.D. in Computer Science, Vienna University of Technology, Austria  |
| 2000 | Master of Science degree (MSc), Department for Optimization and Numerical Analysis, Faculty of Mathematics, University of Belgrade, Serbia |

## EMPLOYMENT

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### Full-time academic positions

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| 2016 - Present | Professor, ESSEC Business School, France  |
| 2015 - 2016    | Associate Professor, ESSEC Business School, France  |
| 2011 - 2015    | Ass./Assoc. Professor. ISOR, Faculty of Business, Economics and Statistics, University of Vienna, University of Vienna, Austria |
| 2007 - 2010    | Post-Doc Researcher & Lecturer, ISOR, University of Vienna, Austria   |
| 2000 - 2004    | Research and Teaching Assistant (PhD candidate), TU Vienna, Austria   |

### Other affiliations and appointments

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|-------------|---|
| 2017 - 2021 | Academic Director of the ESSEC & Mannheim EMBA program, ESSEC Business School, France   |
| 2016 - 2018 | Member of the Scientific Committee, ESSEC Business School, France                       |
| 2015 - 2015 | Visiting Professor, University Adolfo Ibáñez, Chile                                     |
| 2014 - 2014 | Visiting Professor, Université Paris Dauphine, France                                   |
| 2013 - 2015 | Member of the doctoral advisory board at ISOR, University of Vienna, Austria            |
| 2012 - 2013 | Visiting Researcher (APART Fellowship), COGA, TU Berlin, Germany                        |
| 2012 - 2012 | Visiting Researcher (APART Fellowship), Faculty of CS, TU Dortmund Universität, Germany |

2011 - 2012 Visiting Professor, University of Maryland, United States of America

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### Other professional experiences

2018 - 2019 Member of the "Task Force: future directions, strategy, evaluation", ESSEC Business School, France

## GRANTS AND HONORS

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### Awards and Honors

- 2016 Best Paper Award, INFORMS Telecommunications Conference 2016, for the paper "The Generalized Regenerator Location Problem, INFORMS Journal on Computing 27(2): 204 - 220, 2015, (coauthored with S. Chen, I. Ljubic, S. Raghavan)
- 2014 Winner of the DIMACS implementation challenge on Steiner trees (with M. Fischetti et al.)
- 2014 Finalist for the best paper award of the INFORMS Telecommunication Section (with L. Gouveia, M. Leitner)
- 2005 PhD award of Austrian Society for Operations Research, Austria

### Grants

- 2017 Co-applicant Prescriptive Analytics – Operations research, Initiative d'Excellence Paris Seine
- 2015 Co-PI Optimization and Analysis of Large-Scale Networks (ICT 2015) WWTF
- 2014 Co-applicant: e4-share: Models for Ecological, Economical, Efficient, Electric Car-Sharing, JPI Urban Europe
- 2014 Applicant and leader (PI): Network Optimization in Bioinformatics and Systems Biology, FWF
- 2012 Applicant and leader (PI) of the Austrian team: Multi-Criteria Optimization of FTTx Networks, (DACH programme, cooperation with the TU Wien and ZIB Berlin), FWF & DFG
- 2011 APART Fellowship of the Austrian Academy of Sciences, Austria
- 2011 Applicant and leader (PI): Network Design Under Uncertainty: Algorithmic Aspects of Stochastic and Robust Optimization (APART programme), OEAW
- 2011 Member of the graduate school in Computational Optimization (Initiativkolleg programme), University of Vienna
- 2010 Applicant and leader (PI) of the Austrian team: Flow Projection Results in Telecommunication: Models and Algorithms (Acciones Integradas programme, in cooperation with the University of La Laguna, Spain), OEAD (Austrian exchange service)
- 2007 Hertha-Firnberg Post-Doc Fellowship of the Austrian Science Fund, Austria
- 2007 Applicant and leader (PI): Algorithmic Solutions for Last-Mile Networks, (Hertha-Firnberg programme), FWF  
Applicant and leader (PI): Algorithmic Solutions for Last-Mile Networks, (Hertha-Firnberg programme), FWF

- 2007 Applicant and leader (one of two PIs): Algorithmic Solutions for Optimal Design of Telecommunication Networks, (Bridge programme, cooperation with Telekom Austria AG), FFG
- 2003 PhD Fellowship of Austrian Academy of Sciences, Austria
- 2003 Applicant and leader (PI): Combinatorial and Memetic Algorithms for Selected Network Design Problems (DOC programme). OEAW
- 2002 Doctoral Scholarship Programme of the OEAW (DOC Programme)

## PUBLICATIONS

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### Journal Articles

- ÁLVAREZ-MIRANDA, E., GOYCOOLEA, M., LJUBIC, I. and SINNL, M. (2021). The Generalized Reserve Set Covering Problem with Connectivity and Buffer Requirements. *European Journal of Operational Research*, 289(3), pp. 1013-1029.
- LJUBIC, I. (2021). Solving Steiner trees: Recent advances, challenges, and perspectives. *Networks*, 77(2), pp. 177-204.
- ALFANDARI, L., HASSANZADEH, A. and LJUBIC, I. (2021). An Exact Method for Assortment Optimization under the Nested Logit Model. *European Journal of Operational Research*, 291(3), pp. 830-845.
- FURINI, F., LJUBIC, I., SAN SEGUNDO, P. and ZHAO, Y. (2021). A branch-and-cut algorithm for the Edge Interdiction Clique Problem. *European Journal of Operational Research*, 294(1), pp. 54-69.
- LJUBIC, I., MOUACI, A., PERROT, N. and GOURDIN, E. (2021). Benders decomposition for a node-capacitated Virtual Network Function placement and routing problem. *Computers & Operations Research*, 130(105227).
- LEITNER, M., LJUBIC, I., RIEDLER, M. and RUTHMAIR, M. (2020). Exact Approaches for Network Design Problem with Relays. *Omega*, 91.
- LJUBIC, I., FURINI, F., MALAGUTI, E. and PARONUZZI, P. (2020). On Integer and Bilevel Formulations for the k-Vertex Cut Problem. *Mathematical Programming Computation*, 12, pp. 133-164.
- BRANDSTÄTTER, G., LEITNER, M. and LJUBIC, I. (2020). Location of Charging Stations in Electric Car Sharing Systems. *Transportation Science*, 54(5), pp. 1408-1438.
- GOUVEIA, L., LEITNER, M. and LJUBIC, I. (2020). A polyhedral study of the diameter constrained minimum spanning tree problem. *Discrete Applied Mathematics*, 285, pp. 364-379.
- CORDEAU, J.F., FURINI, F. and LJUBIC, I. (2019). Benders Decomposition for Very Large Scale Partial Set Covering and Maximal Covering Location Problems. *European Journal of Operational Research*, 275(3), pp. 882-896.
- ALFANDARI, L., DAVIDOVIC, T., FURINI, F., LJUBIC, I., MARAS, V. and MARTIN, S. (2019). Tighter MIP formulations for Barge Container Ship Routing. *Omega*, 82, pp. 38-54.
- FURINI, F., LJUBIC, I., MARTIN, S. and SAN SEGUNDO, P. (2019). The Maximum Clique Interdiction Problem. *European Journal of Operational Research*, 277(1), pp. 112-127.

- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNI, M. (2019). Interdiction Games and Monotonicity, with Application to Knapsack Problems. *INFORMS Journal on Computing*, 31(2), pp. 390-410.
- ARULSELVAN, A., BLEY, A. and LJUBIC, I. (2019). The Incremental Connected Facility Location Problem. *Computers & Operations Research*, 112.
- SAN SEGUNDO, P., CONIGLIO, S., FURINI, F. and LJUBIC, I. (2019). A new branch-and-bound algorithm for the maximum edge-weighted clique problem. *European Journal of Operational Research*, 278(1), pp. 76-90.
- LEITNER, M., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2018). A Dual Ascent-Based Branch-and-Bound Framework for the Prize-Collecting Steiner Tree and Related Problems. *INFORMS Journal on Computing*, 30(2), pp. 402-420.
- LEITNER, M., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2018). Decomposition Methods for the Two-Stage Stochastic Steiner Tree Problem. *Computational Optimization and Applications*, 69(3), pp. 713-752.
- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2018). On the Use of Intersection Cuts for Bilevel Optimization. *Mathematical Programming*, 172(1-2), pp. 77-103.
- LJUBIC, I. and MORENO, E. (2018). Outer Approximation and Submodular Cuts for Maximum Capture Facility Location Problems with Random Utilities. *European Journal of Operational Research*, 266(1), pp. 46-56.
- LEITNER, M., LJUBIC, I., SALAZAR-GONZALEZ, J.J. and SINNL, M. (2018). The Connected Facility Location Polytope. *Discrete Applied Mathematics*, 234, pp. 151-167.
- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2017). A New General-Purpose Algorithm for Mixed-Integer Bilevel Linear Programs. *Operations Research*, 65(6), pp. 1615-1637.
- BLEY, A., LJUBIC, I. and MAURER, O. (2017). A Node-Based ILP Formulation for the Node-Weighted Dominating Steiner Problem. *Networks*, 69(1), pp. 33-51.
- LEITNER, M., LJUBIC, I., SALAZAR-GONZALEZ, J.J. and SINNL, M. (2017). An Algorithmic Framework for the Exact Solution of Tree-Star Problems. *European Journal of Operational Research*, 1(261), pp. 54-66.
- FURINI, F., LJUBIC, I. and SINNL, M. (2017). An Effective Dynamic Programming Algorithm for the Minimum-Cost Maximal Knapsack Packing Problem. *European Journal of Operational Research*, 262(2), pp. 438-448.
- FISCHETTI, M., LJUBIC, I. and SINNL, M. (2017). Redesigning Benders Decomposition for Large-Scale Facility Location. *Management Science*, 63(7), pp. 2146-2162.
- ÁLVAREZ-MIRANDA, E., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2017). Solving Minimum-Cost Shared Arborescence Problems. *European Journal of Operational Research*, 258(3), pp. 887-901.
- LJUBIC, I., MUTZEL, P. and ZEY, B. (2017). Stochastic Survivable Network Design Problems: Theory and Practice. *European Journal of Operational Research*, 256(2), pp. 333-348.
- FISCHETTI, M., LEITNER, M., LJUBIC, I., LUIPERSBECK, M., MONACI, M. and RESCH, M. (2017). Thinning out Steiner Trees: A Node-Based Model for Uniform Edge Costs. *Mathematical Programming Computation*, 9(2), pp. 203-229.

- EHRGOTT, M., LJUBIC, I. and PARRAGH, S.N. (2017). Feature cluster: Recent advances in exact methods for multi-objective optimisation. *European Journal of Operational Research*, 260(3), pp. 805-806.
- SINNL, M. and LJUBIC, I. (2016). A Node-Based Layered Graph Approach for the Steiner Tree Problem with Revenues, Budget and Hop-Constraints. *Mathematical Programming Computation*, 8(4), pp. 461–490.
- FICHETTI, M., LJUBIC, I. and SINNL, M. (2016). Benders Decomposition without Separability: A Computational Study for Capacitated Facility Location Problems. *European Journal of Operational Research*, 253(3), pp. 557-569.
- LEITNER, M., LJUBIC, I., SINNL, M. and WERNER, A. (2016). ILP Heuristics and a New Exact Method for Bi-Objective 0/1 ILPs: Application to FTTx-Network Design. *Computers & Operations Research*, 72, pp. 128-146.
- LEITNER, M., LJUBIC, I., SALAZAR-GONZÁLEZ, J.J. and SINNL, M. (2016). The Connected Facility Location Polytope. *Discrete Applied Mathematics*, 234, pp. 151-167.
- ÁLVAREZ-MIRANDA, E., FERNÁNDEZ, E. and LJUBIC, I. (2015). The Recoverable Robust Facility Location Problem. *Transportation Research - Part B: Methodological*, 79(1), pp. 93-120.
- CHEN, S., LJUBIC, I. and RAGHAVAN, S. (2015). The Generalized Regenerator Location Problem. *INFORMS Journal on Computing*, 27(2), pp. 204-220.
- GOUVEIA, L., LEITNER, M. and LJUBIC, I. (2015). The Two-Level Diameter Constrained Spanning Tree Problem. *Mathematical Programming*, 150(1), pp. 49-78.
- LJUBIC, I., PUTZ, P. and SALAZAR-GONZALEZ, J.J. (2014). A MIP-based Heuristic Approach to solve a Prize-Collecting Local Access Network Design Problem. *European Journal of Operational Research*, 235(3), pp. 727-739.
- GOUVEIA, L., LEITNER, M. and LJUBIC, I. (2014). Hop constrained Steiner trees with multiple root nodes. *European Journal of Operational Research*, 236(1), pp. 100-112.
- LEITNER, M., LJUBIC, I. and SINNL, M. (2014). The bi-objective prize-collecting Steiner tree problem. *INFORMS Journal on Computing*, 27(1), pp. 118-134.
- ÁLVAREZ-MIRANDA, E., LJUBIC, I. and RAGHAVAN, S. (2014). The Recoverable Robust Two-Level Network Design Problem. *INFORMS Journal on Computing*, 27(1), pp. 1-19.
- GOLLOWITZER, S., GENDRON, B. and LJUBIC, I. (2013). A cutting plane algorithm for the Capacitated Connected Facility Location Problem. *Computational Optimization and Applications*, 55(3), pp. 647-674.
- ALVAREZ-MIRANDA, E., LJUBIC, I. and TOTH, P. (2013). A note on the Bertsimas & Sim algorithm for robust combinatorial optimization problems. *4OR: A Quarterly Journal of Operations Research*, 11(4), pp. 349-360.
- GOLLOWITZER, S., GOUVEIA, L. and LJUBIC, I. (2013). Enhanced Formulations and Branch-and-Cut for the Two Level Network Design Problem with Transition Facilities. *European Journal of Operational Research*, 225(2), pp. 211-222.
- ALVAREZ-MIRANDA, E., LJUBIC, I. and TOTH, P. (2013). Exact Approaches for Solving Robust Prize-Collecting Steiner Tree Problems, *European Journal of Operational Research*. *European Journal of Operational Research*, 229(3), pp. 599-612.
- BLEY, A., LJUBIC, I. and MAURER, O. (2013). Lagrangian decompositions for the two-level FTTx network design problem. *Computational Optimization and Applications*, 1(3), pp. 221-252.

- LJUBIC, I., PUTZ, P. and SALAZAR-GONZALEZ, J.J. (2012). Exact approaches to the single-source network loading problem. *Networks*, 59(1), pp. 89-106.
- LJUBIC, I. and GOLLOWITZER, S. (2012). Layered Graph Approaches to the Hop Constrained Connected Facility Location Problem. *INFORMS Journal on Computing*, 25(2), pp. 256-270.
- FROMMLET, F., LJUBIC, I., BJÖRK ARNARDÓTTIR, H. and BOGDAN, M. (2012). QTL Mapping Using a Memetic Algorithm with Modifications of BIC as Fitness Function. *Statistical Applications in Genetics and Molecular Biology*, 11(4).
- GOLLOWITZER, S. and LJUBIC, I. (2011). MIP models for connected facility location: A theoretical and computational study. *Computers & Operations Research*, 38(2), pp. 435-449.
- LJUBIC, I. (2010). A branch-and-cut-and-price algorithm for vertex-biconnectivity augmentation. *Networks*, 56(3), pp. 169-182.
- CHIMANI, M., KANDYBA, M., LJUBIC, I. and MUTZEL, P. (2010). Orientation-based models for  $\{0,1,2\}$ -survivable network design: theory and practice. *Mathematical Programming*, 124(1), pp. 413-440.
- LJUBIC, I. and CHEN, S. (2010). The regenerator location problem. *Networks*, 55(3), pp. 205-220.
- LJUBIC, I., CHIMANI, M., KANDYBA, M. and MUTZEL, P. (2009). Obtaining optimal k-cardinality trees fast. *ACM Journal of Experimental Algorithmics (JEA)*, 14(5), pp. 5.1-5.23.
- LJUBIC, I., WEISKIRCHER, R., PFERSCHY, U., KLAU, G., MUTZEL, P. and FISCHETTI, M. (2006). An Algorithmic Framework for the Exact Solution of the Prize-Collecting Steiner Tree Problem. *Mathematical Programming*, 105(2), pp. 427-449.
- LJUBIC, I. and RAIDL, G.R. (2003). A Memetic Algorithm for Minimum-Cost Vertex-Biconnectivity Augmentation of Graphs. *Journal of Heuristics*, 9(5), pp. 401-428.
- RAIDL, G.R. and LJUBIC, I. (2002). Evolutionary Local Search for the Edge-Biconnectivity Augmentation Problem. *Information Processing Letters*, 82(1), pp. 39-45.
- LJUBIC, I., TOŠIĆ, D., FILIPOVIC, V. and KRATICA, J. (2001). Solving the simple plant location problem by genetic algorithms. *RAIRO - Operations Research*, 35(1), pp. 127-142.

### Books and book editor

- LJUBIC, I., DOERNER, K., TRAGLER, G. and PFLUG, G. [Eds] (2016). *Operations Research Proceedings 2015*. Springer.

### Book chapters

- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2016). Integer Programming and Combinatorial Optimization. In: *Intersection Cuts for Bilevel Optimization*. 1st ed. Springer, pp. 77-88.
- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2016). Intersection Cuts for Bilevel Optimization. In: *Integer Programming and Combinatorial Optimization*. 1st ed. Berlin: Springer Computer Science, pp. 77-88.
- LJUBIC, I., ALVAREZ-MIRANDA, E. and MUTZEL, P. (2013). The Maximum Weight Connected Subgraph Problem. In: *Facets of Combinatorial Optimization*. 1st ed. Springer, pp. 245-270.
- LJUBIC, I. (2007). A Hybrid VNS for Connected Facility Location. In: Thomas Bartz-Beielstein, María José Blesa Aguilera, Christian Blum, Boris Naujoks, Andrea Roli, Günter Rudolph, Michael Sampels eds. *Hybrid Metaheuristics*. 1 ed. Springer Berlin Heidelberg, pp. 157-169.

KLAU, G.W., LJUBIC, I., MOSER, A., MUTZEL, P., NEUNER, P., PFERSCHY, U. and WEISKIRCHER, R. (2004). Combining a Memetic Algorithm with Integer Programming to Solve the Prize-Collecting Steiner Tree Problem. In: Kalyanmoy Deb (ed.). *Genetic and Evolutionary Computation – GECCO 2004*. 1 ed. Springer Berlin Heidelberg, pp. 1304-1315.

KRATICA, J., LJUBIC, I. and TOŠIĆ, D. (2003). A Genetic Algorithm for the Index Selection Problem. In: Stefano Cagnoni, Colin G. Johnson, Juan J. Romero Cardalda, Elena Marchiori, David W. Corne, Jean-Arcady Meyer, Jens Gottlieb, Martin Middendorf, Agnès Guillot, Günther R. Raidl, Emma Hart eds. *Applications of Evolutionary Computing*. 1 ed. Springer Berlin Heidelberg, pp. 280-290.

KERSTING, S., RAIDL, G.R. and LJUBIC, I. (2002). A Memetic Algorithm for Vertex-Biconnectivity Augmentation. In: Stefano Cagnoni, Jens Gottlieb, Emma Hart, Martin Middendorf, Günther R. Raidl eds. *Applications of Evolutionary Computing*. 1 ed. Springer Berlin Heidelberg, pp. 102-111.

LJUBIC, I., RAIDL, G.R. and KRATICA, J. (2000). A Hybrid GA for the Edge-Biconnectivity Augmentation Problem. In: Marc Schoenauer, Kalyanmoy Deb, Günther Rudolph, Xin Yao, Evelyne Lutton, Juan Julian Merelo, Hans-Paul Schwefel eds. *Parallel Problem Solving from Nature PPSN VI*. 1 ed. Springer Berlin Heidelberg, pp. 641-650.

### Guest editor of a journal special issue

LJUBIC, I., FURINI, F. and TRAVERSI, E. (2020). Special issue on “Decomposition Methods for Hard Optimization Problems”. *Annals of Operations Research*, 284(2).

EHRGOTT, M., LJUBIC, I. and PARRAGH, S.N. (2017). European Journal of Operational Research. *European Journal of Operational Research*, 260(3).

DOERNER, K., LJUBIC, I., PFLUG, G. and TRAGLER, G. (2017). Operations Research Proceedings 2015 ISSN: 0721-5924. *Operations Research Proceedings*.

### Conference proceedings

FURINI, F., LJUBIC, I. and SINNL, M. (2015). ILP and CP Formulations for the Lazy Bureaucrat Problem. In: *CPAIOR 2015, LNCS*.

LEITNER, M., LJUBIC, I., SALAZAR-GONZALEZ, J.J. and SINNL, M. (2014). On the Asymmetric Connected Facility Location Polytope. In: *ISCO 2014*. Springer, pp. 371-383.

ÁLVAREZ-MIRANDA, E., LJUBIC, I. and MUTZEL, P. (2013). The Rooted Maximum Node-Weight Connected  $\tau$  Subgraph Problem. In: *CPAIOR 2013*. Springer, pp. 300-315.

LJUBIC, I., MUTZEL, P. and ZEY, B. (2013). Stochastic survivable network design problems. In: *Proceedings of INOC 2013*. Electronic Notes in Discrete Mathematics (ENDM), pp. 245–252.

LEITNER, M., LJUBIC, I., SINNL, M. and WERNER, A. (2013). On the two-architecture connected facility location problem. In: *Proceedings of INOC 2013*. Electronic Notes in Discrete Mathematics (ENDM), pp. 359-366.

LEITNER, M., LJUBIC, I. and SINNL, M. (2013). Solving the bi-objective prize-collecting Steiner tree problem with the e-constraint method. In: *Proceedings of INOC 2013*. Electronic Notes in Discrete Mathematics (ENDM), pp. 181-188.

GOUVEIA, L., LEITNER, M. and LJUBIC, I. (2012). On the hop constrained Steiner tree problem with multiple root nodes. In: *Proceedings of the 2nd International Symposium on Combinatorial Optimization*. Springer, pp. 201-212.

GOLLOWITZER, S., GOUVEIA, L. and LJUBIC, I. (2012). Variable neighborhood search for solving the balanced location problem. In: *Proceedings of EUROMC XXVIII VNS*. Electronic Notes in Discrete Mathematics (ENDM), pp. 21-28.

ÁLVAREZ-MIRANDA, E., LJUBIC, I. and TOTH, P. (2011). Exact solutions for the robust prize-collecting Steiner tree problem. In: *ICUMT 2011, Budapest, Hungary, Proceedings*. Institute of Electrical and Electronics Engineers (IEEE), pp. 1-7.

ARULSELVAN, A., LJUBIC, I., BLEY, A., GOLLOWITZER, S. and MAURER, O. (2011). MIP modeling of incremental connected facility location. In: *Proceedings of INOC 2011*. Springer, pp. 490-502.

LJUBIC, I., PUTZ, P. and SALAZAR-GONZALEZ, J.J. (2011). A heuristic algorithm for a prize-collecting local access network design problem. In: *Proceedings of INOC 2011*. Springer, pp. 139-144.

GOLLOWITZER, S., LJUBIC, I. and GOUVEIA, L. (2011). A node splitting technique for two level network design problems with transition nodes. In: *Proceedings of INOC 2011*. Springer, pp. 57-70.

BOMZE, I.M., LJUBIC, I., CHIMANI, M., JÜNGER, M., MUTZEL, P. and ZEY, B. (2010). Solving two-stage stochastic Steiner tree problems by two-stage branch-and-cut. In: *Proceedings of the 21st International Symposium on Algorithms and Computation (ISAAC 2010)*. Springer, pp. 427-439.

LJUBIC, I. and GOLLOWITZER, S. (2010). Modelling the hop constrained connected facility location problem on layered graphs. In: *Proceedings of the International Symposium on Combinatorial Optimization (ISCO) 2010*. Electronic Notes in Discrete Mathematics (ENDM), pp. 207-214.

CHIMANI, M., LJUBIC, I., KANDYBA, M. and MUTZEL, P. (2008). Strong formulations for 2-node-connected Steiner network problems. In: *Combinatorial Optimization and Applications, Second International Conference, COCOA*. Springer, pp. 190-200.

TOMAZIC, A. and LJUBIC, I. (2008). A GRASP algorithm for the connected facility location problem. In: *IEEE/IPSJ International Symposium on Applications and the Internet*. Institute of Electrical and Electronics Engineers (IEEE), pp. 257-260.

CHIMANI, M., KANDYBA, M., LJUBIC, I. and MUTZEL, P. (2008). Obtaining optimal k-cardinality trees fast. In: *ALENEX*. SIAM, pp. 27-36.

LJUBIC, I., WEISKIRCHER, R., PFERSCHY, U., KLAU, G., MUTZEL, P. and FISCHETTI, M. (2005). Solving the prize-collecting Steiner tree problem to optimality. In: *ALENEX/ANALCO*. SIAM, pp. 68-76.

KLAU, G., LJUBIC, I., MUTZEL, P., PFERSCHY, U. and WEISKIRCHER, R. (2003). The fractional prize collecting Steiner tree problem on trees: Extended abstract. In: *ESA*. Springer, pp. 691-702.

## Conferences

FURINI, F., LJUBIC, I., SAN SEGUNDO, P. and ZHAO, Y. (2021). The Edge Interdiction Clique Problem. In: *31st European Conference on Operational Research 2021*. Athens (virtual).

ALFANDARI, L., LJUBIC, I. and DE MELO DA SILVA, M. (2021). A tailored Benders Decomposition Approach for Last-Mile Delivery With autonomous Robots. In: *31st European Conference on Operational Research 2021 (EURO 2021)*. Athenes.

ARCHETTI, C. and LJUBIC, I. (2021). Aggregated Formulations for the Inventory Routing Problem. In: *2021 Optimization in Artificial Intelligence and Data Sciences (ODS)*. Rome.

ALFANDARI, L., HASSANZADEH, A. and LJUBIC, I. (2020). Une méthode exacte pour le problème d'assortiment optimal avec modèle de choix nested-logit. In: *21st ROADEF 2020*.



- LEITNER, M., LJUBIC, I., RIEDLER, M. and RUTHMAIR, M. (2020). Two Branch-and-cut Algorithms for the Directed Network Design Problem with Relays. In: 15th INFORMS Telecommunications and Network Analytics Conference.
- LJUBIC, I. (2020). Branch-and-Benders-cut algorithms: modern implementations of Benders Decomposition, (Invited Tutorial), In: 9th Winter School on Network Optimization (NetOpt2020). Estoril.
- LJUBIC, I., FURINI, F., MALAGUTI, E. and PARONUZZI, P. (2020). New Integer and Bilevel Formulations for the k-Vertex Cut Problem. In: 22ème séminaire du groupe Polyèdres et Optimisation Combinatoire (POC). Online.
- LJUBIC, I. (2020). Branch-and-Cut Solvers for Mixed-Integer Bilevel Linear Programs. In: Autumn School on Bilevel Optimization. Online.
- LJUBIC, I. (2019). New Branch-and-Cut Algorithms for Mixed-Integer Bilevel Linear Programs. In: Séminaire Parisien d'Optimisation.
- FURINI, F., LJUBIC, I., MALAGUTI, E. and PARONUZZI, P. (2019). On Integer and Bilevel Formulations for the k-Vertex Cut Problem. In: 2019 International Network Optimization Conference (INOC 2019).
- ALFANDARI, L., LJUBIC, I. and MELO, M. (2019). Optimal Vehicle Routing with Autonomous Devices for Last-Mile Delivery. In: 2019 Workshop of the EURO Working Group on Vehicle Routing and Logistics optimization (VeRoLog 2019).
- FURINI, F., LJUBIC, I., MALAGUTI, E. and PARONUZZI, P. (2019). A New Bilevel Approach for the K-vertex Cut Problem. In: 2019 INFORMS Annual Meeting.
- FURINI, F., LJUBIC, I., MARTIN, S. and SAN SEGUNDO, P. (2018). Analyzing the Resilience of the Networks with respect to Vertex-Interdiction Attacks. In: 2018 Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting.
- CORDEAU, J.F., FURINI, F. and LJUBIC, I. (2018). Benders Decomposition for Covering Location Problems. In: 29th European Conference on Operations Research.
- CORDEAU, J.F., FURINI, F. and LJUBIC, I. (2018). Decomposition Approaches to Covering Location Problems. In: 23rd International Symposium on Mathematical Programming (ISMP) 2018.
- LJUBIC, I. (2018). Exact General-Purpose Solvers for Mixed-Integer Bilevel Linear Programs. In: 37ème Journée Francilienne de Recherche Opérationnelle (JFRO).
- ARULSELVAN, A., BLEY, A. and LJUBIC, I. (2018). MIP Modeling of Incremental Connected Facility Location. In: 14th Institute for Operations Research and the Management Sciences (INFORMS) Telecommunications Conference.
- ALFANDARI, L., DAVIDOVIC, T., FURINI, F., LJUBIC, I., MARAS, V. and MARTIN, S. (2018). New MIP models for liner shipping route design with empty container repositioning. In: 4th International Conference on Logistics Operations Management (GOL'2018).
- LEITNER, M., LJUBIC, I., RUTHMAIR, M. and RIEDLER, M. (2018). The Directed Network Design Problem with Relays. In: 7th International Workshop on Freight Transportation and Logistics 2018.
- LJUBIC, I. (2017). A Branch-and-Cut Algorithm for Mixed Integer Bilevel Optimization. In: 21st Combinatorial Optimization Workshop.
- LEITNER, M., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2017). A Dual-Ascent-Based Branch-And-Bound Framework for the Prize-Collecting Steiner Tree and Related Problems. In: Journées Polyèdres et Optimisation Combinatoire JPOC10.

- LJUBIC, I., FURINI, F., MARTIN, S. and SAN SEGUNDO, P. (2017). Clique Interdiction in the Social Network Analysis. In: International Conference on Network Optimization) INOC 2017.
- LEITNER, M., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2017). Decomposition Methods for Stochastic Steiner Trees. In: 2017 European Conference on Stochastic Optimization (ECSO 2017).
- ALFANDARI, L., FURINI, F., LJUBIC, I. and MARTIN, S. (2017). New MIP models for Liner Shipping Route Design with Empty Container Repositioning. In: 18ème Conférence ROADEF de la Société Française de Recherche Opérationnelle et d'Aide à la Décision.
- LJUBIC, I., FURINI, F., MARTIN, S. and SAN SEGUNDO, P. (2017). On Click Interdiction Problems in Graphs. In: 18ème édition du congrès annuel de la Société Française de Recherche Opérationnelle et d'Aide à la Décision, ROADEF2017.
- LJUBIC, I. and MORENO, E. (2017). Outer Approximation and Submodular Cuts for Maximum Capture Facility Location Problems with Random Utilities. In: Optimization 2017 Conference.
- LJUBIC, I. (2017). Recent Developments on Exact Solvers for the (Prize-Collecting) Steiner Tree Problem. In: 22nd edition of the COMEX Belgian Mathematical Optimization Workshop. La-Roches-en-Ardenne.
- ALFANDARI, L., DAVIDOVIC, T., FURINI, F., LJUBIC, I., MARAS, V. and MARTIN, S. (2017). Tighter MIP Formulations for the Barge Container Ship Routing Problem. In: 21st Conference of the International Federation of Operational Research Societies (IFORS).
- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2016). A New Exact Solver for Mixed-Integer Bilevel Linear Programs Based on Intersection Cuts. In: International Colloquium on Graphs and Optimization 2016 (GO X 2016).
- LEITNER, M., LJUBIC, I., RIEDLER, M. and RUTHMAIR, M. (2016). Exact Approaches for Network Design Problems with Relays. In: 4th International Symposium on Combinatorial Optimization (ISCO 2016).
- FISCHETTI, M., LJUBIC, I. and SINNL, M. (2016). Generalized Benders Cuts for Congested Facility Location. In: 9th Triennial Symposium on Transportation Analysis (TRISTAN16).
- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2016). Interdiction Games and Monotonicity. In: PGMO Days 2016.
- FISCHETTI, M., LJUBIC, I., MONACI, M. and SINNL, M. (2016). Intersection Cuts for Mixed-Integer Bilevel Linear Programs. In: 28th European Conference on Operational Research.
- FISCHETTI, M., LJUBIC, I. and SINNL, M. (2016). Solving Congested Facility Location by Branch-and-Cut. In: 17eme Congrès Annuel de la Société Française de Recherche Opérationnelle et d'Aide à la Décision (ROADEF 2016).
- LJUBIC, I., ALVAREZ-MIRANDA, E., LUIPERSBECK, M. and SINNL, M. (2016). Solving Minimum cost Shared Arborescence Problems. In: Thirteenth INFORMS Telecommunications Conference.
- ÁLVAREZ-MIRANDA, E., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2016). Solving Minimum-Cost Shared Arborescence Problems. In: 28th European Conference on Operational Research.
- LEITNER, M., LJUBIC, I., LUIPERSBECK, M. and SINNL, M. (2016). Solving Minimum-Cost Shared Arborescence Problems. In: INFORMS Telecommunications Conference 2016.
- CHEN, S., LJUBIC, I. and RAGHAVAN, S. (2016). The Generalized Regenerator Location Problem. In: 13th INFORMS Telecommunications Conference 2016.

- LJUBIC, I., LEITNER, M., RUTHMAIR, M. and RIEDLER, M. (2015). Exact Approaches to the Network Design Problem with Relays. In: OR2015: International Conference on Operations Research.
- LJUBIC, I. (2015). On Benders Decomposition for Facility Location. In: 9ème Journée d'Automne d'Optimisation dans les Réseaux, ROADEF GT d'Optimisation des Réseaux, Institut Henri
- LJUBIC, I. (2015). Exact Approaches to the Network Design Problem with Relays. In: Laboratoire d'informatique de Paris Nord. Paris.
- LJUBIC, I. (2015). The diameter constrained minimum spanning tree problem: Polyhedral study, 2. In: Encontro do Centro de Investigação Operacional, University of Lisbon. Lisbon.
- LJUBIC, I. (2015). A polyhedral study of the diameter constrained minimum spanning tree problem. In: Seminario conjunto ACGO y Matemáticas Discretas, Center of Mathematical Modeling. Santiago.
- LJUBIC, I. (2014). The Recoverable Robust Facility Location Problem. In: Graz Discrete Mathematics and Optimization Seminar, TU Graz. Graz.
- LJUBIC, I. (2013). The Maximum Weight Connected Subgraph Problem: Applications in Bioinformatics. In: The Centre for Bioinformatics, Biomarker Discovery and Information-Based Medicine (CIBM), University of Newcastle. Newcastle.
- LJUBIC, I. (2012). Solving 2-Stage Stochastic Network Design Problems by 2-Stage Branch- and-Cut. In: Seminarios CIO, Centro de Investigacao Operacional, Faculdade de Ciencias, Universidade de Lisboa. Lisboa.
- LJUBIC, I. (2012). Optimization Tools for Last Mile Access Networks. In: Colloquium of the Computer Science Department, Faculty of Mathematics and Natural Sciences. Cologne.
- LJUBIC, I. (2012). The Recoverable Robust Two-Level Network Design Problem. In: Kolloquium Optimierung und Operations Research der Wirtschafts- und Sozialwissenschaften, der Fakultät für Informatik und der Fakultät für Mathematik, TU Dortmund. Dortmund.
- LJUBIC, I. (2012). Solving Two-Stage Stochastic Steiner Tree Problems by Two-Stage Branch-and-Cut. In: Department of Decision Sciences, I2SDS Seminar, George Washington University. Washington DC.
- LJUBIC, I. (2011). The Generalized Regenerator Location Problem. In: Decision, Operations and Information Technologies Seminar, University of Maryland. Maryland.
- LJUBIC, I. (2010). Dissaggregated Flow Formulation for the Single-Source Network-Loading Problem. In: COGA, TU Berlin.
- LJUBIC, I. (2010). OptTelNets: Algorithmische Ansätze. In: COGA, TU Berlin. Berlin.
- LJUBIC, I. (2010). Two-Stage Branch & Cut for Two-Stage Stochastic Network Design Problems. In: Algorithm Engineering Seminar, Schloss Dagstuhl.
- LJUBIC, I. (2007). Connected facility location in the design of telecommunication networks. In: ISDS-Kolloquium, University of Vienna. Vienna.
- LJUBIC, I. (2006). Optimization in Telecommunication Networks: Multicommodity Flow, Facility Location and Steiner Tree Problems. In: CI-Colloquium, Sonderforschungsbereich Computational Intelligence, University of Dortmund. Dortmund.

### Invited speaker

LJUBIC, I. (2021). New Integer and Bilevel Formulations for the k-Vertex Cut Problem, In: 5th AIRO Young Workshop. Napoli (online).

LJUBIC, I., FURINI, F., MALAGUTI, E. and PARONUZZI, P. (2020). Casting Light on the Hidden Bilevel Combinatorial Structure of the Capacitated Vertex Separator Problem. In: Mixed Integer Programming Workshop 2020 Online Edition.

LJUBIC, I. (2018). Recent Developments on Exact Solvers for the (Prize-Collecting) Steiner Tree Problem (Invited Tutorial). In: Winter School on Network Optimization NetOpt2018.

LJUBIC, I. (2015). On optimal design of charging stations for electric vehicles. In: PGMO Seminar, École Polytechnique. Paris.

LJUBIC, I. (2015). MIP Approaches to the Lazy Bureaucrat and Greedy Boss Problems. In: Séminaire Pôle 2 Optimisation Combinatoire, University Paris Dauphine. Paris.

LJUBIC, I. (2015). A New Modeling Concept for Facility Location Under Uncertainty. In: Seminar of the Operations Group, Universidad Adolfo Ibanez. Santiago.

### Prefaces of a journal

FURINI, F., LJUBIC, I. and TRAVERSI, E. (2020). Preface: decomposition methods for hard optimization problems. *Annals of Operations Research*, 284(2), pp. 483–485.

EHRGOTT, M., LJUBIC, I. and PARRAGH, S.N. (2017). EDITORIAL: Feature Cluster: Recent Advances in Exact Methods for Multi-Objective Optimization. *European Journal of Operational Research*, 260(3), pp. 805-806.

### Working Papers

ALFANDARI, L., ARCHETTI, C., LJUBIC, I. and DELLE DONNE, D. (2021). *Freight-on-Transit for urban last-mile deliveries: A Strategic Planning Approach*. 2104, ESSEC Business School.

ALFANDARI, L., LJUBIC, I. and DE MELO DA SILVA, M. (2019). *Onlast-mile Delivery with Autonomous Robots*. ESSEC Business School.

### Press

ALFANDARI, L., LJUBIC, I. and ARCHETTI, C. (2021). Sustainable city logistics. *ESSEC Knowledge*.

## OTHER RESEARCH ACTIVITIES

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### Associate Editor

Since 2021    Transportation Science

Since 2019    Networks

Since 2017    Journal of Global Optimization

Since 2016    Omega

### Editorial Board Membership

Since 2018    European Journal of Operational Research

Since 2016    Computers & Operations Research

### Ad-hoc reviewer for :

4OR: A Quarterly Journal of Operations Research, Annals of Operations Research, Computational Management Science, Computational Optimization and Applications, Computers & Operations Research, Discrete Applied Mathematics, Discrete Optimization, European Journal of Operational Research, European Journal on Computational Optimization, Evolutionary Computation, IEEE Transactions on Evolutionary Computation, IIE Transactions, INFOR, INFORMS Journal on Computing, International Transactions in Operational Research, Journal of Combinatorial Optimization, Journal of Global Optimization, Journal of Global Optimization, Journal of Heuristics, Management Science, Mathematical Methods of Operations Research, Mathematical Programming, Networks, Omega, Operations Research, Operations Research Letters, Optimization Letters, OR Spektrum, Plos One, SIAM Journal on Optimization, Transportation Science

### Organisation of a conference

- 2019 Autumn school on advanced BCP tools: VRPSolver and Coluna Autumn school on advanced BCP tools: VRPSolver and Coluna, France
- 2019 EURO 2019 Conference, Stream “Network Analytics and Optimization”, Ireland
- 2019 Optimization and Data Science, France
- Since 2019 Member of Editorial Advisory Board - SN Operations Research Forum, SN Operations Research Forum
- 2018 Optimization, Games and Data Analysis” Workshop (OGDA2018), Austria
- 2018 “Machine Learning, Networks and Combinatorial Optimization” Workshop, France
- 2018 “Cologne-Twente Workshop 2018” (CTW2018), CNAM, France
- 2015 “Operations Research 2015” conference, University of Vienna, Austria
- 2014 INFORMS Telecommunication Conference 2014, Portugal
- 2014 Workshop “Recent Advances in Multi-Objective Optimization”, University of Vienna, Austria
- 2014 Workshop “Routing and Networks”, University of Vienna, Austria
- 2014 IFORS 2014, Spain
- 2013 Workshop “Optimization Tools for Next Generation Telecommunication Networks”, Austrian Academy of Sciences, Austria

### Affiliations

- Since 2018 INFORMS Telecommunication & Network Analytics Section, Chair
- 2017 - 2018 Vice-president of the INFORMS Telecommunication Section
- 2010 - 2016 Member of council and secretary of the INFORMS Telecom Section
- 2006 - 2008 Member of the executive board of the Austrian Society of Operations Research OEGOR
- 2003 Member of the IEEE Computational Intelligence Society (CIS)

### PhD Supervision

- 2019 M. DE MELO DA SILVA (ESSEC Business School), Thesis co-director

- 2017 M. LUIPERSBECK (University of Vienna), Thesis co-director
- 2015 M. SINNL (University of Vienna), Thesis co-director
- 2015 M. LEITNER (University of Vienna), Thesis director
- 2014 E. ALVAREZ-MIRANDA (University of Bologna), Thesis co-director
- 2013 S. GOLLOWITZER (University of Vienna), Thesis co-director
- 2013 P. PUTZ (University of Vienna), Thesis co-director
- 2013 B. WASSERMANN (University of Vienna), Thesis co-director
- 2013 C. BÜSING (University of Vienna), Thesis director
- A. HASSANZADEH (ESSEC Business School), Thesis co-director
- G. BRANDSTÄTTER (University of Vienna), Thesis co-director
- A. MOUACI (Université Paris Dauphine), Thesis co-director

### Other research activities

- 2020 Program Committee member: International Symposium on Combinatorial Optimisation 2020
- 2020 Program Committee member: International Symposium on Combinatorial Optimization, ISCO 2020
- 2020 Program Committee member: INFORMS Telecommunication & Network Analytics Conference 2020
- 2019 Reviewer for DFG (Deutsche Forschungsgemeinschaft), Germany
- 2019 Program Committee member : International Network Optimization Conference, INOC 2019
- 2018 International Symposium on Combinatorial Optimization, ISCO 2018
- 2018 Reviewer for Integer Programming and Combinatorial Optimization (IPCO 2018)
- 2018 International Symposium on Mathematical Programming, ISMP 2018
- 2018 Program Committee Member : INFORMS Telecommunication Conference 2018
- 2017 Reviewer for FONDECYT (Fondo Nacional de Desarrollo Científico y Tecnológico), Chile
- 2017 International Network Optimization Conference, INOC 2017
- 2016 Program Committee member: INFORMS Telecommunication Conference 2016
- 2016 Program committee member : European Conference on Operational Research, EURO 2016, Poznan, Poland
- 2015 Program Committee member: International Network Optimization Conference, INOC 2015
- 2015 Reviewer for FONDECYT (Fondo Nacional de Desarrollo Científico y Tecnológico),

Chile

- 2015 Program Committee member: 11th Metaheuristics International Conference, MIC 2015
- 2015 Program committee member : International Network Optimization Conference, INOC 2015, Warsaw, Poland
- 2014 Program committee member : International Symposium on Combinatorial Optimization, ISCO 2014, Lisbon, Portugal
- 2014 Program Committee : INFORMS Telecommunication Conference 2014, Lisbon, Portugal
- 2014 Reviewer for Integer Programming and Combinatorial Optimization (IPCO 2014)
- 2013 Program Committee Member: International Network Optimization Conference, INOC 2013
- 2013 Program Committee member : 10th Metaheuristics International Conference, MIC 2013
- 2013 Reviewer for International Symposium on Experimental Algorithms (SEA 2013)
- 2012 Reviewer for FONDECYT (Fondo Nacional de Desarrollo Científico y Tecnológico), Chile
- 2012 Program Committee member : INFORMS Telecommunication Conference 2012
- 2012 Reviewer for International Colloquium on Automata, Languages and Programming (ICALP 2011)
- 2011 Program Committee member: International Network Optimization Conference, INOC 2011
- 2011 Reviewer for European Symposia on Algorithms (ESA 2011)
- 2010 Program Committee member: Third international workshop on model-based metaheuristics, Matheuristics 2010
- 2009 Reviewer for International Network Optimization Conference (INOC 2009)
- 2008 Program Committee member: Workshop on Heuristic Methods for the Design, Deployment, and Reliability of Networks and Network Applications, HEUNET 2008
- 2005 Program Committee member: The Genetic and Evolutionary Computation Conference, GECCO 2005
- 2002 Reviewer for European Symposia on Algorithms (ESA 2002)
- 2002 Reviewer for Graph Drawing (GD 2002)
- 2001 Reviewer for European Symposia on Algorithms (ESA 2001)
- 2001 - 2005 Program Committee member: European Conferences on Evolutionary Computation in Combinatorial Optimisation EvoCOP

## PROFESSIONAL ACTIVITIES

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### Consulting

2007 - 2010 OptTelNets, project with Telecom Austria A1

### Other professional activities

2017 - Present Orange Labs, France: Optimal Instantiation of Service Chains in Software Defined Networks. CIFRE contract (PhD supervision of Ahlam Mouaci)

2006 - 2010 Telekom Austria AG: Optimal Design of FTTx Telecommunication Networks: (supervision of 2 PhD students)