Philipp Hungerländer

"Mathematics has beauty and romance. It's not a boring place to be, the mathematical world. It's an extraordinary place; it's worth spending time there." - Marcus du Sautoy

Contact

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Education

Dec 2014 – Oct 2019 **PhD in Discrete Mathematics (Dr.rer.nat.)**, *Universität Wien*.

title of thesis **Extensions of the Traveling Salesman Problem Motivated by Modern Real-World Applications**, *Supervisor: Immanuel Bomze*.

June 2017 **Habilitation in Mathematics**, *Alpen-Adria-Universität Klagenfurt*.

title of thesis **Semi-Smooth Newton Methods for Convex Quadratic Problems with Bound Constraints and Linear Complementarity Problems**.

Mar 2012 – Nov 2014 **PhD in Economics (Dr.rer.soc.oec.)**, *Alpen-Adria-Universität Klagenfurt*.

title of thesis **Semidefinite Optimization Approaches to Applications in Facility Layout and Logistics**, *Supervisor: Miguel F. Anjos*.

Feb 2009 – Feb 2012 **PhD in Technical Mathematics (Dr.techn.)**, *Alpen-Adria-Universität Klagenfurt*.

title of thesis **Semidefinite Approaches to Ordering Problems**, *Supervisor: Franz Rendl*.

Oct 2003 – Oct 2012 **(Under)Graduate in Business and Law**, *Alpen-Adria-Universität Klagenfurt*.

title of thesis	**The Prices of Anarchy, Information and Cooperation**, *Supervisor: Reinhard Neck*.
Oct 2003 – Feb 2009	**(Under)Graduate in Mathematics**, *Alpen-Adria-Universität Klagenfurt*, Specializations: Optimization, Game Theory.
title of thesis	**Algorithms for Convex Quadratic Programming**, *Supervisor: Franz Rendl*.
Oct 2003 – May 2008	**(Under)Graduate in Business Administration**, *Alpen-Adria-Universität Klagenfurt*, Specializations: Finance, Logistics, Economics.
title of thesis	**Discrete-Time Dynamic Noncooperative Game Theory**, *Supervisor: Reinhard Neck*.
Sep 1995 – June 2003	**Secondary School**, *BRG Spittal*.
Sep 1991 – June 1995	**Elementary School**, *Weißenstein*.

Academic Employment

since July 2017	**Associate professor**, Alpen-Adria-Universität Klagenfurt, Department of Mathematics.
Sep 2012 - June 2017	**Assistant professor**, Alpen-Adria-Universität Klagenfurt, Department of Mathematics.
Nov 2015 - Nov 2016	**Visiting professor**, Massachusetts Institute of Technology, Laboratory for Information & Decision Systems.
Oct 2014 - Feb 2015	**Senior researcher**, Technische Universität Dortmund, Department of Mathematics.
Sep 2008 – Sep 2012	**Research and teaching assistant (Universitätsassistent)**, Alpen-Adria-Universität Klagenfurt, Department of Mathematics.
Aug 2011 - Oct 2011	**Researcher**, École Polytechnique de Montréal, Department of Mathematics.
Feb 2007 - Aug 2008	**Project Assistent (Projektassistent)**, Alpen-Adria-Universität Klagenfurt, Department of Economics.
Oct 2006 - Jan 2007	**Internship**, *Robert-Holzmann-Institut, Vienna*, Topic: Dynamic game theory.
Mar 2006 - June 2006	**Graduate Assistent**, Alpen-Adria-Universität Klagenfurt, Department of Finance.

Other Employment

Jul 2015 – Dec 2017 **Consultant**,
Satalia, Optimisation Algorithm Company,
Main Topics:
1.) Development of exact methods and heuristics for the dynamic vehicle routing problem of one of the world's largest supermarket chains.
2.) Development of a staff scheduling solution for one of the world's largest accounting firms.
3.) Improving timetable optimization at University College London.

Mar 2007 – Jun 2007 **Project Assistent**,
"Pewag" company, Topic: Development of a consolidation software.

Summer 03, Summer 02 **Tennis Instructor**.

Oct 2001 – Sep 2002 **Student representative**, BRG Spittal.

Professional Awards and Recognition

2018 **Ranked 1^{st} for the professorship "Universitätsprofessur für Adaptive und Vernetzte Produktionssysteme" (Abgekürztes Berufungsverfahren gemäß § 99 UG) at Alpen-Adria-Universität Klagenfurt**.

2017 **Carinthian laureate for culture (Kulturpreisträger, Förderungspreis) in the category "Natural and Technical Sciences"**.

2017 **Kardinal-Innitzer-Award (Förderungspreis) for social and economic sciences for my PhD thesis in Economics**,
The submitted pieces of work should be on the level of a habiliation thesis.

2015 **Erwin Schrödinger Fellowship**,
Funding for a 1-year stay at the Massachusetts Institute of Technology (MIT).

2015 **Max Kade Fellowship**,
Funding for a 1-year stay at the Massachusetts Institute of Technology (MIT),
Declined due to the Schrödinger Fellowship mentioned above.

2015 **Best Dissertation Award**,
Austrian Society for Operations Research, 1^{st} Austrian to win this award twice.

2015 **Doctoral degree in Economics under the auspices of the Federal President**,
Highest possible distinction for excellent performance in academic studies in Austria,
8^{th} Austrian to achieve this for 2 PhDs.
In 2018 potentially the first Austrian in history to achieve three such distinctions.

2014 **Heidelberg Laureate Forum**, Selected participant.

2014 **"Audience Award" of the "Long Night of Research"**,
Most popular inactive presentation at the Alpen-Adria-Universität Klagenfurt.

2012 **Best Dissertation Award**, *Austrian Society for Operations Research*.

2012 **Best Dissertation Award**, *Austrian Mathematical Society*.

2012 **Doctoral degree in Technical Mathematics under the auspices of the Federal President**,
Highest possible distinction for excellent performance in academic studies in Austria.

2010 **Award for Excellent Supervision of Talented Pupils**,
Austrian Federal Ministry for Transport, Innovation and Technology.

2009 **Kurier High Potential '09**, Finalist.

2009 **WiWi Talents Program/Book 2008/2009**, Admission.

2008 **Lupe 2008**, Award for excellent science communication.

2008 **Award for excellent achievements in university studies**,
Austrian Federal Ministry of Research and Science.

Jan 2007 – Aug 2008 **Scholarship of the Austrian National Bank**,
Research project: "The Macroeconomics of EMU Enlargement".

2008 **Award for the best master thesis in Economics**,
Alpen-Adria-Universität Klagenfurt.

2006 **European Forum Alpbach**, Scholarship holder.

2003–2009 **Merit scholarship (Leistungsstipendium)**,
Academic years 2003/04, 2004/05, 2005/06, 2006/07, 2007/08 and 2008/09.

Research Publications

Research Articles in International Journals

[1] M. F. Anjos, A. Fischer and H. **Solution Approaches for Equidistant Double- and Multi-Row Facility Layout Problems.** *European Journal of Operational Research*, accepted, 2018.

[2] H. and F. Rendl. **An Infeasible Active Set Method with Combinatorial Line Search for Convex Quadratic Problems with Bound Constraints.** *Journal of Global Optimization*, accepted, 2018.

[3] H. and M. F. Anjos. **Improved exact approaches for row layout problems with departments of equal length.** *European Journal of Operational Research*, Vol. 270(2), pp. 514-529, 2018.

[4] H. **The Checkpoint Ordering Problem.** *Optimization*, Vol. 66(10), pp. 1699-1712, 2017.

[5] A. Fischer and H. **The Traveling Salesman Problem with Forbidden Neighborhoods on Grids.** *Journal of Combinatorial Optimization*, Vol. 34(3), pp. 891–915, 2017.

[6] H. **New Semidefinite Programming Relaxations for the Linear Ordering and the Traveling Salesman Problem.** *Discrete Applied Mathematics*, Vol. 217(1), pp. 19–39, 2017.

[7] H. and F. Rendl. **A Feasible Active Set Method for Strictly Convex Problems with Simple Bounds.** *SIAM Journal on Optimization*, Vol. 25(3), pp. 1633-1659, 2015.

[8] H. and M. F. Anjos. **Semidefinite Optimization Approaches to Multi-Row Facility Layout.** *European Journal of Operational Research*, Vol. 245(1), pp. 46–61, 2015.

[9] H. . **A Semidefinite Optimization Approach to the Target Visitation Problem.** *Optimization Letters*, Vol. 9(8) , pp. 1703-1727, 2015.

[10] H. **Single-Row Equidistant Facility Layout as a Special Case of Single-Row Facility Layout.** *International Journal of Production Research*, Vol. 52(5), pp. 1257-1268, 2014.

[11] M. Chimani and H. **Multi-Level Verticality Optimization: Concept, Strategies, and Drawing Scheme.** *Journal of Graph Algorithms and Applications*, Vol. 17(3), pp. 329-362, 2013.

[12] M. Chimani and H. **Exact Approaches to Multi-Level Vertical Orderings.** *INFORMS Journal on Computing*, Vol. 25(4), pp. 611-624, 2013.

[13] H. and F. Rendl. **A Computational Study and Survey of Methods for the Single-Row Facility Layout Problem.** *Computational Optimization and Applications*, Vol. 55(1), pp 1-20, 2013.

[14] H. and F. Rendl. **Semidefinite Relaxations of Ordering Problems.** *Mathematical Programming*, Vol. 140(1), pp 77-97, 2013.

[15] M. Chimani, H. , M. Jünger and P. Mutzel. **An SDP approach to multi-level crossing minimization.** *Journal of Experimental Algorithmics*, 2012, Vol. 17(3), Article 3.3.

Research Articles in Refereed Conference Proceedings

[1] M.F. Anjos, H. and K. Maier. **An Integer Linear Programming Approach for the Combined Cell Layout Problem** *Proceedings of the IEEE International Conference on Industrial Engineering and Engineering Management (IEEM2018)*, accepted, 2018.

[2] Bucur P.A., Frick K. and H. **Correlation Analysis Between the Vibroacoustic Behavior of Steering Gear and Ball Nut Assemblies in the Automotive Industry.** *In: Rodrigues H. et al. (eds), EngOpt 2018 Proceedings of the 6th International Conference on Engineering Optimization*, pp. 1253–1262, 2019.

[3] H. and C. Truden. **Efficient and Easy-to-Implement Mixed-Integer Linear Programs for the Traveling Salesperson Problem with Time Windows.** *Operations Research Procedia*, 2018.

[4] H., K. Maier, J. Pöcher and C. Truden. **On a New Modelling Approach for Circular Layouts and its Practical Advantages.** *Proceedings of the IEEE International Conference on Industrial Engineering and Engineering Management (IEEM2017)*, 2017.

[5] A. Fischer, M. Firstein and H. **Closed Almost Knight's Tours on 2D and 3D Chessboards.** *Operations Research Proceedings 2017*, 2017.

[6] A. Fischer, H. and A. Jellen. **The Traveling Salesperson Problem with Forbidden Neighborhoods on Regular 3D Grids.** *Operations Research Proceedings 2017*, 2017.

[7] H. and K. Maier. **The Multiple Checkpoint Ordering Problem.** *Operations Research Proceedings 2017*, 2017.

[8] H. A. Rendl and C. Truden **On the Slot Optimization Problem in On-Line Vehicle Routing.** *Transportation Research Procedia*, Vol. 27, pp. 492-499, 2017.

[9] M. Aschinger, S. Applebee, A. Bucur, H. Edmonds, H. and K. Maier **New Constraints and Features for the University Course Timetabling Problem.** *In: A. Fink, A. Fügenschuh, M. Geiger (eds), Operations Research Proceedings 2016*, pp. 95-101, 2017.

[10] H. , K. Maier, J. Pöcher, A. Rendl and C. Truden **Solving an On-line Capacitated Vehicle Routing Problem with Structured Time Windows.** *In: A. Fink, A. Fügenschuh, M. Geiger (eds), Operations Research Proceedings 2016*, pp. 127-132, 2017.

[11] A. Fischer, F. Fischer and H. **A New Exact Approach to the Space-Free Double Row Layout Problem.** *Operations Research Proceedings 2015*, pp. 125 – 130, 2017.

[12] M.F. Anjos, A. Fischer and H. **Solution Approaches for the Double-Row Equidistant Facility Layout Problem.** *Operations Research Proceedings 2014*, pp. 17 – 23, 2016.

[13] H. and M. F. Anjos. **An Exact Approach for the Combined Cell Layout Problem.** *Operations Research Proceedings 2012*, pp. 275 – 281, 2013.

[14] H. **A Semidefinite Optimization Approach to the Directed Circular Facility Layout Problem.** *Proceedings of the 7th IFAC Conference on Manufacturing Modelling, Management, and Control*, pp. 2033 – 2038, 2013.

[15] M. Chimani, H. M. Jünger and P. Mutzel. **An SDP approach to multi-level crossing minimization.** *Proceedings of Algorithm Engineering & Experiments [ALENEX'2011]*, 2011.

Book Chapters and Lecture Notes

[1] H. and R. Neck. **An algorithmic equilibrium solution for n-person dynamic Stackelberg difference games with open-loop information pattern.** *In: H. Dawid et al.: Computational Methods in Economic Dynamics*, Springer Publishers, pp. 197-214, 2010.

Papers in Revision and Work in Progress

[1] A. Fischer, F. Fischer and H. **New Exact Approaches to Row Layout Problems.** *Mathematical Programming C*, in revision, 2018.

[2] H. **A comparison of global optimization approaches for row facility layout problems.** *Optimization*, in revision, 2017.

[3] H. and M. F. Anjos. **An Exact Approach for the Combined Cell Layout Problem.** *Journal version of the above proceedings paper.*

[4] H. K. Maier, J. Pöcher, A. Rendl and C. Truden **Solving an On-line Capacitated Vehicle Routing Problem with Structured Time Windows.** *Journal version of the proceedings paper.*

[5] H., J. Júdic and F. Rendl. **A Recursive Semi-Smooth Newton Method for Linear Complementarity Problems.**

[6] A. Fischer and H. **New Combinatorial Properties of and Models for Row Layout Problems.**

[7] H. and K. Maier **A Two-Stage ILP Approach Incorporating New Constraints and Features for the University Course Timetabling Problem.**

[8] P.A. Bucur and H. **A Reinforcement Learning Approach for the Dynamic Container Relocation Problem.**

Technical Reports

[1] H. **A Semidefinite Optimization Approach for the Parallel Ordering Problem.**

[2] H. **Differential Games: Egoism, Cooperation and Altruism.**

PhD and Master Theses

[1] **Semidefinite Optimization Approaches to Applications in Facility Layout and Logistics.** *PhD Thesis Economics,* 2014.

[2] **Semidefinite Approaches to Ordering Problems.**
PhD Thesis Mathematics, 2012.

[3] **The Prices of Anarchy, Information and Cooperation.**
Master Thesis Business and Law, 2012.

[4] **Algorithms for Convex Quadratic Programming.**
Master Thesis Mathematics, 2009.

[5] **Discrete-Time Dynamic Noncooperative Game Theory.**
Master Thesis Economics, 2008.

Grants as Main Project Investigator

Sep 2018 - Aug 2020 **Austrian Research Promotion Agency (FFG)**, *Intelligent agent-based locomotive simulation and optimization for the freight transport in Austria*, € 160.000.

Jul 2015 - Dec 2017 **Satalia, Optimisation Algorithm Company**,
Development of exact methods and heuristics for the dynamic vehicle routing problem of one of the world's largest groceries, Project financing postdoctoral researchers and PhD and master students for 2.5 years, € 715.000.

since Jul 2017 **Austrian Research Promotion Agency**,
Research cooperations with companies related to real-world-problems, € 25.000.

Oct 2015 - Oct 2017 **Austrian Federal Ministry of Research and Science**,
Exact Approaches to Combinatorial Problems in Facility Layout and Logistics,
Research and travel grants for outstanding young researchers, € 11.500.

Jul 2015 - Sep 2015 **Satalia, Optimisation Algorithm Company**,
Improving timetable optimization at University College London, Project financing postdoctoral researchers, PhD and master students for six months, € 50.000.

Jun 2015 **Alpen-Adria-Universität Klagenfurt, Department of Mathematics**,
Extending Various Strategies for determining Traveling Salesman Tours with forbidden neighborhood with radius $r = 2$, Project financing a master student for one month, € 800.

May 2015 **Alpen-Adria-Universität Klagenfurt, Department of Mathematics**,
Comparison of Cutting Plane Approaches for the Linear Ordering Problem,
Project financing a master student for one month, € 800.

May 2014 **Alpen-Adria-Universität Klagenfurt, Lakeside Science & Technology Park and Kleine Zeitung**,
Publicity poly for recruiting mathematics students, € 11.800.

Feb 2014 **Alpen-Adria-Universität Klagenfurt, Department of Mathematics**,
Graphics and computer programs to popularize row-layout problems,
Project financing a master student for one month, € 1.100.

Nov 2013 **Program committee of the Long Night of Research**,
The committee consisted of representatives of the Alpen-Adria-Universität Klagenfurt, the Lakeside Science & Technology Park and media partners,
Financial support to realize the project "Who can quiet the animal shelter?", € 800.

Oct 2012 - Oct 2014 **Austrian Federal Ministry of Research and Science**,
Exact Approaches to Ordering Problems,
Research and travel grants for outstanding young researchers, € 11.500.

Research Supervision

PhD Students

since 2016 **Exact Methods and Heuristics for the On-Line Vehicle Routing Problem with Structured Time Windows.**
Christian Truden, Alpen-Adria-Universität Klagenfurt.

since 2017 **Deep Reinforcement Learning and Heuristics Applied to the Dynamic Container Relocation Problem and the University Timetabling Problem**
Alexandru Bucur, Alpen-Adria-Universität Klagenfurt.

since 2018 **Optimization and Simulation of the Supply Chain in the Food Industry.**
Kerstin Maier, Alpen-Adria-Universität Klagenfurt.

since 2018 **Continuous Improvement of Input Data for Dynamic Combinatorial Optimization Problems through Bayesian Methods.**
Anna Jellen, Alpen-Adria-Universität Klagenfurt.

since 2018 **Logistics Optimization in the Railway Industry.**
Sebastian Steininger, Alpen-Adria-Universität Klagenfurt.

since 2018 **Fleet Optimization Problems with Real-World Constraints.**
Sarah Frisch, Alpen-Adria-Universität Klagenfurt.

Master Students

2018 **A Mixed Integer Linear Program for Optimizing the Utilization of Locomotives with Maintenance Constraints.**
Sarah Frisch, Alpen-Adria-Universität Klagenfurt.

2018 **A Heuristic for the Traveling Salesperson Problem with Forbidden Neighborhoods on Regular 2D and 3D Grids.**
Philipp Armbrust, Alpen-Adria-Universität Klagenfurt.

2018 **Exact and Heuristic Approaches for the Directed Circular Facility Layout Problem.**
Kerstin Maier, Alpen-Adria-Universität Klagenfurt.

2018 **Optimizing the Routes for the Attended Home Delivery Problem in Real Time.**
Jörg Pöcher, Alpen-Adria-Universität Klagenfurt.

2017 **The Multiple Checkpoint Ordering Problem.**
Kerstin Maier, Alpen-Adria-Universität Klagenfurt.

2017 **The Traveling Salesperson Problem with Forbidden Neighborhoods on Regular 3D Grids.**
Anna Jellen, Alpen-Adria-Universität Klagenfurt.

2016 **Local Search Heuristics for the Vehicle Routing Problem with Structured Time Windows.**
Christian Truden, Alpen-Adria-Universität Klagenfurt.

2016 **Human Performance on Facility Layout Problems.**
Daniela Steflitsch, Alpen-Adria-Universität Klagenfurt.

2015 **Algorithms for Solving the Traveling Salesman Problem with Forbidden Neighborhoods on Grids.**
Michael Firstein, Technische Universität Dortmund.

2015 **Exact Approaches to the Directed Circular Facility Layout Problem.**
Vitali Pawelko, Technische Universität Dortmund.

Bachelor Students

2017 **Visualization of Solutions for the Vehicle Problem with Time Windows**
Günther Cwioro, Alpen-Adria-Universität Klagenfurt.

2017 **Applying Warnsdorff's Rule to the Traveling Salesperson Problem with Forbidden Neighborhoods**
Philipp Armbrust, Alpen-Adria-Universität Klagenfurt.

2016 **Implementation of Mixed Integer Linear Programs for the Capacitated Vehicle Routittg Problem with Structured Time Windows**
Kerstin Maier, Alpen-Adria-Universität Klagenfurt.

2016 **Implementation and Visualization of Optimal Solutions for the Traveling Salesperson Problem with Forbidden Neighborhoods.**
Anna Jellen, Alpen-Adria-Universität Klagenfurt.

2016 **Motivation and Modeling of Mixed Integer Linear Programs for the Capacitated Vehicle Routing Problem with Structured Time Windows**
Kerstin Maier, Alpen-Adria-Universität Klagenfurt.

2014 **Game Theory - Braess's Paradox and Selfish Routing.**
Christian Truden, Alpen-Adria-Universität Klagenfurt.

2014 **The Taxi Routing Problem.**
Stefanie Kokarnig, Alpen-Adria-Universität Klagenfurt.

2012 **The Double Row Facility Layout Problem.**
Lucas Gregori, Alpen-Adria-Universität Klagenfurt.

Summer Interns

2012 **Facility Layout Problems.**
Benjamin Hackl, Johanna Mlekusch and Peter Wiltsche,
Alpen-Adria-Universität Klagenfurt.

2011 **Graph Drawing and Quadratic Assignment Problem.**
Benjamin Hackl and Miriam Smolnik, Alpen-Adria-Universität Klagenfurt.

2010 **Traveling Salesman and Target Visitation Problem.**
Benjamin Hackl and Marlene Radl, Alpen-Adria-Universität Klagenfurt.

Research Presentation

Invited Plenary Talks

Mar 2018 **Solving an On-line Vehicle Routing Problem with Structured Time Windows for One of the World's Largest Grocery Retailers.**
20^{th} Logistics Research Austria Meeting, Alpen-Adria-Universität Klagenfurt, Austria.

Invited Seminar Presentations

Jan 2018 **Vehicle Routing Problems with Structured Time Windows.**
Institute of Statistic and Operations Research, University of Vienna, Austria.

Feb 2017 **The Traveling Salesperson Problem with Forbidden Neighborhoods on 3D Grids.** Institute of Optimization and Discrete Mathematics, Graz University of Technology, Austria.

Nov 2016 **Active Set Methods for Convex Quadratic Problems with Bounds and Linear Complementarity Problems.**
Institute of Statistic and Operations Research, University of Vienna, Austria.

Nov 2016 **The Traveling Salesperson Problem with Forbidden Neighborhoods on Regular 2D and 3D Grids.** ISOR-Colloquium, University of Vienna, Austria.

May 2016 **Solving an On-line Vehicle Routing Problem for one of the World's Largest Grocery Retailers.**
DK Seminar of the Karl Popper College, Alpen-Adria-Universität Klagenfurt, Austria.

Dec 2015 **Globally Convergent Active Set Methods for Convex Quadratic Problems with Simple Bounds.** MIT Seminar in Nonlinear Optimization, Cambridge, USA.

Jan 2015 **Exact Approaches to Row Layout Problems.**
Oberseminar on Discrete Optimization, Technical University Dortmund, Germany.

Jun 2012 **An SDP Approach to Circular and Multi-Row Facility Layout.**
Technical University Chemnitz, Germany.

Sep 2011 **Semidefinite Approaches to Ordering Problems.**
GERAD-Mprime Seminar in Optimization, Polytechnique Montréal, Canada.

Mar 2010 **A Feasible Active Set Method for Convex Problems with Simple Bounds.**
Institute of Mathematics and Scientific Computing, University of Graz, Austria.

Invited Conference Presentations (Minisymposia)

Jul 2015 **Solution Approaches for Equidistant Double- and Multi-row Facility Layout Problems.**
22nd International Symposium on Mathematical Programming, Pittsburgh, USA.

May 2014 **A Feasible Active Set Method for Box-Constrained Convex Problems.**
SIAM Conference on Optimization, San Diego, USA.

Sep 2013 **The Price of Cooperation in Differential Games.**
IFIP 2013, System Modelling and Optimization, Klagenfurt, Austria.

Aug 2012 **SDP Approaches to some Facility Layout Problems.**
21st International Symposium on Mathematical Programming, Berlin, Germany.

May 2011 **Semidefinite Relaxations of Ordering Problems.**
SIAM Conference on Optimization, Darmstadt, Germany.

Invited Talks on General Topics

Nov 2017 **The Role of Science in Tomorrow's World.**
40-Year-Celebration of the Austrian Research Community (Österreichische Forschungsgemeinschaft (ÖFG)), Vienna, Austria.

Contributed Conference Presentations

Dec 2017 **On a New Modelling Approach for Circular Layouts and Its Practical Advantages** IEEE IEEM 2017 Conference, Singapore, Singapore.

Sep 2017 **On the Slot Optimization Problem in On-Line Vehicle Routing** International Conference of the German OR Society 2017, Berlin, Germany.

Apr 2017 **Optimizing a Fleet of Vehicles for Efficient and Customer-friendly Grocery Delivery** INFORMS Conference on Business Analytics & OR, Las Vegas, USA.

Nov 2016 **A Feasible Active Set Method for Linear Complementarity Problems.** 4th Alpen-Adria Workshop on Optimization 2016, Klagenfurt, Austria.

May 2015 **The Traveling Salesman Problem with Forbidden Neighborhoods on Grids.** 3rd Alpen-Adria Workshop on Optimization 2015, Klagenfurt, Austria.

Jul 2014 **An Infeasible Active Set Method with Step Size Control.** Optimization 2014, Guimarães, Portugal.

Jul 2014 **An SDP Approach to the Parallel Row Ordering Problem.** 20th Conference of the International Federation of OR Societies, Barcelona, Spain.

Jul 2014 **The Checkpoint Ordering Problem.** 12th EUROPT Workshop on Advances in Continuous Optimization, Perpignan, France.

May 2014 **A Feasible Active Set Method for Box-Constrained Convex Problems.** SIAM Conference on Optimization, San Diego, USA.

May 2014 **SDP Relaxations for the Linear Ordering and Traveling Salesman Problem.** 27th ECCO Conference, Munich, Germany.

Jun 2013 **An SDP Approach to the Directed Circular Facility Layout Problem.** 7th IFAC Conference on Manufacturing Modelling, Management, and Control, Sankt Petersburg, Russia.

Sep 2012 **An SDP Approach for Complex Facility Layout Structures.** International Conference of the German OR Society 2012, Hannover, Germany.

Aug 2012 **A Comparison of Approaches for Ordering Problems.** Future Research in Combinatorial Optimization 2012 (FRICO), Berlin, Germany.

Jul 2012 **A Semidefinite Optimization Approach to Multi-Row Facility Layout.** 25th European Conference on Operational Research (EURO), Vilnius, Lithuania.

Apr 2012 **An SDP Approach to Single-Row and Space-Free Multi-Row Facility Layout.** 25th ECCO Conference, Antalya, Turkey.

May 2011 **Exact Approaches to Mulit-level Vertical Orderings.** 2nd Alpen-Adria Workshop on Optimization 2011, Klagenfurt, Austria.

Jan 2011 **An SDP Approach to Multi-level Crossing Minimization.** Algorithm Engineering & Experiments 2011, San Francisco, California, USA.

Jan 2011 **An SDP Approach to Multi-level Crossing Minimization.** 15th Combinatorial Optimization Workshop, Aussois, France.

Sep 2010 **An SDP Approach to Quadratic Ordering Problems.** Future Research in Combinatorial Optimization 2010 (FRICO), Graz, Austria.

Jun 2010 **Nonstandard active set methods for convex problems with simple bounds.**
1st Alpen-Adria Workshop on Optimization, Klagenfurt, Austria.

Dec 2008 **N-Person Dynamic Stackelberg Affine-Quadratic Difference Games.**
35th Macromodels International Conference, Warsaw, Poland

Jul 2008 **N-Person Dynamic Stackelberg Affine-Quadratic Difference Games.**
13th International Symposium on Dynamic Games and Applications, Wroclaw, Poland.

Jun 2008 **N-Person Dynamic Stackelberg Open-Loop Difference Games.**
14th International Conference on Computing in Economics and Finance, Paris, France.

Poster Presentations

Sep 2014 **New Active Set Methods for Nonlinear Convex Optimization Problems.**
2nd Postgraduate Student & Young Faculty Conference, Klagenfurt, Austria.

Popularization of Mathematics

Apr 2018 **Who is the best monster?**
Traveling Salesman Problem with Forbidden Neighborhoods, Interactive Presentation at the Long Night of Research.

Mar 2018 **Mathematics in practice: Optimized last-mile grocery delivery.**
Vehicle Routing Problem, Presentation for pupils at the open house day of the Alpen-Adria-Universität Klagenfurt.

Apr 2018, May 2017, Jun 2010 **Studying mathematics in Klagenfurt and optimization projects in practice.**
Talks in high schools.

Apr 2016 **Who is jumping the best?**
(Almost) Closed Knight's Tours on Regular Grids, Interactive Presentation at the Long Night of Research.

Dec 2014, Apr 2013 **Who can build the best city?**
Quadratic Assignment Problem, Workshop for several school classes at the Alpen-Adria-Universität Klagenfurt.

Sep 2014 **Semidefinite Programming and its Famous Applications in Mathematics and Computer Science.**
Workshop at the Heidelberg Laureate Forum.

May 2015, Apr 2014 **Who can quiet the animal shelter?**
Single-Row Facility Layout Problem, Interactive Presentation at the Long Night of Research and at the Scratch Day.

Feb 2014 **How to behave in an interrogation?**
Game Theory, Presentation at the University for Kids at the Alpen-Adria-Universität Klagenfurt.

Dec 2013, Nov 2009 **How to behave in an interrogation and a test of courage?**
Game Theory, Presentation for pupils at the Alpen-Adria-Universität Klagenfurt.

Feb 2013 **Who can quiet the school class?**
Row Facility Layout Problems, Presentation at the University for Kids at the Alpen-Adria-Universität Klagenfurt.

Apr 2012 **Who can build the best city?**
Quadratic Assignment Problem, Interactive Presentation at the Long Night of Research.

Feb 2011 **A Journey through the Alpen-Adria-Area.**
Traveling Salesman Problem, Presentation at the University for Kids at the Alpen-Adria-Universität Klagenfurt.

Nov 2010 **Do you find the best itinerary?**
Target Visitation Problem, Interactive Presentation at the Long Night of Research at the Alpen-Adria-Universität Klagenfurt.

Nov 2008 **Do you find the shortest path?**
Chinese Postman Problem, Interactive Presentation at the Long Night of Research at the Alpen-Adria-Universität Klagenfurt.

Referee

I act as a referee for international journals, conferences and books including:

2×since 2014 **SIAM Journal on Optimization**.
7×since 2010 **Mathematical Programming A and B**.
10×since 2011 **European Journal on Operational Research**.
3×since 2015 **Operations Research**.
2015 **Optimization Letters**.
2015 **Computers & Operations Research**.
3×since 2014 **International Journal of Production Research**.
2×since 2010 **Discrete Applied Mathematics**.
2016 **Annals of Operations Research**.
2013 **Optimization Methods and Software**.
2015 **Applied Mathematics and Computation**.
2014 **Logistics Research**.
2013 **IPCO**.
2014 **ISCO**.
2010 **Handbook of Semidefinite, Cone and Polynomial Optimization**.

Research Visits

Nov 2015 – Nov 2016 **Massachusetts Institute of Technology**, *Laboratory for Information & Decision Systems*, Visiting Prof. Parrilo for 1 year.

2017,2014 **Universidade de Coimbra**,
Department of Mathematics, visiting Prof. Júdice for 3 weeks in total.

2012 **Technische Universität Chemnitz**,
Department of Mathematics, visiting Prof. Helmberg for one week.

2011 **Univerza v Ljubljani**,
Department of Mathematics, visiting Prof. Povh for three days.

2011 **Universität zu Köln**,
Department of Computer Science, visiting Prof. Jünger for three days.

2010 **Ruprecht-Karls-Universität Heidelberg**,
Department of Computer Science, visting Prof. Reinelt for two weeks.

Teaching Experience

My teaching includes lectures and exercise sessions for the study programs mathematics, computer science, information technology, business administration, and for teacher training.

Alpen-Adria-Universität Klagenfurt, Department of Mathematics

Winter 17/18 **Lecture "Mathematics for Business Students" (30h)**,
Undergraduate course for business students.

Winter 17/18 **Exercises "Mathematics for Business Students" (15h)**,
Exercise part of the above lecture.

Summer 17 **Lecture "Integer Optimization" (45h)**,
Graduate course in the area of discrete mathematics.

Summer 15 **Lecture "Algorithmic Graph Theory" (45h)**,
Winter 12/13 Undergraduate course in the area of discrete mathematics.

Summer 15 **Proseminar "Discrete Mathematics" (30h)**,
Undergraduate course in the area of discrete mathematics.

Summer 14 **Lecture "Linear Optimization" (30h)**,
Summer 13 Undergraduate course in the area of operations research.

Summer 14, **2 × Exercises "Linear Optimization" (15h)**,
13 and 10 Exercise part of the above lecture.

Winter 17/18 **Lecture "Combinatorial Structures" (45h)**,
Summer 17 Undergraduate course in the area of discrete mathematics.
Winter 13/14

Winter 17/18 **Exercises "Combinatorial Structures" (15h)**,
Winter 13/14 Exercise part of the above lecture.

Winter 12/13 **2 × Exercises "Mathematics for Economic Sciences" (15h)**,
Exercise part of an undergraduate course in Economics.

Summer 12 **Lecture "Game Theory" (45h)**,
Undergraduate course in the area of operations research.

Summer 11 **Lecture "Mathematical Models in Economics" (45h)**,
Undergraduate course in the area of operations research.

Winter 11/12 **Lecture "Nonlinear Optimization" (45h)**,
Winter 10/11 Undergraduate course in the area of operations research.

Winter 09/10 **2 × Exercises "Analysis I" (30h)**,
Exercise part of an introductory undergraduate course.

Summer 09 **Exercises "Analysis II" (30h)**,
Exercise part of an undergraduate course in the area of analysis.

Winter 08/09 **Exercises "Discrete Mathematics" (30h)**,
Exercise part of an undergraduate course in the area of discrete mathematics.

Summer 08 **Tutorial "Mathematics in Business Administration" (30h)**,
A supplementary course for business students.

Summer 08 **Tutorial "Analysis I" (30h)**,
A supplementary course in the area of analysis.

Winter 06/07 **Tutorial "Discrete Mathematics" (30h)**,
Winter 05/06 A supplementary course in the area of discrete mathematics.

Technische Universität Dortmund, Department of Mathematics

Winter 14/15 **Lecture "Combinatorial Optimization" (45h)**,
A graduate course in the area of operations research.

Speaker at Block Courses for PhD Students

2017 **Lecture "Vehicle Routing with Time Windows in Practice" (3h)**,
Spring School on Optimization and Data Science, University of Novi Sad, Serbia.

Administrative activities

since 2011 Member of the **Curricularkommission Computer Science**.

since 2008 Member of the **department panel** of the department of Mathematics in Klagenfurt.

since 2010 **Co-organization** of 4 conferences at the Alpen-Adria-Universität Klagenfurt.

Public Relations

3×since 2011 **University for Kids**.

6×since 2008 **Long Night of Research**.

7×since 2010 Presentations and workshops in **high schools** and for high school students at Alpen-Adria-Universität Klagenfurt.

2010–2012,2015 Supervision of pupils under the project **Forschung macht Schule** in July each year.

Languages

Fluent	**German, English**
Intermediate	**French**
Basic	**Spanish, Russian**

Further Qualification

I attended workshops and trainings for proposal writing, presentation skills, communication and leadership. Additionally I attended several scientific workshops and seminars including:

Sep 2016	**Autumn School 2016 of the RTG**, *Algorithmic Optimization*, Trier, Germany.
Jul 2016	**Georgia Tech Summer School**, *Real Algebraic Geometry and Optimization*, Atlanta, USA.
Jun 2016	**Summer Graduate School**, *Mixed Integer Nonlinear Programming: Theory, Algorithms and Applications*, Spain.
Sep 2014	**Heidelberg Laureate Forum 2014**, Germany.
Aug 2014	**EURO Summer Institute (ESI) 2010**, *Nonlinear Methods in Combinatorial Optimization*, Klagenfurt, Austria.
May 2010	**Oberwolfach–Seminar**, *Semidefinite Optimization: Theory, Algorithms and Applications*, Germany.
Jul 2007 – Jul 2009	**COMISEF-Research- and Trainingsnetwork**, Attendance of several workshops in Europe.