Academic CV

Contact information

- Dr. habil. Matthias Claus
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  University of Duisburg-Essen
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Academic Degrees

- 2022 Habilitation in Mathematics, University of Duisburg-Essen
  Thesis: *Bilevel stochastic linear programming*

- 2016 Dr. rer. nat. in Mathematics, University of Duisburg-Essen
  Thesis: *Advancing stability analysis of mean-risk stochastic programs: Bilevel and two-stage models*
  Advisor: Prof. R. Schultz
  Grade: summa cum laude

- 2013 M.Sc. in Mathematics, University of Duisburg-Essen
  Thesis: *Metric Regularity of Stochastic Dominance Constraints*
  Supervisor: Prof. R. Schultz

- 2011 B.Sc. in Mathematics, University of Duisburg-Essen
  Thesis: *Der Brouwersche Fixpunktsatz: Sperners Lemma, Scarfs Algorithmus und Anwendungen in der nichtkooperativen Spieltheorie*
  Supervisor: Prof. R. Schultz

Honors and Awards

- 2015 *Preis für herausragende Abschlussarbeiten* awarded by the Alumni association *ALMA MATH* for the Master's thesis mentioned above

- 2012 *Bachelorpreis* awarded by the *Gesellschaft für Operations Research (GOR)* for the Bachelor's thesis mentioned above

Memberships

- 2018 Oberwolfach Leibniz Graduate Student

- 2017- SFB Transregio 154 *Mathematical Modelling, Simulation and Optimization using the Example of Gas Networks*

- 2017-2019 Global Young Faculty V

- 2013-2016 RTG 1855 *Discrete Optimization of Technical Systems under Uncertainty*

Scholarships and Employment

- 2018- Postdoc in the research group *Optimization and Discrete Mathematics* under Prof. R. Schultz, University of Duisburg-Essen.
- 2016-2018 Postdoc in the research group *Nonlinear Optimization* under Prof. A. Rösch, University of Duisburg-Essen.
- 2013-2016 Research assistant in the research group *Optimization and Discrete Mathematics* under Prof. R. Schultz, University of Duisburg-Essen. Supported via a full scholarship by the Research Training Group 1855 *Discrete Optimization of Technical Systems under Uncertainty*.
- 2011-2013 *Deutschlandstipendium* supported by the *Dr. Heinz Horst Deichmann Stiftung*.
- 2009-2013 Student assistant, Faculty of Mathematics, University of Duisburg-Essen.

Education

- 2013-2016 PhD studies in RTG 1855 *Discrete Optimization of Technical Systems under Uncertainty*
- 2008-2013 Studies of Mathematics at the University of Duisburg-Essen

Journal Articles

- M. Claus:
  Existence of Solutions for a Class of Bilevel Stochastic Linear Programs,
  European Journal of Operational Research 299(2), pp. 442-549 (2022)
- M. Claus and K. Spürkel:
  Improving constants of strong convexity in linear stochastic programming,
  Operations Research Letters 50, pp. 76-83 (2022)
- J. Burtscheidt, M. Claus, S. Conti, M. Rumpf, J. Sassen and R. Schultz:
  A pessimistic bilevel stochastic problem for elastic shape optimization,
  accepted for publication in Mathematical Programming,
  DOI 10.1007/s10107-021-01736-w (2021)
- M. Claus:
  On continuity in risk-averse bilevel stochastic linear programming with random lower level objective function,
  Operations Research Letters 49(3), pp. 412-417 (2021)
- M. Claus:
  A Second-Order Sufficient Optimality Condition for Risk-Neutral Bi-level Stochastic Linear Programs,
  Journal of Optimization Theory and Applications 188(1), pp. 243-259 (2021)

- M. Claus and M. Simmoteit:
  A note on Σ_2^p-completeness of a robust binary linear program with binary uncertainty set,
  Operations Research Letters 48(5), pp. 594-598 (2020)

- J. Burtscheidt, M. Claus and S. Dempe:
  Risk-Averse Models in Bilevel Stochastic Linear Programming,
  SIAM Journal on Optimization 30(1), pp. 377-406 (2020)

- M. Claus, R. Schultz, K. Spürkel and T. Wollenberg:
  On Risk-Averse Stochastic Semidefinite Programs with Continuous Recourse,
  Vietnam Journal of Mathematics 47(4), pp. 865-879 (2019)

- M. Claus, R. Schultz and K. Spürkel:
  Strong convexity in risk-averse stochastic programs with complete recourse,
  Computational Management Science 15(3), pp. 411-429 (2018)

- M. Claus, V. Krätschmer and R. Schultz:
  Weak continuity of risk functionals with applications to stochastic programming,
  SIAM Journal on Optimization 27(1), pp. 91-108 (2017)

- J. Burtscheidt and M. Claus:
  A note on stability for risk averse stochastic complementarity problems,
  Journal of Optimization Theory and Applications 172(1), pp. 298-308 (2017)

- M. Claus and R. Schultz:
  Lipschitzian properties and stability of a class of first-order stochastic dominance constraints,
  SIAM Journal on Optimization 25(1), pp. 396-415 (2015)

Book Chapters

- J. Burtscheidt and M. Claus:
  Bilevel Linear Optimization Under Uncertainty,
  Bilevel Optimization - Advances and Next Challenges (Eds: S. Dempe and A. Zemkoho), Springer (2020)

Editorship

- 2017- Associate editor for *Operations Research Letters*

Reviewer for

- *Results in Mathematics*
- *European Journal of Operations Research*
- *Mathematical Programming*

- *Mathematical Reviews*
- *Operations Research Letters*
- *Optimization*
- *Optimization Methods and Software*
- *Set-Valued and Variational Analysis*
- *SIAM Journal on Optimization*

Selected Talks

- *Optimality Conditions in Risk-Neutral Bilevel Stochastic Linear Programming*, International Conference on Operations Research, 02.09.21
- *Optimality Conditions in Bilevel Stochastic Linear Optimization*, SIAM Conference on Optimization, 21.07.21
- *Optimality Conditions in Risk-Neutral Bilevel Stochastic Linear Programming*, European Conference on Operational Research, 13.07.21
- *Stochastische Lineare Bilevel-Optimierung*, Mathematisches Kolloquium, Universität Duisburg-Essen, 27.01.21
- *Risk-averse Bilevel Stochastic Linear Programs*, Informs Annual Meeting, Seattle, 23.10.19
- *Risk-Averse Bilevel Stochastic Linear Programs*, International Conference on Operations Research, Dresden, 04.09.19
- *Structure of risk-averse stochastic linear bilevel programs*, International Conference on Computational Management Science, Chemnitz, 27.03.2019
- *Risk averse bilevel programming under uncertainty: Stability and extensive formulations*, International Conference on Operations Research, Brüssel, 13.09.2018
- *Risk averse linear bilevel programming under stochastic uncertainty*, Oberwolfach Workshop 1834: New Directions in Stochastic Optimisation, 23.08.2018
- *On stability of stochastic bilevel programs with risk aversion*, 23rd International Symposium on Mathematical Programming, Bordeaux, 04.07.2018
- *Strong Convexity for Mean-Risk Models with Complete Linear Recourse*, Informs International Conference, Taipei, 20.06.2018
- *Strong Convexity for Mean-Risk Models with Complete Linear Recourse*, International Conference on Computational Management Science, Trondheim, 31.05.2018

- *On stability of stochastic bilevel programs with risk aversion*, International Conference on Operations Research, Berlin, 07.09.2017
- *Steady-State Models for Optimizing Gas Transportation: Analytical and Algebraic Perspectives*, SIAM Conference on Optimization, Vancouver, 23.05.2017
- *Stability analysis for stochastic programs: Mean-risk and stochastic dominance models*, CORMSIS Seminar, Southampton, 02.02.17
- *On stability of stochastic bilevel programs with risk aversion*, 5th International Conference on Continuous Optimization, Tokyo, 10.08.16
- *Stability in mean-risk stochastic bilevel programming*, Workshop on Nonsmooth and Stochastic Optimization with Applications to Energy Management, Weierstrass Institut, Berlin, 10.05.16
- *Stability in stochastic bilevel programming*, International Conference on Bilevel Optimization and Related Topics, Dresden, 06.05.16
- *Stability in bilevel programming under stochastic uncertainty*, SIGOPT International Conference on Optimization 2016, Trier, 07.04.16
- *Conclusions from classical parametric integer programming for stochastic optimization*, 20th Combinatorial Optimization Workshop, Aussois, 07.01.16
- *Weak continuity of risk functionals with applications to 2-stage mean risk models*, International Conference on Operations Research, Vienna, 02.09.2015
- *Weak continuity of risk functionals with applications to 2-stage stochastic programming*, 22nd International Symposium on Mathematical Programming, Pittsburgh, 17.07.2015
- *Weak continuity of risk functionals arising in 2-stage stochastic programming*, 12th International Conference on Computational Management Science, Prague, 27.05.2015
- *Psi-Weak Continuity of Stochastic Functionals*, 6th International Conference on High Performance Scientific Computing, Hanoi, 19.03.15
- *On Continuity and Distribution Sensitivity of Stochastic Programs with Risk Aversion*, Seminar Optimization and Applications, University and ETH Zürich, 02.03.15
- *Sufficient conditions for metric regularity and stability of stochastic dominance constraints*, INFORMS Annual Meeting 2014, San Francisco, 09.11.2014
- *Metric regularity of stochastic dominance constraints induced by linear recourse*, Optimization under Uncertainty: Energy, Transportation and Natural Resources, Workshop at UC Davis, 07.11.2014

- *Sufficient conditions for metric regularity of stochastic dominance constraints induced by linear recourse*, European Mini Conference on Stochastic Programming and Energy Applications, Paris, 25.09.2014
- *A representation of a class of stochastic dominance constraints enabling Lipschitzian properties and stability*, International Conference on Operations Research, Aachen, 03.09.2014
- *Metric regularity of stochastic dominance constraints induced by linear recourse*, SIAM Conference on Optimization, San Diego, 20.05.2014
- *A representation of a class of stochastic dominance constraints enabling Lipschitzian properties and stability*, Seminar *Nichtlineare Optimierung und Inverse Probleme*, Weierstrass Institut, Berlin, 14.01.2014

Teaching Experience

- 2022/23 *Discrete Optimization* (Lecturer)
- 2022 *Bilevel Optimization* (Lecturer and Tutor)
- 2021/22 *Robust Optimization* (Lecturer and Tutor)
- 2021 *Discrete Optimization* (Lecturer and Tutor)
- 2020 *Game Theory* (Lecturer and Tutor)
- 2019 *Bilevel Optimization* (Lecturer and Tutor)
- 2019 *Discrete Mathematics for Computer Engineers 2* (Lecturer)
- 2018 *Robust Optimization* (Lecturer and Tutor)
- 2017/18 *Bilevel Optimization* (Lecturer and Tutor)
- 2017 *Compact Course: Stochastic Optimization* (Lecturer)
- 2017 *Robust Optimization* (Lecturer and Tutor)
- 2016/17 *Numerics and Optimization of Large Nonlinear Systems* (Tutor)
- 2014 *Linear Optimization* (Tutor)
- 2009-2013 *Mathematics for Engineers I and II* (Tutor)

Supervised Master's Theses

- 2021 *Sampling Verfahren für stochastische Bilevel-Probleme*
- 2021 *Hinreichende Optimalitätsbedingungen zweiter Ordnung für Optimierungsprobleme der Klasse* $C^{1,1}$

- 2020 *Probabilistische Schranken für robuste quadratische Probleme*
- 2020 *Cournot-Nash-Equilibria in energy markets under stochastic uncertainty*
- 2019 *Robust binary optimization under linear binary uncertainty*
- 2019 *Robuste Lineare Bilevel-Optimierung*
- 2019 *Neue Ansätze für einen stochastischen Umgang mit mehrelementigen Lower-Level-Lösungsmengen in der linearen Bilevel-Optimierung*
- 2019 *Zu Konvexitätsfragen bei nodalpreisbasierten Marktmodellen für den Strom- und Gashandel*
- 2019 *Konstruktion optimaler Angebotskurven in Strommärkten unter Risikoaversion*
- 2019 *Anwendung von modernen Big Data und Machine Learning Verfahren in der Optimierung von mehrstufigen industriellen Fertigungsprozessen*

Supervised Bachelor's Theses

- 2021 *Der Brouwersche Fixpunktsatz: Ein Beweis mithilfe des Brouwerschen Abbildungsgrades, eine ökonomische Interpretation und Anwendungen auf wirtschaftsmathematische Fragestellungen*
- 2021 *Model-based algorithms for peak shaving at a large electric vehicle charging site*
- 2021 *Die Fixpunktsätze von Brouwer, Kakutani und Schauder*