

# Thomas M. Surowiec

*Applied Mathematician*

*Simula Research Laboratory  
Kristian Augusts gate 23  
0164 Oslo, Norway*

## Professional Experience

- 2022– **Chief Research Scientist**, *Department of Numerical Analysis and Scientific Computing, Simula Research Laboratory, Oslo, Norway, 10.2022–*
- 2016–2022 **Professor (W2)**, *Mathematical Optimization, Department of Mathematics and Computer Science, Philipps-Universität Marburg, Marburg, Germany, 10.2016–09.2022*
- 2014–2016 **Assistant Professor (W1)**, *Nonsmooth Optimization and Variational Analysis, Department of Mathematics, Humboldt-Universität zu Berlin, Berlin, Germany, 05.2014–09.2016*
- 2009–2014 **Research Associate**, *Department of Mathematics, Humboldt-Universität zu Berlin, Berlin, Germany, 05.2009–04.2014*
- 2006–2009 **Research Assistant**, *Department of Mathematics, Humboldt-Universität zu Berlin, Berlin, Germany, 08.2006–04.2009*
- 2004–2006 **Teaching Assistant**, *Department of Mathematical Sciences, Stevens Institute of Technology, Hoboken, NJ, USA, 08.2004–05.2006*

## Additional Experience

- 2023– **Visiting Scholar**, *Department of Applied Mathematics, Brown University, Providence, RI, USA, 09.2023–*
- 2020– **Affiliate & Advisory Board**, *Center for Mathematics and Artificial Intelligence, George Mason University, Fairfax, VA*

## Education

- 2006–2010 **PhD (doc. rer. nat.)**, *Humboldt-Universität zu Berlin, Berlin, Germany, Mathematics*
- 2004–2006 **Master of Science**, *Stevens Institute of Technology, Hoboken, NJ, USA, Stochastic Systems: Analysis and Optimization*
- 2000–2004 **Bachelor of Science**, *Stevens Institute of Technology, Hoboken, NJ, USA, Mathematical Sciences*

## Research Interests

Data-driven optimization and optimization under uncertainty  
Optimization and optimal control of complex systems  
Applications in digital microfluidics, semiconductors, medicine  
Risk management tools in engineering optimization

## Prizes

2020 **Charles Broyden Prize 2020**, with Patrick E. Farrell (Oxford) and Matteo Croci (Oxford)) for the best paper published in the 2020 volume of *Optimization Methods and Software*, <https://doi.org/10.1080/10556788.2019.1613655>

## Research Projects

### As Principal Investigator

- 2019–2022 **Constrained Mean Field Games: Analysis and Algorithms**, PI (with M. Hintermüller) within the SPP 1962: Priority Program “Non-smooth and Complementarity-based Distributed Parameter Systems: Simulation and Hierarchical Optimization”, Total: Est. 360,000 USD. Marburg: Est. 180,000 USD, excluding overheads
- 2016–2021 **Generalized Nash Equilibrium Problems with Partial Differential Operators: Theory, Algorithms, and Risk Aversion**, PI (with M. Hintermüller), within the SPP 1962: Priority Program “Non-smooth and Complementarity-based Distributed Parameter Systems: Simulation and Hierarchical Optimization”, Total: Est. 380,000 USD. Marburg: Est. 190,000 USD, excluding overheads
- 2014–2017 **Mathematical Modeling, Analysis, and Optimization of Strained Germanium-Microbridges**, PI (with M. Hintermüller, A. Mielke, M. Thomas) for the Einstein Center for Mathematics Project OT1, Total: Est. 380,000 USD. HU Berlin: Est. 180,000 USD, excluding overheads

### As Post-Doc or Doctoral Student

- 2009–2013 **Optimal Control of Phase Separation Phenomena**, DFG Research Center MATH-EON Project C28, 05.2009–2013, Post-Doc, 1/3 position, PI M. Hintermüller
- 2009–2012 **Elliptic Mathematical Programs with Equilibrium Constraints (MPECs) in Function Space: Optimality Conditions and Numerical Realization**, DFG Priority Program SPP 1253 “Optimization with Partial Differential Equations”, 05.2009–05.2012, Post-Doc, 1/3 position, PI M. Hintermüller
- 2006–2009 **DFG-RTG 1128 Analysis, Numerics and Optimization of Multiphase Problems**, 08.2006–08.2009, PhD Student, Stipend Est. 44,000 USD

## Journal Articles & Book Chapters

1. *Asymptotic Consistency for Nonconvex Risk-Averse Stochastic Optimization with Infinite Dimensional Decision Spaces* to appear in Math. Oper. Res. (w. J. Milz)
2. *On Binary Optimal Control in  $H^s(0, T)$ ,  $s < 1/2$*  to appear in C. R. Math. (w. P. Manns)
3. *Optimal Control of the Landau-de Gennes Model of Nematic Liquid Crystals* SIAM J. Control Optim. 61(4) 2546–2570 (w. S.W. Walker)
4. *Optimal control of the stationary Kirchhoff equation* Comput. Optim. Appl. 85, 479–508 (2023) (w. M. Hashemi, R. Herzog)
5. *A Relaxation-based Probabilistic Approach for PDE-constrained Optimization under Uncertainty with Pointwise State Constraints* (w. D.P. Kouri, M. Staudigl) Comput. Optim. Appl. 85 (2023), 441–478
6. *Risk-Neutral PDE-Constrained Generalized Nash Equilibrium Problems*, Math. Program. (2022). <https://doi.org/10.1007/s10107-022-01800-z> (w. D.B. Gahururu, M. Hintermüller)

7. *A Wavelet-Based Approach for the Optimal Control of Non-Local Operator Equations*, SIAM J. Sci. Comput., 44(4) (2022), pp. A2691-A2708 (w. S. Dahlke, H. Harbrecht)
8. *Uncertainty Quantification in Image Segmentation using the Ambrosio-Tortorelli Approximation of the Mumford-Shah Energy*, Journal of Mathematical Imaging and Vision volume 63, pages 1095–1117 (2021) (w. M. Hintermüller, S.-M. Stengl)
9. *Computing Multiple Solutions of Topology Optimization Problems*, SIAM J. Sci. Comput., 43(3) (2021), 1555–1582 (w. P.E. Farrell, I. Papadopoulos)
10. *On Quantitative Stability in Infinite-Dimensional Optimization under Uncertainty*, Optim. Lett. (2021). <https://doi.org/10.1007/s11590-021-01707-2> (w. M. Hoffhues, W. Römisch)
11. *A Primal-Dual Algorithm for Risk Minimization*, Math. Program. (2021). <https://doi.org/10.1007/s10107-020-01608-9> (w. D.P. Kouri)
12. *Wavelet-based approximations of pointwise bound constraints in Lebesgue and Sobolev spaces*, IMA J. Numer. Anal. (2020) draa066, <https://doi.org/10.1093/imanum/draa066> (w. S. Dahlke)
13. *An Interior-Point Approach for Solving Risk-Averse PDE-Constrained Optimization Problems with Coherent Risk Measures*, SIAM J. Optim., 31(1) (2021) 1-29. (w. S. Garreis, M. Ulbrich)
14. *Risk-Averse Optimal Control of Semilinear Elliptic PDEs*, ESAIM: COCV, 26(53) (2020) (w. D.P. Kouri)
15. *Epi-Regularization of Risk Measures*, Math. Oper. Res., 45(2) (2020) 774–795 (w. D.P. Kouri)
16. *Deflation for Semismooth Equations*, Optim. Method. Softw., DOI: 10.1080/10556788.2019.1613655 (w. P.E. Farrell, M. Croci)
17. *Optimization of a multiphysics problem in semiconductor laser design*, SIAM J. Appl. Math. 79(1) (2019) 257–283. (w. L. Adam, M. Hintermüller, D. Peschka)
18. *A Semismooth Newton Method with Analytical Path-Following for the  $H^1$ -Projection onto the Gibbs Simplex*, IMA J. Numer. Anal. 39(3) (2019) 1276–1295 (w. L. Adam, M. Hintermüller)
19. *A PDE-constrained optimization approach for topology optimization of strained photonic devices*, Optim. Eng. 19(3) (2018) 521–557., (w. L. Adam, M. Hintermüller)
20. *Numerical Optimization Methods for the Optimal Control of Elliptic Variational Inequalities*, In: Antil H., Kouri D.P., Lacasse MD., Ridzal D. (eds) Frontiers in PDE-Constrained Optimization. The IMA Volumes in Mathematics and its Applications, vol 163. (2018) Springer, New York, NY
21. *Existence and Optimality Conditions for Risk-Averse PDE-Constrained Optimization*, SIAM/ASA J. Uncertainty Quantification 6 (2), (2018) 787-815. (w. D.P. Kouri)
22. *On the Directional Differentiability of the Solution Mapping for a Class of Variational Inequalities of the Second Kind*, Set-Valued Var. Anal 26 (3) (2018) 631–642. (w. M. Hintermüller)
23. *Finite Horizon Model Predictive Control of Electrowetting on Dielectric with Pinning*, Interface Free Bound. 19 (1), (2017) 1-30. (w. H. Antil, M. Hintermüller, R.H. Nochetto, and D. Wegner)
24. *A Bundle-Free Implicit Programming Approach for a Class of Elliptic MPECs in Function Space*, Math. Program. 160 (1-2), (2016), 271-305 (w. M. Hintermüller)
25. *Risk-Averse PDE-Constrained Optimization Using the Conditional Value-At-Risk*, SIAM J. Optim., 26(1), (2016), 365-396. (w. D.P. Kouri)

26. *Generalized Nash Equilibrium Problems in Banach Spaces: Theory, Nikaido–Isoda-Based Path-Following Methods, and Applications*, SIAM J. Optim., 25(3), (2015), 1826-1856. (w. M. Hintermüller and A. Kämmler)
27. *Several Approaches for the Derivation of Stationarity Conditions for Elliptic MPECs with Upper-Level Control Constraints*, Math. Prog. Ser. A., 146(1-2) (2014), 555-582. (w. M. Hintermüller and B.S. Mordukhovich)
28. *A PDE-constrained Generalized Nash Equilibrium Problem with Pointwise Control and State Constraints*, Pac. J. Opt., 9(2), (2013) 251-273. (w. M. Hintermüller)
29. *On Regular Coderivatives in Parametric Equilibria with Non-Unique Multipliers*, Math. Prog. Ser. B., 136(1) (2012), 111-131. (w. R. Henrion and J.V. Outrata)
30. *Analysis of M-stationary points to an EPEC modeling Oligopolistic Competition in an Electricity Spot Market*, ESAIM: COCV 18 (2012) 295-317. (w. R. Henrion and J.V. Outrata)
31. *First Order Optimality Conditions for Elliptic Mathematical Programs with Equilibrium Constraints via Variational Analysis*, SIAM J. Optim., 21(4), (2011) 1561-1593. (w. M. Hintermüller)
32. *On Calmness Conditions in Convex Bilevel Programming*, Applicable Analysis, 90 (2011) 951-970. (w. R. Henrion)
33. *A Note on the Relation between Strong and M-stationarity for a Class of Mathematical Programs with Equilibrium Constraints*, Kybernetika, 46 (2010) 423-434. (w. R. Henrion and J.V. Outrata)
34. *On the Co-Derivative of Normal Cone Mappings to Inequality Systems*, to appear in: Nonlinear Analysis: Theory, Methods & Applications (2008). (w. R. Henrion and J.V. Outrata)
35. *Subdivision of Edges and Matching Size*, Ars Combinatoria, 84 (2007) 141 - 153. (w. D. Bauer and E. Schmeichel)
36. *Tutte sets in graphs II: The complexity of finding Maximum Tutte sets*, Discrete Applied Math., 155 (2007) 1336 - 1343. (w. D. Bauer, H. J. Broersma, N. Kahl, A. Morgana, and E. Schmeichel)

### Preprints (Submitted & In Revision)

37. *Asymptotic properties of Monte Carlo methods in elliptic PDE-constrained optimization under uncertainty* Submitted to Computational and Applied Mathematics, arXiv.2106.06347 <https://arxiv.org/abs/2106.06347>. (w. W. Römisich)
38. *A Risk Management Perspective on Statistical Estimation and Generalized Variational Inference*, In Revision (w. D.P. Kouri)
39. *On a Differential Generalized Nash Equilibrium Problem with Mean Field Interaction* submitted (w. M. TheiBand M. Hintermüller)

### Other Publications (Newsletters, Interdisciplinary, In Preparation)

40. *Detection of the Lateral Thermal Spread during Bipolar Vessel Sealing in an Ex Vivo Model—Preliminary Results*, Diagnostics 12(5):1217 (3rd author w. A. Kirschbaum, J. Jonas, A. Pehl, und N. Mirow)
41. *PDE-Constrained Optimization under Uncertainty*, SIAG/OPT Views and News, Volume 25 Number 2, December 2017 (w. D.P. Kouri)
42. *Suturing of the laser resection area is recommended over a depth of 2 cm in an experimental porcine lung model*, Journal of Thoracic Disease 10(9):5339-5345 (2nd author w. A. Kirschbaum, A. Pehl, A. Gockel, D.K. Bartsch, und N. Mirow)

43. *Local lung coagulation post resection - an ex-vivo porcine model*, Lasers Med Sci. 2021;1-5. doi:10.1007/s10103-021-03280-7 (2nd author w. A. Kirschbaum, A. Pehl, T. Wiesmann, D.K. Bartsch, N. Mirow)
44. *Explicit Stationarity Conditions and Solution Characterization for Equilibrium Problems with Equilibrium Constraints*, Doctoral Thesis (doc. rer. nat. Mathematics), January 2010, Humboldt-Universität zu Berlin.
45. *Stability of Stochastic Optimization Problems with Stochastic Dominance Constraints*, Master's Thesis (M.S. Stochastic Systems: Analysis and Optimization), May 2006 Stevens Institute of Technology.

## Invited Presentations (Conferences, Colloquia, & Seminars)

1. *Almost sure state constraints in PDE-constrained optimization under uncertainty* SIAM Conference on Optimization, Seattle WA, USA (June 1, 2023)
2. *Almost sure state constraints in PDE-constrained optimization under uncertainty* Frontiers of Stochastic Optimization and its Applications in Industry, Weierstraß-Institut, Berlin, Germany (May 12, 2023).
3. *Risk-Averse Optimization of Random Elliptic Variational Inequalities* SIAM Conference on Computational Science and Engineering, Amsterdam, The Netherlands (March 3, 2023).
4. *Asymptotic Properties of Monte Carlo Methods for PDE-Constrained Optimization under Uncertainty* abstract SIAM Conference on Uncertainty Quantification (virtual, April 12, 2022).
5. *Exploiting Structure in Risk-Averse PDE-Constrained Optimization: An Interior Point Approach* SIAM Conference on Optimization, (virtual, July 21, 2021)
6. *An Introduction to Risk-Averse PDE-Constrained Optimization: Theory, Numerical Solution, and Open Problems* Summer School Courses at CMAI George Mason University. (June 18, 2021) **Link to videos:** <https://math.gmu.edu/~hantil/CMAI/SummerSchool/2021/Surowiec/>
7. *An Interior-Point Approach for Risk-Averse PDE-Constrained Optimization using Mean-Plus-CVaR* SIAM Conference on Computational Science and Engineering, (virtual, March 1, 2021)
8. *An interior point approach for a class of risk-averse PDE-constrained optimization problems with coherent risk measures* Oberwolfach Workshop 2107 "Challenges in Optimization with Complex PDE-Systems" (virtual, February 16, 2021)
9. *Risk-Averse Optimization of Random Elliptic Partial Differential Equations: Modeling, Theory, and Numerical Solution* Mathematisches Kolloquium am Fachbereich Mathematik, TU Darmstadt (virtual, January 2021)
10. *A Primal-Dual Algorithm for Risk Minimization in PDE-Constrained Optimization* Centre de recherches mathématiques - CRM Applied Mathematics Seminar, (virtual, November 23, 2020) **Link to video:** <https://www.youtube.com/watch?v=r60uFvaRsY0&t=1s>
11. *Stability Analysis for a Class of Risk-Neutral PDE-Constrained Optimization Problems* Uncertainty Management and Machine Learning in Engineering Applications, Stony Brook University (virtual, November 16, 2020)
12. *Optimization of Elliptic PDEs with Uncertain Inputs: Basic Theory and Numerical Stability* Center for Mathematics and Artificial Intelligence (CMAI) at George Mason University, Fairfax VA USA (virtual. Talk and slides available at <http://cmai.science.gmu.edu/index.php/events/#colloquium>)
13. *Solving Risk-Averse PDE-Constrained Optimization Problems via an Interior-Point Approach* GDO2020, DIAG, Rome, Italy. February 24-26, 2020
14. *An interior-point approach for a class of risk-averse PDE-constrained optimization problems* Workshop on PDE Constrained Optimization under Uncertainty and Mean Field Games, WIAS, Berlin, Germany,

January 28-30, 2020

15. *A New Primal-Dual Approach for Solving Risk-Averse PDE-Constrained Optimization Problems*  
RICAM Workshop "Optimization and Inversion under Uncertainty" Linz, Austria 11.2019
16. *A primal-dual algorithm for risk-averse PDE-constrained optimization*  
ICCOPT Berlin 09.2019
17. *PDE-Constrained Optimization under Uncertainty*  
15th International Conference on Stochastic Programming Trondheim 08.2019
18. *A primal-dual algorithm for risk-averse PDE-constrained optimization*  
ICIAM Valencia 07.2019
19. *A primal-dual algorithm for PDE-constrained optimization und uncertainty*  
Erwin Schrödinger Institute Workshop on "Modern Maximal Monotone Operator Theory: From Nonsmooth Optimization to Differential Inclusions" 03.2019
20. *A primal-dual algorithm for risk minimization*  
GAMM Annual Meeting Wien 02.2019
21. *Perspectives on PDE-Constrained Optimization under Uncertainty*  
Oberwolfach Workshop 1834 "New Directions in Stochastic Optimisation" 08.2018
22. *Smoothing Techniques for PDE-Constrained Optimization under Uncertainty*  
SIAM UQ, Garden Grove, CA, USA, 04.2018
23. *Risk-Averse Optimal Control of PDE-Systems with Random Parameters* Oberwolfach Workshop  
1815 "Challenges in Optimal Control of Nonlinear PDE-Systems" 04.2018
24. *Regularization Techniques for PDE-Constrained Optimization under Uncertainty*  
GAMM Annual Meeting, Munich, Germany, 03.2018
25. *Introduction to PDE-Constrained Optimization under Uncertainty*  
Short course as part of the spring school "New Directions in PDE Constrained Optimisation" at the IIT Bombay, Mumbai, India, 03.2018
26. *Aspects of Variational Analysis in Risk-Averse PDE-Constrained Optimization* Third Central European  
Set-Valued and Variational Analysis Meeting CESVAM, TU Chemnitz, 11.2017
27. *Risk-Averse Optimization of Partial Differential Equations with Random Inputs*  
Rhein-Main Arbeitskreis Mathematics of Computation, Universität Mannheim, 07.2017
28. *Risk-Averse Optimization of Partial Differential Equations with Random Inputs*  
SIAM Conference on Optimization, Vancouver, Canada, 05.2017
29. *Risk-Averse Optimization of Partial Differential Equations with Random Inputs*  
Numerical Analysis Seminar, University of Oxford, 04.2017
30. *Risk-Averse PDE-Constrained Optimization: Analysis, Optimality, and Numerical Solution* University  
Seminar Series at Stevens Institute of Technology, 03.2017
31. *Risk-Averse PDE-Constrained Optimization: Analysis, Optimality, and Numerical Solution* Applied  
Math and Analysis Seminar, Duke University, 03.2017
32. *Risk-Averse PDE-Constrained Optimization*  
SIAM CS&E, Atlanta, Georgia, 02.2017
33. *Risk Averse PDE-Constrained Optimization using Risk Measures*  
Seminar of the IGDK Munich-Graz at the TU München 09.2016
34. *Risk Averse PDE-Constrained Optimization using Coherent Measures of Risk*  
ICCOPT 2016, Tokyo, 08.2016
35. *Tutorial on Optimal Control of Variational Inequalities*  
IMA Workshop "Frontiers in PDE-Constrained Optimization", Minneapolis, 06.2016
36. *Handling non-smooth risk measures in risk-averse PDE-constrained optimization* WIAS - PGMO  
Workshop Nonsmooth and Stochastic Optimization with Applications to Energy Management, Berlin,  
05.2016

37. *Managing Uncertainty in PDE-Constrained Optimization Using Risk Measures*  
SIAM UQ 2016, Lausanne, 04.2016
38. *A Model Predictive Control Approach for a Time-Dependent Free-Boundary Problem in Electro-microfluidics*  
Seminar of the Automatic Control Lab. ETH Zurich, 01.2016
39. *Analysis and Numerics of Optimization Problems with Variational Inequality Constraints*  
ISMP 2015, Pittsburgh, 07.2015
40. *Instantaneous Control of a Model of Electrowetting on Dielectric with Complementarity-based Contact-Line Pinning*  
IFIP TC 7, Sofia-Antipolis, 06.2015
41. *Optimal Control of Elliptic Variational Inequalities: Optimality Conditions and Numerical Methods*,  
Numerical Analysis Seminar, University of Maryland College Park, College Park, Maryland, USA, 04.2015
42. *On risk-averse PDE-constrained optimization using convex risk measures inspired by conditional value-at-risk*  
SIAM Conference on Computational Science and Engineering, Salt Lake City, 04.2015
43. *Path-Following Methods for Generalized Nash Equilibrium Problems in Banach Spaces*, Universität der Bundeswehr München, Germany, 12.2014
44. *Nonsmooth analysis and implicit programming approaches for optimal control problems governed by variational inequalities of the first and second kind*,  
Bilevel Optimal Control, Heidelberg, 10.2014
45. *Solving optimal control problems governed by variational inequalities of the first and second kind via non-smooth analysis and bundle-free implicit programming approaches*, Applied and Computational Math Seminar, George Mason University, Fairfax, Virginia, USA, 09.2014
46. *On the Optimal Control of a Class of Variational Inequalities of the Second Kind*  
SIAM Conference on Optimization, San Diego, 05.2014
47. *Bundle-Free Implicit Programming Approaches for the Optimal Control of Variational Inequalities of the First and Second Kind*,  
6th International Conference on Complementarity Problems, Berlin, 08.2014
48. *On a class of generalized Nash equilibrium problems in Banach space with applications to multiobjective PDE-constrained optimization*,  
ICCOPT 2013, Lisbon, 08.2013
49. *A PDE-Constrained Generalized Nash Equilibrium Problem: Analysis and Numerics*, Mathematical Sciences Seminar, Stevens Institute of Technology, Hoboken, 09.2012
50. *A PDE-Constrained Generalized Nash Equilibrium Problem with Pointwise Control and State Constraints*,  
ISMP 2012, Berlin, 08.2012
51. *A Bundle-Free Implicit Programming Approach for the Optimal Control of Variational Inequalities*, Free Boundary Problems (FBP) 2012, Chiemsee, 06.2012
52. *On the Derivation of Optimality Conditions for Elliptic MPECs via Variational Analysis* IFIP TC 7, Berlin, 09.2011
53. *A Bundle-Free Implicit Programming Approach for a Class of Elliptic MPECs*,  
OR 2011, Zürich, 08.2011
54. *Mathematical Programs with Equilibrium Constraints in Function Spaces*, Optimization and Applications Seminar, ETH Zürich and University of Zürich, 05.2011
55. *Derivation of Optimality Conditions for Elliptic MPECs via Variational Analysis*,  
SIOPT 2011, Darmstadt, 05.2011
56. *Bundle-Free Implicit Programming for Elliptic MPECs*, Seminar des Fachgebiets Optimierung bei

Partiellen Differentialgleichungen, Technische Universität Berlin, 01.2011

- 57. *Strong Stationarity Conditions for Elliptic Mathematical Programs with Equilibrium Constraints*, PARAOPT X, Karlsruhe, 09.2010
- 58. *Analysis of M-stationary Points to an Electricity Spot Market EPEC*, ISMP 2009, Chicago, 08.2009

### Contributed Talks

- 54. *On Wavelets, Bound Constraints, and the Optimal Control of Nonlocal Operator Equations* ALOP Workshop 2021: Nonlocal Models: Analysis, Optimization and Implementation July 12, 2021 Universität Trier (virtual)
- 55. *Some Structural Properties and Stationarity of Solutions to a Stochastic Spot Market EPEC*, Conference on Optimization and Practices in Industry 2008, Paris, France 11.2008
- 56. *Analysis of M-stationary Points and Solutions to an SEPEC Modeling Oligopolistic Competition*, CARIPLO Workshop on Numerical Linear and Nonlinear Stochastic Programming, Edinburgh, Scotland, UK 09.2008
- 57. *On the Coderivative of the Normal Cone Mapping to Non-Polyhedral Sets*, ECMI 2008, London, UK 07.2008

### Research Visits

- 09.2018 University of Oxford
- 04.2018 Sandia National Laboratories, (Albuquerque)
- 04.2018 University of Oxford
- 03.2017 Stevens Institute of Technology
- 03.2017 Duke University
- 09.2016 TU München
- 09.2016 Sandia National Laboratories, (Albuquerque)
- 03.2015 University of Maryland College Park
- 03.2015 George Mason University
- 03.2015 Sandia National Laboratories, (Albuquerque)
- 09.2014 University of Maryland College Park
- 09.2014 George Mason University

### Reviewing and Editorial Work

I regularly write reviews for SIAM J. on Optimization, SIAM J. on Control and Optimization, SIAM J. Scientific Computing, SIAM/ASA J. Uncertainty Quantification, Optimization, Optimization Methods and Software, Set-Valued and Variational Analysis, Control Optimization and Calculus of Variations, Mathematical Programming, Numerische Mathematik, German Research Foundation (DFG), Austrian Science Fund (FWF), KU Leuven Research Council

- 09.2023- Associate Editor (Mathematics) for Optimization and Engineering
- 2021- Area Editor (Optimization) for Advances in Continuous and Discrete Models: Theory and Applications

### Conference Organization



Member of Scientific Committee for *European Conference on Computational Optimization (EUCCO)* Universität Heidelberg, September 25-27, 2023

Member of Organizing Committee for *Frontiers of Stochastic Optimization and its Applications in Industry* Weierstrass Institute Berlin, May 10-12, 2023

Member of Organizing Committee for the Rhein-Main-Arbeitskreis "Mathematics of Computation" (biannual colloquia for numerics, stochastics, and optimization) (2016-2022)

Organizer of the *DFG-SPP 1962 Summer School on Optimization under Uncertainty* at Philipps-Universität Marburg (September 8-10, 2021, virtual). Info: <https://thomas-surowiec.github.io/> and Slides: <https://drive.google.com/drive/folders/11q6wwlCI8TV29slGdwe7kr4sVGT5BTy1>

Co-organizer of a minisymposium on *Optimization and Estimation of Complex Systems under Uncertainty* at the SIAM Conference on Computational Science and Engineering, March 1-5, 2021, Fort Worth TX (virtual with D.P. Kouri)

Co-organizer of the BIRS Workshop: Optimization under Uncertainty: Learning and Decision Making with C. Schillings, J. Royset, L. Ruthotto. February 7-12, 2021, Banff Canada (virtual due to COVID-19)

Cluster Chair for Complementarity and Variational Inequalities at the ICCOPT 2019 in Berlin (with M. Ferris)

Co-organizer a minisymposium on *PDE-constrained Optimization Under Uncertainty* at the ICCOPT 2019 in Berlin (with H. Antil, D.P. Kouri, M. Ulbrich, S. Ulbrich)

Co-organizer of a minisymposium on *PDE-Constrained Optimization under Uncertainty and Applications* at the 15th International Conference on Stochastic Programming in Trondheim, Norway. (with D.P. Kouri)

Organizer of the fourth annual *Central European Set-Valued and Variational Analysis Meeting* at Philipps-Universität Marburg, November 2018.

Co-organizer of a minisymposium on *Exploiting Structure in Optimization under Uncertainty* at the SIAM Conference on Uncertainty Quantification 2018 in Garden Grove, California, USA. (with H. Antil, D.P. Kouri, D. Ridzal)

Co-organizer of the spring school on *New Directions in PDE Constrained Optimisation* at the IIT Bombay, Mumbai, India, March 2018. (with H. Antil, A. Kumar, N. Nataraj)

Co-organizer of a minisymposium on *Risk-Averse Optimization for Engineering Applications* at the SIAM Conference on Optimization, Vancouver, Canada, May 2017. (with D.P. Kouri, S. Uryasev)

Co-organizer of a minisymposium on *Stochastic PDE-Constrained Optimization and Applications* at the SIAM Conference on Computational Science and Engineering, Atlanta, Georgia, USA, March 2017. (with D.P. Kouri)

Co-organizer of ECMathColloquia 1-3 together with C. Hartmann, C. Gräser, R. Kruse (05.06.2015 "Uncertainty Quantification", 01.08.2016 "Geometric PDEs and free boundary problems", 22.04.2016 "Sparsity: Statistics, Optimization and Applications?")

Co-organizer of a minisymposium on *Mathematical Programs with Equilibrium Constraints* at the EUCCO Conference 2016 in Leuven, Belgium. (with G. Wachsmuth)

Organizer of a two-part minisymposium on *Optimization of Non-smooth and Complementarity-based Systems with PDE-constraints* at the ISMP 2015 Conference in Pittsburgh.

Co-organizing a two-part minisymposium on *Optimization and Control of Nonsmooth and Complementarity-Based Systems: Theory and Numerics* at the IFIP TC7 Conference 2015 in Sophia-Antipolis. (with G. Wachsmuth)

Co-organizer of a two-part minisymposium titled *Variational Inequalities and MPECs in Function Space: Analysis, Numerics, and Applications* at the IFIP TC7 Conference 2011 in Berlin. (with M. Hintermüller)

Co-organizer of a three-part minisymposium titled *(Quasi)-Variational Inequalities, Complementarity Problems and MPECs* at the SIAM Conference on Optimization 2011 in Darmstadt. (with M. Hintermüller)

Co-organizer of the *International Conference on Complementarity Problems* at HU Berlin August, 2014. (with M. Hintermüller)

## Teaching Experience

Philipps-Universität Marburg, Marburg, Germany

### Lectures

- WS 21/22 Mathematical Optimization for Machine Learning
- WS 21/22 Linear Programming
  - SS 21 PDE-Constrained Optimization
  - SS 21 Nonlinear Optimization
- WS 20/21 Linear Programming
- WS 20/21 Convex Analysis
  - SS 20 Mathematical Optimization for Machine Learning
  - SS 20 Nonlinear Optimization
- WS 19/20 Linear Programming
- WS 19/20 Stochastic Optimization
  - SS 19 Nonlinear Optimization
  - SS 19 PDE-Constrained Optimization
- WS 18/19 Linear Programming
- WS 18/19 Convex Analysis
- WS 17/18 Linear Programming
- WS 17/18 Stochastic Optimization
  - SS 17 Nonlinear Optimization
  - SS 17 PDE-Constrained Optimization
- WS 16/17 Linear Programming
- WS 16/17 Convex Optimization in Banach Spaces

### Seminars and Praktika

- SS 21 Seminar Numerics and Optimization
- SS 21 Praktikum Numerics and Optimization

WS 20/21   Praktikum Numerics and Optimization  
SS 20     Seminar Numerics and Optimization  
SS 20     Praktikum Numerics and Optimization  
WS 19/20   Seminar Optimization  
WS 16/17-   Praktikum Numerics and Optimization  
SS 20  
WS 16/17 -   Oberseminar Numerics and Optimization  
WS 21/22

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#### Lectures

SS 16   Stochastic Optimization  
WS 15/16   Mathematical Programms with Equilibrium Constraints  
SS 15   Theory and Numerics of Nonsmooth Optimization  
WS 14/15   Real Analysis for Physicists  
SS 14   Variational Inequalities  
SS 13   Nonlinear Optimization

#### Recitations

WS 12/12   Linear Algebra  
SS 12   Real Analysis I  
WS 11/12   Real Analysis I  
SS 11   Real Analysis II  
WS 10/11   Applied Mathematics for Computer Scientists  
SS 10   Real Analysis II  
WS 09/10   Real Analysis I

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#### Recitations

SpS 06   Calculus IV  
FS 05/06   Calculus I  
SpS 05   Calculus II  
FS 04/05   Calculus I

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## Advising & Supervision

Philipps-Universität Marburg, Marburg, Germany

#### Supervision

Patrick Stremme, Examensarbeit, 01.2018  
Fynn Adam, B.S. Mathematics, 04.2018  
Kai Alexander Stelter, B.S. Industrial Mathematics, 08.2018  
Sarah Heibutzki, B.S. Mathematics, 08.2018  
Bianca Raffelsiefer, M.S. Industrial Mathematics, 06.2018

Mario Hoffhues, M.S. Industrial Mathematics, 12.2018  
Masume Hashemi, M.S. Mathematics, 05.2019  
Kai Alexander Stelter, M.S. Mathematics, 02.2020  
Mike Theiß, M.S. Mathematics, 11.2019  
Ina Horst, B.S. Industrial Mathematics 11.2019  
Simon Schneider, B.S. Industrial Mathematics 11.2019  
Stefan Störmer, B.S. Mathematics 02.2021  
Verena Schmerer B.S. Mathematics 10.2020  
Andreas Mehring B.S. Mathematics 03.2021  
Paulina Hussmann B.S. Mathematics 11.2020  
Maximilian Born B.S. Industrial Mathematics 11.2020  
Bogdan Levagin, M.S. Data Science 06.2020 with DB Analytics  
Anton Broessel, B.S. Mathematics 09.2021  
Sarah Heibutzki, M.S. Mathematics, 09.2022  
Verena Schmerer M.S. Mathematics 09.2022  
Mike Theiß, PhD Mathematics, 11.2023 (tentative)  
Deborah Gahururu, PhD Mathematics, 03.2022  
Carolin Wehner, B.S. Industrial Mathematics, 12.2021  
Indrit Berbiu, B.S. Industrial Mathematics, 09.2022  
Hannah Rickmann, B.S. Industrial Mathematics, 01.2022  
Julia Ristau, B.S. Industrial Mathematics, 05.2022

#### Second Reviewer

Martina Seibert, M.S. Mathematics, 2017  
Sophie Döpp, B.S. Mathematics, 2017  
Melanie Herchenhahn, B.S. Mathematics, 2017  
Stella Joswig, B.S. Mathematics, 2017  
Christoph Kötzsche, B.S. Mathematics, 2017  
Cinja Kollmus-Heege, B.S. Mathematics, 2017  
Anne Kopsch, B.S. Mathematics, 2017  
Fabian Lötschert, B.S. Mathematics, 2017  
Christoph Schwab, B.S. Mathematics, 2017  
Mike Theiß, B.S. Mathematics, 2017  
Dorian Vogel, B.S. Mathematics, 2017  
Vania Zhang, B.S. Mathematics, 2017  
Ann-Christin Schmidt, B.S. Mathematics, 2018  
Alexander Michel, B.S. Mathematics, 2018  
Hilke Isabell Stibbe, Ph.D. Mathematics, 9.2019  
Alexander Hirsch, B.S. Mathematics 04.2021  
Sophie Dietrich, B.S. Mathematics 06.2021  
Polina Nikolenko, B.S. Mathematics 06.2021

Anna-Katarina Marx, B.S. Mathematics 10.2021

Marie Skott, B.S. Mathematics 05.2022

Humboldt-Universität zu Berlin, Berlin, Germany

#### Supervision and Second Reviewer

Julius Seiberl, B.S. Mathematics (with M. Hintermüller), 11.2012

Daniel Zechlin, B.S. Mathematics (with M. Hintermüller), 05.2012

Jennifer Rasch, M.S. Mathematics (with M. Hintermüller), 07.2012

Tobias Keil, M.S. Mathematics (with M. Hintermüller), 06.2013

Adrian Kämmler, M.S. Mathematics (with M. Hintermüller), 01.2014

Andrea von Schirp, M.S. Mathematics (with M. Hintermüller), 06.2014

Philipp Heltzel, B.S. Mathematics, 02.2015

Jesse Scherwitz, B.S. Mathematics (with C. Tischendorff), 01.2015

Magdalena Nöth, M.S. Mathematics, 05.2016

Steven-Marian Stengl, M.S. Mathematics, 08.2016

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## Departmental Work

### Administration

Philipps-Universität Marburg, Marburg, Germany

Faculty Council Member (Elected Position) WS 20-22

Doctoral Examination Board WS 21-22

Tenure-Track Committee WS 20-22

Student Counselor for B.S. and M.S. in Wirtschaftsmathematik (Analytics) WS 20-22

Acting Director of Examination Board: Mathematics and Wirtschaftsmathematik (Analytics) WS 18/19–20

Director of Examination Board: Wirtschaftsmathematik (Analytics) WS 18/19–20

### Search & Hiring Committees (for professorships)

2022 (Marburg), 2021 (Marburg), 2019 (Marburg), 2017 (Marburg), 2015 (HU Berlin), 2013 (HU Berlin).

### Chair of PhD Committees

C. Hartmann 2018 (Marburg)

L. Pfeiffer 2018 (Marburg)

F. Eichenauer 2016 (HU Berlin)

### Reviewer of PhD Theses

R. Patho 2014 (Charles University Prague)

A. Hempel, 2016 (ETH Zurich)

H. Stibbe 2019 (Marburg)

J. Becker, 2021 (TU Darmstadt)

M. Stengl 2022 (tentative, HU Berlin)

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## Stipends, Awards, Scholarships

Member of DFG RTG 1128 "Multiphase Problems", 08.2006-05.2009

Teaching Assistantship, Department of Mathematics, Stevens Institute of Technology,  
08.2004-05.2006

ECE/NSF Undergraduate Research Scholarship, 2002-2003

Charles L. Petchek Scholarship, 2003

Stevens Technogenesis Summer Research Program, 06.2003-08.2003, 06.2002-08.2002

Stevens Institute of Technology University Scholarship, 2000-2004

## Languages

English	Native
German	Fluent (Native Level)
Norwegian	Basic Knowledge (A2-B1)