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

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 MATHEON 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. *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)
2. *A Wavelet-Based Approach for the Optimal Control of Non-Local Operator Equations*, to appear in SIAM J. Sci. Comput. (w. S. Dahlke, H. Harbrecht)
3. *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)
4. *Computing Multiple Solutions of Topology Optimization Problems*, SIAM J. Sci. Comput., 43(3) (2021), 1555–1582 (w. P.E. Farrell, I. Papadopoulos)
5. *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)
6. *A Primal-Dual Algorithm for Risk Minimization*, Math. Program. (2021). `https://doi.org/10.1007/s10107-020-01608-9` (w. D.P. Kouri)
7. *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)

8. *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)
9. *Risk-Averse Optimal Control of Semilinear Elliptic PDEs*, ESAIM: COCV, 26(53) (2020) (w. D.P. Kouri)
10. *Epi-Regularization of Risk Measures*, Math. Oper. Res., 45(2) (2020) 774–795 (w. D.P. Kouri)
11. *Deflation for Semismooth Equations*, Optim. Method. Softw., DOI: 10.1080/10556788.2019.1613655 (w. P.E. Farrell, M. Croci)
12. *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)
13. *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)
14. *A PDE-constrained optimization approach for topology optimization of strained photonic devices*, Optim. Eng. 19(3) (2018) 521–557., (w. L. Adam, M. Hintermüller)
15. *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
16. *Existence and Optimality Conditions for Risk-Averse PDE-Constrained Optimization*, SIAM/ASA J. Uncertainty Quantification 6 (2), (2018) 787-815. (w. D.P. Kouri)
17. *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)
18. *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)
19. *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)
20. *Risk-Averse PDE-Constrained Optimization Using the Conditional Value-At-Risk*, SIAM J. Optim., 26(1), (2016), 365-396. (w. D.P. Kouri)
21. *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)
22. *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)
23. *A PDE-constrained Generalized Nash Equilibrium Problem with Pointwise Control and State Constraints*, Pac. J. Opt., 9(2), (2013) 251-273. (w. M. Hintermüller)
24. *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)
25. *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)
26. *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)

27. *On Calmness Conditions in Convex Bilevel Programming*, Applicable Analysis, 90 (2011) 951-970. (w. R. Henrion)
28. *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)
29. *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)
30. *Subdivision of Edges and Matching Size*, Ars Combinatoria, 84 (2007) 141 - 153. (w. D. Bauer and E. Schmeichel)
31. *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)

32. *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. Römisch)
33. *A Risk Management Perspective on Statistical Estimation and Generalized Variational Inference*, In Revision (w. D.P. Kouri)
34. *On a Differential Generalized Nash Equilibrium Problem with Mean Field Interaction* submitted (w. M. Theißand M. Hintermüller)
35. *Optimal Control of the Kirchhoff Equation* In Revision (w. M. Hashemi, R. Herzog)
36. *A Relaxation-based Probabilistic Approach for PDE-constrained Optimization under Uncertainty with Pointwise State Constraints* Submitted (w. D.P. Kouri and M. Staudigl)
37. *Optimal Control of the Landau-de Gennes Model of Nematic Liquid Crystals* Submitted (w. S.W. Walker)
38. *Asymptotic Consistency for Nonconvex Risk-Averse Stochastic Optimization with Infinite Dimensional Decision Spaces* Submitted (w. J. Milz)
39. *On Binary Optimal Control in* $H^s(0,T)$, $s < 1/2$ Submitted (w. P. Manns)

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. *Asymptotic Properties of Monte Carlo Methods for PDE-Constrained Optimization under Uncertainty abstract* SIAM Conference on Uncertainty Quantification (virtual, April 12, 2022).
2. *Exploiting Structure in Risk-Averse PDE-Constrained Optimization: An Interior Point Approach* SIAM Conference on Optimization, (virtual, July 21, 2021)
3. *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/`
4. *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)
5. *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)
6. *Risk-Averse Optimization of Random Elliptic Partial Differential Equations: Modeling, Theory, and Numerical Solution* Mathematisches Kolloquium am Fachbereich Mathematik, TU Darmstadt (virtual, January 2021)
7. *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`
8. *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)
9. *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`))
10. *Solving Risk-Averse PDE-Constrained Optimization Problems via an Interior-Point Approach* GDO2020, DIAG, Rome, Italy. February 24-26, 2020
11. *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
12. *A New Primal-Dual Approach for Solving Risk-Averse PDE-Constrained Optimization Problems* RICAM Workshop "Optimization and Inversion under Uncertainty" Linz, Austria 11.2019
13. *A primal-dual algorithm for risk-averse PDE-constrained optimization*
    ICCOPT Berlin 09.2019
14. *PDE-Constrained Optimization under Uncertainty*
    15th International Conference on Stochastic Programming Trondheim 08.2019
15. *A primal-dual algorithm for risk-averse PDE-constrained optimization*
    ICIAM Valencia 07.2019
16. *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
17. *A primal-dual algorithm for risk minimization*

GAMM Annual Meeting Wien 02.2019

18. *Perspectives on PDE-Constrained Optimization under Uncertainty*
    Oberwolfach Workshop 1834 "New Directions in Stochastic Optimisation" 08.2018
19. *Smoothing Techniques for PDE-Constrained Optimization under Uncertainty*
    SIAM UQ, Garden Grove, CA, USA, 04.2018
20. *Risk-Averse Optimal Control of PDE-Systems with Random Parameters* Oberwolfach Workshop 1815 "Challenges in Optimal Control of Nonlinear PDE-Systems" 04.2018
21. *Regularization Techniques for PDE-Constrained Optimization under Uncertainty*
    GAMM Annual Meeting, Munich, Germany, 03.2018
22. *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
23. *Aspects of Variational Analysis in Risk-Averse PDE-Constrained Optimization* Third Central European Set-Valued and Variational Analysis Meeting CESVVAM, TU Chemnitz, 11.2017
24. *Risk-Averse Optimization of Partial Differential Equations with Random Inputs*
    Rhein-Main Arbeitskreis Mathematics of Computation, Universität Mannheim, 07.2017
25. *Risk-Averse Optimization of Partial Differential Equations with Random Inputs*
    SIAM Conference on Optimization, Vancouver, Canada, 05.2017
26. *Risk-Averse Optimization of Partial Differential Equations with Random Inputs*
    Numerical Analysis Seminar, University of Oxford, 04.2017
27. *Risk-Averse PDE-Constrained Optimization: Analysis, Optimality, and Numerical Solution* University Seminar Series at Stevens Institute of Technology, 03.2017
28. *Risk-Averse PDE-Constrained Optimization: Analysis, Optimality, and Numerical Solution* Applied Math and Analysis Seminar, Duke University, 03.2017
29. *Risk-Averse PDE-Constrained Optimization*
    SIAM CS&E, Atlanta, Georgia, 02.2017
30. *Risk Averse PDE-Constrained Optimization using Risk Measures*
    Seminar of the IGDK Munich-Graz at the TU München 09.2016
31. *Risk Averse PDE-Constrained Optimization using Coherent Measures of Risk*
    ICCOPT 2016, Tokyo, 08.2016
32. *Tutorial on Optimal Control of Variational Inequalities*
    IMA Workshop "Frontiers in PDE-Constrained Optimization", Minneapolis, 06.2016
33. *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
34. *Managing Uncertainty in PDE-Constrained Optimization Using Risk Measures*
    SIAM UQ 2016, Lausanne, 04.2016
35. *A Model Predictive Control Approach for a Time-Dependent Free-Boundary Problem in Electromicrofluidics*
    Seminar of the Automatic Control Lab. ETH Zurich, 01.2016
36. *Analysis and Numerics of Optimization Problems with Variational Inequality Constraints*
    ISMP 2015, Pittsburgh, 07.2015
37. *Instantaneous Control of a Model of Electrowetting on Dielectric with Complementarity-based Contact-Line Pinning*
    IFIP TC 7, Sofia-Antipolis, 06.2015
38. *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

39. *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
40. *Path-Following Methods for Generalized Nash Equilibrium Problems in Banach Spaces*, Universität der Bundeswehr München, Germany, 12.2014
41. *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
42. *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
43. *On the Optimal Control of a Class of Variational Inequalities of the Second Kind*
    SIAM Conference on Optimization, San Diego, 05.2014
44. *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
45. *On a class of generalized Nash equilibrium problems in Banach space with applications to multiobjective PDE-constrained optimization*,
    ICCOPT 2013, Lisbon, 08.2013
46. *A PDE-Constrained Generalized Nash Equilibrium Problem: Analysis and Numerics*, Mathematical Sciences Seminar, Stevens Institute of Technology, Hoboken, 09.2012
47. *A PDE-Constrained Generalized Nash Equilibrium Problem with Pointwise Control and State Constraints*,
    ISMP 2012, Berlin, 08.2012
48. *A Bundle-Free Implicit Programming Approach for the Optimal Control of Variational Inequalities*, Free Boundary Problems (FBP) 2012, Chiemsee, 06.2012
49. *On the Derivation of Optimality Conditions for Elliptic MPECs via Variational Analysis* IFIP TC 7, Berlin, 09.2011
50. *A Bundle-Free Implicit Programming Approach for a Class of Elliptic MPECs*,
    OR 2011, Zürich, 08.2011
51. *Mathematical Programs with Equilibrium Constraints in Function Spaces*, Optimization and Applications Seminar, ETH Zürich and University of Zürich,05.2011
52. *Derivation of Optimality Conditions for Elliptic MPECs via Variational Analysis*,
    SIOPT 2011, Darmstadt, 05.2011
53. *Bundle-Free Implicit Programming for Elliptic MPECs*, Seminar des Fachgebiets Optimierung bei Partiellen Differentialgleichungen, Technische Universität Berlin, 01.2011
54. *Strong Stationarity Conditions for Elliptic Mathematical Programs with Equilibrium Constraints*, PARAOPT X, Karlsruhe, 09.2010
55. *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).

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

Conference Organization

Member of Organizing Committee for the Rhein-Main-Arbeitsrkeis "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 Forth 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, George, 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-SS 20	Praktikum Numerics and Optimization
WS 16/17 - WS 21/22	Oberseminar Numerics and Optimization

Humboldt-Universität zu Berlin, Berlin, Germany

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

Stevens Institute of Technology, Hoboken, New Jersey USA

Recitations

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

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

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)

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
Norwegian	Basic Knowledge