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Roland Herzog

Prof. Dr. rer. nat.

Personal Information

Date of Birth	July 31, 1974
Place of Birth	Hannover, Germany
Marital Status	Married
Birth Name	Griesse
Children	one daughter, one son
Citizenship	German

Professional Record

May 2025 – Aug 2025	Visiting professorship University of British Columbia, Vancouver, Canada
Apr 2021 – present	W3 (full) professor in *Scientific Computing and Optimization* Interdisciplinary Center for Scientific Computing, Heidelberg University, Germany
Jul 2020	Offer for a W3 (full) professorship in *Scientific Computing* Heidelberg University, Germany (accepted in November 2020)
Mar 2008 – Mar 2021	W3 (full) professor in *Numerical Mathematics and PDEs* Technische Universität Chemnitz, Germany
Apr 2017 – Aug 2017	Visiting professorship University of British Columbia, Vancouver, Canada
Jan 2016	Offer for a W3 (full) professorship in *Mathematical Optimization* Technische Universität Braunschweig, Germany
Apr 2011	Offer for a W3 (full) professorship in *Optimization and Inverse Problems* University of Stuttgart, Germany
Aug 2007	Offer for a W3 (full) professorship in *Numerical Mathematics and PDEs* Technische Universität Chemnitz, Germany (accepted in November 2007)
Aug 2007	Offer for a W2 (associate) professorship in *Continuous Optimization* RWTH Aachen, Germany
Jul 2007	Offer for a W2 (associate) professorship in *Numerical Methods in Optimal Control* TU Dresden, Germany
Oct 2006 – Feb 2007	W3 (full) replacement professorship in *Numerical Mathematics and PDEs* Technische Universität Chemnitz, Germany

Sep 2004	Offer for a W1 (junior) professorship in *Numerical Methods in Optimal Control* University of Hamburg, Germany
Aug 2004 – Feb 2008	Senior Scientist, Johann Radon Institute for Comp. and Appl. Mathematics (RICAM) Austrian Academy of Sciences, Linz, Austria (group of Prof. Karl Kunisch)
Mar 2003 – Jul 2004	Postdoctoral Research Assistant Karl Franzens University Graz, Austria (group of Prof. Karl Kunisch)
Oct 1999 – Feb 2003	Scientific Assistant University of Bayreuth, Germany (group of Prof. Hans Josef Pesch)

Education

Jun 2008	Habilitation at Karl Franzens University Graz, Austria Title of Habilitation Thesis: *Stability and Sensitivity Analysis in Optimal Control of Partial Differential Equations*
Feb 2003	Doctorate degree from the University of Bayreuth, Germany Title of Dissertation: *Parametric Sensitivity Analysis for Control-Constrained Optimal Control Problems Governed by Systems of Parabolic Partial Differential Equations* (Supervisor Prof. Hans Josef Pesch, second supervisor Prof. Fredi Tröltzsch)
Aug 1999	Diploma with Honors in Applied Mathematics from TU Clausthal, Germany Title of Thesis: *Optimal and Suboptimal Control of the Navier-Stokes Equations* (Supervisor Prof. Hans Josef Pesch)
1996 – 1997	First year Ph.D. program in Mathematics at Tulane University, New Orleans, USA
1994 – 1999	Study in Applied Mathematics (Minors: Mechanical Engineering, Fluid Dynamics and Computer Science) at TU Clausthal, Germany

Teaching Experience

Jun 2025	Summer School on Numerical Analysis of PDEs, Optimization and UQ, University of Edinburgh, UK Introduction to PDE-Constrained Optimization & Discretization in PDE-Constrained Optimization
Apr 2021 – present	Heidelberg University, Germany Introduction to Optimization, Nonlinear Optimization, Infinite-Dimensional Optimization, Introduction to Numerical Analysis, Linear Algebra
Sep 2018	Short Course for Members of the Research Training Group π^3, University of Bremen, Germany Introduction to PDE-Constrained Optimization
Aug 2014	Gene Golub SIAM Summer School 2014, RICAM Linz, Austria Optimization subject to Complementarity Constraints
Apr 2013	Short Course for Members of the International Research Training Group IGDK 1754, TU München, Germany Introduction to PDE-Constrained Optimization
Jul 2010	Summer School on Analysis and Numerics of PDE Constrained Optimization, Lambrecht, Germany Algorithms and Preconditioning for PDE-Constrained Optimization
Apr 2008 – Mar 2021	Technische Universität Chemnitz, Germany Various lectures on Optimization, Optimal Control of PDEs and ODEs, Numerical Methods for PDEs and ODEs, Mathematics for Engineers, Optimization for Engineers

Mar 2008	Short Course at Middle East Technical University, Ankara, Turkey
	Sensitivity Analysis in Optimal Control
Apr 2007	Short Course at Universidad Autónoma de Aguascalientes, Mexico
	Optimalsteuerung von PDEs
Oct 2006 – Feb 2007	Technische Universität Chemnitz, Germany
	Lecture and tutorial classes in Numerical Methods for ODEs, and Optimal Control of PDEs
Jan 2006	Short Course at University of Bremen
	Infinite-Dimensional Optimization
2005	Johannes Kepler University Linz, Austria
	Lecture and tutorial classes in Control Theory
2004 – 2005	Johannes Kepler University Linz, Austria
	Tutorial classes in Real Analysis
2003 – 2004	Karl Franzens University Graz, Austria
	Occasional stand-in lectures in Numerical Analysis
1999 – 2003	University of Bayreuth, Germany
	Full time Teaching Assistant for Mathematics for Engineers and advanced courses in applied mathematics, occasional stand-in lectures in Mathematics for Engineers and Optimal Control
1997 – 1999	Clausthal University of Technology, Germany
	Teaching Assistant for Mathematics for Engineers and Real Analysis
1996 – 1997	Tulane University, New Orleans, USA
	Teaching Assistant for various Calculus classes, including honors classes
1995 – 1996	Clausthal University of Technology, Germany
	Teaching Assistant for Real Analysis

Educational Training

Apr 2020	Webinar on the web conferencing system BigBlueButton for teaching
Jan 2018	Workshop on Flipped Classroom Techniques for STEM Education
Oct 2016	Workshop on Academic Teaching
Dec 2014	Student Motivation in Academic Teaching
Nov 2003	English Presentation Skills
Jun 2002	Didactic Training: Planning a lecture
Sep 1996	Training for Teaching Assistants, Tulane University

Professional Training

Jun 2025	New Worker Safety Orientation; Privacy & Information Security Fundamentals; Privacy & Information Security Fundamentals; Preventing & Addressing Workplace Bullying & Harassment; Preventing and Responding to Sexual Misconduct
	UBC Vancouver mandatory courses
Apr 2023	Workplace First Aid Training
Nov 2016	Leadership Skills at the University
	DHV (German Association of University Professors and Lecturers)

Fellowships

1998 – 1999	Fellow of the German National Merit Foundation (Studienstiftung des deutschen Volkes)
1996 – 1997	Fellowship Tulane University, New Orleans, USA

Professional Responsibilities

Jan 2025 – present	Member of the Directorate of the Heidelberg Center for Digital Humanities, Heidelberg University
Nov 2024 – present	Member of the University Computing Center's User Forum, Heidelberg University
Apr 2024 – present	Member of the Rectorate's Strategy Advisory Team, Heidelberg University
Feb 2024	Member of the jury for the SIAM/MOS Lagrange Prize in Continuous Optimization
Dec 2023 – present	Member of the Scientific Board of the Scientific Software Center, Heidelberg University
Nov 2023 – present	Member of the Commission for Research and Strategy, Heidelberg University
Nov 2023 – present	Member of the selection committee for the journalist in residence, Heidelberg Institute for Theoretical Studies
Nov 2023 – present	Managing Director, Interdisciplinary Center for Scientific Computing (IWR), Heidelberg University
Jan 2023 – present	Member of the Board of Directors, Interdisciplinary Center for Scientific Computing (IWR), Heidelberg University
Jun 2022 – present	Liaison Officer of GAMM at Heidelberg University
Apr 2022 – present	Member of the language jury for the KlarText prize for science communication by the Klaus Tschira Foundation
Jan 2022 – Dec 2025	GAMM Delegate at the European Mathematical Society (EMS)
Oct 2021 – present	Chairman of the study commission (Studienkommission) of the Degree Program M.Sc. Scientific Computing, Heidelberg University
Oct 2021 – present	Vice Chairman of the board of examiners (Prüfungsausschuss) of the Degree Program M.Sc. Scientific Computing, Heidelberg University
Oct 2021 – present	Member of the Admission Committee of the Degree Program M.Sc. Scientific Computing, Heidelberg University
Jan 2021 – present	Principal Investigator, Heidelberg Graduate School of Mathematical and Computational Methods for the Sciences (HGS MathComp), Heidelberg University
Apr 2019 – Dec 2020	Academic Advisor for Industrial Mathematics, TU Chemnitz
Apr 2019 – Dec 2020	Member of the study commission (Studienkommission) of the Degree Program M.Sc. Data Science, TU Chemnitz
Jan 2019 – Dec 2024	Member of the Managing Board of GAMM
May 2018 – Dec 2020	Member of the board of examiners (Prüfungsausschuss) of the Degree Program M.Sc. Data Science and of the Degree Program Diplom Mathematics, TU Chemnitz

Oct 2017 – Dec 2020	Vice speaker of the research field *Materials and Intelligent Systems*, TU Chemnitz
Apr 2017 – Dec 2020	Member of the advisory committee (Fakultätsrat) of the Faculty of Mathematics, TU Chemnitz
Mar 2017 – Aug 2022	Member of the advisory board (Kuratorium) of the Institute of Mechatronics, Chemnitz
Sep 2016 – Dec 2020	Member of the board of examiners (Prüfungsausschuss) of the International Degree Program M.Sc./Ph.D. Mathematics, TU Chemnitz
Sep 2016 – Dec 2020	Member of the board of examiners (Prüfungsausschuss) of the Degree Program B.Sc./M.Sc. Mathematics, TU Chemnitz
Oct 2015 – Dec 2020	Vice Chairman of the board of examiners (Prüfungsausschuss) of the Degree Program M.Sc. Finance, TU Chemnitz
Apr 2015 – Mar 2021	Member of the Extended Senate, TU Chemnitz
Apr 2015 – Dec 2020	Member of the board of examiners (Prüfungsausschuss) of the Degree Program M.Sc. Finance, TU Chemnitz
Jan 2015 – Dec 2020	Vice speaker of the research field *Resource Efficient Production and Lightweight Construction*, TU Chemnitz
Oct 2014 – Oct 2016	(Provisional) Academic Advisor for Business Mathematics, TU Chemnitz
Sep 2014 – Sep 2017	Speaker of the GAMM activity group on optimization with PDE constraints
Apr 2014 – Mar 2021	Member of the Council (Beirat) of the Center for Teacher Training, TU Chemnitz
Apr 2014 – Apr 2016	Member of the study commission (Studienkommission) of the Center for Teacher Training, TU Chemnitz
Apr 2013 – May 2016	Member of the Senate Commission on Education and Studies, TU Chemnitz
Apr 2013 – Mar 2016	Dean of Studies (Studiendekan) of the Faculty of Mathematics, TU Chemnitz
May 2011 – Sep 2014	Vice speaker of the GAMM activity group on optimization with PDE constraints
May 2010 – Mar 2013	Member of the study commission (Studienkommission) and Academic Advisor for Industrial Mathematics, TU Chemnitz
Dec 2009 – Mar 2013	Chairman of the board of examiners (Prüfungsausschuss) of the Faculty of Mathematics, TU Chemnitz
Nov 2009 – Mar 2016	Member of the advisory committee (Fakultätsrat) of the Faculty of Mathematics, TU Chemnitz
Sep 2008 – present	Member of the scientific committee of the Chemnitz FEM Symposium
Oct 2004 – Oct 2007	Chairman of the Employees of the Johann Radon Institute for Computational and Applied Mathematics

Membership in Professional Societies

- ○ DANTE (German TeX Users Association)
- ○ SIAM (Society for Industrial and Applied Mathematics), and member of its activity groups on optimization, imaging and linear algebra
- ○ DMV (German Mathematical Society)
- ○ DHV (German Association of University Professors and Lecturers)
- ○ GAMM (International Association of Applied Mathematics and Mechanics), and member of its activity groups on optimization with PDE constraints, uncertainty quantification, numerical analysis, mathematical signal and image processing, and computational and mathematical methods in data science
- ○ IPIA (Inverse Problems International Association)
- ○ MOS (Mathematical Optimization Society)
- ○ Friends of Oberwolfach
- ○ Committee for Mathematical Modeling, Simulation and Optimization (KoMSO e.V.)

Involvement in Successful Coordinated Research Proposals

Dec 2022 – Dec 2027
Member of the cluster of excellence *STRUCTURES: A Unifying Approach to Emergent Phenomena in the Physical World, Mathematics, and Complex Data*, Heidelberg University

Mar 2021 – present
Co-Proposer and Member of the Program Committee of DFG Priority Program SPP 2353 *Daring More Intelligence – Design Assistants in Mechanics and Dynamics*; coordinator: Peter Eberhard

Sep 2018 – Jun 2023
Member of the Executive Board of SFB/Transregio 96

Oct 2016 – Sep 2023
Member of the Steering Committee of DFG Priority Program SPP 1962

Mar 2015
Co-Proposer of DFG Priority Program SPP 1962 *Non-Smooth and Complementarity-Based Distributed Parameter Systems: Simulation and Hierarchical Optimization*; coordinator: Michael Hintermüller

Funded Research Projects (5 198 000 € in Total)

Feb 2025 – Jan 2028
Machine Learning and Optimal Experimental Design for Thermodynamic Property Modeling
DFG grant (348 000 €) within the Priority Program 2331, together with Markus Richter, Chemnitz; investigator: Viktor Martinek

Oct 2024 – Sep 2027
Ersatzmodell-gestützte Vorhersage der Wechselfestigkeit umlaufender Wellen und Prozessoptimierung auf Basis flexibler Kriging-Modelle
DFG grant (238 000 €), coordinated proposal with Thomas Lampke, Chemnitz and Andreas Schubert, Chemnitz; investigator: Hannah Rickmann

Jul 2023 – Jun 2026
Phase Field Methods, Parameter Identification and Process Optimization
DFG grant (9800 €) within the *Printed & Stable Organic Photovoltaics from Non-fullerene Acceptors*, together with Martin Stoll, Chemnitz and Jan-Frederik Pietschmann, Augsburg

Jan 2023 – Dec 2025
Multilevel Architectures and Algorithms in Deep Learning
DFG grant (218 000 €) within the Priority Program 2298, together with Anton Schiela, Bayreuth; investigator: Leonie Kreis

Apr 2022 – Mar 2028	*Optimal Control and Optimal Experimental Design for MRI and Photoacoustic Imaging* Project (400 000 €) within the Carl Zeiss Center *Model-Based AI: Physical Models and Deep Learning for Imaging and Cancer Treatment*, together with Jürgen Hesser, Robert Scheichl and others; investigator: Karina Koval
Mar 2022 – Dec 2024	*Optimization and Visualization Support Sytem for Cardiac Arrhythmia Management* Project (108 000 €) within *Informatics4Life*, an initiative by the Klaus Tschira Foundation, together with Ann-Kathrin Rahm; investigator: Reyhaneh Majidi
Feb 2022 – Jan 2025	*Machine Learning and Optimal Experimental Design for Thermodynamic Property Modeling* DFG grant (285 000 €) within the Priority Program 2331, together with Markus Richter, Chemnitz; investigator: Viktor Martinek
May 2020 – Oct 2022	*Simulation Based Optimization of the Time-Dependent Pulse Power for Laser Beam Welding of Aluminum Alloys in Order to Avoid Hot Cracks* AiF Project (204 000 €) in Forschungsvereinigung Schweißen und verwandte Verfahren e.V., together with Jean-Pierre Bergmann, Ilmenau; Mitarbeiter: Dmytro Strelnikov
Jun 2021 – May 2024	*A Calculus for Non-Smooth Shape Optimization with Applications to Geometric Inverse Problems* DFG grant (215 000 €) within the Priority Program 1962, together with Stephan Schmidt, Berlin; investigator: Manuel Weiß
Jan 2020 – Dec 2022	*High Entropy Alloys as Coating Materials for Surface Protection* Project within an ESF junior research group (200 000 €); investigator: Felix Ospald
Jul 2019 – Jun 2023	*Model Predictive Parameter and State Estimation and Optimal Sensor Placement* DFG grant (675 000 €) within the Collaborative Research Center SFB/TR 96, together with Martin Stoll, Chemnitz; investigator: Andreas Naumann
Jan 2017 – Dec 2019	*A Calculus for Non-Smooth Shape Optimization with Applications to Geometric Inverse Problems* DFG grant (190 000 €) within the Priority Program 1962, together with Stephan Schmidt, Würzburg; investigator: José Vidal-Núñez
Oct 2016 – May 2020	*Optimal Control of Dissipative Solids: Viscosity Limits and Non-Smooth Algorithms* DFG grant (126 000 €) within the Priority Program 1962, together with Dorothee Knees, Kassel, and Christian Meyer, Dortmund; investigator: Ailyn Stötzner
Jul 2015 – Jun 2019	*Model Predictive Parameter and State Estimation and Optimal Sensor Placement* DFG grant (304 000 €) within the Collaborative Research Center SFB/TR 96; investigator: Ilka Riedel
Apr 2015 – May 2018	*Impulse Control Problems and Adaptive Numerical Solution of Quasi-Variational Inequalities in Markovian Factor Models* DFG grant (351 000 €), together with Thorsten Schmidt; investigator: Jan Blechschmidt
Nov 2012 – Okt 2017	*Bivalent and Multi-Criteria Optimization of Coupled Simulations of Manufacturing and Loading of Hybrid Structures* Project within DFG Cluster of Excellence (364 000 €); investigators: Andreas Günnel and Felix Ospald
Oct 2012 – Sep 2015	*Preconditioned SQP Solvers for Nonlinear Optimization Problems with PDEs* DFG grant (178 000 €); investigator: Susann Mach
Jul 2011 – Jun 2015	*Correction Algorithms and High Dimensional Characteristic Diagrams* DFG grant (265 000 €) within the Collaborative Research Center SFB/TR 96, together with Ulrich Priber, Fraunhofer IWU, Chemnitz, Germany; investigator: Ilka Riedel
Oct 2009 – Sep 2012	*Optimal Control in Elastoplasticity* DFG grant (320 000 €) within the Priority Program 1253, together with Christian Meyer, TU Dortmund, Germany; investigators: Gerd Wachsmuth and Frank Schmidt

Aug 2007 – Dec 2010	*Optimal Control of Stefan Problems with Constraints* FWF grant (105 000 €), together with Karl Kunisch, Graz, Austria; investigator: Martin Bernauer
Sep 2005 – Aug 2008	*SSC and SQP for Mixed Constrained Optimal Control Problems* FWF grant (95 000 €), together with Arnd Rösch, Duisburg-Essen, Germany; investigator: Nataliya Metla

Other Grants (108 000 € in Total)

Sep 2023	European Conference on Computational Optimization (EUCCO 2023) (20 000 €) awarded by DFG
Aug 2014	Gene Golub SIAM Summer School (63 000 €) awarded by SIAM, together with Winnifried Wollner, Esther Klann, Michael Stingl
Jul 2013	ESF support (17 000 €) for the 3rd European Conference on Computational and Applied Mathematics (EUCCO), Chemnitz, Germany
Jul 2011	DAAD travel grant (2221 €) to attend the ICIAM meeting, Vancouver, Canada
Jul 2010 – Jun 2011	DAAD travel grant (4723 €) for cooperation visits with the group of Andy Wathen, University of Oxford, together with Ekkehard Sachs, Trier, Germany
Aug 2009	DAAD (German Academic Exchange Service) travel grant (1465 €) to attend the IFIP TC7 conference, Buenos Aires, Argentina

Former Group Members with Permanent Positions in Academia

since 2025	Estefanía Loayza-Romero, University of Strathclyde, Glasgow, UK (former Ph.D. student)
since 2024	Max Winkler, Technische Universität Chemnitz (former postdoctoral researcher)
since 2023	Maurício Silva Louzeiro, Federal University of Goias, Brazil (former postdoctoral researcher)
since 2021	Andreas Makowski, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany (former Ph.D. student)
since 2021	Ronny Bergmann, NTNU Trondheim, Norway (former postdoctoral researcher)
since 2020	José Vidal-Núñez, University of Alcalá, Spain (former postdoctoral researcher)
since 2018	Gerd Wachsmuth, BTU Cottbus-Senftenberg, Germany (former Ph.D. student and postdoctoral researcher)

Reviewer for Habilitation Theses

2024	Sébastien Court *Optimization, Control and Simulation Problems Related to Coupled Systems of Partial Differential Equations* (University of Innsbruck)
2020	Stefan Takacs *Robust Multigrid Solvers and Related Topics* (Johannes Kepler University of Linz)
2017	Andreas Potschka *Efficient Numerical Methods for Large-Scale Nonlinear Problems* (University of Heidelberg)

2017 Gerd Wachsmuth
Optimization Problems with Complementarity Constraints in Infinite-Dimensional Spaces (TU Chemnitz)

2016 Martin Stoll
Fast Iterative Solvers for Time-Dependent PDE-Constrained Optimization Problems (University of Magdeburg)

Dissertation Theses Supervised

current Eric Legler, Manuel Weiß, Viktor Martinek, Leonie Kreis, Nico Haaf, Hannah Rickmann, Johannes Manstein, Antonia Stavemann

2024 Masoumeh Hashemi
Optimal Control of Nonlocal Partial Differential Equations

2022 Jan Blechschmidt
Numerical Methods for Stochastic Control Problems with Applications in Financial Mathematics

2022 Estefanía Loayza
A Discrete Perspective on PDE-Constrained Shape Optimization Problem

2019 Felix Ospald
Contributions to the Simulation and Optimization of the Manufacturing Process and the Mechanical Properties of Short Fiber-Reinforced Plastic Parts

2018 Ailyn Stötzner
Optimal Control of Thermoviscoplasticity

2014 Andreas Günnel
Numerical Aspects in Optimal Control of Elasticity Models with Large Deformations

2011 Gerd Wachsmuth
Optimal Control of Quasistatic Plasticity — An MPCC in Function Space

2010 Martin Bernauer
Motion Planning for the Two-Phase Stefan Problem in Level Set Formulation

2008 Nataliya Metla
The Sequential Quadratic Programming Method for Elliptic Control Problems with Mixed Control-State Constraints (together with Arnd Rösch, Duisburg-Essen, Germany)

Second Reviewer for Dissertation Theses

2025 Lukas Baumgärtner
Total Generalized Variation with Finite Elements for Imaging and Shape Optimization (supervised by Stephan Schmidt, Trier)

2024 Ophelia Frotscher
Investigation of the Potential of Optimal Experimental Design and Symbolic Regression for Thermodynamic Property Modeling (supervised by Markus Richter, Chemnitz)

2024 Corinna Zurloh
Adjoint-Based Optimization of a Free Boundary Problem (supervised by René Pinnau, Kaiserslautern)

2022 Jesús Bellver Arnau
Optimal Mosquito Release Strategies for Vector-Borne Disease Control (supervised by Luis Almeida, Sorbonne, Paris and Yannick Privat, Strasbourg)

2022 Ahmad Bokhari
Material Distribution-Based Topology Optimization for Wave Propagation Problems (supervised by Eddie Wadbro, Karlstadt)

2021 Marc Herrmann

The Total Variation on Surfaces and as Shape Prior (supervised by Stephan Schmidt, Humboldt University Berlin, and myself)

2020 Tomáš Gergelits

Krylov Subspace Methods—Analysis and Application (supervised by Zdeněk Strakoš, Charles University, Prague)

2019 Florian Wechsung

Shape Optimisation and Robust Solvers for Incompressible Flow (supervised by Patrick Farrell, University of Oxford)

2019 Georg Müller

Optimal Control of Time-Discretized Contact Problems (supervised by Anton Schiela, University of Bayreuth)

2019 Yona Frekers

Investigation of Thermal Boundary Conditions at Contact Interfaces (supervised by Reinhold Kneer, Institute of Heat and Mass Transfer, Faculty of Mechanical Engineering, RWTH Aachen)

2018 Niels Goldberg

Homogenisierung und Modellierung des Materialverhaltens kurzfaserverstärkter Thermoplaste (supervised by Jörn Ihlemann, Faculty of Mechanical Engineering, TU Chemnitz)

2017 Magne Nordaas

Operator Preconditioning for PDE-Constrained Optimisation and Multiscale Problems (supervised by Kent-Andre Mardal, University of Oslo)

2016 Juri Merger

Optimal Control and Function Identification in Biological Processes (supervised by Alfio Borzì, University of Würzburg)

2016 Kathrin Welker

Efficient PDE Constrained Shape Optimization in Shape Spaces (supervised by Volker Schulz, University of Trier)

2016 Hans Wulf

Modellierung und Simulation von Selbstorganisationsprozessen in belasteten technischen Gummiwerkstoffen (supervised by Jörn Ihlemann, Faculty of Mechanical Engineering, TU Chemnitz)

2015 Moritz Keuthen

Second Order Shape Optimization with Geometric Constraints (supervised by Michael Ulbrich, TU München)

2015 Dirk Schellenberg

Identifikation und Optimierung im Kontext technischer Anwendungen (supervised by Jörn Ihlemann, Faculty of Mechanical Engineering, TU Chemnitz)

2015 Thomas Betz

Optimal Control of Two Variational Inequalities Arising in Solid Mechanics (supervised by Christian Meyer, TU Dortmund)

2015 Max Winkler

Finite Element Error Analysis for Neumann Boundary Control Problems on Polygonal and Polyhedral Domains (supervised by Thomas Apel, University of the Armed Forces, Munich)

2013 Markus Kollmann

Efficient Iterative Solvers for Saddle Point Systems arising in PDE-Constrained Optimization Problems with Inequality Constraints (supervised by Walter Zulehner, University of Linz)

2012 Dominik Skanda

Robust Optimal Experimental Design for Model Discrimination of Kinetic ODE Systems (supervised by Dirk Lebiedz, University of Freiburg)

2012   Armin Rund
Contributions in Optimal Control of Partial Differential Algebraic Equations (supervised by Hans Josef Pesch, University of Bayreuth)

2011   Ira Neitzel
Numerical Analysis of PDE Constrained Optimal Control Problems with Pointwise Inequality Constraints on the State and the Control (supervised by Fredi Tröltzsch, TU Berlin)

2011   Sabine Repke
Adjoint-Based Optimization Approaches for Stationary Free Surface Flows (supervised by René Pinnau, TU Kaiserslautern)

2010   Tyrone Rees
Preconditioning Iterative Methods for PDE Constrained Optimization (supervised by Andy Wathen, University of Oxford)

2010   Wolfgang Hess
Geometry Optimization with PDE Constraints and Applications to the Design of Branched Sheet Metal Products (supervised by Stefan Ulbrich, TU Darmstadt)

Master's Theses Supervised (76 in Total)

current   Jens Molge
Bifurcation Control via Shape Optimization for Particle Separation in Microfluidic Channels

current   Lena Becker
Preconditioning in Multiobjective Optimization (supervised by Georg Müller)

current   Kim Sandro Betschel
Domain Decomposition Methods for Nonlocal PDEs and Optimal Control

2025   Julius Meyer Ohlendorf
Optimization of Battery Storage Systems in Power Markets using Reinforcement Learning (joint with Ullrich Köthe)

2025   Jeanine Wippermann
Inverse Reinforcement Learning (joint with Georgia Koppe)

2025   Stanislaus Viktor Stein von Kamienski
Trajectory Reconstruction in Single-Cell Expression Data via Score Estimation with Normalizing Flows (joint with Simon Anders)

2025   Johannes Manstein
The Simplex Method on Manifolds (joint with Peter Albers)

2024   Laurin Ernst
Generative Models for Probability Density Estimation with Applications in Bayesian Inference

2024   Mario Marić
Preconditioned Solution in Nonlocal Optimal Control

2024   Nico Haaf
Optimal Control with Functions of Bounded Variation in Mixed Formulation

2024   Changjing Hu
Enhancing Acoustic Classification in Ecological Monitoring: Using Self-Supervised Learning for Limited Mammal Sound Datasets

2024   Hannah Rickmann
Global Convergence Theory for Non-Smooth Newton Methods Applied to Quadratic Programs

2023   Isabel Gernand
Prediction of Optimal Trajectories by Neural Networks

2023 Johannes Wagner
Physics-Informed Neural Networks for Optimal Control Problems

2023 Melissa Weber
Duality and Sensitivity in Linear Optimization

2022 Leonie Kreis
Multilevel Training of Residual Neural Networks

2022 Renée Dornig
Constrained Optimization on Manifolds (supervised by Ronny Bergmann)

2022 Sven Jacob
Computational Methods for Universal Kriging Models

2021 Manuel Weiß
The Chambolle-Pock Algorithm for Geometry Labeling and Segmentation based on the Normal Vector Field

2021 Johannes Bierschneider
Implementation and comparison of different machine learning forecasting methods in the logistics area of Lidl International

2019 Felix Maschke
Constrained Geodesic Regression on Manifolds

2019 Maximilian Bochmann
Finite Element Methods and Iterative Algorithms for Total-Variation Problems

2018 Robin Herz
Optimal Experimental Design for Bayessian Inversion (together with Oliver Ernst)

2018 Hatice Tavli
Variable Metric Bundle Methods for Non-Smooth Non-Convex Optimization Problems

2017 Marcus Pelz
Markov Based Prediction of Driving Manoeuvers using Reinforcement Learning

2017 Luca Landwehrjohann
Variational Problems with Convexity Constraints (supervised by Gerd Wachsmuth)

2017 Annemarie Kühn
Modelling the Dependency Structure of a Portfolio and Impact on Risk Measures (supervised by Dana Uhlig)

2017 Friedrich Salzer
Parameter Optimization for Flow Chart Based Acyclic Simulation Models

2017 Felix Lacher
Stability of the Semi-Smooth Newton Method (supervised by Gerd Wachsmuth)

2017 Florian Modrzik
Text Mining — Presentation of Various Classificators and their Application to the Assessment of the Ideological Quality of Texts (together with the professorship Wirtschaftsinformatik I)

2017 Robert Schiffmann
Error Compensation in Auxiliary Drives of Machine Tools with Rotating Tools

2017 Alexander Köwitsch
Shape Optimization of Measurement Devices for Identification Problems in Stationary Fluid Flow

2016 Sandy Bitterlich
Numerical Methods for the Solution of Support Vector Machines

2016   Felix Harder

Optimal Control of the Obstacle Problem Using the Value Function (supervised by Gerd Wachsmuth)

2016   Nadine Erath

Adapting Distributions in Household Insurance Premium Modelling

2016   Toni Kowalewitz

Numerical Methods of Option Pricing in Jump Markets

2016   Hussain Obaid

Identification Problems in Heat Conducting Networks

2016   Saber Jalilzadeh-Galaeh

Identification of the Topology of Heat Conducting Networks (A Comparison between Continuous and Discrete Optimization Techniques)

2015   Christina Schubert

The Traveling Salesman Problem with Range Constraints

2015   Tobias Hofmann

Dynamic Price Optimization in E-Commerce

2015   Martin Uhlmann

Dynamic Valve Train Simulation for Four-Cylinder, Four-Stroke Engines (together with the professorship Advanced Powertrains)

2014   Martin Uhlig

Optimum Experimental Design for Parameter Identification and Model Discrimination

2014   Stephan Schleicher

Shape Optimization Problems in FEniCS

2014   Robert Schaffrath

Calculus of Variations Problems under Convexity Constraints (supervised by Gerd Wachsmuth)

2014   Jörn Richter

Modeling of Heat Transfer in the Air Gap of Electrical Machines (together with the professorship Elektrische Energiewandlungssysteme und Antriebe)

2014   Niklas Nostitz

Simulation of Contact Forces under the Influence of Adhesion and Surface Roughness

2014   Michael Heinz

Parameter Identification for Yield Surfaces in Plane Stress Situations (supervised by Rene Schneider and Gerd Wachsmuth)

2013   Stephan Schlömer

Optimal Control of Planned Trajectories

2013   Christopher Robert Pech

Quality and Stability Assessment of Dynamic Object Recognition in Monocular Fish Eye Cameras under Egomotion (together with intenta GmbH)

2013   Marcel Nicklas

A Trajectory Planner for Highly Automatic Driving in Dynamic Traffic Environments (together with IAV GmbH)

2013   Rolf Springer

Solution of Hamilton-Jacobi-Bellman Equations on Sparse Grids

2013   Felix Ospald

Implementation of Geometric Multigrid in FEniCS

2013   Jens Müller
Methods for Statistical Design of Experiments and Simulation with Applications in Engine Development (together with IAV GmbH)

2013   Jan Blechschmidt
Adaptive Solution of Portfolio Optimization Problems

2013   Anna Bauer
Optimization Methods for the Resource Efficient Design of Assembly Lines (together with Fraunhofer Institute for Machine Tools and Forming Technology)

2013   Johannes Obermeier
Optimal Control with Sparsity Structures in Polar Coordinates

2013   Philipp Menzel
Geometric Methods for Hamiltonian Systems: Theory and Applications

2012   Tommy Etling
Optimum Experimental Design for the Identification of Heat Transfer Coefficients (together with Lehrstuhl für Wärme- und Stoffübertragung, RWTH Aachen)

2012   Sarah Stoppe
Numerical Simulation of Plastic Materials under Large Deformations

2012   Ilka Riedel
Open and Closed Loop Control of the Nonlinear Inverse Pendulum

2011   Tom Waldenburger
Intersection of Bézier Curves with Applications in Shape Optimization (supervised by Rene Schneider)

2011   Sandra Hartl
Preconditioned Solvers for Stationary Problems in Magnetohydrodynamics

2011   Mario Krüger
Shape Optimization of Material Boundaries in Isothermal, Stationary, Incompressible Fluid Flows in Layered Porous Media (supervised by Rene Schneider)

2011   Susann Mach
Primal-Dual Algorithms for Color Image Restoration Problems

2011   Marie Müllner
Implementation of a Three-Dimensional Advection Scheme for the COSMO Dynamical Core (together with Meteo Schweiz)

2010   Judith Will
An Optimal Control Problem in Electromagnetic Induction Heating

2010   Eric Schmidl
Simulation and Parameter Optimization of an Electromagnetic Cloaking Device

2010   Stefan Wild
Numerical Simulation of Elasticity in FEniCS

2009   Katharina Urbach
Optimization of the Velocity Profile for Five-Axis Machine Tools (together with Chiron AG)

2009   Carolin Kraft
Convex Bodies of Minimal Resistance

2009   Hansjörg Schmidt
Parallelization of Surrogate-Based Optimization Methods (together with IAV GmbH)

2008	Gerd Wachsmuth
	Elliptic Optimal Control Problems with Sparsity Constraints
	was awarded the thesis prize of the university 2009 and a prize of the DMV students' conference 2009
2008	Silvia Wieser
	Numerical Solution of Optimal Control Problems using FEniCS
2007	Frank Schmidt
	Inexact Newton Methods and their Applications in Solving Semilinear PDEs
	was awarded a prize of the Förderverein Mathematik zu Chemnitz
2007	Martin Bernauer
	A Robustification Approach in Unconstrained Optimization and its Application in Optimal Control
2005	Kerstin Brandes
	Robustness of optimal solutions for optimal control problems with PDEs

Bachelor's Theses Supervised (36 in Total)

current	Jan Müller
	Voronoi Games on Graphs
2025	Gero Brunke
	Sorting by Linear Programming
2025	Rebekka Bernard
	Lineare Kleinste-Quadrate-Aufgaben mit mehreren Modellen
2025	Johannes Kamlage
	Structural Optimization using Linear Programming
2025	Simone Hechler
	Invex Optimization
2025	Christian Reibold
	The Courant-Fisher Theorem from an Optimization Perspective
2025	Lukas Moritz
	Parser und Visualisierungstools für verteile LaTeX-Dokumente
2024	Martin Koloseus
	Single Line Image Approximation using Optimization Techniques
2023	Anna Häfner
	The PageRank Algorithm and Extensions
2023	Karina Kniel
	Parametric Linear Optimization Using Neural Networks
2023	Max Jungmann
	Introduction to Stochastic Linear Programming
2023	Phil Neitzel
	Iterative Solution of Markov Decision Processes
2023	Nico Haaf
	Optimal Control Problems with Measures
2023	Tomislav Popov
	A Survey of Generalized Convexity and Generalized Monotonicity

2022 Fidelius von Manstein
Planning Optimal Smart-Homes using Integer Linear Programming

2022 Jan-Philipp Pfaue
Constrained Optimization on Riemannian Manifolds using Geodesic Polygonal Sets (supervised by Ronny Bergmann)

2020 Tom-Christian Riemer
The Riemannian BFGS Method and its Implementation in Julia (supervised by Ronny Bergmann)

2020 Josie König
The Generalized Labelled Multi-Bernoulli Particle Filter for Multiple Object-Tracking

2019 Renée Dornig
Regularized Clustering of Manifold-Valued Data

2019 Manuel Weiß
Modelling and Numerical Simulation Methods for a Pendulum on a Rope

2019 Zihan Wang
Solution Techniques for the Radiosity Equation

2018 Theresa Wagner
Linear Programming to Determine Extremal Loads in Hybrid Engine Drivetrains

2017 Felix Maschke
Approximation of Estimated Domains via Level-Set Method

2017 Florian Pasch
Topographical Properties of Least-Squares Functions (together with the professorship Solid Mechanics)

2016 Felix Queitzsch
Hidden Markov Decision Processes in Finite Time

2016 Luca Landwehrjohann
Method for Optimal Placement of Measurement Times in Time-Dependent Systems

2016 Marcus Pelz
Uncertainty Quantification in Optimal Control Problems with ODEs (together with Oliver Ernst)

2016 Sophie Henning
Numerical Methods for the Solution of a Mean Field Game

2016 Robin Herz
Linear Stochastic Optimization Problems and Applications

2015 Sandy Bitterlich
Algorithms for Reinforcement Learning
was awarded a prize of the DMV students' conference 2015

2015 Eric Huster
Approximation of Measurement Points by Piecewise Euler Spirals

2015 Eric Legler
Toll Optimization as an MPCC
was awarded a prize of the DMV students' conference 2015

2014 Alexander Köwitsch
Optimization of a Frame Structure under Dynamical Loads (supervised by Gerd Wachsmuth)

2012 Tamara Giering
Digit Recognition by Support Vector Machines

2011 Johannes Obermeier
Globalization Approaches for Optimization Problems with 1-Norm-Objectives

2010 Stephan Schlömer
Maximal Overhang

Activities as Organizer

Aug 2024 Organization of a minisymposium on *Optimal Control and Machine Learning*
ICIAM, Tokyo, Japan (together with Evelyn Herberg, Heidelberg)

Jul 2024 Member of the Scientific Committee for the *International Symposium on Mathematical Programming*
Montreal, Canada (2024)

Sep 2023 Co-Organization of the *6th European Conference on Computational Optimization (EUCCO)*, 200 participants
Heidelberg, Germany

Aug 2023 Organization of a minisymposium on *Emerging Methods for Shape and Topology Optimization*
ICIAM, Tokyo, Japan (together with Stephan Schmidt, Trier)

Aug 2022 Co-Organization of the *International Conference on Preconditioning and Industrial Applications*, 115 participants
Chemnitz, Germany (together with Martin Stoll, Esmond Ng, Yousef Saad, Andy Wathen)

Nov 2020 Organization of a mini-workshop on *Computational Optimization on Manifolds*
Oberwolfach (together with Pierre-Antoine Absil, Louvain-la-Neuve and Gabriele Steidl, Berlin; via video conference)

Sep 2020 Organization of a minisymposium on *Optimization on Manifolds: Theory and Numerics*
DMV Annual Meeting, Chemnitz, Germany (together with André Uschmajew, Leipzig)

Oct 2019 Organization of an international workshop on *New Trends in PDE Constrained Optimization*
RICAM, Linz, Austria (together with Emmanuel Trélat, Paris)

Aug 2019 Organization of an international workshop on *Optimization on Manifolds*
Chemnitz, Germany (together with Ronny Bergmann, Glaydston de Carvalho Bento)

Aug 2019 Organization of a minisymposium on *Geometric Methods in Optimization of Variational Problems*
ICCOPT, Berlin, Germany (together with Anton Schiela, Bayreuth)

Jul 2019 Organization of a minisymposium on *Inverse Problems in Shape and Geometry*
ICIAM, Valencia, Spain (together with Bastian von Harrach, Frankfurt and Jan-Frederik Pietschmann, Chemnitz)

Jun 2019 Organization of a minisymposium on *Advanced Shape Optimization: Non-Smoothness and Time-Dependency*
SIAM Conference on Computational Geometric Design, Vancouver, Canada (together with Stephan Schmidt, Würzburg)

Jun 2019 Organization of an international workshop on *Beyond the Discrete: Iterative Methods from the Continuum Perspective*
Hamilton Mathematics Institute, Dublin, Ireland (together with Kirk Soodhalter, Matthias Bolten, Stefan Güttel, John Pearson, Jennifer Pestana)

Jul 2018	Organization of a minisymposium on *Optimum Experimental Design* 28th IFIP TC7 Conference, Essen, Germany (together with Ekatarina Kostina, Heidelberg)
Jun 2018	Organization of a minisymposium on *Images and Finite Elements* SIAM Conference on Imaging Sciences, Bologna, Italy (together with Stephan Schmidt, Würzburg)
May 2018	Organization of a minisymposium on *Preconditioning for PDE Constrained Optimization* SIAM Conference on Applied Linear Algebra, Hong Kong, China (together with John Pearson, Edinburgh)
Oct 2017	Member of the Scientific Committee for the workshop *Optimization of Infinite Dimensional Non-Smooth Distributed Parameter Systems* Darmstadt, Germany (2017)
May 2017	Organization of a minisymposium on *Infinite Dimensional Nonsmooth Optimization* SIAM Conference on Optimization, Vancouver, Canada (together with Christian Meyer, Dortmund)
Aug 2016	Organization of a session on *Optimal Control of Coupled Systems* International Conference on Continuous Optimization, Tokyo, Japan
Oct 2015 – present	Member of the Scientific Committee for the conference series *European Conference on Computational Optimization (EUCCO)* Leuven, Belgium (2016); Trier, Germany (2018)
Sep 2015 – Aug 2017	Member of the Scientific Committee for the GAMM Annual Meeting Ilmenau/Weimar, Germany (2017); Munich, Germany (2018)
Aug 2014	Organization of the Gene Golub SIAM Summer School 2014 on Simulation, Optimization, and Identification in Solid Mechanics Linz, Austria (together with Winnifried Wollner, Esther Klann, Michael Stingl)
Sep 2013	Organization of a minisymposium on *Stability, Sensitivity and Error Analysis for Optimal Control Problems* 26th IFIP TC7 Conference, Klagenfurt, Austria (together with Arnd Rösch, Duisburg-Essen)
Jul 2013	Organization of the *3rd European Conference on Computational Optimization (EUCCO)*, 115 participants Chemnitz, Germany (together with Peter Benner, Michael Hinze, Arnd Rösch, Anton Schiela, Volker Schulz)
Aug 2012	Organization of a session on *Nonsmooth Phenomena in Optimal Control* and a session on *Preconditioning in PDE-Constrained Optimization* International Symposium on Mathematical Programming (ISMP), Berlin, Germany
Mar 2012	Organization of a section on *Optimization of Differential Equations* GAMM Annual Scientific Meeting, Darmstadt, Germany (together with Barbara Kaltenbacher, Klagenfurt)
Nov 2011	Organization of an international workshop on Optimal Control of Partial Differential Equations Klaffenbach, Germany (together with Christian Meyer, Darmstadt, and Arnd Rösch, Duisburg-Essen)
Sep 2011	Organization of a minisymposium on *Optimal Control of Nonlinear PDEs and Variational Inequalities* 25th IFIP TC7, Berlin, Germany (together with Arnd Rösch, Duisburg-Essen)

Jul 2011	Organization of a minisymposium on *Saddle-Point Problems in Large-Scale Optimization* ICIAM, Vancouver, Canada (together with Andy Wathen, Oxford, UK)
Jul 2011	Organization of a minisymposium on *Nonlinear Aspects in Optimal Control* ICIAM, Vancouver, Canada (together with Arnd Rösch, Duisburg-Essen)
May 2011	Organization of a minisymposium on *Preconditioning in PDE-Constrained Optimization* SIAM Conference on Optimization, Darmstadt, Germany (together with Martin Stoll, Magdeburg)
Apr 2011	Organization of a minisymposium on *Sparsity in Inverse Problems and Optimal Control* GAMM Annual Scientific Meeting, Graz, Austria (together with Dirk Lorenz, Braunschweig)
Jul 2009	Organization of a minisymposium on *Stability, Sensitivity and Error Analysis for Optimal Control Problems* 24th IFIP TC7 Conference, Buenos Aires, Argentina (together with Arnd Rösch, Duisburg-Essen, and Fredi Tröltzsch, Berlin)
Apr 2008	Organization of a section on *Flow Control* GAMM Annual Scientific Meeting, Bremen, Germany (together with Andre Thess, Ilmenau)
Jul 2007	Organization of a minisymposium on *PDE-Constrained Optimization: Numerical Analysis and Scientific Computing*, sponsored by the SIAM Activity Group on Optimization ICIAM, Zurich, Switzerland (together with Arnd Rösch, Duisburg-Essen)
Feb 2006	Organization of a special session on *Optimal Control of Applications described by DAEs/PDEs/PDAEs* MATHMOD, Vienna, Austria (together with Kurt Chudej, Bayreuth)
Oct 2005	Organization of a section on *Control and Optimization Problems in Mechanics* within the Special Semester on Computational Mechanics RICAM, Linz, Austria (together with Karl Kunisch, Graz, Austria, Ekkehard Sachs, Trier, and Boris Vexler, Linz, Austria)
May 2005	Organization of a minisymposium on *Numerical Methods in PDE-Constrained Optimization* SIAM Meeting on Optimization, Stockholm, Sweden (together with Stefan Volkwein, Graz, Austria)
Mar 2005	Organization of a Young Researchers' Minisymposium on *Computational Optimization with Differential Equations* GAMM Annual Scientific Meeting, Luxembourg (together with Andrea Walther, Dresden)

Editorial Activities

Jun 2021 – Jun 2023	Editorial board member for *Advances in Discrete and Continuous Models*
Jul 2018 – present	Editorial board member for *SMAI Journal of Computational Mathematics*
Jan 2018 – Dec 2023	Editorial board member for *SIAM Journal on Control and Optimization*
2017	Guest editor for *GAMM Reports 40(3–4)*, special issue on *Nonsmooth Models in Continuum Mechanics—Analysis and Optimization* jointly with Dorothee Knees, Kassel and Christian Meyer, Dortmund

Jan 2016 – Dec 2024	Editorial board member for *SIAM Journal on Numerical Analysis*
Nov 2015 – present	Editorial board member for *Journal of Optimization Theory and Applications*
Jan 2014 – present	Editorial board member for *Electronic Transactions on Numerical Analysis*
2013	Guest editor for *Computational Optimization and Applications*, special issue associated with the *3rd European Conference on Computational and Applied Mathematics (EUCCO), Chemnitz, Germany*
	jointly with Peter Benner, Magdeburg, Michael Hinze, Hamburg, Arnd Rösch, Duisburg-Essen, Anton Schiela, Berlin, and Volker Schulz, Trier
Nov 2012 – present	Co-Founder of and editorial board member for the *OPTPDE Problem Collection*
Jun 2012 – present	Editorial board member for *Optimization Methods and Software*
2011	Guest editor for *Control & Cybernetics*, special issue on the occasion of the 60th birthday of Prof. Fredi Tröltzsch
	jointly with Christian Meyer, Dortmund, Arnd Rösch, Duisburg-Essen, and Jan Sokolowski, Nancy

Manuscripts Refereed for Journals

I received an Outstanding Reviewer Award from the Journal *Inverse Problems* in 2019. My peer reviewing activities can also be found on the Web of Science.

Applicable Analysis
Applied Mathematical Modelling
Applied Mathematics and Optimization (2x)
Applied Numerical Mathematics (2x)
Advances in Computational Mathematics
Arabian Journal for Science and Engineering
Calcolo
Communications in Mathematical Sciences
Computational and Applied Mathematics (3x)
Computational Methods in Applied Mathematics (3x)
Computational Optimization and Applications (8x)
Computers and Fluids
Control and Cybernetics (2x)
Electronic Transactions on Numerical Analysis (2x)
ESAIM Control, Optimisation and Calculus of Variations (5x)
ESAIM Mathematical Modelling and Numerical Analysis
European Journal of Applied Mathematics
Foundations of Computational Mathematics
GAMM Mitteilungen
IEEE Signal Processing Letters
IEEE Transactions on Automatic Control
IET Systems Biology
IMA Journal on Numerical Analysis (3x)
IMA Journal of Mathematical Control and Information
International Journal of Computer Mathematics (2x)

International Journal for Numerical Methods in Engineering
Inverse Problems (10x)
Inverse Problems and Imaging
Journal of Applied Mathematics and Mechanics (6x)
Journal of Computational Mathematics
Journal of Computational Physics
Journal of Differential Equations
Journal of Industrial and Management Optimization (2x)
Journal of Mathematical Analysis and Applications
Journal of Mathematical Imaging and Vision
Journal of Numerical Functional Analysis and Optimization (2x)
Journal of Optimization Theory and Applications (9x)
Journal of Process Control
Journal of Scientific Computing (5x)
Mathematical and Computer Modelling of Dynamical Systems (2x)
Mathematical and Computational Applications
Mathematical Control and Related Fields (3x)
Mathematical Methods in the Applied Sciences (2x)
Mathematical Programming (3x)
Mathematical Programming Computation
Mathematics of Computation
Nonlinear Analysis: Real World Applications
Nonlinear Analysis: Modelling and Control
Numerical Algorithms (2x)
Numerical Functional Analysis and Optimization (2x)
Numerical Linear Algebra with Applications
Numerische Mathematik (3x)
Open Journal on Mathematical Optimization
Optimization (3x)
Optimization and Engineering (2x)
Optimization Methods and Software (4x)
Optimal Control Applications and Methods
Proceedings in Applied Mathematics and Mechanics
Proceedings of the Royal Society A
Pure and Applied Functional Analysis (2x)
SIAM Journal on Control and Optimization (10x)
SIAM Journal on Imaging Sciences
SIAM Journal on Matrix Analysis and Applications (2x)
SIAM Journal on Numerical Analysis (2x)
SIAM Journal on Optimization (10x)
SIAM Journal on Scientific Computing (13x)

Publications

Publications in Journals

1. R. Herzog, F. Köhne, L. Kreis, and A. Schiela (2025). "Metric Frobenius norms and inner products of matrices and linear maps". In: *Linear Algebra and its Applications* 727, pp. 112–128. DOI: 10.1016/j.laa.2025.08.005. arXiv: 2311.15419

2. P. Çiloğlu, C. Tretmans, R. Herzog, J.-F. Pietschmann, and M. Stoll (2025). "Preconditioning for

a Cahn-Hilliard-Navier-Stokes model for morphology formation in organic solar cells". In: *Journal of Computational Physics* 540, p. 114280. DOI: 10.1016/j.jcp.2025.114280. arXiv: 2501.11767

3. H. Rickmann, E. Herberg, and R. Herzog (2025). "Global convergence of semismooth Newton methods for quadratic problems". In: *GAMM Archive for Students* 7.1, pp. 14–30. DOI: 10.14464/gammas.v7i1.810

4. J. Wagner, E. Herberg, and R. Herzog (2025). "Experiences with physics-informed neural networks for optimal control problems". In: *GAMM Archive for Students* 7.1, pp. 31–45. DOI: 10.14464/GAMMAS.V7I1.813

5. L. Baumgärtner, R. Bergmann, R. Herzog, S. Schmidt, J. Vidal-Núñez, and M. Weiß (2025). "Mesh denoising and inpainting using the total variation of the normal and a shape Newton approach". In: *SIAM Journal on Scientific Computing* 47.1, A300–A324. DOI: 10.1137/24m1646121. arXiv: 2012.11748

6. V. Martinek, I. Bell, R. Herzog, M. Richter, and X. Yang (2025). "Entropy scaling of viscosity IV—application to 124 industrially important fluids". In: *Journal of Chemical & Engineering Data*. DOI: 10.1021/acs.jced.4c00451

7. A. Bünger, R. Herzog, A. Naumann, and M. Stoll (2024). "Uncertainty propagation of initial conditions in thermal models". In: *International Journal for Computational Methods in Engineering Science and Mechanics* 25.6, pp. 475–488. DOI: 10.1080/15502287.2024.2408291. arXiv: 2306.12736

8. K. Koval, R. Herzog, and R. Scheichl (2024). "Tractable optimal experimental design using transport maps". In: *Inverse Problems* 40.12, p. 125002. DOI: 10.1088/1361-6420/ad8260. arXiv: 2401.07971

9. M. Seibold, J. Hildebrand, D. Strelnikov, J. P. Bergmann, K. Schricker, and R. Herzog (2024). "Simulationsbasierte Optimierung der zeitabhängigen Pulsleistung beim Laserstrahlschweißen von Aluminiumlegierungen zum Vermeiden von Heißrissen". In: *Schweißen und Schneiden* 68.4, pp. 38–45. DOI: 10.53192/SUS20240438

10. R. Herzog, J.-F. Pietschmann, and M. Winkler (2023). "Optimal control of Hughes' model for pedestrian flow via local attraction". In: *Applied Mathematics and Optimization* 88.3. DOI: 10.1007/s00245-023-10064-8. arXiv: 2011.03580

11. R. Herzog and E. Loayza-Romero (2023). "A discretize-then-optimize approach to PDE-constrained shape optimization". In: *ESAIM: Control, Optimisation and Calculus of Variations* 30, p. 11. DOI: 10.1051/cocv/2023071. arXiv: 2109.00076

12. L. Baumgärtner, R. Herzog, S. Schmidt, and M. Weiß (2023). "The proximal map of the weighted mean absolute error". In: *Proceedings in Applied Mathematics and Mechanics* 23.4. DOI: 10.1002/pamm.202300042. arXiv: 2209.13545

13. C. Mages, J. Steinfurt, A.-K. Rahm, D. Thomas, R. Majidi, F. Kehrle, F. André, K. Seidensaal, B. Rhein, T. Wengenmayer, A. Gressle, D. Westermann, R. Herzog, J. Debus, N. Frey, and P. Lugenbiel (2023). "Recurrent ventricular tachycardia originating from the "LV summit" effectively eliminated by stereotactic irradiation - a case report". In: *HeartRhythm Case Reports* 9.11, pp. 802–807. DOI: 10.1016/j.hrcr.2023.08.009

14. K. Bergermann, C. Deibel, R. Herzog, R. C. I. MacKenzie, J.-F. Pietschmann, and M. Stoll (2023). "Preconditioning for a phase-field model with application to morphology evolution in

organic semiconductors". In: *Communications in Computational Physics* 34.1, pp. 1–17. DOI: 10.4208/cicp.oa-2022-0115. arXiv: 2204.03575

15. O. Frotscher, V. Martinek, R. Fingerhut, X. Yang, J. Vrabec, R. Herzog, and M. Richter (2023). "Proof of concept for fast equation of state development using an integrated experimental-computational approach". In: *International Journal of Thermophysics* 44.7. DOI: 10.1007/s10765-023-03197-z

16. M. Hashemi, R. Herzog, and T. M. Surowiec (2023). "Optimal control of the stationary Kirchhoff equation". In: *Computational Optimization and Applications* 85.2, pp. 479–508. DOI: 10.1007/s10589-023-00463-6. arXiv: 2112.01067

17. R. Herzog and D. Strelnikov (2023). "An optimal control problem for single-spot pulsed laser welding". In: *Journal of Mathematics in Industry* 13.1. DOI: 10.1186/s13362-023-00132-7. arXiv: 2109.10788

18. L. Baumgärtner, R. Bergmann, R. Herzog, S. Schmidt, and J. Vidal-Núñez (2023). "Total generalized variation for piecewise constant functions on triangular meshes with applications in imaging". In: *SIAM Journal on Imaging Sciences* 16.1, pp. 313–339. DOI: 10.1137/22m1505281. arXiv: 2206.12331

19. E. Herberg, R. Herzog, and F. Köhne (2023). "Time regularization in optimal time variable learning". In: *Proceedings in Applied Mathematics and Mechanics* 24.1. DOI: 10.1002/pamm.202300299. arXiv: 2306.16111

20. R. Bergmann, R. Herzog, J. Ortiz López, and A. Schiela (2022). "First- and second-order analysis for optimization problems with manifold-valued constraints". In: *Journal of Optimization Theory and Applications* 195.2, pp. 596–623. DOI: 10.1007/s10957-022-02107-x. arXiv: 2110.04882

21. R. Herzog and E. Loayza-Romero (2022). "A manifold of planar triangular meshes with complete Riemannian metric". In: *Mathematics of Computation* 92.339, pp. 1–50. DOI: 10.1090/mcom/3775. arXiv: 2012.05624

22. M. Silva Louzeiro, R. Bergmann, and R. Herzog (2022). "Fenchel duality and a separation theorem on Hadamard manifolds". In: *SIAM Journal on Optimization* 32.2, pp. 854–873. DOI: 10.1137/21m1400699. arXiv: 2102.11155

23. R. Altmann and R. Herzog (2021). "Continuous Galerkin schemes for semiexplicit differential-algebraic equations". In: *IMA Journal of Numerical Analysis* 42.3, pp. 2214–2237. DOI: 10.1093/imanum/drab037. arXiv: 2011.09336

24. R. Herzog (2021). "Dimensionally consistent preconditioning for saddle-point problems". In: *Computational Methods in Applied Mathematics* 21.3, pp. 593–607. DOI: 10.1515/cmam-2020-0037. arXiv: 2003.09478

25. F. Ospald, K. Bergermann, and R. Herzog (2021). "An extension of the strain transfer principle for fiber reinforced materials". In: *Computational Mechanics* 67.5, pp. 1453–1463. DOI: 10.1007/s00466-021-01997-4. arXiv: 2010.05857

26. O. Frotscher, R. Herzog, and M. Richter (2021). "Planning of measurement series for thermodynamic properties based on optimal experimental design". In: *International Journal of Thermophysics* 42.7. DOI: 10.1007/s10765-021-02827-8. arXiv: 2012.12098

27. R. Bergmann, R. Herzog, M. Silva Louzeiro, D. Tenbrinck, and J. Vidal-Núñez (2021). "Fenchel duality theory and a primal-dual algorithm on Riemannian manifolds". In: *Foundations of*

Computational Mathematics 21.6, pp. 1465–1504. DOI: 10.1007/s10208-020-09486-5. arXiv: 1908.02022

28. J. Blechschmidt, R. Herzog, and M. Winkler (2020). "Error estimation for second-order partial differential equations in nonvariational form". In: *Numerical Methods for Partial Differential Equations* 37.3, pp. 2190–2221. DOI: 10.1002/num.22678. arXiv: 1909.12676

29. T. Etling, R. Herzog, E. Loayza, and G. Wachsmuth (2020). "First and second order shape optimization based on restricted mesh deformations". In: *SIAM Journal on Scientific Computing* 42.2, A1200–A1225. DOI: 10.1137/19m1241465. arXiv: 1810.10313

30. R. Bergmann, M. Herrmann, R. Herzog, S. Schmidt, and J. Vidal-Núñez (2020a). "Discrete total variation of the normal vector field as shape prior with applications in geometric inverse problems". In: *Inverse Problems* 36.5, p. 054003. DOI: 10.1088/1361-6420/ab6d5c. arXiv: 1908.07916

31. R. Bergmann, M. Herrmann, R. Herzog, S. Schmidt, and J. Vidal-Núñez (2020b). "Total variation of the normal vector field as shape prior". In: *Inverse Problems* 36.5, p. 054004. DOI: 10.1088/1361-6420/ab6d5b. arXiv: 1902.07240

32. J. Hart, B. van Bloemen Waanders, and R. Herzog (2020). "Hyper-differential sensitivity analysis of uncertain parameters in PDE-constrained optimization". In: *International Journal for Uncertainty Quantification* 10.3, pp. 225–248. DOI: 10.1615/int.j.uncertaintyquantification.2020032480. arXiv: 1909.07336

33. T. Etling, R. Herzog, and M. Siebenborn (2019). "Optimum experimental design for interface identification problems". In: *SIAM Journal on Scientific Computing* 41.6, A3498–A3523. DOI: 10.1137/18M1208125. arXiv: 1808.05776

34. R. Bergmann and R. Herzog (2019). "Intrinsic formulation of KKT conditions and constraint qualifications on smooth manifolds". In: *SIAM Journal on Optimization* 29.4, pp. 2423–2444. DOI: 10.1137/18M1181602. arXiv: 1804.06214

35. M. Herrmann, R. Herzog, S. Schmidt, J. Vidal-Núñez, and G. Wachsmuth (2019). "Discrete total variation with finite elements and applications to imaging". In: *Journal of Mathematical Imaging and Vision* 61.4, pp. 411–431. DOI: 10.1007/s10851-018-0852-7. arXiv: 1804.07477

36. R. Herzog, J. W. Pearson, and M. Stoll (2019). "Fast iterative solvers for an optimal transport problem". In: *Advances in Computational Mathematics* 45.2, pp. 495–517. DOI: 10.1007/s10444-018-9625-5. arXiv: 1801.04172

37. R. Herzog, I. Riedel, and D. Uciński (2018). "Optimal sensor placement for joint parameter and state estimation problems in large-scale dynamical systems with applications to thermo-mechanics". In: *Optimization and Engineering* 19.3, pp. 591–627. DOI: 10.1007/s11081-018-9391-8

38. S.-J. Kimmerle, M. Gerdts, and R. Herzog (2018a). "An optimal control problem for a rotating elastic crane-trolley-load system". In: *IFAC-PapersOnLine* 51.2, pp. 272–277. DOI: 10.1016/j.ifacol.2018.03.047

39. R. Herzog and A. Stötzner (2019). "Hadamard differentiability of the solution map in thermoviscoplasticity". In: *Pure and Applied Functional Analysis* 4.2, pp. 271–295

40. P. Benner, R. Herzog, N. Lang, I. Riedel, and J. Saak (2019). "Comparison of model order reduction methods for optimal sensor placement for thermo-elastic models". In: *Engineering Optimization* 51.3, pp. 465–483. DOI: 10.1080/0305215X.2018.1469133

41. T. Etling and R. Herzog (2018). "Optimum experimental design by shape optimization of specimens in linear elasticity". In: *SIAM Journal on Applied Mathematics* 78.3, pp. 1553–1576. DOI: 10.1137/17M1147743

42. M. Herrmann, R. Herzog, H. Kröner, S. Schmidt, and J. Vidal-Núñez (2018). "Analysis and an interior point approach for TV image reconstruction problems on smooth surfaces". In: *SIAM Journal on Imaging Sciences* 11.2, pp. 889–922. DOI: 10.1137/17M1128022

43. S.-J. Kimmerle, M. Gerdts, and R. Herzog (2018b). "Optimal control of an elastic crane-trolley-load system—A case study for optimal control of coupled ODE-PDE systems". In: *Mathematical and Computer Modelling of Dynamical Systems* 24.2, pp. 182–206. DOI: 10.1080/13873954.2017.1405046

44. R. Herzog and K. Soodhalter (2017). "A modified implementation of MINRES to monitor residual subvector norms for block systems". In: *SIAM Journal on Scientific Computing* 39.6, A2645–A2663. DOI: 10.1137/16M1093021

45. R. Herzog and W. Wollner (2017). "A conjugate direction method for linear systems in Banach spaces". In: *Journal of Inverse and Ill-Posed Problems* 25.5, pp. 553–572. DOI: 10.1515/jiip-2016-0027

46. R. Herzog, C. Meyer, and A. Stötzner (2017). "Existence of solutions of a thermoviscoplastic model and associated optimal control problems". In: *Nonlinear Analysis: Real World Applications* 35, pp. 75–101. DOI: 10.1016/j.nonrwa.2016.10.008

47. R. Herzog and F. Ospald (2017). "Parameter identification for short fiber-reinforced plastics using optimal experimental design". In: *International Journal for Numerical Methods in Engineering* 110.8, pp. 703–725. DOI: 10.1002/nme.5371

48. J. C. de los Reyes, R. Herzog, and C. Meyer (2016). "Optimal control of static elastoplasticity in primal formulation". In: *SIAM Journal on Control and Optimization* 54.6, pp. 3016–3039. DOI: 10.1137/130920861

49. J. Merger, A. Borzì, and R. Herzog (2017). "Optimal control of a system of reaction-diffusion equations modeling the wine fermentation process". In: *Optimal Control Applications and Methods* 38.1, pp. 112–132. DOI: 10.1002/oca.2246

50. R. Herzog and S. Mach (2016). "Preconditioned solution of state gradient constrained elliptic optimal control problems". In: *SIAM Journal on Numerical Analysis* 54.2, pp. 688–718. DOI: 10.1137/130948045

51. A. Günnel and R. Herzog (2016). "Optimal control problems in finite strain elasticity by inner pressure and fiber tension". In: *Frontiers in Applied Mathematics and Statistics* 2.4. DOI: 10.3389/fams.2016.00004

52. E. Casas, R. Herzog, and G. Wachsmuth (2017). "Analysis of spatio-temporally sparse optimal control problems of semilinear parabolic equations". In: *ESAIM: Control, Optimisation and Calculus of Variations* 23.1, pp. 263–295. DOI: 10.1051/cocv/2015048

53. R. Herzog and E. Sachs (2015). "Superlinear convergence of Krylov subspace methods for self-adjoint problems in Hilbert space". In: *SIAM Journal on Numerical Analysis* 53.3, pp. 1304–1324. DOI: 10.1137/140973050

54. R. Herzog, J. Obermeier, and G. Wachsmuth (2015). "Annular and sectorial sparsity in optimal control of elliptic equations". In: *Computational Optimization and Applications* 62.1, pp. 157–180. DOI: 10.1007/s10589-014-9721-5

55. R. Herzog and I. Riedel (2015). "Sequentially optimal sensor placement in thermoelastic models for real time applications". In: *Optimization and Engineering* 16.4, pp. 737–766. DOI: 10.1007/s11081-015-9275-0

56. A. Günnel, R. Herzog, and E. Sachs (2014). "A note on preconditioners and scalar products in Krylov subspace methods for self-adjoint problems in Hilbert space". In: *Electronic Transactions on Numerical Analysis* 41, pp. 13–20. URL: https://etna.mcs.kent.edu/volumes/2011-2020/vol41/

57. R. Herzog, C. Meyer, and G. Wachsmuth (2013). "B- and strong stationarity for optimal control of static plasticity with hardening". In: *SIAM Journal on Optimization* 23.1, pp. 321–352. DOI: 10.1137/110821147

58. R. Herzog, K. Kunisch, and J. Sass (2013). "Primal-dual methods for the computation of trading regions under proportional transaction costs". In: *Mathematical Methods of Operations Research* 77.1, pp. 101–130. DOI: 10.1007/s00186-012-0416-3

59. R. Herzog, C. Meyer, and G. Wachsmuth (2012a). "C-stationarity for optimal control of static plasticity with linear kinematic hardening". In: *SIAM Journal on Control and Optimization* 50.5, pp. 3052–3082. DOI: 10.1137/100809325

60. E. Casas, R. Herzog, and G. Wachsmuth (2012b). "Approximation of sparse controls in semilinear equations by piecewise linear functions". In: *Numerische Mathematik* 122.4, pp. 645–669. DOI: 10.1007/s00211-012-0475-7

61. E. Casas, R. Herzog, and G. Wachsmuth (2012c). "Optimality conditions and error analysis of semilinear elliptic control problems with L^1 cost functional". In: *SIAM Journal on Optimization* 22.3, pp. 795–820. DOI: 10.1137/110834366

62. R. Herzog, G. Stadler, and G. Wachsmuth (2012). "Directional sparsity in optimal control of partial differential equations". In: *SIAM Journal on Control and Optimization* 50.2, pp. 943–963. DOI: 10.1137/100815037

    R. Herzog, G. Stadler, and G. Wachsmuth (2015). "Erratum to: Directional sparsity in optimal control of partial differential equations". In: *SIAM Journal on Control and Optimization* 53.4, pp. 2722–2723. DOI: 10.1137/15M102544X

63. M. Bernauer and R. Herzog (2012). "Implementation of an X-FEM solver for the classical two-phase Stefan problem". In: *Journal of Scientific Computing* 52.2, pp. 271–293. DOI: 10.1007/s10915-011-9543-x

64. R. Herzog and F. Schmidt (2012). "Weak lower semi-continuity of the optimal value function and applications to worst-case robust optimal control problems". In: *Optimization* 61 (6), pp. 685–697. DOI: 10.1080/02331934.2011.603322

65. R. Herzog, C. Meyer, and G. Wachsmuth (2011b). "Integrability of displacement and stresses in linear and nonlinear elasticity with mixed boundary conditions". In: *Journal of Mathematical Analysis and Applications* 382.2, pp. 802–813. DOI: 10.1016/j.jmaa.2011.04.074

66. R. Herzog and C. Meyer (2011). "Optimal control of static plasticity with linear kinematic hardening". In: *Journal of Applied Mathematics and Mechanics* 91.10, pp. 777–794. DOI: `10.1002/zamm.200900378`

67. R. Herzog, C. Meyer, and G. Wachsmuth (2011a). "Existence and regularity of the plastic multiplier in static and quasistatic plasticity". In: *GAMM Reports* 34.1, pp. 39–44. DOI: `10.1002/gamm.201110006`

68. M. Bernauer and R. Herzog (2011). "Optimal control of the classical two-phase Stefan problem in level set formulation". In: *SIAM Journal on Scientific Computing* 33.1, pp. 342–363. DOI: `10.1137/100783327`

69. R. Herzog and K. Kunisch (2010). "Algorithms for PDE-constrained optimization". In: *GAMM Reports* 33.2, pp. 163–176. DOI: `10.1002/gamm.201010013`

70. R. Herzog and E. Sachs (2010). "Preconditioned conjugate gradient method for optimal control problems with control and state constraints". In: *SIAM Journal on Matrix Analysis and Applications* 31.5, pp. 2291–2317. DOI: `10.1137/090779127`

71. R. Griesse, N. Metla, and A. Rösch (2010). "Local quadratic convergence of SQP for elliptic optimal control problems with mixed control-state constraints". In: *Control and Cybernetics* 39.3, pp. 717–738

72. M. K. Bernauer and R. Griesse (2009). "A robustification approach in unconstrained quadratic optimization". In: *Mathematical Programming Series A* 128.1–2, pp. 231–252. DOI: `10.1007/s10107-009-0302-9`

73. W. Alt, R. Griesse, N. Metla, and A. Rösch (2010). "Lipschitz stability for elliptic optimal control problems with mixed control-state constraints". In: *Optimization* 59.6, pp. 833–849. DOI: `10.1080/02331930902863749`

74. R. Griesse and K. Kunisch (2009). "A semismooth Newton method for solving elliptic equations with gradient constraints". In: *ESAIM M2AN. Mathematical Modelling and Numerical Analysis* 43.2, pp. 209–238. DOI: `10.1051/m2an:2008049`

75. R. Griesse and A. J. Meir (2009). "Modeling of a magnetohydrodynamics free surface problem arising in Czochralski crystal growth". In: *Mathematical and Computer Modelling of Dynamical Systems* 15.2, pp. 163–175. DOI: `10.1080/13873950802551542`

76. R. Griesse, N. Metla, and A. Rösch (2008). "Convergence analysis of the SQP method for nonlinear mixed-constrained elliptic optimal control problems". In: *Journal of Applied Mathematics and Mechanics* 88.10, pp. 776–792. DOI: `10.1002/zamm.200800036`

77. R. Griesse and D. Wachsmuth (2009). "Sensitivity analysis and the adjoint update strategy for optimal control problems with mixed control-state constraints". In: *Computational Optimization and Applications* 44.1, pp. 57–81. DOI: `10.1007/s10589-008-9181-x`

78. R. Griesse and D. Lorenz (2008). "A semismooth Newton method for Tikhonov functionals with sparsity constraints". In: *Inverse Problems* 24.3, 035007 (19pp). DOI: `10.1088/0266-5611/24/3/035007`

79. J. C. de los Reyes and R. Griesse (2008). "State-constrained optimal control of the three-dimensional stationary Navier-Stokes equations". In: *Journal of Mathematical Analysis and Applications* 343.1, pp. 257–272. DOI: `10.1016/j.jmaa.2008.01.029`

80. R. Griesse, T. Grund, and D. Wachsmuth (2008). "Update strategies for perturbed nonsmooth equations". In: *Optimization Methods and Software* 23.3, pp. 321–343. DOI: 10.1080/10556780701523551

81. R. Griesse and M. Weiser (2008). "On the interplay between interior point approximation and parametric sensitivities in optimal control". In: *Journal of Mathematical Analysis and Applications* 337.2, pp. 771–793. DOI: 10.1016/j.jmaa.2007.03.106

82. K. Brandes and R. Griesse (2007). "Quantitative stability analysis of optimal solutions in PDE-constrained optimization". In: *Journal of Computational and Applied Mathematics* 206.2, pp. 908–926. DOI: 10.1016/j.cam.2006.08.038

83. R. Griesse and B. Vexler (2007). "Numerical sensitivity analysis for the quantity of interest in PDE-constrained optimization". In: *SIAM Journal on Scientific Computing* 29.1, pp. 22–48. DOI: 10.1137/050637273

84. R. Griesse and K. Kunisch (2006). "Optimal control for a stationary MHD system in velocity–current formulation". In: *SIAM Journal on Control and Optimization* 45.5, pp. 1822–1845. DOI: 10.1137/050624236

85. A. Borzì and R. Griesse (2006). "Distributed optimal control of Lambda–Omega systems". In: *Journal of Numerical Mathematics* 14.1, pp. 17–40. DOI: 10.1163/156939506776382120

86. R. Griesse (2006). "Lipschitz stability of solutions to some state-constrained elliptic optimal control problems". In: *Journal of Analysis and its Applications* 25, pp. 435–455. DOI: 10.4171/ZAA/1300

87. R. Griesse, M. Hintermüller, and M. Hinze (2005). "Differential stability of control constrained optimal control problems for the Navier-Stokes equations". In: *Numerical Functional Analysis and Optimization* 26.7–8, pp. 829–850. DOI: 10.1080/01630560500434278

88. C. Büskens and R. Griesse (2006). "Parametric sensitivity analysis of perturbed PDE optimal control problems with state and control constraints". In: *Journal of Optimization Theory and Applications* 131.1, pp. 17–35. DOI: 10.1007/s10957-006-9122-8

89. A. Borzì and R. Griesse (2005). "Experiences with a space-time multigrid method for the optimal control of a chemical turbulence model". In: *International Journal for Numerical Methods in Fluids* 47.8–9, pp. 879–885. DOI: 10.1002/fld.904

90. R. Griesse and S. Volkwein (2005). "A primal-dual active set strategy for optimal boundary control of a nonlinear reaction-diffusion system". In: *SIAM Journal on Control and Optimization* 44.2, pp. 467–494. DOI: 10.1137/S0363012903438696

91. R. Griesse (2004a). "Parametric sensitivity analysis in optimal control of a reaction-diffusion system—Part I: solution differentiability". In: *Numerical Functional Analysis and Optimization* 25.1–2, pp. 93–117. DOI: 10.1081/NFA-120034120

92. R. Griesse (2004b). "Parametric sensitivity analysis in optimal control of a reaction-diffusion system—Part II: practical methods and examples". In: *Optimization Methods and Software* 19.2, pp. 217–242. DOI: 10.1080/10556780410001654250

93. R. Griesse and A. Walther (2003). "Parametric sensitivity analysis for optimal control problems using automatic differentiation". In: *Optimal Control Applications and Methods* 24.6, pp. 297–314. DOI: 10.1002/oca.733

94. R. Griesse and A. Walther (2004a). "Evaluating gradients in optimal control: continuous adjoints versus automatic differentiation". In: *Journal of Optimization Theory and Applications* 122.1, pp. 63–86. DOI: 10.1023/B:JOTA.0000041731.71309.f1

Submitted Publications and Preprints

95. N. Emonds, E. Herberg, M. F. Gerchen, M. Pritsch, J. Rocha, V. Zamoscik, P. Kirsch, R. Herzog, and G. Koppe (2025). *A data-driven closed-loop control approach to drive neural state transitions for mechanistic insight.* bioRxiv: 2025.07.21.665992

96. B. Dittrich, E. Herberg, R. Herzog, and G. Müller (2025). *A DC-reformulation for gradient-L^0-constrained problems in function spaces.* arXiv: 2506.11917

97. T. Cui, K. Koval, R. Herzog, and R. Scheichl (2025). *Subspace accelerated measure transport methods for fast and scalable sequential experimental design, with application to photoacoustic imaging.* arXiv: 2502.20086

98. L. Baumgärtner, R. Bergmann, R. Herzog, S. Schmidt, and M. Weiß (2024). *Two models for surface segmentation using the total variation of the normal vector.* arXiv: 2412.00445

99. A. Schiela, R. Herzog, and R. Bergmann (2024). *Nonlinear Fenchel conjugates.* arXiv: 2409.04492

100. V. Martinek, J. Reuter, O. Frotscher, S. Mostaghim, M. Richter, and R. Herzog (2024). *Shape constraints in symbolic regression using penalized least squares.* arXiv: 2405.20800

101. R. Bergmann, R. Herzog, and H. Jasa (2024). *The Riemannian convex bundle method.* arXiv: 2402.13670

102. E. Herberg, R. Herzog, F. Köhne, L. Kreis, and A. Schiela (2023). *Sensitivity-based layer insertion for residual and feedforward neural networks.* arXiv: 2311.15995

103. F. Köhne, L. Kreis, A. Schiela, and R. Herzog (2023). *Adaptive step sizes for preconditioned stochastic gradient descent.* arXiv: 2311.16956

104. R. Herzog and E. Legler (2020). *First-order methods for optimal experimental design problems with bound constraints.* arXiv: 2004.08084

Books Edited

105. R. Herzog, M. Heinkenschloss, D. Kalise, G. Stadler, and E. Trélat, eds. (2022). *Optimization and Control for Partial Differential Equations.* Vol. 29. Radon Series on Computational and Applied Mathematics. De Gruyter. DOI: 10.1515/9783110695984

106. M. Hintermüller, R. Herzog, C. Kanzow, M. Ulbrich, and S. Ulbrich, eds. (2022). *Non-Smooth and Complementarity-Based Distributed Parameter Systems.* Vol. 172. International Series of Numerical Mathematics. Springer International Publishing. DOI: 10.1007/978-3-030-79393-7

Book Chapters

107. A. Naumann, I. Riedel, and R. Herzog (2025). "Datenassimilation und optimale Sensorplatzierung". In: *Thermo-energetische Gestaltung von Werkzeugmaschinen.* Springer Fachmedien Wiesbaden, pp. 189–197. DOI: 10.1007/978-3-658-45180-6_12

108. M. Herrmann, R. Herzog, S. Schmidt, and J. Vidal-Núñez (2022). "A calculus for non-smooth shape optimization with applications to geometric inverse problems". In: *Non-Smooth and Complementarity-Based Distributed Parameter Systems.* Ed. by M. Hintermüller, R. Herzog,

C. Kanzow, M. Ulbrich, and S. Ulbrich. Vol. 172. International Series of Numerical Mathematics. Springer International Publishing, pp. 101–120. DOI: 10.1007/978-3-030-79393-7_5

109. R. Dietze, N. Goldberg, R. Herzog, S. Hannusch, M. Hofmann, J. Ihlemann, L. Kroll, A. Meyer, F. Ospald, E. Peretzki, G. Rünger, H. Schmidt, N. Schramm, R. Springer, M. Stockmann, and L. Ulke-Winter (2019). "Modellierung, integrative Simulation und Optimierung". In: *Technologiefusion für multifunktionale Leichtbaustrukturen: Ressourceneffizienz durch die Schlüsseltechnologie "Leichtbau"*. Ed. by L. Kroll. Springer Berlin Heidelberg, pp. 577–645. DOI: 10.1007/978-3-662-54734-2_8

110. R. Herzog, D. Knees, C. Meyer, M. Sievers, A. Stötzner, and S. Thomas (2019). "Rate-independent systems and their viscous regularizations: analysis, simulation and optimal control". In: *Non-Smooth and Complementarity-Based Distributed Parameter Systems*. Ed. by M. Hintermüller, R. Herzog, C. Kanzow, M. Ulbrich, and S. Ulbrich. Vol. 172. International Series of Numerical Mathematics. Springer. DOI: 10.1007/978-3-030-79393-7_6

111. J. Blechschmidt and R. Herzog (2018). "Improving policies for Hamilton-Jacobi-Bellman equations by postprocessing". In: *Hamilton-Jacobi-Bellman Equations*. Vol. 21. Radon Series on Computational and Applied Mathematics. De Gruyter, Berlin, pp. 25–42. DOI: 10.1515/9783110543599-002

112. C. Naumann, I. Riedel, U. Priber, and R. Herzog (2015). "Correction algorithms and high-dimensional characteristic diagrams". In: *Thermo-Energetic Design of Machine Tools*. Ed. by K. Großmann. Lecture Notes in Production Engineering. Springer International Publishing, pp. 159–174. DOI: 10.1007/978-3-319-12625-8_14

113. R. Herzog, C. Meyer, and G. Wachsmuth (2014). "Optimal control of elastoplastic processes: analysis, algorithms, numerical analysis and applications". In: *Trends in PDE Constrained Optimization*. Vol. 165. International Series of Numerical Mathematics. Springer, pp. 27–41. DOI: 10.1007/978-3-319-05083-6_4

114. R. Herzog and O. Rheinbach (2014a). "FETI-DP methods for optimal control problems". In: *Domain Decomposition Methods in Science and Engineering XXI*. ed. by J. Erhel, M. J. Gander, L. Halpern, G. Pichot, T. Sassi, and O. Widlund. Vol. 98. Lecture Notes in Computational Science and Engineering. Springer, pp. 337–344. DOI: 10.1007/978-3-319-05789-7_36

115. R. Herzog, A. Rösch, S. Ulbrich, and W. Wollner (2014). "OPTPDE: a collection of problems in PDE-constrained optimization". In: *Trends in PDE Constrained Optimization*. Vol. 165. International Series of Numerical Mathematics. Springer, pp. 539–543. DOI: 10.1007/978-3-319-05083-6_34

Publications in Proceedings

116. J. Reuter, V. Martinek, R. Herzog, and S. Mostaghim (2024). "Unit-aware genetic programming for the development of empirical equations". In: *Parallel Problem Solving from Nature – PPSN XVIII*. Springer Nature Switzerland, pp. 168–183. DOI: 10.1007/978-3-031-70055-2_11. arXiv: 2405.18896

117. C. Naumann, A. Naumann, N. Bertaggia, A. Geist, J. Glänzel, R. Herzog, D. Zontar, C. Brecher, and M. Dix (2023). "Hybrid thermal error compensation combining integrated deformation sensor and regression analysis based models for complex machine tool designs". In: *3rd International Conference on Thermal Issues in Machine Tools (ICTIMT2023)*. Lecture Notes in Production Engineering. Springer International Publishing, pp. 28–40. DOI: 10.1007/978-3-031-34486-2_3

118. A. Naumann, J. Saak, S. Sauerzapf, J. Vettermann, M. Beitelschmidt, and R. Herzog (2022). "Advanced open source data formats for geometrically and physically coupled systems". In:

Proceedings of Asian Modelica Conference 2022. Ed. by T. Shen, R. Gao, and Y. Hirano. Linköping University Electronic Press. DOI: 10.3384/ecp19381

119. M. Seibold, D. Strelnikov, K. Schricker, R. Herzog, and J. P. Bergmann (2022). "Influence of solidification rate on hot crack behavior in heat conduction laser beam welding of EN AW-6082". In: *Procedia CIRP* 111, pp. 490–495. DOI: 10.1016/j.procir.2022.08.076

120. R. Herzog and A. Naumann (2021). "Optimal sensor placement for stochastic sources in machine tools". In: *Proceedings in Applied Mathematics and Mechanics* 21.1. DOI: 10.1002/pamm.202100089

121. C. Brecher, R. Herzog, R. Spierling, A. Naumann, and F. Tzanetos (2021). "Optimal positioning methods of integral deformation sensors — expert knowledge versus mathematical optimization". In: *MM Science Journal* 2021.3, pp. 4628–4635. DOI: 10.17973/MMSJ.2021_7_2021069

122. J. Vettermann, S. Sauerzapf, A. Naumann, J. Saak, P. Benner, M. Beitelschmidt, and R. Herzog (2021). "Model order reduction methods for coupled machine tool models". In: *MM Science Journal* 2021.3, pp. 4652–4659. DOI: 10.17973/MMSJ.2021_7_2021072

123. A. Naumann and R. Herzog (2021). "Optimal sensor placement for thermo-elastic coupled machine models". In: *Proceedings in Applied Mathematics and Mechanics* 20.1. DOI: 10.1002/pamm.202000255

124. C. Brecher, R. Herzog, R. Spierling, F. Tzanetos, and A. Naumann (2020). "Evaluation of optimal positioning methods of integral deformation sensors for the correction of thermal errors in machine tools". In: *Conference Proceedings on Thermal Issues 2020.* euspen Special Interest Group Meeting on Thermal Issues. Aachen, Germany, pp. 26–29. URL: https://www.euspen.eu/knowledge-base/TI20137.pdf

125. R. Bergmann, M. Herrmann, R. Herzog, S. Schmidt, and J. Vidal-Núñez (2019). "Geometry processing problems using the total variation of the normal vector field". In: *Proceedings in Applied Mathematics and Mechanics* 19.1. DOI: 10.1002/pamm.201900189

126. R. Bergmann, R. Herzog, E. Loayza-Romero, and K. Welker (2019). "Shape optimization: what to do first, optimize or discretize?" In: *Proceedings in Applied Mathematics and Mechanics* 19.1. DOI: 10.1002/pamm.201900067

127. P. Benner, R. Herzog, N. Lang, I. Riedel, and J. Saak (2018). "Optimal sensor placement based on model order reduction". In: *Proceedings of the 1st Conference on Thermal Issues in Machine Tools.* Verlag Wissenschaftliche Scripten, pp. 355–365. URL: https://www.verlag-wiss-scripten.de/Shop/Detail.html?&PR_ID=326

128. J. P. Bergmann, M. Bielenin, R. A. Herzog, J. Hildebrand, I. Riedel, K. Schricker, C. Trunk, and K. Worthmann (2017). "Prevention of solidification cracking during pulsed laser beam welding". In: *Proceedings in Applied Mathematics and Mechanics* 17.1, pp. 405–406. DOI: 10.1002/pamm.201710172

129. F. Ospald and R. Herzog (2017b). "Topology optimization for injection molding of short fiber-reinforced plastics". In: *Proceedings in Applied Mathematics and Mechanics* 17.1, pp. 337–338. DOI: 10.1002/pamm.201710138

130. R. Herzog and I. Riedel (2017). "Optimale Sensorplatzierung und Online-Zustands- und Parameter-Identifikation". In: *Proceedings of the 5th Colloquium of SFB/Transregio 96*

131. R. Herzog and K. Soodhalter (2018). "Iterative solution of optimality systems in optimal control". In: *Mini-Workshop: Adaptive Methods for Control Problems Constrained by Time-Dependent PDEs.* Ed. by M. Gunzburger, K. Kunisch, and A. Kunoth. Vol. 14. 1. European Mathematical Society Publishing House, pp. 185–186. DOI: 10.4171/owr/2017/4

132. F. Ospald and R. Herzog (2017a). "SIMP based topology optimization for injection molding of SFRPs". In: *Advances in Structural and Multidisciplinary Optimization.* Proceedings of the 12th World Congress on Structural and Multidisciplinary Optimization. Springer International Publishing, pp. 850–861. DOI: 10.1007/978-3-319-67988-4_65

133. F. Ospald and R. Herzog (2016). "Optimal experimental design to identify the average stress-strain response in short fiber-reinforced plastics". In: *Proceedings in Applied Mathematics and Mechanics* 16.1, pp. 673–674. DOI: 10.1002/pamm.201610325

134. J. Glänzel, R. Herzog, S. Ihlenfeldt, A. Meyer, and R. Unger (2016). "Simulation-based correction approach for thermo-elastic workpiece deformations during milling process". In: *Proceedings of the 7th HPC 2016 - CIRP Conference on High Performance Cutting.* Vol. 46. Elsevier, pp. 103–106. DOI: 10.1016/j.procir.2016.03.178

135. R. Herzog, I. Riedel, B. Kauschinger, and S. Schroeder (2016). "Parameteridentifikation in thermo-elastischen Systemen". In: *Proceedings of the 4th Colloquium of SFB/Transregio 96*, pp. 55–82

136. S. Schleicher and R. Herzog (2015). "Towards topology optimization in quasi-static elastoplasticity". In: *IFAC-PapersOnLine* 48.1, pp. 627–628. DOI: 10.1016/j.ifacol.2015.05.130

137. S. Hannusch, M. Herzog Roland Hofmann, J. Ihlemann, L. Kroll, A. Meyer, F. Ospald, G. Rünger, R. Springer, M. Stockmann, and L. Ulke-Winter (2015). "Efficient simulation, optimization, and validation of lightweight structures". In: *Proceedings of the 2nd International MERGE Technologies Conference for Lightweight Structures (IMTC 2015)*, pp. 219–227. DOI: 10.1364/ofs.2018.tub6

138. R. Herzog and I. Riedel (2014). "Comparison of two suboptimal sensor placement strategies in thermo-elastic models". In: *Proceedings in Applied Mathematics and Mechanics* 14.1, pp. 881–882. DOI: 10.1002/pamm.201410421

139. A. Günnel and R. Herzog (2014). "Optimal control of large deformation elasticity by fiber tension". In: *Proceedings in Applied Mathematics and Mechanics* 14.1, pp. 879–880. DOI: 10.1002/pamm.201410420

140. R. Herzog and O. Rheinbach (2014b). "Scalability of a FETI-DP method for optimal control problems". In: *Proceedings in Applied Mathematics and Mechanics* 14.1, pp. 837–838. DOI: 10.1002/pamm.201410399

141. E. Casas, R. Herzog, and G. Wachsmuth (2012a). "Approximation of sparse controls in semilinear elliptic equations". In: *Large-Scale Scientific Computing.* Ed. by I. Lirkov, S. Margenov, and J. Wasniewski. Vol. 7116. Lecture Notes in Computer Science. 8th International Conference LSSC 2011, Sozopol, Bulgaria: Springer, pp. 16–27. DOI: 10.1007/978-3-642-29843-1_2

142. M. Bernauer, R. Herzog, and K. Kunisch (2010). "Optimal control of the two-phase Stefan problem in level set formulation". In: ed. by C. Elliott, Y. Giga, M. Hinze, and V. Styles. European Mathematical Society Publishing House, p. 261. DOI: 10.4171/owr/2010/07

143. R. Griesse and K. Kunisch (2008). "A semismooth Newton method for solving elliptic equations with gradient constraints". In: ed. by K. Kunisch, G. Leugering, J. Sprekels, and F. Tröltzsch. European Mathematical Society Publishing House, pp. 603–605. DOI: 10.4171/owr/2008/13

144. R. Griesse, A. J. Meir, and K. Kunisch (2007). "Control issues in magnetohydrodynamics". In: ed. by C. Elliott, M. Hinze, and V. Styles. European Mathematical Society Publishing House, pp. 447–486. DOI: 10.4171/owr/2007/08

145. R. Griesse and A. J. Meir (2006). "Modeling of an MHD free surface problem arising in CZ crystal growth". In: *5th IMACS Symposium on Mathematical Modelling—5th MATHMOD Vienna.* Ed. by I. Troch and F. Breitenecker. ARGESIM Reports

146. R. Griesse and K. Kunisch (2005). "Optimal control in magnetohydrodynamics". In: ed. by K. Kunisch, G. Leugering, J. Sprekels, and F. Tröltzsch. European Mathematical Society Publishing House, pp. 1011–1014. DOI: 10.4171/owr/2005/18

147. R. Griesse and A. Walther (2005). "Towards matrix-free AD-based preconditioning of KKT systems in PDE-constrained optimization". In: *Proceedings in Applied Mathematics and Mechanics* 5.1, pp. 47–50

148. R. Griesse and S. Volkwein (2006). "Parametric sensitivity analysis for optimal boundary control of a 3D reaction-diffusion system". In: *Large-Scale Nonlinear Optimization.* Ed. by G. Di Pillo and M. Roma. Vol. 83. Nonconvex Optimization and its Applications. Proceedings of the Workshop Large Scale Nonlinear Optimization, Erice. Berlin: Springer, pp. 127–149

149. R. Griesse and S. Volkwein (2004). "A semi-smooth Newton method for optimal boundary control of a nonlinear reaction-diffusion system". In: *Proceedings of the Sixteenth International Symposium on Mathematical Theory of Networks and Systems (MTNS), Leuven, Belgium*

150. R. Griesse and A. Walther (2004b). "Using AD-generated derivatives in optimal control of an industrial robot". In: *Progress in Industrial Mathematics at ECMI 2002.* Ed. by A. Buikis, R. Čiegis, and A. Fitt. Vol. 5. Mathematics in Industry. Springer, pp. 127–132

151. R. Griesse (2003a). "A reduced SQP algorithm for the optimal control of semilinear parabolic equations". In: *System Modeling and Optimization XX.* ed. by E. W. Sachs and R. Tichatschke. Vol. 130. IFIP — The International Federation for Information Processing. Kluwer Academic Publishers, pp. 239–253. DOI: 10.1007/978-0-387-35699-0_13

152. R. Griesse (2001). "Some aspects for instantaneous boundary control of backward-facing step flow". In: *Short Communications in Mathematics and Mechanics* 81.Supplement 2. Ed. by G. E. A. Meier, S251–S252

Theses

153. R. Griesse (2007). "Stability and Sensitivity Analysis in Optimal Control of Partial Differential Equations". Habilitation thesis. Faculty of Natural Sciences, Karl-Franzens University Graz

154. R. Griesse (2003b). "Parametric Sensitivity Analysis for Control-Constrained Optimal Control Problems Governed by Systems of Parabolic Partial Differential Equations". PhD thesis. Universität Bayreuth

155. R. Griesse: *Optimale und suboptimale Steuerung der Navier-Stokes-Gleichungen* (in German), Diploma Thesis, TU Clausthal, 1999

Further Documents

156. V. Martinek, O. Frotscher, M. Richter, and R. Herzog (2023). *Introducing thermodynamics-informed symbolic regression – a tool for thermodynamic equations of state development.* arXiv: 2309.02805

157. F. Ospald and R. Herzog (2020). *Short note on a relation between the inverse of the cosine and Carlson's elliptic integral R_D*. arXiv: 2001.02203

158. R. Herzog, C. Meyer, and G. Wachsmuth (2012b). "Optimale Steuerung in der Elastoplastizität". In: *GAMM-Rundbrief* 2, pp. 16–20. URL: https://www.gamm-ev.de/wp-content/uploads/2020/06/RB_2012_02_weba.compressed.pdf

159. R. Griesse: *The RICAM Information Leaflet* (Information for Incoming Ph.D. Students, Postdocs, and Visiting Scientists), 2005

Presentations

Invited/Plenary Conference Talks

1. *Krylov Subspace Methods with a Twist*, 30th Biennial Numerical Analysis Conference, University of Strathclyde, Glasgow, UK, June 2025

2. *Total Generalized Variation with Finite Elements and Applications*, 8th Chinese-German Workshop on Computational and Applied Mathematics, Sichuan University, Chengu, China, September 2024

3. *A Bundle Method for Convex Optimization on Manifolds*, Brazilian Workshop on Continuous Optimization, Rio de Janeiro, Brazil, March 2024

4. *A Brief History of Optimal Control of Partial Differential Equations: Past, Present and Future*, German SIAM Student Chapters meet Algorithmic Optimization, Trier, Germany, July 2023

5. *Total (Generalized) Variation for Images and Shapes*, Workshop Numerik im Ländle, Freiburg, Germany, May 2023

6. *The Role of the Metric in Numerical Linear Algebra and Optimization*, 25th International Symposium on Mathematical Theory of Networks and Systems, Bayreuth, Germany, September 2022

7. *Total Variation and Total Generalized Variation of the Normal Vector*, Workshop on Geometric Curvature Functionals and Optimization, Göttingen, Germany, March 2020

8. *An Optimum Experimental Design Problem for Interface Identification*, Indo-German Conference on Computational Mathematics, Bangalore, India, December 2019

9. *Data-Driven Imaging and Inverse Problems on Manifolds*, 7th Sino-German Symposium on Computational and Applied Mathematics, Kiel, Germany, August 2019

10. *Optimization and Inverse Problems on Manifolds*, Workshop on Numerical Methods for Optimal Control and Inverse Problems (OCIP), Munich, Germany, March 2019

11. *Total Variation Image Reconstruction on Surfaces*, 4th Conference on Optimization Methods and Software, Havana, Cuba, December 2017

12. *Preconditioning Techniques for Nonlinear Optimal Control Problems*, Austrian Numerical Analysis Days, Linz, Austria, May 2015

13. *Optimal Control of Static Elastoplasticity in Primal and Dual Formulations*, Workshop on Modeling, Analysis and Computing in Nonlinear PDEs, Chateau Liblice, Czech Republic, September 2014

14. *PDE-Constrained Optimization — A Linear Algebra Perspective*, SIAM Conference on Applied Linear Algebra, Valencia, Spain, June 2012

15. *On Optimal Control Problems with Sparsity Terms*, SIGOPT International Conference on Optimization, Lambrecht, Germany, June 2011

16. *Semismooth Newton Methods for Portfolio Optimization Problems*, 1st Latin American Workshop on Optimization and Control, Quito, Ecuador, July 2008

17. *Stability and Sensitivity Analysis in PDE-Constrained Optimization*, Czech-French-German Conference on Optimzation, Heidelberg, Germany, September 2007

18. *Optimal Control Challenges in Magnetohydrodynamics*, Simposium Internacional de Optimización y Ecuaciones Diferenciales, Universidad Autónoma de Aguascalientes, Mexico, April 2007

19. *Finite Elements for Magnetohydrodynamics and its Optimal Control*, Finite Element Symposium, Chemnitz, September 2006

20. *Optimal Control in Magnetohydrodynamics*, New Trends in Simulation and Control of PDEs, WIAS, Berlin, September 2005

Conference Talks in Minisymposia

21. *Optimal Control of Some Nonlocal PDEs*, ICIAM 2023, Tokyo, Japan, August 2023

22. *Total Generalized Variation with Finite Elements and Applications*, GAMM Annual Scientific meeting, Kassel, Germany, March 2021 (via video conference)

23. *Total Variation and Total Generalized Variation of the Normal Vector*, DMV Annual Meeting, Chemnitz, Germany, September 2020

24. *Total Variation of the Normal as a Prior in Geometric Inverse Problems*, ICIAM 2019, Valencia, Spain, July 2019

25. *Fast Solvers for Optimal Experimental Design Problems*, ICIAM 2019, Valencia, Spain, July 2019

26. *Total Variation of the Normal: Properties, Discretization and Variational Problems*, SIAM Conference on Computational Geometric Design, Vancouver, Canada, June 2019

27. *Total Variation of the Normal as a Prior in Geometric Inverse Problems*, GAMM Annual Scientific Meeting, Vienna, Austria, February 2019

28. *Intrinsic KKT Conditions on Smooth Manifolds*, EUCCO, Trier, Germany, September 2018

29. *An Optimum Experimental Design Problem for Interface Identification*, IFIP TC7 Conference, Essen, Germany, July 2018

30. *Discrete Total Variation with Finite Elements*, SIAM Conference on Imaging Sciences, Bologna, Italy, June 2018

31. *Total Variation Image Reconstruction on Smooth Surfaces*, SIAM Conference on Optimization, Vancouver, Canada, May 2017

32. *Solution of Structured Saddle-Point Systems with Applications in Optimal Control*, EUCCO, Leuven, Belgium, August 2016

33. *Formulations and Algorithms for Continuous Optimum Experimental Design Revisited*, EUCCO, Leuven, Belgium, August 2016

34. *Solution of Structured Saddle-Point Systems with Minres*, ICCOPT, Tokyo, Japan, August 2016

35. *A Conjugate Direction Method for Linear Systems in Banach Space*, European Congress of Mathematics, Berlin, Germany, July 2016

36. *Preconditioned Solution of Nonlinear Optimal Control Problems by Trust-Region SQP Methods*, DMV Annual Meeting, Hamburg, September 2015

37. *First- and Second-Order Optimality Conditions for Optimal Control Problems with Directional Sparsity Constraints*, AIMS, Madrid, Spain, July 2014

38. *Optimal Control of Elastoplastic Processes*, 21st International Symposium on Mathematical Programming (ISMP), Berlin, Germany, August 2012

39. *On the Preconditioning of Linear Systems arising in Trust-Region Methods*, GAMM Annual Scientific Meeting, Darmstadt, Germany, March 2012

40. *Analysis of an Elliptic Control Problem with Non-Differentiable Cost Functional*, ICIAM 2011, Vancouver, Canada, July 2011

41. *A Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, SIAM Conference on Optimization, Darmstadt, Germany, May 2011

42. *A Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, 2nd IMA Conference on Numerical Linear Algebra and Optimisation, Birmingham, UK, September 2010

43. *Optimal Control Problems with Directional Sparsity*, IFIP TC7 (System Modelling and Optimization), Buenos Aires, Argentina, August 2009

44. *An SQP Method for Semilinear Optimal Control Problems with Mixed Constraints*, ENUMATH 2007, Graz, Austria, September 2007

45. *Update Strategies for Perturbed Nonsmooth Equations*, IFIP TC7 (System Modelling and Optimization), Cracow, Poland, July 2007

46. *KKT Systems in Optimal Control of Magnetohydrodynamics*, ICIAM 2007, Zurich, Switzerland, July 2007

47. *Mathematical Methods in MHD Flow Control*, GAMM Annual Scientific Meeting (within ICIAM), Zurich, Switzerland, July 2007

48. *Elliptic Optimal Control Problems with Mixed Constraints*, DMV Annual Meeting, Bonn, September 2006

49. *Preconditioning of Linear Systems Arising in the Optimal Control of Magnetohydrodynamics*, GAMM-SIAM Conference on Applied Linear Algebra, Düsseldorf, Germany, July 2006

50. *Optimal Control in Magnetohydrodynamics*, MAFELAP, Uxbridge, Great Britain, June 2006

51. *Postcorrection Strategies for Perturbed Nonsmooth Equations*, High Performance Scientific Computing, Hanoi, Vietnam, March 2006

52. *Modeling of an MHD Free Surface Problem Arising in CZ Crystal Growth*, MATHMOD Vienna, Austria, February 2006

53. *Optimal Control in Magnetohydrodynamics*, ÖMG/DMV (Austrian/German Mathematical Society) Annual Meeting, Klagenfurt, September 2005

54. *Optimal Control in Magnetohydrodynamics*, IFIP TC7 (System Modelling and Optimization), Turin, Italy, July 2005

55. *Matrix–Free AD–Based Preconditioning of KKT Systems*, GAMM 2005, Luxembourg, March 2005

56. *Parametric Sensitivity Analysis for 3D Reaction-Diffusion Control Problems*, DMV (German Mathematical Society) Annual Meeting, Heidelberg, Germany, September 2004

57. *Parametric Sensitivities for Perturbed Reaction-Diffusion Optimal Control Problems*, EUCCO, Dresden, Germany, March 2004

58. *Post-optimal Parametric Sensitivity Analysis for Control-Constrained Reaction–Diffusion Optimal Control Problems*, SCICADE, Trondheim, Norway, July 2003

59. *Using AD-generated Adjoints in Optimal Control of an Industrial Robot*, Dresden University of Technology, Germany, ECMI (European Consortium of Mathematics in Industry), Jurmala, Latvia, September 2002

Other Conference Talks

60. *Perspective on Iterative Solvers from Optimization*, Workshop on New Insights and Future Directions for Discretized PDE Solvers, University of Strathclyde, Glasgow, UK, June 2025

61. *Nonlinear Fenchel Conjugates*, 1st Heidelberg-Chile Workshop on Scientific Computing, Santiago de Chile, Chile, March 2025

62. *Preconditioned Solution of Structured Saddle-Point Problems in PDE-Constrained Optimization*, 1st Heidelberg-Chile Workshop on Scientific Computing, Santiago de Chile, Chile, March 2025

63. *Nonlinear Fenchel Conjugates*, Haus im Ennstal, Austria, February 2025

64. *Mesh Denoising and Inpainting Using the Total Variation of the Normal*, 25th International Symposium on Mathematical Programming (ISMP), Montreal, Canada, July 2024

65. *A Bundle Method for Convex Optimization on Manifolds*, Haus im Ennstal, Austria, February 2024

66. *Total Generalized Variation with Finite Elements and Applications*, Finite Element Symposium, Seggau, Austria, September 2023

67. *A Second-Order Method for Mesh Denoising and Inpainting*, GAMM Annual Scientific Meeting, Dresden, Germany, May 2023

68. *An Introduction to Nonlinear Programming*, Computational Science Summer School and Workshop, KMUTT, Bangkok, Thailand, March 2023

69. *The SCOOP Template Engine*, 12th Heidelberg Seminar on Optimal Control, Haus im Ennstal, Austria, February 2023

70. *On Discretized Shape Optimization Problems*, Workshop on Mathematical Data Science, Control and Optimization, Graz, Austria, September 2022

71. *Efficient Solution of a Nonlocal Optimal Control Problem*, Finite Element Symposium, Herrsching, Germany, September 2022

72. *A Unified View of Residual Minimizing Krylov Subspace Methods*, GAMM Annual Scientific Meeting, Aachen, Germany, August 2022

73. *An Introduction to Optimal Experimental Design*, XIV Congreso de Ciencias Exactas, Aguascalientes, Mexico, November 2020 (via video conference)

74. *A Discretize-then-optimize Approach for PDE-Constrained Shape Optimization Problems*, Finite Element Symposium, Mülheim, Germany, September 2019

75. *SUBMINRES: An Extended Implementation of MINRES to Monitor Residual Subvector Norms*, Workshop Beyond the discrete: iterative methods from the continuum perspective, Dublin, Ireland, June 2019

76. *First and Second Order Shape Optimization Based on Restricted Mesh Deformations*, 11th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2019

77. *Discrete Total Variation with Finite Elements*, Finite Element Symposium, Chemnitz, Germany, September 2018

78. *GMRES in the ℓ_∞-Norm*, SIAM Conference on Applied Linear Algebra, Hong Kong, May 2018

79. *On Optimal Control Problems in Thermoelastoplasticity*, Workshop: Challenges in Optimal Control of Nonlinear PDE-Systems, Oberwolfach, Germany, April 2018

80. *Discrete Total Variation with Finite Elements and Applications in Imaging, Inverse Problems and Optimal Control*, GAMM Annual Scientific Meeting, Munich, Germany, March 2018

81. *An Introduction to Differential Geometry*, 10th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2018

82. *Preconditioned GMRES Revisited*, International Conference on Preconditioning Techniques for Scientific and Industrial Applications, Vancouver, Canada, July 2017

83. *SUBMINRES: An Extended Implementation of MINRES to Monitor Residual Subvector Norms*, Cascade Rain Meeting, Vancouver, Canada, April 2017

84. *Preconditioned GMRES Revisited*, GAMM Annual Scientific Meeting, Weimar, Germany, March 2017

85. *Preconditioned GMRES revisited with an introduction of Krylov subspace methods*, 9th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2017

86. *Iterative Solution of Optimality Systems in Optimal Control*, Workshop: Adaptive Methods for Control Problems Constrained by Time-Dependent PDEs, Oberwolfach, Germany, January 2017

87. *Postprocessing for Finite Element Solutions of HJB Equations*, Workshop Numerical methods for Hamilton-Jacobi equations in optimal control and related fields, RICAM Linz, Austria, November 2016

88. *Solution of structured saddle-point systems with applications in optimal control*, IFIP Workshop Optimal Control meets Inverse Problems, Essen, Germany, September 2016

89. *Optimum Experimental Design by Shape Optimization of Specimens in Linear Elasticity*, GAMM Annual Scientific Meeting, Braunschweig, Germany, March 2016

90. *Solution of structured saddle-point systems using MINRES: residuals, energies, physics, and preconditioning*, 8th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2016

91. *A Conjugate Direction Method for Linear Systems in Banach Spaces*, Finite Element Symposium, Burgstädt, Germany, September 2015

92. *Hamilton-Jacobi-Bellman Quasi-Variational Inequalities in Portfolio Optimization and their Discretization by Finite Elements*, Workshop From Open to Closed Loop Control, Graz, Austria, June 2015

93. *A Conjugate Direction Method in Banach Space*, 7th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2015

94. *Preconditioning of Trust-Region SQP Methods in PDE-Constrained Optimization*, Workshop of GAMM activity group on optimization with PDE constraints, Dortmund, Germany, September 2014

95. *Optimal Control Problems with Sparsity Constraints*, Workshop of MPI Magdeburg, Ringberg Castle, Germany, June 2014

96. *Old and New Convergence Results for Krylov Subspace Methods in Hilbert Space*, GAMM Annual Scientific Meeting, Erlangen, Germany, March 2014

97. *Old and New Convergence Results for Krylov Subspace Methods in Hilbert Space*, DK/RICAM Workshop on PDE-Constrained Optimization, Linz, Austria, March 2014

98. *Old and New Convergence Results for Krylov Subspace Methods in Hilbert Space*, 6th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2014

99. *An Introduction to Optimum Experimental Design*, Conference of Mathematical Student Bodies of German-Speaking Universities, Chemnitz, Germany, November 2013

100. *On the Preconditioning of Optimal Control Problems with State Gradient Constraints*, International Conference on Preconditioning Techniques for Scientific and Industrial Applications, Oxford, UK, June 2013

101. *Methods of Optimum Experimental Design*, Meeting of the Interest Group on Experiments, SFB/Transregio 96, Aachen, Germany, April 2013

102. *Tools for the Scientific Workflow*, 5th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, March 2013

103. *Optimum Experimental Design in Heat Transfer Experiments*, Workshop: Numerical Methods for PDE Constrained Optimization with Uncertain Data, Oberwolfach, Germany, January 2013

104. *Optimum Experimental Design for the Determination of Heat Transfer Coefficients*, Colloquium of SFB/Transregio 96, Chemnitz, Germany, October 2012

105. *An Introduction to Optimum Experimental Design*, Summer School of the International Doctorate Program *Identification, Optimization and Control in Technical Applications*, Pommersfelden, Germany, July 2012

106. *Optimal Control Problems with Directional Sparsity Terms*, Workshop on Numerical Methods for Optimal Control and Inverse Problems, Munich, Germany, March 2012

107. *An Introduction to Optimum Experimental Design*, 4th Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, February 2012

108. *Optimality Conditions in Optimal Control of Elastoplasticity*, Workshop on Control and Optimisation of PDEs, Graz, Austria, October 2011

109. *A Priori Error Estimates for an Elliptic Control Problem with Non-Differentiable Cost Functional*, Finite Element Symposium, Holzhau, Germany, September 2011

110. *On Nonlinear Optimal Control Problems with an L^1 Norm*, Workshop on Inverse Problems and Optimal Control for PDEs, Warwick, UK, May 2011

111. *Krylov Methods in Hilbert Space*, 3rd Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, March 2011

112. *Four Aspects in Optimal Control of PDEs*, Workshop on Optimization, Design and Control, Oxford, UK, September 2010

113. *Regularization and C-Stationarity for an Optimal Control Problem in Static Plasticity*, Workshop on Optimal Control and Partial Differential Equations, Greifswald, Germany, August 2010

114. *Preconditioning of KKT Systems in PDE-Constrained Optimization*, 2nd Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, March 2010

115. *Optimal Control of Variational Inequalities in Plasticity*, Annual Meeting of the DFG Priority Program 1253 (Optimization with Partial Differential Equations), Bad Staffelstein, Germany, October 2009

116. *Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, Finite Element Symposium, Oberwiesenthal, Germany, September 2009

117. *Semismooth Newton Methods for Portfolio Optimization*, Workshop Statistics meets Finance and Insurance, Chemnitz, Germany, September 2009

118. *Elliptic Equations with Gradient Constraints*, 15th South East German Colloquium on Numerical Mathematics, Chemnitz, Germany, May 2009

119. *Introduction to Nonlinear Optimization*, 1st Chemnitz Seminar on Optimal Control, Gerlosberg, Austria, March 2009

120. *Optimal Control of Static Plasticity*, Fourth German Polish Conference on Optimization, Moritzburg, Germany, March 2009

121. *Optimal Control Problems with Directional Sparsity*, Workshop: Optimal Control of Coupled PDE Systems, Oberwolfach, Germany, January 2009

122. *A Semismooth Newton Method for Solving Elliptic Equations with Gradient Constraints*, Workshop: Optimal Control of Coupled PDE Systems, Oberwolfach, Germany, March 2008

123. *A Semismooth Newton Method for Tikhonov Functionals with Sparsity Constraints*, Workshop: Hybrid Imaging, Sparsity, and Mathematical Biology, Obergurgl, Austria, January 2008

124. *Optimal Control for MHD Flows*, Colloquium of SFB 609, Schmochtitz, Germany, September 2007

125. *Optimal Boundary Control of Phase Transitions in a Crystal Growth Process*, Workshop: Optimization Methods, Approximation, and Adaptivity in PDE-Constrained Optimization (DFG Priority Program 1253), RICAM Linz, Austria, March 2007

126. *Control Issues in Magnetohydrodynamics*, Miniworkshop: Control of Free Boundaries, Oberwolfach, Germany, February 2007

127. *Optimal Control in Magnetohydrodynamics*, GAMM Annual Scientific Meeting, Berlin, March 2006

128. *Modeling and Optimal Control in Instationary Magnetohydrodynamics*, Workshop: Control of Complex Fluids, Special Semester on Computational Mechanics, RICAM Linz, Austria, October 2005

129. *Optimal Control in Magnetohydrodynamics*, Workshop: Optimal Control of Coupled PDE Systems, Oberwolfach, Germany, April 2005

130. *Parametric Sensitivity Analysis and Applications*, Workshop: Inverse Problems and 1st Austrian Numerical Analysis Day, Obergurgl, Austria, April 2005

131. *Parametric Sensitivity Analysis for a Perturbed 3D Reaction-Diffusion Problem*, Nonlinear Large Scale Optimization, Erice, Italy, June 2004

132. *A Nonlinear Primal-Dual Active Set Method for Optimal Boundary Control of a 3D Reaction-Diffusion Model*, EUCCO, Dresden, Germany, March 2004

133. *Optimal Control of a Reaction-Diffusion Process*, Workshop: Optimization in Partial Differential Equations and Applications, Heidelberg, Germany, October 2002

134. *Optimal Control of Time-dependent Partial Differential Equations with Strict Terminal Conditions*, Workshop: Adjoints — Analysis and Applications, Děčín, Czech Republic, September 2001

135. *Distributed and Neumann Boundary Control of Reaction-Diffusion Equations*, IFIP TC7 (System Modeling and Optimization), Trier, Germany, July 2001

136. *Neumann Boundary Control of Reaction-Diffusion Equations*, SIAM Optimal Control and Applications, San Diego, July 2001

137. *Calculation of Sensitivity Derivatives for Perturbed Parabolic Optimal Control Problems*, Workshop: Stability and Sensitivity of Continuous Control Problems, Burg, Germany, April 2001

138. *An Adaptive POD Algorithm for Optimal Control Problems of the Heat Equation*, Workshop on POD and its applications, Graz, Austria, May 2000

139. *Instantaneous Control of the Navier-Stokes Equations*, GAMM Annual Scientific Meeting 2000, Göttingen, Germany, April 2000

Colloquium and Seminar Talks

140. *Geodesic Programs*, Optimization Seminar, Mannheim, March 2025

141. *Nonlinear Fenchel Conjugates*, Research Seminar Optimization, Heidelberg, Germany, November 2024

142. *Applying for a Professorship*, GAMM Juniors Fall Meeting, Essen, September 2024

143. *Total (Generalized) Variation for Images and Shapes*, heiAIMS Kick-Off Event, Heidelberg, July 2023

144. *Total Variation and Total Generalized Variation: From Optimal Control to Geometry Processing*, Mathematical Colloquium, TU Clausthal, January 2023

145. *Constrained Optimization on Manifolds*, Jour fixe in the STRUCTURES cluster of excellence, Heidelberg, Germany November 2022

146. *Constrained Optimization on Manifolds*, Research Seminar Optimization, Heidelberg, Germany, November 2022

147. *Constraint Handling in Linear Programming*, First Integrative Think Tank, Heidelberg University, Germany, July 2022

148. *Total Variation and Total Generalized Variation: From Optimal Control to Geometry Processing*, Seminar, Umeå University, Sweden, April 2022

149. *Large-Scale Optimization and Applications*, Inaugural Lecture, Heidelberg University, Germany, January 2022

150. *Optimum Experimental Design Meets Shape Optimization*, Seminar, HU Berlin, Germany, June 2021 (via video conference)

151. *Large-Scale Optimization and Applications*, Informatics4Life Colloquium, Heidelberg University, Germany, April 2021 (via video conference)

152. *Total Variation and Total Generalized Variation: From Optimal Control to Geometry Processing*, CMAI Colloquium, George Mason University, USA, April 2021 (via video conference)

153. *First and Second Order Shape Optimization based on Restricted Mesh Deformations*, Seminar, IISER Thiruvananthapuram, India, November 2020 (via video conference)

154. *Total Variation of the Normal as a Prior in Geometric Inverse Problems*, Applied Mathematics Seminar Series, University of Birmingham, UK, January 2020

155. *First and Second Order Shape Optimization ased on Restricted Mesh Deformations*, Optimisation and Numerical Analysis Seminars, University of Birmingham, UK, January 2020

156. *The Total Variation in PDE-Constrained Optimization: Optimal Control, Imaging, and Shape Optimization*, University of Heidelberg, Germany, January 2020

157. *Optimization and Inverse Problems on Manifolds*, University of Göttingen, Germany, May 2019

158. *Data-Driven Imaging and Inverse Problems on Manifolds*, University of Edinburgh, UK, March 2019

159. *Families of Finite Elements and Their Applications*, University of Halle, Germany, February 2019

160. *An Introduction to Optimal Experimental Design with PDEs*, TU Darmstadt, Germany, December 2018

161. *An Introduction to Optimization on Manifolds*, Trinity College, Dublin, November 2018

162. *An Introduction to Optimal Experimental Design with PDEs*, University of Stuttgart, Germany, October 2018

163. *Optimal control in thermoelastoplasticity: analysis, numerics, and applications*, University of Erlangen, Germany, January 2018

164. *Analysis and Algorithms for Optimal Control Problems with Sparsity Terms*, Simon Fraser University, Vancouver, Canada, July 2017

165. *Total Variation Image Reconstruction on Smooth Surfaces*, Simula Research Laboratory, Oslo, Norway, May 2017

166. *Total Variation Image Reconstruction on Smooth Surfaces*, SCAIM Seminar, Vancouver, Canada, April 2017

167. *Large-Scale Optimization Problems and Applications*, Colloquium at TU Ilmenau, Germany, December 2016

168. *Optimization Problems with Partial Differential Equations: from Optimal Control via Parameter Estimation to Shape Optimization*, Colloquium at Karlsruhe Institute of Technology, Germany, June 2016

169. *Optimum Experimental Design by Shape Optimization of Specimens in Linear Elasticity*, Colloquium at University of Duisburg-Essen, Germany, February 2016

170. *Numerical Analysis and Efficient Solution for Optimal Control Problems with Sparsity Terms*, Colloquium at University of Augsburg, Germany, January 2016

171. *Function Space Aspects of Optimal Control Problems*, Colloquium at DTU Lyngby, Denmark, December 2015

172. *Optimum Experimental Design for Models Involving Ordinary and Partial Differential Equations*, Colloquium at TU Braunschweig, Germany, June 2015

173. *An Introduction to Optimum Experimental Design*, Colloquium at University of Hamburg, Germany, June 2015

174. *An Introduction to Optimum Experimental Design*, Colloquium at University of the Armed Forces, Munich, Germany, November 2014

175. *Analysis and Numerical Methods for Optimization Problems in Elastoplasticity*, Colloquium at University of Zurich, Zurich, Switzerland, October 2014

176. *Analysis and Numerics for Optimization Problems in Elastoplasticity*, Colloquium at University of Freiburg, Germany, June 2014

177. *An Introduction to Optimum Experimental Design*, Colloquium at University of Würzburg, Germany, May 2014

178. *An Introduction to Optimum Experimental Design*, Colloquium at University of Paderborn, Germany, May 2014

179. *An Introduction to Optimal Control*, Research Seminar Analysis and Stochastics, Chemnitz, Germany, June 2013

180. *An Introduction to Optimum Experimental Design*, Colloquium at the Institute of Scientific Computing, TU Braunschweig, Germany, May 2013

181. *On Optimal Control Problems with Sparsity Constraints*, Colloquium at the Institute of Computational Mathematics, Linz, Austria, May 2013

182. *PDE-Constrained Optimization — A Linear Algebra Perspective*, Colloquium at Charles University Prague, Czech Republic, February 2013

183. *An Introduction to Optimum Experimental Design*, Colloquium of the Institute of Materials Science and Engineering, Chemnitz, Germany, November 2012

184. *Simulation and Optimization of Macroscopic Mechanical Systems*, Fraunhofer ENAS, Chemnitz, Germany, October 2012

185. *An Introduction to Optimum Experimental Design*, Research Seminar Scientific Computing, Chemnitz, Germany, March 2012

186. *Optimierung — Studieren geht über Probieren*, Open House Day, TU Chemnitz, Germany, January 2012

187. *Optimal Control Problems with L^1 Terms*, Universität der Bundeswehr, München, Germany, June 2011

188. *On the Relation of Preconditioning and Inner Products in Krylov Subspace Methods*, Research Seminar Numerical Mathematics, Chemnitz, Germany, May 2011

189. *On the Relation of Preconditioning and Inner Products in Krylov Subspace Methods*, MPI for Dynamics of Complex Technical Systems, Magdeburg, Germany, February 2011

190. *Optimization with Complementarity Constraints and Applications in Elastoplasticity*, University of Stuttgart, Germany, November 2010

191. *Optimal Control with Partial Differential Equations: an Introduction*, University of Freiburg, Germany, June 2010

192. *Optimal Control Challenges in Magnetohydrodynamics*, University of Kiel, Germany, May 2010

193. *A Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, University of Oxford, UK, May 2010

194. *Techniques for Simulation and Optimal Control of Static Plasticity*, University of Heidelberg, Germany, February 2010

195. *Optimization with Partial Differential Equations*, Colloquium at Johannes-Gutenberg University, Mainz, Germany, January 2010

196. *Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, Research Seminar Numerical Mathematics, Chemnitz, Germany, January 2010

197. *Sparse Control and Applications*, Colloquium on the occasion of the 60th birthday of Hans Josef Pesch, Bayreuth, Germany, October 2009

198. *Numerical Techniques for Portfolio Optimization Problems with Transaction Costs*, Dresden Mathematical Seminar, TU Dresden, Germany, May 2009

199. *Optimale Steuerung — Studieren geht über Probieren*, Open House Day, TU Chemnitz, Germany, January 2009

200. *Optimal Control of Coupled Systems*, MPI for Dynamics of Complex Technical Systems, Magdeburg, Germany, December 2008

201. *Optimale Steuerung — Studieren geht über Probieren*, Inaugural Lecture, TU Chemnitz, Germany, October 2008

202. *Stability and Sensitivity Analysis in Optimal Control of Partial Differential Equations*, Karl Franzens University Graz, Austria, June 2008

203. *A Semismooth Newton Method for Solving Elliptic Equations with Gradient Constraints*, University of Greifswald, Germany, May 2008

204. *Optimal Control in Magnetohydrodynamics*, Middle East Technical University, Ankara, Turkey, March 2008

205. *Optimal Control Challenges in Magnetohydrodynamics*, University of Regensburg, Germany, July 2007

206. *The SQP Method for Optimal Control Problems with Mixed Control-State Constraints*, University of Trier, Germany, June 2007

207. *Stability and Sensitivity in Optimization with Partial Differential Equations*, TU Kaiserslautern, Germany, June 2007

208. *Coupled Field Problems in Magnetohydrodynamics and Their Optimal Control*, TU Chemnitz, Germany, May 2007

209. *Optimal Control Challenges in Magnetohydrodynamics*, University of Edinburgh, UK, March 2007

210. *Numerical Methods for Large-Scale Optimal Control Problems*, University of Basel, Switzerland, February 2007

211. *Numerical Methods in PDE-Constrained Optimization*, TU Chemnitz, Germany, January 2007

212. *From Finite-Dimensional Optimization to Optimal Control*, RWTH Aachen, Germany, January 2007

213. *Analytical and Numerical Treatment of Optimal Control Problems in Magnetohydrodynamics*, TU Dresden, Germany, January 2007

214. *Continuous Optimization — Applications and Prospects*, TU Kaiserslautern, Germany, July 2006

215. *Numerical Methods in PDE-Constrained Optimization*, TU Darmstadt, Germany, May 2006

216. *Optimal Control in Magnetohydrodynamics*, RICAM Scientific Board Meeting, Linz, Austria, April 2006

217. *Analysis, Numerical Simulation and Optimal Control of Coupled PDE Systems*, University of Münster, Germany, December 2005

218. *A Stokes-MHD Problem*, RICAM Linz, Austria, December 2005

219. *Modeling and Optimal Control in Magnetohydrodynamics*, TU Berlin, Germany, September 2005

220. *Preconditioning of Linear Systems in PDE-Constrained Optimization*, RICAM Linz, Austria, July 2005

221. *Parametric Sensitivity Analysis for Constrained Optimal Control Problems*, ZIB, Berlin, Germany, February 2005

222. *Towards Simulation and Control in Magnetohydrodynamics*, RICAM Linz, Austria, February 2005

223. *Parametric Sensitivity Analysis for 3D Reaction-Diffusion Control Problems*, TU Vienna, Austria, November 2004

224. *Parametric Sensitivity Derivatives of Perturbed Optimal Control Problems*, TU Chemnitz, Germany, June 2004

225. *Recent Advances in Magnetohydrodynamics*, Karl Franzens University Graz, Austria, May 2004

226. *Parametric Sensitivity Derivatives of Constrained Optimal Control Problems*, University of Hamburg, Germany, May 2004

227. *Parametric Sensitivities for Perturbed Reaction-Diffusion Optimal Control Problems*, University of Heidelberg, Germany, March 2004

228. *Automatic Differentiation and Constrained Optimization*, Karl Franzens University Graz, Austria, December 2003

229. *Post-Optimal Sensitivity Analysis for Control-Constrained Optimal Control Problems*, Karl Franzens University Graz, Austria, March 2003

230. *Strongly Regular Generalized Equations and Sensitivity Derivatives for Perturbed Parabolic Control Problems*, Dresden University of Technology, Germany, January 2003

231. *Parametric Optimization and Applications*, University of Jena, Germany, January 2003

232. *Parametric Sensitivity Analysis for Perturbed Reaction-Diffusion Control Problems*, Karl Franzens University Graz, Austria, July 2002

233. *Computation of Sensitivity Derivatives for Perturbed Parabolic Control Problems*, Dresden University of Technology, Germany, December 2001

234. *The Newton-Lagrange Method and Variants for Optimal Control of Time-dependent Partial Differential Equations*, Berlin University of Technology, Germany, September 2001

235. *Optimal Control of a Reaction-Diffusion Process — Comparison of Time Integration Methods*, Dresden University of Technology, Germany, January 2001

236. *The Newton-Lagrange Method for Solving Unconstrained Optimal Control Problems with Partial Differential Equations*, Berlin University of Technology, August 2000

237. *Suboptimal Control Problems for the Navier-Stokes Equations using FEATFLOW*, University of Dortmund, Germany, March 2000

Public Talks

238. *Official Speech at the Finals for the Nation-Wide Round of the 58th German Mathematical Olympiad*, Chemnitz, Germany, May 2019

239. *Current Mathematical Problems within the MERGE Cluster of Excellence*, TU Chemnitz, September 2014

240. *LEGO Models for Reality*, TU Chemnitz, Girls' Day, Germany, April 2013

241. *LEGO Models for Reality*, TU Chemnitz, Technikwoche, Germany, October 2012

242. *Official Speech at the Finals for the 3rd Round of the 48th German Mathematical Olympiad*, Kepler High School, Chemnitz, Germany, February 2009

Volunteer Activities

1992 – 1999   Active Member of the Volunteer Fire Department, Gleidingen, Germany

Foreign Language Skills

German	native language
English	written and oral fluency
Spanish	good knowledge
French	good knowledge
Swedish	beginning level

Hobbies

Photography
Playing the piano
Latte Art
Marathon race (personal best: 3:24:15, Berlin 2007)
Grouse Grind (personal best: 0:47:21, 2017)
Riding road and mountain bikes

Heidelberg, October 29, 2025