

# Curriculum Vitae

**Prof. Dr. Roland Herzog**

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## Personal Information

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

## Professional Record

April 2011	offer for a W3 (full) professorship in <i>Optimization and Inverse Problems</i> , University of Stuttgart, Germany (declined)
March 2008–present	W3 (full) professor in <i>Numerical Methods and Partial Differential Equations</i> , Chemnitz University of Technology, Germany
August 2007	offer for a W3 professorship in <i>Numerical Methods and Partial Differential Equations</i> from Chemnitz University of Technology, Germany (accepted in November 2007)
August 2007	offer for a W2 professorship in <i>Continuous Optimization</i> from RWTH Aachen, Germany (declined)
July 2007	offer for a W2 professorship in <i>Numerical Methods in Optimal Control</i> from TU Dresden, Germany (declined)
October 2006–Feb 2007	W3 (full) replacement professorship in <i>Numerical Mathematics and Partial Differential Equations</i> , Chemnitz University of Technology, Germany

- September 2004 offer for a junior professorship from the University of Hamburg, Germany (declined)
- August 2004–February 2008 Senior Scientist, [Johann Radon Institute for Computational and Applied Mathematics \(RICAM\)](#), Austrian Academy of Sciences, Linz, Austria (group of Prof. Karl Kunisch)
- March 2003–July 2004 Postdoctoral Research Assistant, Karl Franzens University Graz, Austria (group of Prof. Karl Kunisch)
- October 1999–Feb 2003 Scientific Assistant, University of Bayreuth, Germany (group of Prof. Hans Josef Pesch)

## Education

- June 2008 Habilitation at Karl Franzens University Graz, Austria. Title of Habilitation Thesis: *Stability and Sensitivity Analysis in Optimal Control of Partial Differential Equations*
- February 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)
- October 1999–Feb 2003 Study for doctorate degree at the University of Bayreuth
- August 1999 Diploma with Honors in Applied Mathematics from Clausthal University of Technology, 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
- 1994–1999 Study in Applied Mathematics (Minors: Mechanical Engineering, Fluid Dynamics and Computer Science), Clausthal University of Technology, Germany

## Teaching Experience

- July 2010 Summer School on Analysis and Numerics of PDE Constrained Optimization, Lambrecht, Germany: Short Course on Algorithms and Preconditioning for PDE-Constrained Optimization
- April 2008–present Chemnitz University of Technology, Germany: [Lectures](#) on Optimization, Optimal Control of PDEs and ODEs, Numerical Methods for PDEs and ODEs, Mathematics for Engineers
- March 2008 Middle East Technical University, Ankara, Turkey: Short Course on Sensitivity Analysis
- April 2007 Universidad Autónoma de Aguascalientes, Mexico: Short Course on Optimal Control of PDEs
- 2006–2007 Chemnitz University of Technology, Germany: Lecture and tutorial classes in Numerical Methods for ODEs, and Optimal Control of PDEs
- January 2006 University of Bremen (invited by Prof. Peter Maaß): Short Course on 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

- November 2003 English Presentation Skills
- June 2002 Didactic Training: Planning a lecture
- September 1996 Training for Teaching Assistants, Tulane University

## Fellowships

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

## Membership in Professional Societies

- SIAM, and member of its activity groups on optimization (SIAG/OPT) and uncertainty quantification (SIAG/UQ)
- DMV (German Mathematical Society)
- DHV (German Association of University Professors and Lecturers)
- GAMM (International Association of Applied Mathematics and Mechanics)
- GAMM activity group on magnetically controlled fluids
- GAMM activity group on optimization with PDE constraints

## Professional Responsibilities

- May 2011–present Vice speaker of the [GAMM activity group on optimization with PDE constraints](#)
- December 2009–present Chairman of the board of examiners (Prüfungsausschuss) of the Faculty of Mathematics, TU Chemnitz
- November 2009–present Member of the advisory committee (Fakultätsrat) of the Faculty of Mathematics, TU Chemnitz
- September 2008–present Member of the scientific committee of the Chemnitz FEM Symposium
- October 2004–October 2007 Chairman of the Employees of the Johann Radon Institute for Computational and Applied Mathematics

## Funded Research Projects

- July 2011–present *Correction Algorithms and High Dimensional Characteristic Diagrams*, investigator: NN, DFG grant (€264 800) within the Collaborative Research Center SFB/TR 96, together with Ulrich Priber, Fraunhofer IWU, Chemnitz, Germany
- October 2009–present *Optimal Control in Elastoplasticity*, investigators: Gerd Wachsmuth and Frank Schmidt, DFG grant (€319 600) within the Priority Program SPP 1253, together with Christian Meyer, TU Dortmund, Germany
- August 2007–Dec 2010 *Optimal Control of Stefan Problems with Constraints*, investigator: Martin Bernauer, FWF research grant (€105 431), together with Karl Kunisch, Graz, Austria
- Sep 2005–August 2008 *SSC and SQP for Mixed Constrained Optimal Control Problems*, investigator: Nataliya Metla, FWF research grant (€95 141), together with Arnd Rösch, Duisburg-Essen, Germany

## Other Grants

- July 2011 DAAD travel grant (€2 221) to attend the ICIAM meeting, Vancouver, Canada
- July 2010–June 2011 DAAD travel grant (€4 723) for cooperation visits with the group of Andy Wathen, University of Oxford, together with Ekkehard Sachs, Trier, Germany
- August 2009 DAAD (German Academic Exchange Service) travel grant (€1 465) to attend the IFIP TC7 conference, Buenos Aires, Argentina

## Dissertation Theses Supervised

- Susann Mach, current  
Andreas Günnel, current  
Frank Schmidt, current

- Gerd Wachsmuth, 2011 *Optimal Control of Quasistatic Plasticity — An MPCC in Function Space*
- Martin Bernauer, 2010 *Motion Planning for the Two-Phase Stefan Problem in Level Set Formulation*
- Nataliya Metla, 2008 *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

- Ira Neitzel, 2011 *Numerical Analysis of PDE Constrained Optimal Control Problems with Pointwise Inequality Constraints on the State and the Control* (supervised by Fredi Tröltzsch, TU Berlin)
- Sabine Repke, 2011 *Adjoint-Based Optimization Approaches for Stationary Free Surface Flows* (supervised by René Pinnau, TU Kaiserslautern)
- Tyrone Rees, 2010 *Preconditioning Iterative Methods for PDE Constrained Optimization* (supervised by Andy Wathen, University of Oxford)
- Wolfgang Hess, 2010 *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

- Tommy Etling, current *Optimum Experimental Design for the Identification of Heat Transfer Coefficients*
- Eik Langschwager, current *Identification of a Tube's Inner Temperature from Measurements*
- Sarah Stoppe, current *Numerical Simulation of Plastic Materials under Large Deformations*
- Ilka Riedel, current *Open and Closed Loop Control of the Nonlinear Inverse Pendulum*
- Irina Nishakova, current *Robust Optimal Control under Stochastic Uncertainties*

- Sandra Hartl, 2011 *Preconditioned Solvers for Stationary Problems in Magnetohydrodynamics*
- [Susann Mach](#), 2011 *Primal-Dual Algorithms for Color Image Restoration Problems*
- Marie Müllner, 2011 *Implementation of a Three-Dimensional Advection Scheme for the COSMO Dynamical Core (together with [Meteo Schweiz](#))*
- [Judith Will](#), 2010 *An Optimal Control Problem in Electromagnetic Induction Heating*
- Eric Schmidl, 2010 *Simulation and Parameter Optimization of an Electromagnetic Cloaking Device*
- Stefan Wild, 2010 *Numerical Simulation of Elasticity in FENICS*
- Katharina Urbach, 2009 *Optimization of the Velocity Profile for Five-Axis Machine Tools (together with [Chiron AG](#))*
- Carolin Kraft, 2009 *Convex Bodies of Minimal Resistance*
- [Hansjörg Schmidt](#), 2009 *Parallelization of Surrogate-Based Optimization Methods*
- [Gerd Wachsmuth](#), 2008 *Elliptic Optimal Control Problems with Sparsity Constraints*
- Silvia Wieser, 2008 *Numerical Solution of Optimal Control Problems using FENICS*
- [Frank Schmidt](#), 2007 *Inexact Newton Methods and their Applications in Solving Semilinear PDEs*
- [Martin Bernauer](#), 2007 *A Robustification Approach in Unconstrained Optimization and its Application in Optimal Control*
- Kerstin Brandes, 2005 *Robustness of optimal solutions for optimal control problems with PDEs*

## Bachelor's Theses Supervised

- Johannes Obermeier, 2011 *Globalization Approaches for Optimization Problems with 1-Norm-Objectives*
- Stephan Schlömer, 2010 *Maximal Overhang*

## Activities as Organizer

- March 2012 Co-organization of a Section on Optimization of Differential Equations, GAMM Annual Scientific Meeting, Darmstadt, Germany (together with Barbara Kaltenbacher, Klagenfurt)
- November 2011 Co-organization of an international [workshop on Optimal Control of Partial Differential Equations](#), Klaffenbach, Germany (together with Christian Meyer, Darmstadt, and Arnd Rösch, Duisburg-Essen)
- September 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)
- July 2011 Organization of a minisymposium on *Saddle-Point Problems in Large-Scale Optimization*, ICIAM, Vancouver, Canada (together with Andy Wathen, Oxford, UK)
- July 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)
- April 2011 Organization of a minisymposium on *Sparsity in Inverse Problems and Optimal Control*, GAMM Annual Scientific Meeting, Graz, Austria (together with Dirk Lorenz, Braunschweig)
- July 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)
- April 2008 Organization of the section *Flow Control*, GAMM Annual Scientific Meeting, Bremen (together with Andre Thess, Ilmenau)

- July 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)
- February 2006 Organization of a special session on *Optimal Control of Applications described by DAEs/PDEs/PDAEs*, MATHMOD, Vienna, Austria (together with Kurt Chudej, Bayreuth)
- October–December 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)
- March 2005 Organization of a Young Researchers' Minisymposium on *Computational Optimization with Differential Equations*, GAMM Annual Scientific Meeting, Luxemburg (together with Andrea Walther, Dresden)

## Manuscripts Refereed for Journals

Applicable Analysis

Calcolo

Communications in Mathematical Sciences

Computational Optimization and Applications (5x)

Computers and Fluids

Control and Cybernetics (2x)

ESAIM Control, Optimisation and Calculus of Variations

European Journal of Applied Mathematics

IET Systems Biology

International Journal of Computer Mathematics

Inverse Problems (4x)

Journal of Applied Mathematics and Mechanics (3x)

Journal of Computational Physics  
Journal of Optimization Theory and Applications  
Mathematical and Computer Modelling of Dynamical Systems (2x)  
Mathematical Methods in Applied Sciences  
Nonlinear Analysis: Real World Applications  
Nonlinear Analysis: Modelling and Control  
Numerical Algorithms  
Numerische Mathematik  
Optimization Methods and Software (3x)  
Optimal Control Applications and Methods  
SIAM Journal on Control and Optimization (8x)  
SIAM Journal on Matrix Analysis and Applications  
SIAM Journal on Numerical Analysis  
SIAM Journal on Optimization (5x)  
SIAM Journal on Scientific Computing (2x)  
Zeitschrift für angewandte Mathematik und Mechanik (3x)

## Publications

### Publications in Journals

1. R. HERZOG, G. STADLER AND G. WACHSMUTH: *Directional Sparsity in Optimal Control of Partial Differential Equations*, to appear in: SIAM Journal on Control and Optimization
2. M. BERNAUER AND R. HERZOG: *Implementation of an X-FEM Solver for the Classical Two-Phase Stefan Problem*, to appear in: Journal of Scientific Computing
3. R. HERZOG AND F. SCHMIDT: *Weak Lower Semi-Continuity of the Optimal Value Function and Applications to Worst-Case Robust Optimal Control Problems*, to appear in: Optimization
4. R. HERZOG, C. MEYER AND G. WACHSMUTH: *Integrability of Displacement and Stresses in Linear and Nonlinear Elasticity with Mixed Boundary Conditions*, Journal of Mathematical Analysis and Applications 382(2), p.802–813, 2011
5. R. HERZOG AND C. MEYER: *Optimal Control of Static Plasticity with Linear Kinematic Hardening*, Journal of Applied Mathematics and Mechanics 91(10), p.777–794, 2011

6. R. HERZOG, C. MEYER AND G. WACHSMUTH: *Existence and Regularity of the Plastic Multiplier in Static and Quasistatic Plasticity*, GAMM Reports 34(1), p.39–44, 2011
7. M. BERNAUER AND R. HERZOG: *Optimal Control of the Classical Two-Phase Stefan Problem in Level Set Formulation*, SIAM Journal on Scientific Computing, 33(1), p.342–363, 2011
8. R. HERZOG AND K. KUNISCH: *Algorithms for PDE-Constrained Optimization*, GAMM Reports 33(2), p.163-176, 2010
9. R. HERZOG AND E. SACHS: *Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, SIAM Journal on Matrix Analysis and Applications, 31(5), p.2291–2317, 2010
10. R. GRIESSE, N. METLA AND A. RÖSCH: *Local Quadratic Convergence of SQP for Elliptic Optimal Control Problems with Mixed Control-State Constraints*, Control and Cybernetics, 39(3), p.717–738, 2010
11. M. BERNAUER AND R. GRIESSE: *A Robustification Approach in Unconstrained Quadratic Optimization*, Mathematical Programming Series A, 128(1–2), p.231–252, 2009
12. W. ALT, R. GRIESSE, N. METLA AND A. RÖSCH: *Lipschitz Stability for Elliptic Optimal Control Problems with Mixed Control-State Constraints*, Optimization, 59(6), p.833–849, 2010
13. R. GRIESSE AND K. KUNISCH: *A Semismooth Newton Method for Solving Elliptic Equations with Gradient Constraints*, ESAIM Mathematical Modelling and Numerical Analysis, 43(2), p.209–238, 2009
14. R. GRIESSE AND A.J. MEIR: *Modeling of a Magnetohydrodynamics Free Surface Problem Arising in Czochralski Crystal Growth*, Mathematical and Computer Modelling of Dynamical Systems, 15(2), p.163–175, 2009
15. R. GRIESSE, N. METLA AND A. RÖSCH: *Convergence Analysis of the SQP Method for Nonlinear Mixed-Constrained Elliptic Optimal Control Problems*, Journal of Applied Mathematics and Mechanics, 88(10), p.776–792, 2008
16. R. GRIESSE AND D. WACHSMUTH: *Sensitivity Analysis and the Adjoint Update Strategy for Optimal Control Problems with Mixed Control-State Constraints*, Computational Optimization and Applications, 44(1), p.57–81, 2009

17. R. GRIESSE AND D. LORENZ: *A Semismooth Newton Method for Tikhonov Functionals with Sparsity Constraints*, Inverse Problems, 24(3), 035007 (19pp), 2008 (elected one of the Highlights 2008 by the editorial board)
18. J.C. DE LOS REYES AND R. GRIESSE: *State-Constrained Optimal Control of the Stationary Navier-Stokes Equations*, Journal of Mathematical Analysis and Applications, 343(1), p.257–272, 2008
19. R. GRIESSE, T. GRUND AND D. WACHSMUTH: *Update Strategies for Perturbed Nonsmooth Equations*, Optimization Methods and Software 23(3), p.321–343, 2008
20. R. GRIESSE AND M. WEISER: *On the Interplay Between Interior Point Approximation and Parametric Sensitivities in Optimal Control*, Journal of Mathematical Analysis and Applications, 337(2), p.771–793, 2008
21. K. BRANDES AND R. GRIESSE: *Quantitative Stability Analysis of Optimal Solutions in PDE-Constrained Optimization*, Journal of Computational and Applied Mathematics, 206(2), p.809–826, 2007
22. R. GRIESSE AND B. VEXLER: *Numerical Sensitivity Analysis for the Quantity of Interest in PDE-Constrained Optimization*, SIAM Journal on Scientific Computing, 29(1), p.22–48, 2007
23. R. GRIESSE AND K. KUNISCH: *Optimal Control for a Stationary MHD System in Velocity-Current Formulation*, SIAM Journal on Control and Optimization, 45(5), p.1822–1845, 2006
24. A. BORZÌ AND R. GRIESSE: *Distributed Optimal Control of Lambda-Omega Systems*, Journal of Numerical Mathematics 14(1), p.17–40, 2006
25. R. GRIESSE: *Lipschitz Stability of Solutions to Some State-Constrained Elliptic Optimal Control Problems*, Journal of Analysis and its Applications, 25(4), p.435–444, 2006
26. R. GRIESSE, M. HINTERMÜLLER AND M. HINZE: *Differential Stability of Control Constrained Optimal Control Problems for the Navier-Stokes Equations*, Numerical Functional Analysis and Optimization 26(7–8), p.829–850, 2005
27. C. BÜSKENS AND R. GRIESSE: *Parametric Sensitivity Analysis of Perturbed PDE Optimal Control Problems with State and Control Constraints*, Journal of Optimization Theory and Applications 131(1), p.17–35, 2006

28. A. BORZÌ AND R. GRIESSE: *Experiences with a Space-Time Multigrid Method for the Optimal Control of a Chemical Turbulence Model*, International Journal for Numerical Methods in Fluids 47(8–9), p.879–885, 2005
29. R. GRIESSE AND S. VOLKWEIN: *A Primal-Dual Active Set Strategy for Optimal Boundary Control of a Reaction-Diffusion System*, SIAM Journal on Control and Optimization 44(2), p.467–494, 2005
30. R. GRIESSE: *Parametric Sensitivity Analysis in Optimal Control of a Reaction-Diffusion System—Part I: Solution Differentiability*, Numerical Functional Analysis and Optimization 25(1–2), p.93–117, 2004
31. R. GRIESSE: *Parametric Sensitivity Analysis in Optimal Control of a Reaction-Diffusion System—Part II: Practical Methods and Examples*, Optimization Methods and Software 19(2), p.217–242, 2004
32. R. GRIESSE AND A. WALTHER: *Parametric Sensitivities for Optimal Control Problems using Automatic Differentiation*, Optimal Control Applications and Methods 24(6), p.297–314, 2003
33. R. GRIESSE AND A. WALTHER: *Evaluating Gradients in Optimal Control — Continuous Adjoints versus Automatic Differentiation*, Journal of Optimization Theory and Applications 122(1), p.63–86, 2004

#### Submitted Publications and Preprints

34. A. GÜNNEL, R. HERZOG AND E. SACHS: *A Note on Preconditioners and Scalar Products for Krylov Methods in Hilbert Space*
35. E. CASAS, R. HERZOG AND G. WACHSMUTH: *Approximation of Sparse Controls in Semilinear Equations by Piecewise Linear Functions*
36. R. HERZOG, K. KUNISCH AND J. SASS: *Primal-Dual Methods for the Computation of Trading Regions under Proportional Transaction Costs*
37. R. HERZOG, C. MEYER AND G. WACHSMUTH: *B- and Strong Stationarity for Optimal Control of Static Plasticity with Hardening*
38. R. HERZOG, C. MEYER AND G. WACHSMUTH: *C-Stationarity for Optimal Control of Static Plasticity with Linear Kinematic Hardening*
39. E. CASAS, R. HERZOG AND G. WACHSMUTH: *Optimality Conditions and Error Analysis of Semilinear Elliptic Control Problems with  $L^1$  Cost Functional*

### Publications in Proceedings

40. E. CASAS, R. HERZOG AND G. WACHSMUTH: *Approximation of Sparse Controls in Semilinear Elliptic Equations*, in: Large-Scale Scientific Computing, Proceedings of the 8th International Conference *Large-Scale Scientific Computing*, Sozopol, Bulgaria, June 6–10, 2011, Volume of *Lecture Notes in Computer Science*, Springer, Berlin, 2011
41. M. BERNAUER, R. HERZOG AND K. KUNISCH: *Optimal Control of the Two-Phase Stefan Problem in Level Set Formulation*, in: New Directions in Simulation, Control and Analysis for Interfaces and Free Boundaries, Report No. 07/2010, 2010
42. R. GRIESSE AND K. KUNISCH: *A Semismooth Newton Method for Solving Elliptic Equations with Gradient Constraints*, in: Optimal Control of Coupled Systems of PDE, Report No. 13/2008, Oberwolfach Reports 5(1), p.603–605, 2008
43. R. GRIESSE, A.J. MEIR AND K. KUNISCH: *Control Issues in Magnetohydrodynamics*, in: Optimal Control of Free Boundaries, Report No. 8/2007, Oberwolfach Reports 4(1), p.466–469, 2007
44. R. GRIESSE AND A.J. MEIR: *Modeling of an MHD Free Surface Problem Arising in CZ Crystal Growth*, in: Proceedings of the 5th IMACS Symposium on Mathematical Modelling (5th MATHMOD), I. Troch, F. Breiteneker (eds), ARGESIM Report 30, Vienna, 2006
45. R. GRIESSE AND K. KUNISCH: *Optimal Control in Magnetohydrodynamics*, in: Optimal Control of Coupled Systems of PDE, Report No. 18/2005, Oberwolfach Reports 2(2), p.1011–1014, 2005
46. R. GRIESSE AND A. WALTHER: *Towards Matrix-Free AD-Based Preconditioning of KKT Systems in PDE-Constrained Optimization*, Proceedings of the GAMM 2005 Annual Scientific Meeting, PAMM 5(1), p.47–50, 2005
47. R. GRIESSE AND S. VOLKWEIN: *Parametric Sensitivity Analysis for Optimal Boundary Control of a 3D Reaction-Diffusion System*, in: Large-Scale Nonlinear Optimization, G. Di Pillo, M. Roma (eds), Proceedings of the Workshop *Large Scale Nonlinear Optimization*, Erice, 2004, Volume 83 of *Nonconvex Optimization and its Applications*, Springer, Berlin, 2006
48. R. GRIESSE AND S. VOLKWEIN: *A Semi-Smooth Newton Method for Optimal Boundary Control of a Nonlinear Reaction-Diffusion System*, Proceedings of

the Sixteenth International Symposium on Mathematical Theory of Networks and Systems (MTNS), Leuven, Belgium, 2004

49. R. GRIESSE AND A. WALTHER: *Using AD-generated Derivatives in Optimal Control of an Industrial Robot*, Progress in Industrial Mathematics at ECMI 2002, Volume 5, p.127–132, 2004
50. R. GRIESSE: *A Reduced SQP Algorithm for the Optimal Control of Semilinear Parabolic Equations — and its Application to Reaction-Diffusion Systems*, Proceedings of the 20th IFIP TC7 Conference, p.239–253, 2003
51. R. GRIESSE: *Some Aspects for Instantaneous Boundary Control of Backward-facing Step Flow*, Proceedings of the GAMM 2000 Annual Scientific Meeting, Zeitschrift für Angewandte Mathematik und Mechanik 81 (S2), p.251–252, 2001

### Further Documents

52. R. GRIESSE: *Stability and Sensitivity Analysis in Optimal Control of Partial Differential Equations*, Cumulative Habilitation Thesis, Karl Franzens University Graz, Austria, 2008
53. R. GRIESSE: *The RICAM Information Leaflet* (Information for Incoming Ph.D. Students, Postdocs, and Visiting Scientists), 2005
54. R. GRIESSE: *Parametric Sensitivity Analysis for Control-Constrained Optimal Control Problems Governed by Systems of Parabolic Partial Differential Equations*, Dissertation, University of Bayreuth, 2003
55. R. GRIESSE: *Optimale und suboptimale Steuerung der Navier-Stokes-Gleichungen* (in German), Diploma Thesis, Clausthal University of Technology, 1999.

## Presentations

### Invited Conference Talks

1. *On Optimal Control Problems with Sparsity Terms*, SIGOPT International Conference on Optimization, Lambrecht, Germany, June 2011
2. *Semismooth Newton Methods for Portfolio Optimization Problems*, 1st Latin American Workshop on Optimization and Control, Quito, Ecuador, July 2008
3. *Stability and Sensitivity Analysis in PDE-Constrained Optimization*, Czech-French-German Conference on Optimization, Heidelberg, Germany, September 2007

4. *Optimal Control Challenges in Magnetohydrodynamics*, Simposium Internacional de Optimización y Ecuaciones Diferenciales, Universidad Autónoma de Aguascalientes, Mexico, April 2007
5. *Finite Elements for Magnetohydrodynamics and its Optimal Control*, FEM Symposium, Chemnitz, September 2006
6. *Optimal Control in Magnetohydrodynamics*, New Trends in Simulation and Control of PDEs, WIAS, Berlin, September 2005

#### Conference Talks in Minisymposia

7. *A Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, SIAM Conference on Optimization, Darmstadt, Germany, May 2011
8. *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
9. *Optimal Control Problems with Directional Sparsity*, IFIP TC7 (System Modelling and Optimization), Buenos Aires, Argentina, August 2009
10. *An SQP Method for Semilinear Optimal Control Problems with Mixed Constraints*, ENUMATH 2007, Graz, Austria, September 2007
11. *Update Strategies for Perturbed Nonsmooth Equations*, IFIP TC7 (System Modelling and Optimization), Cracow, Poland, July 2007
12. *KKT Systems in Optimal Control of Magnetohydrodynamics*, ICIAM 2007, Zurich, Switzerland, July 2007
13. *Mathematical Methods in MHD Flow Control*, GAMM Annual Scientific Meeting (within ICIAM), Zurich, Switzerland, July 2007
14. *Elliptic Optimal Control Problems with Mixed Constraints*, DMV Annual Meeting, Bonn, September 2006
15. *Preconditioning of Linear Systems Arising in the Optimal Control of Magnetohydrodynamics*, GAMM-SIAM Conference on Applied Linear Algebra, Düsseldorf, Germany, July 2006

16. *Optimal Control in Magnetohydrodynamics*, MAFELAP, Uxbridge, Great Britain, June 2006
17. *Postcorrection Strategies for Perturbed Nonsmooth Equations*, High Performance Scientific Computing, Hanoi, Vietnam, March 2006
18. *Modeling of an MHD Free Surface Problem Arising in CZ Crystal Growth*, MATHMOD Vienna, Austria, February 2006
19. *Optimal Control in Magnetohydrodynamics*, ÖMG/DMV (Austrian/German Mathematical Society) Annual Meeting, Klagenfurt, September 2005
20. *Optimal Control in Magnetohydrodynamics*, IFIP TC7 (System Modelling and Optimization), Turin, Italy, July 2005
21. *Matrix-Free AD-Based Preconditioning of KKT Systems*, GAMM 2005, Luxemburg, March 2005
22. *Parametric Sensitivity Analysis for 3D Reaction-Diffusion Control Problems*, DMV (German Mathematical Society) Annual Meeting, Heidelberg, Germany, September 2004
23. *Parametric Sensitivities for Perturbed Reaction-Diffusion Optimal Control Problems*, EUCCO, Dresden, Germany, March 2004
24. *Post-optimal Parametric Sensitivity Analysis for Control-Constrained Reaction-Diffusion Optimal Control Problems*, SCICADE, Trondheim, Norway, July 2003
25. *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**

26. *Optimality Conditions in Optimal Control of Elastoplasticity*, Workshop on Control and Optimisation of PDEs, Graz, Austria, October 2011
27. *A Priori Error Estimates for an Elliptic Control Problem with Non-Differentiable Cost Functional*, FEM Symposium, Holzhau, Germany, September 2011
28. *On Nonlinear Optimal Control Problems with an  $L^1$  Norm*, Workshop on Inverse Problems and Optimal Control for PDEs, Warwick, UK, May 2011

29. *Krylov Methods in Hilbert Space*, 3rd Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, March 2011
30. *Four Aspects in Optimal Control of PDEs*, Workshop on Optimization, Design and Control, Oxford, UK, September 2010
31. *Regularization and C-Stationarity for an Optimal Control Problem in Static Plasticity*, Workshop on Optimal Control and Partial Differential Equations, Greifswald, Germany, August 2010
32. *Preconditioning of KKT Systems in PDE-Constrained Optimization*, 2nd Chemnitz Seminar on Optimal Control, Haus im Ennstal, Austria, March 2010
33. *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
34. *Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, FEM Symposium, Oberwiesenthal, Germany, September 2009
35. *Semismooth Newton Methods for Portfolio Optimization*, Workshop Statistics meets Finance and Insurance, Chemnitz, Germany, September 2009
36. *Elliptic Equations with Gradient Constraints*, 15th South East German Colloquium on Numerical Mathematics, Chemnitz, Germany, May 2009
37. *Introduction to Nonlinear Optimization*, 1st Chemnitz Seminar on Optimal Control, Gerlosberg, Austria, March 2009
38. *Optimal Control of Static Plasticity*, Fourth German Polish Conference on Optimization, Moritzburg, Germany, March 2009
39. *Optimal Control Problems with Directional Sparsity*, Workshop: Optimal Control of Coupled PDE Systems, Oberwolfach, Germany, January 2009
40. *A Semismooth Newton Method for Solving Elliptic Equations with Gradient Constraints*, Workshop: Optimal Control of Coupled PDE Systems, Oberwolfach, Germany, March 2008
41. *A Semismooth Newton Method for Tikhonov Functionals with Sparsity Constraints*, Workshop: Hybrid Imaging, Sparsity, and Mathematical Biology, Obergurgl, Austria, January 2008

42. *Optimal Control for MHD Flows*, Colloquium of SFB 609, Schmochtitz, Germany, September 2007
43. *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
44. *Control Issues in Magnetohydrodynamics*, Miniworkshop: Control of Free Boundaries, Oberwolfach, Germany, February 2007
45. *Optimal Control in Magnetohydrodynamics*, GAMM Annual Scientific Meeting, Berlin, March 2006
46. *Modeling and Optimal Control in Instationary Magnetohydrodynamics*, Workshop: Control of Complex Fluids, Special Semester on Computational Mechanics, RICAM Linz, Austria, October 2005
47. *Optimal Control in Magnetohydrodynamics*, Workshop: Optimal Control of Coupled PDE Systems, Oberwolfach, Germany, April 2005
48. *Parametric Sensitivity Analysis and Applications*, Workshop: Inverse Problems and 1st Austrian Numerical Analysis Day, Obergurgl, Austria, April 2005
49. *Parametric Sensitivity Analysis for a Perturbed 3D Reaction-Diffusion Problem*, Nonlinear Large Scale Optimization, Erice, Italy, June 2004
50. *A Nonlinear Primal-Dual Active Set Method for Optimal Boundary Control of a 3D Reaction-Diffusion Model*, EUCCO, Dresden, Germany, March 2004
51. *Optimal Control of a Reaction-Diffusion Process*, Workshop: Optimization in Partial Differential Equations and Applications, Heidelberg, Germany, October 2002
52. *Optimal Control of Time-dependent Partial Differential Equations with Strict Terminal Conditions*, Workshop: Adjoints — Analysis and Applications, Děčín, Czech Republic, September 2001
53. *Distributed and Neumann Boundary Control of Reaction-Diffusion Equations*, IFIP TC7 (System Modeling and Optimization), Trier, Germany, July 2001
54. *Neumann Boundary Control of Reaction-Diffusion Equations*, SIAM Optimal Control and Applications, San Diego, July 2001
55. *Calculation of Sensitivity Derivatives for Perturbed Parabolic Optimal Control Problems*, Workshop: Stability and Sensitivity of Continuous Control Problems, Burg, Germany, April 2001

56. *An Adaptive POD Algorithm for Optimal Control Problems of the Heat Equation*, Workshop on POD and its applications, Graz, Austria, May 2000
57. *Instantaneous Control of the Navier-Stokes Equations*, GAMM Annual Scientific Meeting 2000, Göttingen, Germany, April 2000

### Colloquium and Seminar Talks

58. *Optimal Control Problems with  $L^1$  Terms*, Universität der Bundeswehr, München, Germany, June 2011
59. *On the Relation of Preconditioning and Inner Products in Krylov Subspace Methods*, Research Seminar Numerical Mathematics, Chemnitz, Germany, May 2011
60. *On the Relation of Preconditioning and Inner Products in Krylov Subspace Methods*, MPI for Dynamics of Complex Technical Systems, Magdeburg, Germany, February 2011
61. *Optimization with Complimentarity Constraints and Applications in Elastoplasticity*, University of Stuttgart, Germany, November 2010
62. *Optimal Control with Partial Differential Equations: an Introduction*, University of Freiburg, Germany, June 2010
63. *Optimal Control Challenges in Magnetohydrodynamics*, University of Kiel, Germany, May 2010
64. *A Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, University of Oxford, UK, May 2010
65. *Techniques for Simulation and Optimal Control of Static Plasticity*, University of Heidelberg, Germany, February 2010
66. *Optimization with Partial Differential Equations*, Colloquium at Johannes-Gutenberg University, Mainz, Germany, January 2010
67. *Preconditioned Conjugate Gradient Method for Optimal Control Problems with Control and State Constraints*, Research Seminar Numerical Mathematics, Chemnitz, Germany, January 2010
68. *Sparse Control and Applications*, Colloquium on the occasion of the 60th birthday of Hans Josef Pesch, Bayreuth, Germany, October 2009

69. *Numerical Techniques for Portfolio Optimization Problems with Transaction Costs*, Dresden Mathematical Seminar, TU Dresden, Germany, May 2009
70. *Optimale Steuerung — Studieren geht über Probieren*, Open House Day, TU Chemnitz, Germany, January 2009
71. *Optimal Control of Coupled Systems*, MPI for Dynamics of Complex Technical Systems, Magdeburg, Germany, December 2008
72. *Optimale Steuerung — Studieren geht über Probieren*, Inaugural Lecture, TU Chemnitz, Germany, October 2008
73. *Stability and Sensitivity Analysis in Optimal Control of Partial Differential Equations*, Karl Franzens University Graz, Austria, June 2008
74. *A Semismooth Newton Method for Solving Elliptic Equations with Gradient Constraints*, University of Greifswald, Germany, May 2008
75. *Optimal Control in Magnetohydrodynamics*, Middle East Technical University, Ankara, Turkey, March 2008
76. *Optimal Control Challenges in Magnetohydrodynamics*, University of Regensburg, Germany, July 2007
77. *The SQP Method for Optimal Control Problems with Mixed Control-State Constraints*, University of Trier, Germany, June 2007
78. *Stability and Sensitivity in Optimization with Partial Differential Equations*, TU Kaiserslautern, Germany, June 2007
79. *Coupled Field Problems in Magnetohydrodynamics and Their Optimal Control*, TU Chemnitz, Germany, May 2007
80. *Optimal Control Challenges in Magnetohydrodynamics*, University of Edinburgh, UK, March 2007
81. *Numerical Methods for Large-Scale Optimal Control Problems*, University of Basel, Switzerland, February 2007
82. *Numerical Methods in PDE-Constrained Optimization*, TU Chemnitz, Germany, January 2007
83. *From Finite-Dimensional Optimization to Optimal Control*, RWTH Aachen, Germany, January 2007

84. *Analytical and Numerical Treatment of Optimal Control Problems in Magnetohydrodynamics*, TU Dresden, Germany, January 2007
85. *Continuous Optimization — Applications and Prospects*, TU Kaiserslautern, Germany, July 2006
86. *Numerical Methods in PDE-Constrained Optimization*, TU Darmstadt, Germany, May 2006
87. *Optimal Control in Magnetohydrodynamics*, RICAM Scientific Board Meeting, Linz, Austria, April 2006
88. *Analysis, Numerical Simulation and Optimal Control of Coupled PDE Systems*, University of Münster, Germany, December 2005
89. *A Stokes-MHD Problem*, RICAM Linz, Austria, December 2005
90. *Modeling and Optimal Control in Magnetohydrodynamics*, TU Berlin, Germany, September 2005
91. *Preconditioning of Linear Systems in PDE-Constrained Optimization*, RICAM Linz, Austria, July 2005
92. *Parametric Sensitivity Analysis for Constrained Optimal Control Problems*, ZIB, Berlin, Germany, February 2005
93. *Towards Simulation and Control in Magnetohydrodynamics*, RICAM Linz, Austria, February 2005
94. *Parametric Sensitivity Analysis for 3D Reaction-Diffusion Control Problems*, TU Vienna, Austria, November 2004
95. *Parametric Sensitivity Derivatives of Perturbed Optimal Control Problems*, TU Chemnitz, Germany, June 2004
96. *Recent Advances in Magnetohydrodynamics*, Karl Franzens University Graz, Austria, May 2004
97. *Parametric Sensitivity Derivatives of Constrained Optimal Control Problems*, University of Hamburg, Germany, May 2004
98. *Parametric Sensitivities for Perturbed Reaction-Diffusion Optimal Control Problems*, University of Heidelberg, Germany, March 2004

99. *Automatic Differentiation and Constrained Optimization*, Karl Franzens University Graz, Austria, December 2003
100. *Post-Optimal Sensitivity Analysis for Control-Constrained Optimal Control Problems*, Karl Franzens University Graz, Austria, March 2003
101. *Strongly Regular Generalized Equations and Sensitivity Derivatives for Perturbed Parabolic Control Problems*, Dresden University of Technology, Germany, January 2003
102. *Parametric Optimization and Applications*, University of Jena, Germany, January 2003
103. *Parametric Sensitivity Analysis for Perturbed Reaction-Diffusion Control Problems*, Karl Franzens University Graz, Austria, July 2002
104. *Computation of Sensitivity Derivatives for Perturbed Parabolic Control Problems*, Dresden University of Technology, Germany, December 2001
105. *The Newton-Lagrange Method and Variants for Optimal Control of Time-dependent Partial Differential Equations*, Berlin University of Technology, Germany, September 2001
106. *Optimal Control of a Reaction-Diffusion Process — Comparison of Time Integration Methods*, Dresden University of Technology, Germany, January 2001
107. *The Newton-Lagrange Method for Solving Unconstrained Optimal Control Problems with Partial Differential Equations*, Berlin University of Technology, August 2000
108. *Suboptimal Control Problems for the Navier-Stokes Equations using FEATFLOW*, University of Dortmund, Germany, March 2000

### Public Talks

109. *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), TOEFL score of 657/660

Spanish (good knowledge)

French (good knowledge)

Swedish (beginning level)

## Hobbies

Photography

Playing the Piano

Marathon race (personal best: 3:24:15, Berlin 2007)

## References

Available upon request