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Education

Ph. D. (Dr. rer. nat.)	Mathematics, University of Paderborn, Germany, October 2007. Thesis: *On the Complexity of Counting Irreducible Components and Computing Betti Numbers of Algebraic Varieties.* Grade: Summa cum laude. Advisor: Prof. Dr. Peter Bürgisser. Referees: Prof. Dr. Felipe Cucker, Prof. Dr. Joachim von zur Gathen.
Master (Diplom)	Mathematics (minor subject: Physics), Albert-Ludwigs University Freiburg, Germany, May 1998. Thesis: *Eine C++-Bibliothek für verschiedene algebraische Strukturen.* Grade: Sehr gut. Advisor: Prof. Dr. Christian Bär.
Bachelor (Vordiplom)	Mathematics (minor subject: Physics), Philipps-University Marburg, Germany, September 1993. Grade: Sehr gut.
High School	Martin-Luther-Schule Marburg, 1991. Total grade: 1.5

Academic Experience

09/2012 – today	Lecturer for Mathematics, Lucerne University of Applied Sciences and Arts, School of Engineering and Architecture.
05/2011 – 08/2012	Postdoc, Hausdorff Center for Mathematics, Bonn University. Supervisor: Prof. Dr. Nitin Saxena.
01/2010 – 05/2011	Visiting Assistant Professor (Research Assistant Professor), Purdue University.
09/2008 – 12/2009	Postdoctoral Fellow, Purdue University. Supervisor: Prof. Dr. Saugata Basu. Project: *Computational Complexity of the Betti Numbers of Complex Algebraic Varieties.*
09/2003 – 08/2008	Research Assistant (wissenschaftlicher Mitarbeiter), University of Paderborn.

Business Experience

07/1999 – 08/2003	Software developer (Smalltalk) and IT-Consultant at ClassWare GmbH, Freiburg (Brsg.)
10/2000 – 03/2001	Software developer (Smalltalk) at UBS, Zurich, Switzerland.
05 – 08/2000	Software developer (C++ and VB) at LexWare GmbH, Freiburg (Brsg.).
06/1998 – 06/1999	IT-Consultant and Software developer (SAP) at LITEF GmbH, Freiburg (Brsg.).

Grant/Awards

09/2008 – 02/2010	DFG (German Research Foundation) research fellowship SCHE 1639/1-1.
1985/86	Champion on school and county level in the mathematics competition of the state government of Hessen.
1991	3. price on the first level of the math competition of Germany (Bundeswettbewerb Mathematik).

Research Interests

Statistics, Data Analysis, Machine Learning, Computational Algebra, Geometry, and Topology, Algebraic and Classical Complexity Theory.

Publications

Journal Publications

1. M. Bilski, P. Scheiblechner: Effective approximation of the solutions of algebraic equations, *Journal of Symbolic Computation* 109: 144–176 (2022). arXiv:1603.07298.

2. J. Koehler, J. Bürgler, U. Fontana, E. Fux, F. Herzog, M. Pouly, S. Saller, A. Salyaeva, P. Scheiblechner, K. Waelti: Cable Tree Wiring – Benchmarking Solvers on a Real-World Scheduling Problem with a Variety of Precedence Constraints, *Constraints* (2021/06/15), arXiv:2011.12862.

3. P. Scheiblechner, Effective de Rham Cohomology – The General Case, *Communications in Contemporary Mathematics* 21(05) (2018). arxiv:1203.5706.

4. J. Mittmann, N. Saxena, and P. Scheiblechner, Algebraic Independence in Positive Characteristic: a p-adic Calculus. *Transactions of the AMS* 366(7): 3425-3450 (2014). arXiv:1202.4301v1.

5. P. Scheiblechner, Castelnuovo-Mumford Regularity and Computing the de Rham Cohomology of Smooth Projective Varieties. *Foundations of Computational Mathematics* 12(5): 541–571 (2012). arXiv:0905.2212v4.

6. P. Scheiblechner, On a Generalization of Stickelberger's Theorem. *Journal of Symbolic Computation*, 45(12): 1459–1470 (2010), Special Issue to MEGA 2009. Part of this paper was presented at MEGA 2009.

7. P. Bürgisser and P. Scheiblechner, Counting Irreducible Components of Complex Algebraic Varieties. *Computational Complexity*, 19(1): 1–35 (2010), selected by the editors.

8. P. Bürgisser and P. Scheiblechner, On the Complexity of Counting Components of Algebraic Varieties. *Journal of Symbolic Computation*, 44(9): 1114–1136 (2009), Special Issue to MEGA 2007.

9. P. Scheiblechner, On the Complexity of Deciding Connectedness and Computing Betti Numbers of a Complex Algebraic Variety. *Journal of Complexity*, 23(3): 359–379 (2007).

Conference Publications

1. J. Koehler, J. Bürgler, U. Fontana, E. Fux, F. Herzog, M. Pouly, S. Saller, A. Salyaeva, P. Scheiblechner, K. Waelti: Cable Tree Wiring – Benchmarking Solvers on a Real-World Scheduling Problem with a Variety of Precedence Constraints, *18th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2021)*, July 5 – 8, Vienna, Austria.

2. P. Scheiblechner, Effective de Rham Cohomology – The Hypersurface Case. In Proceedings of the *2012 International Symposium on Symbolic and Algebraic Computation (ISSAC 2012)*, Grenoble, France, 305–310, ACM, New York, USA, 2012. arXiv:1112.2489v1.

3. P. Scheiblechner, On Lower Bounds for Algebraic Decision Trees over the Complex Numbers. In Proceedings of the *12th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC 2010)*, Timisoara, Romania, 362–365, 2010.

4. P. Scheiblechner, Comparison of Complexity over the Real vs. Complex Numbers. Extended abstract, presented at the workshop *Logical Approaches to Barriers in Computing and Complexity*, 2010, Greifswald, Germany.

5. P. Bürgisser and P. Scheiblechner, Differential Forms in Computational Algebraic Geometry. In Proceedings of the *2007 International Symposium on Symbolic and Algebraic Computation (ISSAC 2007)*, Waterloo, Canada, 61–68, ACM, New York, USA, 2007.

Preprints

1. P. Scheiblechner, N. Mañas, L. Plastina, K. Geraedts, M. Egli, C. De Geyter, F. Ille, B. Leeners, M. Popovic, Growth Dynamics and Oocyte Quality: Does Follicle Growth Rate Influence Oocyte Quality and Treatment Outcome in ICF/ICSI?, to be submitted to *Human Reproduction*.

Book

P. Scheiblechner, *Complexity of Counting Components of Algebraic Varieties – Irreducible and Connected Components, Betti Numbers*. VDM-Verlag Dr. Müller, 160 pp, paperback, ISBN 978-3-8364-9844-9.

Selected Invited Talks

- *Optimization and Real Algebraic Geometry Seminar*, May 12, 2022, Purdue University, West Lafayette, USA. Talk: *Effective de Rham Cohomology*.
- *Dagstuhl Seminar: Computational Counting*, January 13–18, 2013, Dagstuhl, Germany. Talk: *Complexity of de Rham cohomology*.
- *64. Theorietag – Workshop über Algorithmen und Komplexität*, October 4–5, 2012, TU Darmstadt, Germany. Vortrag: *Effective De Rham Cohomology*.
- *SIAM Conference on Applied Algebraic Geometry*, October 6 – 9, 2011, North Carolina State University, Raleigh, USA. Talk: *On the Role of Compactness in Algebraic Complexity Theory*.
- *Mathematical Aspects of P versus NP and its Variants*, Topical Workshop, August 1 – 5, 2011, ICERM, Brown University, USA. Talk: *Transfer Results and Number Theoretic Conjectures*.
- *Foundations of Computational Mathematics* (FoCM 2011), Workshop on Real Number Complexity, July 4 – 6, 2011, Budapest, Hungary. Talk: *Effective de Rham Cohomology*.
- *Seminar Symbolic Computation*, January 18, 2011, RICAM, Linz, Austria. Talk: *On the Computation of the Betti Numbers of Complex Algebraic Varieties*.
- *Dagstuhl Seminar: Computational Counting*, November 28 – December 3, 2010, Dagstuhl, Germany. Talk: *On the Computation of the Betti Numbers of Complex Algebraic Varieties*.
- *Algebra, Geometry and Combinatorics Day*, May 1, 2010, Purdue University, West Lafayette, USA. Talk: *On the Computation of the Cohomology of Complex Algebraic Varieties*.

- *Colloquium*, March 12, 2010, Boise State University, USA. Talk: *A Quick Tour through Computational Algebra and Geometry.*
- *Working Algebraic Geometry Seminar*, December 9, 2009, Purdue University, West Lafayette, USA. Talk: *Castelnuovo-Mumford Regularity and Computing the de Rham Cohomology of Smooth Projective Varieties.*
- *Master's course Algebraic Geometry*, December 1, 2009, University of Duisburg-Essen, Germany. Talk: *Castelnuovo-Mumford Regularity and Computing the de Rham Cohomology of Smooth Projective Varieties.*
- *Oberwolfach Seminar: New Trends in Algorithms for Real Algebraic Geometry*, November 22 – 28, 2009, Mathematisches Forschungsinstitut Oberwolfach, Germany. Talk: *Castelnuovo-Mumford Regularity and Computing the de Rham Cohomology of Smooth Projective Varieties.*
- *Visitor Seminar of the Thematic Program on the Foundations of Computational Mathematics*, July – December, 2009, Fields Institute, Toronto, Ontario, Canada. Talk: *Castelnuovo-Mumford Regularity and Computing the de Rham Cohomology of Smooth Projective Varieties.*
- *Working Algebraic Geometry Seminar*, October 15 and 22, 2008, Purdue University, West Lafayette, USA. Talk: *Counting Components of Complex Algebraic Varieties.*
- *Foundations of Computational Mathematics* (FoCM 2008), Workshop on Real Number Complexity, June 16 – 26, 2008, Hong Kong, China. Talk: *Counting Irreducible Components of Complex Algebraic Varieties.*
- *Complexity Theory Workshop*, June 24 – 30, 2007, Mathematisches Forschungsintitut Oberwolfach, Germany. Talk: *On the Complexity of Counting Components of Algebraic Varieties.*

Contributed Talks

- *International Symposium on Symbolic and Algebraic Computation* (ISSAC 2012), July 22–25, 2012, Grenoble, Frankreich. Talk: *Effective de Rham Cohomology – The Hypersurface Case.*
- *Advances in the Theory of Computing (special track of SYNASC 2010)*, September 23 – 26, 2010, Timisoara, Romania. Talk: *On Lower Bounds for Algebraic Decision Trees over the Complex Numbers.*
- *Logical Approaches to Barriers in Computing and Complexity*, February 17 – 20, 2010, Greifswald, Germany. Talk: *Comparison of Complexity over the Real vs. Complex Numbers.*
- *Effective Methods in Algebraic Geometry* (MEGA 2009), June 15 – 19, 2009, Barcelona, Spain. Talk: *Counting Connected Components of Hypersurfaces.*
- *International Symposium on Symbolic and Algebraic Computation* (ISSAC 2007), July 29 – August 1, 2007, Waterloo, Ontario, Canada. Talk: *Differential Forms in Computational Algebraic Geometry.*

Poster Presentation

Foundations of Computational Mathematics (FoCM 2005), Workshop on Real Number Complexity, June 30 – July 9, 2005, Santander, Spain. Poster: *Countig Irreducible Components of Algebraic Varieties.*

Teaching Experience

Lucerne University of Applied Sciences and Arts, School of Engineering and Architecture. Since 2012, on Bachelor level lecturer for

- HMAT (Higher dimensional integration, Fourier series and transforms, Vector calculus, systems of ODE, fundamentals of PDE)
- LINALG (Linear algebra, applications with Octave)
- LRS (Laplace- and Fourier-Transform)
- MATH, MA_BG (Calculus)
- MA+PHY1_T (Complex numbers, ordinary differential equations, Fourier series)
- MA+PHY2_T (Several variables, introduction into probability)
- MA+PH3 (linear systems, second order differential equations, probability)
- PT+STG (Introduction to the basics of computer science)
- STOC (Probability and statistics)

Since 2020, on Master level lecturer for

- AppStat (Applied Statistics and Data Analysis)
- LIA01/02 (Linear algebra)
- NumMeth (Numerical Methods for Building Engineering)

Hausdorff Center for Mathematics, Bonn University. Together with Nitin Saxena Organizer of

- Graduate Seminar on Algorithms in Real Algebraic Geometry, Spring 2012
- Graduate Seminar on Topics in Computational Algebraic Geometry, Fall 2011

Department of Mathematics, Purdue University. Instructor for

- Ordinary Differential Equations, Spring 2011
- Ordinary Differential Equations, Fall 2010
- Elements of Complex Analysis, Fall 2010
- Advanced Mathematics for Engineers and Physicists I, Summer 2010
- Ordinary Differential Equations, Spring 2010

Department of Mathematics, University of Paderborn. Teaching assistant (Tutor) for

- Proseminar: Combinatorics, Spring 2008
- Linear Algebra I/II, Fall 2007, Spring 2008
- Analysis II, Spring 2007
- Complexity Theory, Spring 2005, Spring 2007
- Computer Algebra I/II, Fall 2003, Spring 2007
- Proseminar: The BOOK of Proofs, Fall 2006
- Mathematics for Computer Scientists I/II, Spring 2004, Fall 2005

- Seminar: Computer Algebra, Combinatorics, and Complexity, Spring 2005
- Complex Analysis, Fall 2004

Department of Mathematics, Albert-Ludwigs University Freiburg. Teaching assistant (Tutor) for

- Analysis, Fall 1996, Fall 1997
- Linear Algebra, Spring 1994, Spring 1997
- Elementary Differential Geometry, Spring 1996

Supervision

- Bachelor Thesis Mathurshan Baskaran, *Erprobung von Machine-Learning-Methoden in klinischen Reproduktionsdaten*, 2020
- Bachelor Thesis Damian Lötscher, *Prediction of building (heating) energy demand based on meta-data*, 2019

Other Activities

- Expert for the final exam of the Berufsmatura (secondary school degree qualifying for Universites of Applied Sciences and Arts) of the canton Lucerne
- Referee for *Bulletin of the London Mathematical Society*, *Computational Complexity*, *ICALP*, *ISSAC*, *Journal of Complexity*, *Journal Foundations of Computational Mathematics*, *Journal of Symbolic Computation*, *FOCS*, *Theoretical Computer Science*.
- Reviewer for Mathematical Reviews and Zentralblatt für Mathematik.
- Instructor for Mathematics exam review sessions of Chi - Epsilon, Civil Engineering honorary society.
- Member doctoral committee Dr. Sina Ober-Blöbaum, University of Paderborn, 2008.