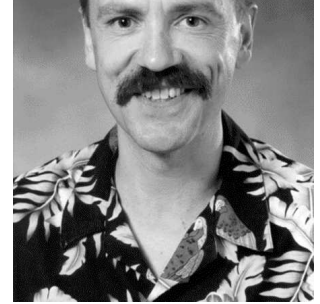


CURRICULUM VITAE

Christoph Maximilian Sebastian KREITZ



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Born 24. November 1957 in Düsseldorf
German Citizen
Married to Bärbel Kreitz.

Academic Degrees

- April 1993:* Advanced Ph.D. (“Habilitation”) in Computer Science, Darmstadt University of Technology, Germany. *Thesis on program synthesis within proof assistant systems.*
- December 1984:* Ph.D. in Computer Science, University of Hagen, Germany (summa cum laude).
(German) *Thesis on computability in non-countable domains, particularly real numbers.*
- December 1981:* Master (“Diplom”) of Computer Science, RWTH Aachen, Germany.
(German) *Thesis on CPO-based computability models for non-countable domains.*
(top 1% of class, “mit Auszeichnung”)
- October 1979:* Bachelor (“Vordiplom”) of Computer Science, RWTH Aachen, Germany.
(top 1% of class)

Fellowships and Awards

- June 1995:* Prize for Excellence in Teaching and Research, Adolf-Messer Stiftung, Darmstadt University of Technology, Germany.
- September 1985:* Prize for Excellence as Young Investigator, University of Hagen, Germany.
- April 1985 – September 1986:* DFG Computer Science Postdoctoral Fellowship, Deutsche Forschungsgemeinschaft, Germany.
- July 1982:* Prize for Excellence on Master’s Studies (Springorum-Gedenkmünze der RWTH Aachen), RWTH Aachen, Germany.
- February 1980 – December 1981:* Graduate Fellow, Studienstiftung des Deutschen Volkes, Germany.

Research Interests

- Program Synthesis:* Algorithm design strategies, formalized programming knowledge, program optimization techniques, abstract specifications, and object-oriented system design
- Automated Deduction:* Proof procedures for constructive and higher order logics, induction techniques, tactical theorem proving, decision procedures, program transformations
- Program Verification:* Formal semantics of programming languages, extended typechecking, formal reasoning about programs, logical programming environments
- Formal Logics and Calculi:* Type Theory, Modal Logic, Linear Logic, Programming Logics

Professional Positions

May 2003 – today: Professor for Computer Science, University of Potsdam, Germany.

March 1999 – today: Senior Research Associate, Dept. of Computer Science, Cornell University.

October 1996 – March 1999: Visiting Scientist, Dept. of Computer Science, Cornell University.

April 1996 – September 1996: Professor for Computer Science, University of Halle, Germany.

October 1995 – March 1996: Associate Professor for Computer Science, Darmstadt University of Technology, Germany.

October 1993 – March 1994: Associate Professor for Computer Science, Darmstadt University of Technology, Germany.

October 1989 – October 1995: Assistant Professor (Wissenschaftlicher Assistent) for Computer Science, Darmstadt University of Technology, Germany.

April 1989 – October 1989: Research Associate (Wissenschaftlicher Angestellter) Darmstadt University of Technology, Germany.

November 1986 – March 1989: Research Associate (Wissenschaftlicher Angestellter) Munich University of Technology, Germany.

April 1985 – September 1986: DFG Postdoctoral Fellow, Department of Computer Science, Cornell University.

January 1982 – April 1984: Research Associate (Wissenschaftlicher Angestellter) University of Hagen, Germany.

Professional Activities

Program Committee:

- IJCAR/FLoC Workshop on Verification (VERIFY) (2001, 2002, 2006)
- International Conference TABLEAUX (1999, 2000, 2002, 2003, 2005, 2007)
- International Conference on Automated Deduction (1997, 1998, 2002)
- LPAR-05 Empirically Successful Automated Reasoning in Higher-Order Logic (ESHOL) (2005)
- IJCAR-04 Workshop on Computer-Supported Mathematical Theory Development (2004)
- Fourth International Workshop on Logical Frameworks and Meta-Languages (LFM'04)
- NASA Intelligent Systems / Automated Reasoning NRA Technical Review Panel (2003)
- IJCAI-03 Workshop on Agents and Automated Reasoning (2003)
- AAAI Spring Symposium on Deduction-based Software Synthesis (2002)
- CADE-17 Workshop on the Automation of Proof by Mathematical Induction (2000)
- NSF Information Technology Research Program Panel, Software (2000)
- NSF Information Technology Research Program Panel, Verification (2000)
- 1st International Conference on Computational Logic (2000)
- 3rd International Workshop FroCoS'2000
- NSF Program Panel on Software Engineering and Languages (1999)
- 7th International Workshop on Logic Program Synthesis and Transformation (1997)

Editorial Board: Journal of Applied Logic

University Activities

Member: Development and Planning Committee, University of Potsdam (Head)

Faculty search Committee, Department of Computer Science, University of Potsdam (Head)

Publications

Refereed Journal Papers and Book Chapters

- C. Kreitz. **Formale Methoden der künstlichen Intelligenz**, Künstliche Intelligenz, 2007 (accepted for publication).
- J. Otten, T. Raths, C. Kreitz. **The ILTP Problem Library for Intuitionistic Logic** Journal of Automated Reasoning, 2006 (accepted for publication).
- S. Allen, M. Bickford, R. Constable, R. Eaton, C. Kreitz, L. Lorigo, E. Moran. **Innovations in Computational Type Theory using Nuprl**, Journal of Applied Logic, 2006 (to appear)
- C. Kreitz & H. Mantel. **A Matrix Characterization for Multiplicative Exponential Linear Logic**, Journal of Automated Reasoning 32(2):121–166, 2004.
- C. Kreitz. **Building Reliable, High-Performance Networks with the Nuprl Proof Development System**, Journal of Functional Programming 14(1):21–68, 2004.
- C. Kreitz, & B. Pientka. **Connection-based Inductive Theorem Proving**, Studia Logica 69(2):293–326, 2001.
- C. Kreitz & S. Schmitt. **A Uniform Procedure for Converting Matrix Proofs into Sequent-Style Systems**, Journal of Information and Computation 162(1–2):226–254, 2000.
- C. Kreitz, J. Otten, S. Schmitt, B. Pientka. **Matrix-based Constructive Theorem Proving**. In *Intellectics and Computational Logic. Papers in honor of Wolfgang Bibel*, pp. 189–205, Kluwer, 2000.
- X. Liu, C. Kreitz, R. van Renesse, J. Hickey, M. Hayden, K. Birman, R. Constable. **Building Reliable, High-Performance Systems from Components**, Operating Systems Review 33(5):80–92, 1999.
- B. Pientka & C. Kreitz. **Automating inductive Specification Proofs**, Fundamenta Informatica 39(1-2):189–209, 1999.
- C. Kreitz & J. Otten. **Connection-based Theorem Proving in Classical and Non-classical Logics**, Journal for Universal Computer Science 5(3):88–112, Springer-Verlag, 1999.
- C. Kreitz. **Program Synthesis**. Chapter III.2.5 of *Automated Deduction – A Basis for Applications*, pp. 105–134, Kluwer, 1998.
- C. Kreitz. **Projektaufgaben in Anfängerveranstaltungen: ein Mittel zur Förderung eines objektorientierten Programmierstils**. *GI Softwaretechnik-Trends*, 16(4):30–43, 1996. (in German)
- C. Kreitz. **Formal Mathematics for Verifiably Correct Program Synthesis**. *Journal of the Interest Group in Pure and Applied Logics (IGPL)*, 4(1):75–94, 1996.
- K. Weihrauch & C. Kreitz. **Type 2 Computational Complexity of Functions on Cantor’s Space**. *Theoretical Computer Science*, 82:1–18, 1991.
- C. Kreitz. **Towards a Formal Theory of Program Construction**. *Revue d’ intelligence artificielle*, 4(3):53–79, 1990.
- C. Kreitz & K. Weihrauch. **Compactness in Constructive Analysis Revisited**. *Annals of pure and applied logic*, 36:29–38, 1987.
- K. Weihrauch & C. Kreitz. **Representations of the Real Numbers and the Open Subsets of the Set of Real Numbers**. *Annals of pure and applied logic*, 35:247–260, 1987.
- C. Kreitz & K. Weihrauch. **Theory of Representations**. *Theoretical Computer Science*, 38:35–53, 1985.

Refereed Conference Proceedings

- D. Kozen, C. Kreitz, E. Richter. **Automating Proofs in Category Theory**, *International Conference IJCAR-2006*, LNAI 4130, pp. 392–407, Springer, 2006.
- J. Otten, T. Raths, C. Kreitz. **The ILTP Library: Benchmarking Automated Theorem Provers for Intuitionistic Logic** *International Conference TABLEAUX-2005*, LNAI 3702, pp. 333–337, Springer, 2005.

- J. Hickey, A. Nogin, R. Constable, B. Aydemir, E. Barzilay, Y. Bryukhov, R. Eaton, A. Kopylov, C. Kreitz, V. Krupski, L. Lorigo, S. Schmitt, C. Witty, X. Yu. **MetaPRL – A Modular Logical Environment**, *International Conference on Theorem Proving in Higher-Order Logics*, LNCS 2758, pp. 287–303, Springer, 2003.
- M. Bickford, C. Kreitz, R. van Renesse, X. Liu. **Proving Hybrid Protocols Correct**, *14th International Conference on Theorem Proving in Higher Order Logics*, LNCS 2152, pp. 105–120, Springer, 2001.
- S. Schmitt, L. Lorigo, C. Kreitz, A. Nogin. **JProver: Integrating Connection-based Theorem Proving into Interactive Proof Assistants**, *International Joint Conference on Automated Reasoning*, LNAI 2083, pp. 421–426, Springer, 2001.
- M. Bickford, C. Kreitz, R. van Renesse, R. Constable. **An Experiment in Formal Design using Meta-Properties**, *DARPA Information Survivability Conference and Exposition II (DISCEX 2001)*, pp. 100–107, IEEE Computer Society Press, 2001.
- X. Liu, R. van Renesse, M. Bickford, C. Kreitz, R. Constable. **Protocol Switching: Exploiting Meta-Properties**, *International Workshop on Applied Reliable Group Communication (WARGC 2001)* pp. 37–42, IEEE CS Press, 2001.
- S. Allen, R. Constable, R. Eaton, C. Kreitz, L. Lorigo. **The Nuprl Open Logical Environment**, *17th International Conference on Automated Deduction*, LNAI 1831, pp. 170–176, Springer, 2000.
- C. Kreitz, & B. Pientka. **Matrix-based Inductive Theorem Proving**, *International Conference TABLEAUX-2000*, LNAI 1847, pp. 294–308, Springer, 2000.
- K. Birman, B. Constable, M. Hayden, J. Hickey, C. Kreitz, R. van Renesse, O. Rodeh, W. Vogels. **The Horus and Ensemble Projects: Accomplishments and Limitations**. *DARPA Information Survivability Conference and Exposition (DISCEX 2000)*, pp. 149–160, IEEE Computer Society Press 2000.
- C. Kreitz. **Automated Fast-Track Reconfiguration of Group Communication Systems**, *5th International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, LNCS 1579, pp. 104–118, Springer, 1999.
- H. Mantel & C. Kreitz. **A Matrix Characterization for MELL**, *6th European Workshop on Logics in Artificial Intelligence, European Workshop, JELIA '98*, LNAI 1489, pp. 169–183, Springer, 1998.
- B. Pientka & C. Kreitz. **Instantiation of Existentially Quantified Variables in Inductive Specification Proofs**, *4th International Conference on Artificial Intelligence and Symbolic Computation*, LNAI 1476, pp. 247–258, Springer, 1998.
- C. Kreitz, M. Hayden, J. Hickey. **A Proof Environment for the Development of Group Communication Systems**, *15th International Conference on Automated Deduction*, LNAI 1421, pp. 317–332, Springer, 1998.
- S. Schmitt & C. Kreitz. **Deleting Redundancy in Proof Reconstruction**, *International Conference TABLEAUX-98*, LNAI 1397, pp. 262–276, Springer, 1998.
- W. Bibel, D. Korn, C. Kreitz, F. Kurucz, J. Otten, S. Schmitt, G. Stolpmann. **A Multi-Level Approach to Program Synthesis**. *7th International Workshop on Logic Program Synthesis and Transformation*, LNAI 1463, pp. 1–25, Springer, 1998.
- D. Korn & C. Kreitz. **Deciding Intuitionistic Propositional Logic via Translation into Classical Logic**, *14th International Conference on Automated Deduction*, LNAI 1249, pp. 131–145, Springer, 1997.
- C. Kreitz, H. Mantel, J. Otten, S. Schmitt. **Connection-Based Proof Construction in Linear Logic**, *14th International Conference on Automated Deduction*, LNAI 1249, pp. 207–221, Springer, 1997.
- J. Otten & C. Kreitz. **A Uniform Proof Procedure for Classical and Non-classical Logics**. *KI-96: Advances in Artificial Intelligence*, LNAI 1137, pp. 307–319, Springer, 1996.
- W. Bibel, D. Korn, C. Kreitz, S. Schmitt. **Problem-Oriented Applications of Automated Theorem Proving**. *4th International Symposium on Design and Implementation of Symbolic Computation Systems*, LNCS 1128, pp. 1–21, Springer, 1996.
- S. Schmitt & C. Kreitz. **Converting Non-Classical Matrix Proofs into Sequent-Style Systems**. *13th International Conference on Automated Deduction*, LNAI 1104, pp. 418–432, Springer, 1996.

- C. Kreitz, K. Lau, M. Ornaghi. **Formal Reasoning about Modules, Reuse, Objects, and their Correctness.** *International Conference on Formal and Applied Practical Reasoning*, LNAI 1085, pp. 384–398, Springer, 1996.
- J. Otten & C. Kreitz. **T-String-Unification: Unifying Prefixes in Non-Classical Proof Methods.** *5th International Workshop on Theorem Proving with Analytic Tableaux and Related Methods*, LNAI 1071, pp. 244–260, Springer, 1996.
- C. Kreitz, J. Otten, S. Schmitt. **Guiding Program Development Systems by a Connection Based Proof Strategy.** *5th International Workshop on Logic Program Synthesis and Transformation*, LNCS 1048, pp. 137–151, Springer, 1996.
- S. Schmitt & C. Kreitz. **On Transforming Intuitionistic Matrix Proofs into Standard-Sequent Proofs.** *4th International Workshop on Theorem Proving with Analytic Tableaux and Related Methods*, LNAI 918, pp. 106–121, Springer, 1995.
- J. Otten & C. Kreitz. **A Connection Based Proof Method for Intuitionistic Logic.** *4th International Workshop on Theorem Proving with Analytic Tableaux and Related Methods*, LNAI 918, pp. 122–137, Springer, 1995.
- T. Boy de la Tour & C. Kreitz. **Building Proofs by Analogy via the Curry-Howard Isomorphism.** *Conference on Logic Programming and Automated Reasoning*, LNAI 624, pp. 202–213, Springer, 1992.
- C. Kreitz. **The Representation of Program Synthesis in Higher Order Logic.** *14th German Workshop on Artificial Intelligence*, IFB 251, pp. 171–180, Springer, 1990.
- G. Neugebauer, B. Fronhöfer, C. Kreitz. **XPRTS - an Implementation Tool for Program Synthesis.** *13th German Workshop on Artificial Intelligence*, IFB 216, pp. 348–357, Springer, 1989.
- C. Kreitz & K. Weihrauch. **Towards a Theory of Representations.** *2nd Frege Conference*, pp. 73–79, Akademie Verlag, 1984.
- C. Kreitz & K. Weihrauch. **A Unified Approach to Constructive and Recursive Analysis.** *Computation and proof theory*, LNM 1104, pp. 259–278, Springer, 1984.
- C. Kreitz & K. Weihrauch. **Complexity Theory on Real Numbers and Functions.** *6th GI conference on Theoretical Computer Science*, LNCS 145, pp. 165–174, Springer, 1983.

Workshop Proceedings

- C. Kreitz. **Designing Reliable, High-Performance Networks with the Nuprl Logical Programming Environment.** *2002 AAI Spring Symposium on Logic-Based Program Synthesis*, Stanford University. Technical Report SS-02-05, AAI Press, pp. 55–56, 2002
- O. Hafizoğulları & C. Kreitz. **Dependency Analysis Through Type Inference.** *6th Workshop on Logic, Language, Information and Computation (WoLLIC'99)*, Rio de Janeiro, Brazil, pp. 127–138, 1999.
- D. Korn & C. Kreitz. **A Constructively Adequate Refutation System for Intuitionistic Logic.** *6th International Conference TABLEAUX'97*, Technical Report CRIN 97-R-030, Université de Nancy II, 1997.
- C. Kreitz, J. Otten, S. Schmitt. **Integrating a Connection Based Proof Method into an Interactive Program Development System.** *ProCos Workshop on Linking Theories*, Vedbaek, 1995.
- D. Korn & C. Kreitz. **On Testing Irreflexivity of Reduction Orderings for Combined Substitutions in Intuitionistic Matrix Proofs.** *4th Workshop on Theorem Proving with Analytic Tableaux and Related Methods – Short Papers & Poster Sessions*, Universität Koblenz, pp. 55–60, 1995.
- C. Kreitz. **Das Grundstudium an der TH Darmstadt aus studentischer Sicht – Analyse einer fachübergreifenden Umfrage.** *2. THD Werkstattgespräch zur Verbesserung der Lehre, Darmstadt*, THD Schriftenreihe Wissenschaft und Technik 67, pp. 81–105, 1995. (in German)
- C. Kreitz. **Förderung des Guten – Änderung des Schlechten: 5 Thesen zur Verbesserung der Grundlehre an der TH Darmstadt.** *2. THD Werkstattgespräch zur Verbesserung der Lehre, Darmstadt*, THD Schriftenreihe Wissenschaft und Technik 67, pp. 107–117, 1995. (in German)

Academic Theses

- **Metasynthesis – Deriving Programs that Develop Programs.** Thesis for Habilitation, Darmstadt University of Technology, 1992.
Forschungsbericht AIDA-93-03, FG Intellektik, Darmstadt University of Technology, 1983.
- **Theorie der Darstellungen und ihre Anwendungen in der konstruktiven Analysis.** Ph.D. Thesis FernUniversität Hagen, 1984. (in German)
Informatik-Berichte 50. FernUniversität Hagen, 1984.
- **Zulässige CPO's - ein Entwurf für ein allgemeines Berechenbarkeitskonzept.** Diploma Thesis, RWTH Aachen, 1981. (in German)
Schriften zur Mathematik und angewandten Informatik 76, RWTH Aachen, 1982.

Recent Technical Reports

- S. Allen, M. Bickford, R. Constable, R. Eaton, C. Kreitz. A Nuprl-PVS Connection: Integrating Libraries of Formal Mathematics, Technical Report, Cornell University, Ithaca, NY, January 2003.
- C. Kreitz. *The Nuprl Proof Development System, Version 5: Reference Manual and User's Guide.* Technical Report, Cornell University, Ithaca, NY, December 2002.
- M. Hicks, R. van Renesse, M. Bickford, R. Constable, C. Kreitz, L. Lorigo. *User-specific Adaptive Scheduling in a Streaming Media Network,* Technical Report, Cornell University, Ithaca, NY, September 2002.
- S. Allen, M. Bickford, R. Constable, R. Eaton, C. Kreitz, L. Lorigo. *FDL: A Prototype Formal Digital Library,* Technical Report, Cornell University, Ithaca, NY, May 2002.
- C. Kreitz. *Formal Reasoning about Communication Systems II: Automated Fast-Track Reconfiguration.* Technical Report TR 98-1707, Cornell University, Ithaca, NY, September 1998.
- O. Hafizoğulları & C. Kreitz. *A Type-based Framework for Automatic Debugging,* Technical Report, Cornell University, Ithaca, NY, July 1998.
- O. Hafizoğulları & C. Kreitz. *Dead Code Elimination Through Type Inference* Technical Report TR 98-1698, Cornell University, Ithaca, NY, March 1998.
- C. Kreitz. *Formal Reasoning about Communication Systems I: Embedding ML into Type Theory.* Technical Report TR 97-1637, Cornell University, Ithaca, NY, July 1997.

Ph.D. Students

Jens Otten (University of Potsdam, in progress)

Ozan Hafizoğulları (Ph.D. January 2001, Cornell University)

A Typed Framework for Program Analysis

Stefan Schmitt (Ph.D. November 1999, Darmstadt University of Technology)

Proof Reconstruction in Classical and Non-classical Logics

Daniel Korn (Ph.D. November 1998, Darmstadt University of Technology)

Konstruktiv adäquate Beweisautomatisierung für intuitionistische Logik

Marion Kremer (Ph.D. March 1995, Darmstadt University of Technology) *Entwurf eines sprachunabhängigen*

Verifikationssystems auf der Basis denotationaler Semantikbeschreibungen

Masters Students

Scientific studies in Computer Science in Germany lead to the degree of a “Diplom-Informatiker”, ranked somewhat above the Masters degree in the USA. All Students received their degree from the Darmstadt University of Technology. Their theses had to be written in German.

Ferenc Kurucz: *Realisierung verschiedener Induktionsstrategien basierend auf dem Rippling-Kalkül*, 1997

Gerd Stolpmann: *Schematische Konstruktion von Globalsuchalgorithmen*, 1997.

Oliver Hanemann: *Steuerung des NuPRL-Systems mit einer matrix-basierten Beweisstrategie*, 1997.

Dirk Schlimm: *Intuitionismus und Informatik*, 1997.

Heiko Mantel: *Ein Matrix-Charakterisierung für ein Fragment der linearen Logik*, 1996.

Tran van thanh Liem: *Induktion im NuPRL System*, 1996.

Andreas Raab: *Prädikative Algorithmensynthese mit dem LOPS-Ansatz*, 1996.

Eva Hornecker: *Grundzüge der Informatik I – Didaktische Analyse des Übungsbetriebes*, 1995.

Jens Otten: *Ein konnektionen-orientiertes Beweisverfahren für intuitionistische Logik*, 1995.

Stefan Schmitt: *Ein erweiterter intuitionistischer Sequenzenkalkül und dessen Anwendung im intuitionistischen Konnektionsbeweisen*, 1995

Ilka Gassmann: *Eine Matrix-basierte Beweisprozedur für intuitionistische Top-Down Sequenzenbeweise*, 1994

Marco van den Berg: *Automatische Verifikation – ein unlösbares Problem?*, 1994

Stefanos Padelis: *Steuerung von Programmsynthesen mit dem LOPS-Ansatz*, 1994

Daniel Korn: *KonSequenz – Ein Konnektionsmethoden-gesteuertes Sequenzenbeweis-Verfahren*, 1993

Martina Hammel: *Hypothesenanalyse von Künstlicher Intelligenz und Konnektionismus: Zu den Wechselwirkungen zwischen Wissenschaft und Gesellschaft*, 1991

Teaching Experience

Since 1982 I have organized and supervised Graduate Level Seminars at the University of Hagen and the Darmstadt University of Technology. Topics were *Cryptography and Data Security*, *Theory of Computation*, *Fundamentals of Artificial Intelligence*, *Intuitionistic Type Theory*, *Program Synthesis and Machine Learning*, *Automated Planning*, *The Development of Logic*

Since 1989 I have given computer science courses at the Darmstadt University of Technology, the University of Marburg (invited course), the University of Halle, at Cornell University, and at the University of Potsdam.

Undergraduate Level Courses

Introduction to Programming:

Object-oriented Design, Programming Languages, Verification (beginner's course)

Introduction to Theoretical Computer Science:

Computability, complexity, formal languages

Introduction into Artificial Intelligence:

An overview of the most important topics in AI

Applied Logic:

Formal Logics, proof methods, and their applications – joint course with Prof. R. Constable

Graduate Level Courses

Automated Logic and Programming:

Two-semester course leading to current topics of my research area

I: Formalization, calculi (intuitionistic type theory) and interactive theorem proving

II: Implementation of theorem provers, automating logical inferences, algorithm synthesis

Computational Type Theory:

Theoretical foundations of formal computational logics

Program Synthesis / Construction of Reliable Software:

Foundations and methods of computer-supported software development

Automated Inference Methods:

Proof procedures for propositional and first-order logic, induction, rewriting, etc.

Introduction to Automated Reasoning:

Type Theory, Proof Systems, and Applications – joint course with Prof. R. Constable

Fundamentals of Data Base Systems:

Architectures and models, relational data bases, administering transactions, current developments

Social Aspects of Developing Computer Technology:

Joint course together with professors of social sciences, ethics (theology), psychology, and law