

# Curriculum Vitae

Priv.-Doz. Dipl.-Math. Dr. Teimuraz (Temur) Kutsia

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## Contact

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## Personal Information

Born on November 30, 1968, in Abasha, Georgia. Married (three children).

## Education

- 2011: Habilitation in Mathematics. Johannes Kepler University, Linz, Austria
- 2002: PhD degree (Dr. Techn.), Johannes Kepler University, Linz, Austria
- 1998–2002: PhD studies (Doktoratsstudium der technischen Wissenschaften) at the Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria
- 1997: Degree of Candidate of Science in Physics and Mathematics (corresponds to German Dr. rer. Nat.), Tbilisi State University, Tbilisi, Georgia
- 1992–1995: Post-graduate studies, Tbilisi State University, Tbilisi, Georgia
- 1992: Diploma degree in Mathematics, Tbilisi State University, Tbilisi, Georgia
- 1985–1992: Studies at the Dept. of Mechanics and Mathematics, Tbilisi State University, Tbilisi, Georgia (interrupted in 1987–1989, mandatory military service)
- 1974–1985: School education, Abasha, Georgia

## Honors, Fellowships

- 2002: PhD with distinction. Johannes Kepler University, Linz, Austria.
- 1998–1999: Upper Austrian government scholarship.
- 1992: Diploma with honors. Tbilisi State University, Georgia.
- 1986–87, 1989–1992: Special financial grant for excellent studies. Tbilisi State University, Georgia.
- 1985: School graduation with Gold Medal for Excellent Studies. Abasha, Georgia.

## Dissertations

1. T. Kutsia. Solving and Proving in Equational Theories with Sequence Variables and Flexible Arity Symbols. *PhD Thesis*. Johannes Kepler University, Linz, Austria, 2002.  
Thesis advisor: o. Univ. Prof. Dr. Dr. h. c. mult. Bruno Buchberger.
2. T. Kutsia. G-Resolution Based Programming in Three-Valued Logic. *Candidate of Sciences Thesis*. Tbilisi State University, Georgia, 1997.  
Thesis advisors: Prof. Dr. Shalva Pkhakadze, Dr. Jemal Antidze.

## Career History

- Since 2011: Privat-Dozent (associate professor) at Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria.
- Since 2006: Coordinator and the scientific adviser of the activities of the EC FP6 Project SCIENCE—Symbolic Computation Infrastructure for Europe at RISC.
- Since 2004: Member of the faculty, Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria
- Since 2003: Lecturer, Johannes Kepler University, Linz, Austria
- 2002–2006: Post doctoral researcher, Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria
- 2000–2002: Industrial researcher, projects MathSoft (in cooperation with Wolfram Research, Inc.) and ForMI, at the Software Competence Center Hagenberg, Austria
- 1998–2002: Guest researcher, Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria
- 1998: Lecturer at the Departments of Computer Science and Mathematics and Mechanics, Tbilisi State University, Tbilisi, Georgia
- 1995–1998: Researcher at the Vekua Institute of Applied Mathematics, Tbilisi State University, Tbilisi, Georgia
- 1995–1996: Programmer at the State Health Fund, Tbilisi, Georgia
- 1994: Programmer at the Governmental Center of Social Management, Tbilisi, Georgia
- 1994: Teacher at the preparatory courses of the Georgian Technical University, Tbilisi, Georgia
- 1993–1995: Research Assistant at the Vekua Institute of Applied Mathematics, Tbilisi State University, Tbilisi, Georgia

## Research Interests

Unification, rule-based programming, automated reasoning, symbolic computation techniques for unranked terms and hedges and their applications in software science and Web systems.

## Publications

### Edited Books, Journal Special Issues, Proceedings

1. L. Lovacs, T. Kutsia. Editorial. *J. Applied Logic* 10(1):1–2, 2012. (Special Issue on on Automated Specification and Verification of Web Systems.)
2. D. Ballis, T. Kutsia. Foreword. *J. Symbolic Computation* 46(2):93–94, 2011. (Special Issue on on Automated Specification and Verification of Web Systems.)
3. M. Fernández, T. Kutsia, W. Schreiner (editors). Principles and Practice of Declarative Programming. *Proceedings of the 12th International ACM SIGPLAN Symposium, PPDP 2010*, July 26–28, 2010. Hagenberg, Austria. ACM Press, 2010.
4. T. Kutsia. Symbolic computation in software science: Foreword from the editor. *J. Symbolic Computation*. 45(5):499–500, 2010. (Special Issue on Symbolic Computation in Software Science.)
5. H. Anai, K. Horimoto, T. Kutsia (editors). Algebraic Biology. *Proceedings of the 2nd International Conference*. July 2–4, 2007. Hagenberg, Austria. Volume 4545 of the Lecture Notes in Computer Science. Springer, 2007.

### Articles in Journals

6. T. Kutsia, J. Levy, M. Villaret. On the Relation Between Context and Sequence Unification. *J. Symbolic Computation*. 45(1):74–95, 2010.
7. M. Marin, T. Kutsia. On the Computation of Quotients and Factors of Regular Languages. *Frontiers of Computer Science in China*. 4(2):173–184, 2010. Springer.
8. T. Kutsia. Flat Matching. *J. Symbolic Computation*. 43(12):858–873, 2008.
9. T. Kutsia. Solving Equations with Sequence Variables and Sequence Functions. *J. Symbolic Computation*. 42(3):352–388, 2007.
10. B. Buchberger, A. Craciun, T. Jebelean, L. Kovacs, T. Kutsia, K. Nakagawa, F. Piroi, N. Popov, J. Robu, M. Rosenkranz, W. Windsteiger. Theorema: Towards Computer-Aided Mathematical Theory Exploration. *J. Applied Logic*, 4:470–504, 2006.
11. M. Marin, T. Kutsia. Foundations of a Rule-Based System  $\rho$ Log. *J. Applied Non-Classical Logics*, 16(1–2):151–168, 2006.
12. T. Kutsia. Context Sequence Matching for XML. *Electronic Notes on Theoretical Computer Science*, 157(2):47–65, 2006.
13. T. Kutsia. Pattern Unification with Sequence Variables and Flexible Arity Symbols. *Electronic Notes on Theoretical Computer Science*, 66(5):1–18, 2002.

### Refereed Conference Papers in Formal Proceedings

14. T. Kutsia, J. Levy, M. Villaret. Anti-Unification for Unranked Terms and Hedges. In: M. Schmidt-Schauß, editor. *Proceedings of the 22nd International Conference on Rewriting Techniques and Applications, (RTA'11)*. Volume 10 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2011, 219–234.
15. J. Coelho, B. Dundua, M. Florido, T. Kutsia. A Rule-Based Approach to XML Processing and Web Reasoning. In: P. Hitzler and T. Lukasiewicz, editors, *Proceedings of the 4th International Conference on Web Reasoning and Rule Systems, RR 2010*. Volume 6333 of Lecture Notes in Computer Science. Springer, 2010. 164–172.

16. T. Kutsia, M. Marin. Order-Sorted Unification with Regular Expression Sorts. In: Ch. Lynch, editor. *Proceedings of the 21st International Conference on Rewriting Techniques and Applications, (RTA'10)*. Volume 6 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2010. 193–208.
17. M. Marin, T. Kutsia. Regular Hedge Language Factorization Revisited. In: Sheng Yu, editor. *Proceedings of the 14th International Conference on Developments in Language Theory, (DLT'10)*. Volume 6224 of Lecture Notes in Computer Science. Springer, 2010. 328–339.
18. M. Marin, T. Kutsia. Linear Systems for Regular Hedge Languages. In: J. Grundspenkis, M. Kirikova, Y. Manolopoulos, L. Novickis, editors, *Advances in Databases and Information Systems (ADBIS'09). Selected Papers of the Associated Workshops*. Volume 5968 of the Lecture Notes in Computer Science. Springer, 2010. pp. 104–112.
19. B. Dundua, T. Kutsia, M. Marin, Strategies in P $\rho$ Log. In: M. Fernández, editor, *9th International Workshop on Reduction Strategies in Rewriting and Programming (WRS'09). Electronic Proceedings in Theoretical Computer Science*. 15, 2010, pp. 32–43.
20. J. Coelho, M. Florido, T. Kutsia. Collaborative Schema Construction using Regular Sequence Types. In: *Proceedings of the 2009 IEEE International Conference of Information Reuse and Integration (IRI'09)*. 290–295.
21. J. Coelho, M. Florido, T. Kutsia. Sequence Disunification and its Application in Collaborative Schema Construction. In: M. Weske, M.-S. Hacid and C. Godart, editors, *Web Information Systems Engineering—WISE 2007 Workshops*, Volume 4832 of Lecture Notes in Computer Science. Springer, 2007, 91–102.
22. T. Kutsia, J. Levy, M. Villaret. Sequence Unification Through Curryng. In: F. Baader, editor, *Proceedings of the 18th International Conference on Rewriting Techniques and Applications (RTA'07)*. Volume 4533 of the Lecture Notes in Computer Science. Springer, 2007, 288–302.
23. T. Kutsia, M. Marin. Matching with Regular Constraints. In G. Sutcliffe and A. Voronkov, editors, *Logic in Programming, Artificial Intelligence and Reasoning. Proceedings of the 12th International Conference LPAR'05*. Volume 3835 of Lecture Notes in Artificial Intelligence, Springer, 2005, 215–229. (Also as RISC Technical Report 05-05.)
24. F. Piroi, T. Kutsia. The Theorema Environment for Interactive Proof Development. In G. Sutcliffe and A. Voronkov, editors, *Logic in Programming, Artificial Intelligence and Reasoning. Proceedings of the 12th International Conference LPAR'05*. Volume 3835 of Lecture Notes in Artificial Intelligence, Springer, 2005, 261–275.
25. T. Kutsia. Solving Equations Involving Sequence Variables and Sequence Functions. In: B. Buchberger, J.A. Campbell, editors. *Proc. of the 7th International Conference on Artificial Intelligence And Symbolic Computation (AISC'04)*. Volume 3249 Lecture Notes in Artificial Intelligence, Springer, 2004, 157–170. (Also a RISC Technical Report 04-01. Subsumed by the article 9.)
26. T. Kutsia, B. Buchberger. Predicate Logic with Sequence Variables and Sequence Function Symbols. In: A. Asperti, G. Bancerek, A. Trybulec, editors. *Proc. of the 3rd International Conference on Mathematical Knowledge Management (MKM'04)*. Volume 3119 of Lecture Notes in Computer Science, Springer, 2004, 205–219. (Also as RISC Technical Report 05-17.)
27. T. Kutsia. Equational Prover of Theorema. In: R. Nieuwenhuis, editor, *Proceedings of the 14th International Conference on Rewriting Techniques and Applications, RTA'03*. Volume 2706 of Lecture Notes in Computer Science, Springer, 2003, 367–379.

28. T. Kutsia. Theorem Proving with Sequence Variables and Flexible Arity Symbols. In: M. Baaz and A. Voronkov, editors, *Logic in Programming, Artificial Intelligence and Reasoning. Proceedings of the 9th International Conference LPAR'02*. Volume 2514 of Lecture Notes in Artificial Intelligence, Springer, 2002, 278–291.
29. T. Kutsia. Unification with Sequence Variables and Flexible Arity Symbols and its Extension with Pattern-Terms. In J. Calmet, B. Benhamou, O. Caprotti, L. Henocque, and V. Sorge, editors, *Artificial Intelligence, Automated Reasoning and Symbolic Computation. Proceedings of Joint AISC'02 - Calculemus'02 Conference*. Volume 2385 of Lecture Notes in Artificial Intelligence, Springer, 2002, 290–304. (Also as SFB Report 02–06, Johannes Kepler University, Linz.)

### Book Chapter

30. T. Jebelean, B. Buchberger, T. Kutsia, N. Popov, W. Schreiner, W. Windsteiger. Automated Reasoning. In: B. Buchberger et al., editors, *Hagenberg Research*. Springer, 2009. 63–101.

### Miscellaneous

31. T. Kutsia, M. Marin. Matching of Order-Sorted Terms with Regular Expression Sorts and Second-Order Variables. In: A. Bouhoula and T. Ida, editors, *Tunisia-Japan Workshop on Symbolic Computation in Software Science (SCSS'09)*. September 22–24, Gammarth, Tunisia.
32. T. Kutsia, M. Marin. Order-Sorted Unification with Regular Expression Sorts. In: Ch. Lynch and P. Narendran, editors, *23th International Workshop on Unification (UNIF'09)*, August 2, 2009, Montreal, Canada. (Subsumed by the paper 16.)
33. M. Marin, T. Kutsia. On the Computation of Quotients and Factors of Regular Languages. *Sixth Asian Workshop on Foundations of Software (AWFS'09)*, April 6–8, 2009, Tokyo, Japan. (Subsumed by the article 7.)
34. T. Kutsia, M. Marin. Solving Regular Constraints for Hedges and Contexts. In: J. Levy, editor, *Proceedings of the 20th International Workshop on Unification (UNIF'06)*, August 11, 2006, Seattle, USA, 89–107. (Also as RISC Technical report 06–01).
35. T. Kutsia, M. Marin. Can Context Sequence Matching be Used for Querying XML? In: L. Vigneron, editor, *Proceedings of the 19th International Workshop on Unification (UNIF'05)*, April 22, 2005, Nara, Japan, 77–92. (Subsumed by the article 12.)
36. M. Marin, T. Kutsia. A Rule-based Approach to the Implementation of Evaluation Strategies. *Annals of West University of Timisoara*. Volume XLII, Special Issue on Computer Science II, pp. 117–134, 2004.
37. T. Kutsia, M. Marin. Unification Procedure for Terms with Sequence Variables and Sequence Functions (Extended Abstract). In: *Proc. of the 18th International Workshop on Unification (UNIF'04)*, Cork, Ireland, July 5, 2004. (Subsumed by the article 9.)
38. T. Kutsia. Unification Modulo Flatness. In: D. Petcu, D. Zaharie, V. Negru, T. Jebelean, editors, *Proc. of the 5th International Workshop on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC'03)*, October 1–4, 2003, Timisoara, Romania. Mirton, 2003, 135–148. (Also as SFB Report 03–36, Johannes Kepler University, Linz.)
39. M. Marin, T. Kutsia. On the Implementation of a Rule-Based Programming System and some of its Applications. In: B. Konev, R. Schmidt, editor, *Proceedings of the 4th International Workshop on the Implementation of Logics, WIL'03*, September 26, 2003, Almaty, Kazakhstan, 55–68. (Also as SFB Report 03–35, Johannes Kepler University, Linz.)

40. M. Marin, T. Kutsia. Programming with Transformation Rules. *Annals of West University of Timisoara*, Volume XLI, Special Issue on Computer Science, pp. 163–175, 2003.
41. T. Kutsia. Matching in Flat Theories. In: J. Levy, M. Kohlhase, J. Niehren, M. Villaret, editors, *Proceedings of the 17th International Workshop on Unification*, June 8–9, 2003, Valencia, Spain, 57–63. (Also as SFB Report 03–37, Johannes Kepler University, Linz. Subsumed by the article 8.)
42. T. Kutsia, K. Nakagawa. An Interface between Theorema and External Automated Deduction Systems. In: S. Linton and R. Sebastiani (eds.), *Proceedings of 9th Symposium on the Integration of Symbolic Computation and Mechanized Reasoning*, June 21–23, 2001, 178–182, Siena, Italy. (Also as RISC Technical Report 00-29.)
43. T. Kutsia. Unification in the Empty and Flat Theories with Sequence Variables and Flexible Arity Symbols. In: F. Baader, V. Diekert, C. Tinelli, R. Treinen (eds.), *Proceedings of 15th International Workshop on Unification*, June 18–19, 2001, Siena, Italy. (Also as SFB Report 01–13, Johannes Kepler University, Linz.)
44. T. Kutsia. A Framework for Some Semantics of Normal Logic Programs (Extended Abstract). Reports of Enlarged Session of the Seminar of the I. Vekua Institute of Applied Mathematics, Tbilisi, April 21–24, 1998, vol. 13(4), 5 pages, Tbilisi, 1998.
45. T. Kutsia. Semantics and Proof Theory of Disjunctive Logic Programs with Implicative Goals. In: R. Cooper and Th. Gamkrelidze (eds.) *Proceedings of the 2nd International Symposium on Language, Logic and Computation*, Tbilisi, September 15–20, 1997, 160–178, Tbilisi University Press, 1997.
46. T. Kutsia. On Semantics and Proof Theory of Disjunctive Logic Programs with Classical Negation. *Applied Mathematics and Informatics*, vol. 1(1), 96–110, 1996, Tbilisi University Press.
47. T. Kutsia. Description of One Variant of Three-Valued Logic Programming. Reports of Seminar of I. Vekua Institute of Applied Mathematics, no. 22, 53–64, I. Vekua Institute of Applied Mathematics, Tbilisi State University, 1993.

## Technical Reports

48. D. Ballis and T. Kutsia (editors). WWV'09 - Automated Specification and Verification of Web Systems. Preliminary Proceedings. Technical report no. 09-10, Research Institute for Symbolic Computation (RISC), Johannes Kepler University Linz, Austria. 2009.
49. T. Kutsia, M. Marin. Computational Methods in an Algebra of Regular Hedge Expressions. Technical Report 09–03, 39 pages, Research Institute for Symbolic Computation, Johannes Kepler University, Linz. 2009.
50. B. Buchberger, T. Ida, T. Kutsia (editors). SCSS 2008 - Austria-Japan Workshop on Symbolic Computation in Software Science, Proceedings. July 12-13, 2008, Linz, Austria. Technical Report 08-08, Research Institute for Symbolic Computation, Johannes Kepler University, Linz. 2007.
51. T. Kutsia, M. Marin (editors). Extended abstracts of the First Austria-Japan Workshop on Symbolic Computation and Software Verification. July 1, 2007, Linz, Austria. Technical Report 07-09, Research Institute for Symbolic Computation, Johannes Kepler University, Linz. 2007.
52. T. Kutsia. Solving and Proving in Equational Theories with Sequence Variables and Flexible Arity Symbols. PhD Thesis. Technical Report 02–09, 155 pages, Research Institute for Symbolic Computation, Johannes Kepler University, Linz, 2002.

53. T. Kutsia, J. Schicho. Numerical Solving of Constraints of Multivariate Polynomial Strict Inequalities. Technical Report 99–31, 16 pages, Research Institute for Symbolic Computation, Johannes Kepler University, Linz. 1999.
54. T. Kutsia. G-Resolution Based Programming in Three-Valued Logic (Candidate of Science thesis). Technical Report 95–30, 132 pages, Techinform, Tbilisi, 1995 (in Georgian).
55. T. Kutsia. Towards Fixpoint Semantics of General Logic Programs. In: Abstracts of the First International Symposium on Language, Logic and Computation, October 14–19, 1995, Gudauri, Georgia. Human Communication Research Centre, RP-72, 1 page, Edinburgh, UK, 1995.

## Career Related Activities

### Program, Steering, Examination Committees

1. Steering committee member, International Symposium on Principles and Practice of Declarative Programming, PPDP.
2. Steering Committee member, International Workshop on Automated Specification and Verification of Web Systems, WWV.
3. PC member, International Symposium on Symbolic Computation in Software Science, SCSS 2012.
4. PC member, Workshop on Automated Theory Exploration, ATX 2012.
5. PC member, 8th International Workshop on Automated Specification and Verification of Web Systems, WWV 2012.
6. PC member, the 13th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2011.
7. PC member, Advances in the Theory of Computing, AITC 2011, Special Session at SYNASC 2011, the 13th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing.
8. PC member, area co-chair, 9th International Tbilisi Symposium on Language, Logic and Computation, LLC 2011.
9. PC member, 7th International Workshop on Automated Specification and Verification of Web Systems, WWV 2011.
10. Member of the PhD thesis examination committee of Michele Baggi. Department of Computer Science, Technical University of Valencia and Department of Mathematics and Computer Science, University of Siena. November 16, 2010.
11. PC member, 20th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2010.
12. PC member, 12th International Symposium on Principles and Practice of Declarative Programming, PPDP 2010.
13. PC member, 17th International Symposium on on the Integration of Symbolic Computation and Mechanized Reasoning, Calculemus 2010.
14. PC member, the 12th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2010.

15. PC co-chair, 6th International Workshop on Automated Specification and Verification of Web Systems, WWV 2010.
16. PC member, Workshop on Symbolic Computation in Software Science, SCSS 2010.
17. PC member, Workshop on Automated Mathematical Theory Exploration, Automattheo 2010.
18. PC member, 4th International Conference on Algebraic and Numeric Biology, ANB 2010.
19. PC member, 24th International Workshop on Unification, UNIF 2010.
20. PC member, 2nd workshop on Practical Aspects of Automated Reasoning, PAAR 2010.
21. PC co-chair, 5th International Workshop on Automated Specification and Verification of Web Systems, WWV 2009.
22. PC member, area co-chair, 8th International Tbilisi Symposium on Language, Logic and Computation, LLC 2009.
23. PC member, Tunisian-Japanese Workshop on Symbolic Computation in Software Science, SCSS 2009.
24. PC member, 19th International Conference on Rewriting Techniques and Applications, RTA 2008.
25. PC member, 22nd International Workshop on Unification, UNIF 2008.
26. PC member, 8th International Workshop on Reduction Strategies in Rewriting and Programming, WRS 2008.
27. PC co-chair, Austria-Japan Workshop on Symbolic Computation in Software Science, SCSS 2008.
28. PC member, 4th International Workshop on Automated Specification and Verification of Web Systems, WWV 2008.
29. PC member, 3rd International Workshop on Automated Specification and Verification of Web Systems, WWV 2007.
30. Member of the PhD thesis examination committee of Jorge Coelho. Department of Computer Science, University of Porto, Portugal. November 28, 2007.
31. PC co-chair, 2nd International Conference on Algebraic Biology, AB 2007.
32. PC member, 20th International Workshop on Unification, UNIF 2006.
33. Member (in many occasions, chairman) of the final MSc examination committees. Johannes Kepler University International Master's Program Informatics (ISI Hagenberg). Regularly, since 2008.

## Editorship

1. Member of the editorial board, Tbilisi Mathematical Journal.
2. Guest co-editor, special issue of the Journal of Applied Logic on Automated Specification and Verification of Web Systems, 2011.
3. Guest co-editor, special issue of the Journal of Symbolic Computation on Automated Specification and Verification of Web Systems, 2010.
4. Guest editor, special issue of the Journal of Symbolic Computation on Symbolic Computation in Software Science, 2009.

5. Proceedings co-editor, 5th International Workshop on Automated Specification and Verification of Web Systems, WWV 2009.
6. Proceedings co-editor, Austria-Japan Workshop on Symbolic Computation in Software Science, SCSS 2008.
7. Co-editor of the collection of abstracts, Austria-Japan Workshop on Symbolic Computation and Software Verification, SCSV 2007.
8. Proceedings co-editor, 2nd International Conference on Algebraic Biology, AB 2007.

## Reviewing

Refereeing for

- Mathematical Reviews (AMS);
- Journals: SIAM Journal of Computing; Journal of Symbolic Computation; Information and Computation, Journal of Automated Reasoning; Theory and Practice of Logic Programming; Journal of Algorithms in Cognition, Informatics and Logic; Linear Algebra and Applications; Applicable Algebra in Engineering, Communication and Computing; Journal of Applied Non-Classical Logics; Science in China Series F: Information Sciences;
- Georgian National Science Foundation (GNSF);
- Various editions of the international conferences: RTA, LPAR, IJCAR, ISSAC, MFCS, KI, FroCoS, LATA, MKM, Calculemus, TbiLLC, EurAsia-ICT; international workshops.

Second reader of the Chapter 2 (First-Order Logic) of the book Verification of Object-Oriented Software - The KeY approach, volume 4334 of LNCS, Springer, 2007

## Organization and Coordination

1. Conference chair of the 20th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2010. July 23-25, 2010, Hagenberg, Austria.
2. Conference chair of the 12th International ACM SIGPLAN Symposium on Principles and Practice of Declarative Programming, PPDP 2010. July 26-28, 2010, Hagenberg, Austria.
3. Member of the organization committee, Sage Days 24, July 17–22, 2010, Hagenberg, Austria.
4. Member of the RISC Summer 2010 organization committee, June–July 2010, Hagenberg, Austria.
5. Coordinator and organizer of the Fifth RISC/SCIENCE Training School in Symbolic Computation, June 28–July 9, 2010, Hagenberg, Austria.
6. Member of the RISC Summer 2009 organization committee, June–July 2009, Hagenberg, Austria.
7. Coordinator and organizer of the Fourth RISC/SCIENCE Training School in Symbolic Computation, June 29–July 10, 2009, Hagenberg, Austria.
8. Co-organizer of the 5th International Workshop on Automated Specification and Verification of Web Systems, WWV'09. July 2009, Hagenberg, Austria.
9. Organization committee chair of the 19th International Conference on Rewriting Techniques and Applications, RTA'08. July 15–17, 2008, Hagenberg, Austria.

10. Member of the RISC Summer 2008 organization committee, July–August 2008, Hagenberg, Austria.
11. Coordinator and organizer of the Third RISC/SCIENCE Training School in Symbolic Computation, July 7–18, 2008, Hagenberg, Austria.
12. Co-organizer of the Austria-Japan Workshop on Symbolic Computation in Software Science. July 12–13, 2008, Hagenberg, Austria.
13. Co-organizer of the 2nd International Conference on Algebraic Biology, AB'07, July 2–4, 2007, Hagenberg, Austria.
14. Member of the RISC Summer 2007 organization committee, June–July 2007, Hagenberg, Austria.
15. Co-organizer of the First Austria–Japan Workshop on Symbolic Computation and Software Verification, July 1, 2007, Linz, Austria.
16. Coordinator and organizer of the Second RISC/SCIENCE Training School in Symbolic Computation, June 24–July 8, 2007, Hagenberg, Austria.
17. Coordinator and organizer of the First RISC/SCIENCE Training School in Symbolic Computation, February 5–18, 2007, Hagenberg, Austria.
18. Co-organizer of the 20th International Workshop on Unification, UNIF'06. August 2006, Seattle, Washington, USA.
19. Member of the Organizing Committee of the 6th International Conference on Logic for Programming and Automated Reasoning, LPAR'99. September 6–10, 1999, Tbilisi, Georgia.
20. Member of the Organizing Committee of Tbilisi Symposia on Logic, Language and Computation (LLC'95, LLC'97, LLC'99).

### Research Visits, Invited Talks

1. Department of Mathematics and Computer Science, West University of Timisoara, Romania. In October–November 2011.
2. ESF Strategic Workshop on Correct Software in Web Applications. Hagenberg. September 2011.
3. Workshop on Logic and Computer Science. Kurt Gödel Research Center, University of Vienna. In March 2011.
4. Department of Information Systems and Computation, Technical University of Valencia, Spain. In November 2010.
5. Japan–Austria Joint Workshop on ICT. Tokyo, Japan. In October 2010.
6. Institute of Applied Mathematics, Tbilisi State University, Georgia. In September 2010.
7. Invitation to give a talk at the IFIP WG 1.6 (Term Rewriting) meeting, Edinburgh, UK. July 10, 2010.
8. Department of Computer Science and Applied Mathematics, University of Girona, Spain. In June 2010.
9. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan, In March–April 2009.

10. Department of Mathematics and Computer Science, University of Kagoshima, Japan. In April 2009.
11. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. In April 2008.
12. Dagstuhl Seminar on Deduction and Decision Procedures. In October 2007. Schloss Dagstuhl, Germany.
13. SCORE Summer Workshop on Symbolic Computation and Software Verification. Fuji Susono, Japan. In September 2007.
14. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. In August 2007.
15. Austria - Japan Summer Workshop in Term Rewriting. In August 2007. Obergurgl, Austria.
16. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. In May-June 2007.
17. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. In March 2006.
18. Workshop on Formal Gröbner Bases Theory of the Special Semester on Gröbner Bases and Related Methods. Linz, Austria. In March 2006.
19. Computer Science Department, University of Aizu, Aizuwakamatsu, Japan. In March 2006.
20. Austria - Japan Summer Workshop in Term Rewriting. Obergurgl, Austria. In August 2005.

## Conference Participation

Participation in more than 60 conferences and international meetings.

## Teaching, Guest Lectures

### Johannes Kepler University Linz

(In alphabetic order of courses)

1. Algebraic and Discrete Methods in Biology (with Stephan Dreiseitl, Tudor Jebelean, Manuel Kauers, Wolfgang Schreiner, and Wolfgang Windsteiger): SS 2007, SS 2008, SS 2009.
2. Automated reasoning systems: SS 2007, SS 2011.
3. Information systems: WS 2007, WS 2008.
4. Logic programming: WS 2002, WS 2003, WS 2004, WS 2005, WS 2006, WS 2007, WS 2008, WS 2009, WS 2010, WS 2011.
5. Selected algorithms (seminar, with Manuel Kauers): WS 2006, WS 2007, SS 2009.
6. Selected algorithms (seminar, with Manuel Kauers, Veronika Pillwein, and Carsten Schneider): SS 2012.
7. Unification theory: SS 2008, SS 2010, SS 2012.

**International Summer and Training Schools**

8. Matching, Unification, and Generalizations. Invitation to teach at the Fifth International School on Rewriting (ISR 2012), July 2012, Valencia, Spain.
9. Unification. Seventh International Tbilisi Summer School in Logic and Language, September 2011, Tbilisi, Georgia.
10. Unification. Series of lectures at the Fourth Training School in Symbolic Computation. July 2009, Castle of Hagenberg, Austria.
11. Unification. Series of lectures at the Third Training School in Symbolic Computation. July 2008, Castle of Hagenberg, Austria.
12. Introduction to Unification theory. One-week course at the 19th European Summer School in Logic, Language and Information, ESSLLI 2007. Trinity College, Dublin, Ireland. (The course proposal has been selected by the school committee on a competitive basis.)

**Universities Abroad**

13. Unification. Guest lectures at the Department of Mathematics and Computer Science, West University of Timisoara, Romania. (November 2011)
14. Unification. Guest lectures at Computer Science Department, University of Tsukuba, Japan. (March 2009)
15. Logic programming. Tbilisi State University, Georgia. (SS 1998)
16. Programming languages. Tbilisi State University, Georgia. (SS 1998)
17. General mathematics. Preparatory courses of Georgian Technical University, Tbilisi, Georgia. (SS 1994)

**Student Supervision**

- Besik Dundua (PhD, University of Linz and University of Porto, ongoing),
- Noran Azmy (MSc, University of Linz and ISI-Hagenberg, 2010),
- Diana Maris (MSc, University of Linz and ISI-Hagenberg, 2010).

**Project Experience**

- Since 2012: Leader of the Project SToUT: Symbolic Computation Techniques for Unranked Terms, funded by Austrian Science Fund FWF (2012-2015). Budget: 312.763,50 Euro.
- Since 2012: Leader of the Project “Constraint Logic Programming over Unranked Terms and Hedges with Description Operators”, funded by Georgian Rustaveli National Science Foundation (2012-2015). Budget: 150.000,- GEL ( $\approx$  70.000,- Euro).
- Since 2012: Participant in the Project LogicGuard: The Efficient Checking of Time-Quantified Logic Formulas with Applications in Computer Security. Funded by FFG BRIDGE (2012-2013).
- Since 2006: Coordinator and the scientific adviser of the activities of the EC FP6 Project SCIEnc—Symbolic Computation Infrastructure for Europe at RISC. Financial and technical management of the activities with the total budget of 965.000,- Euro, coordination and organization of training events.

- 2006: Preparation of the grant proposal from the Austrian side in Austria-Japan cooperation program, to organize joint seminars between the Theorema group at RISC-Linz, Symbolic Computation Research Group at the University of Tsukuba, and the Software Science Foundation Group at Kyoto University. The seminars have been funded by the FWF and JSPS.
- 1999-2005 Participation in FWF funded projects “Proving and Solving over the Reals”, “Proving and Solving in General Domains” (“Theorema”) within SFB 013.

## Professional Membership

- Since 2005: Member of the Association for Computing Machinery
- Since 2001: Member of the Association for Automated Reasoning
- 1998: Member of the Georgian Mathematicians’ Union
- 1997–99: Member of the Association for Logic Programming

## System Development

1. Since 2008:  $P\rho$ Log—PROLOG implementation of the  $\rho$ Log calculus for rule-based programming. The obtained package extends Prolog with possibilities to formulate strategic transformation rules with conditions over sequences of terms built over variadic function symbols and individual, sequence, function, and context variables.
2. In 2008: Implemented in MATHEMATICA a procedure for solving matching equations in flat theories with individual, function, and sequence variables. The procedure enumerates the minimal complete set of matchers. Other implementations include two terminating incomplete restrictions (one of them simulates MATHEMATICA’s flat matching algorithm) and a complete algorithm that gives a finite description of the infinite solution set as regular expressions over substitutions.
3. In 2006: Implemented in MATHEMATICA an algorithm for solving equations with individual, function, and sequence variables, where no variable occurs more than twice (quadratic equations). The algorithm returns a nondeterministic finite automaton that gives a finite description of the infinite solution set.
4. In 2005–2006: Implemented in PROLOG an algorithm for solving regular context sequence constraints.
5. In 2000–2005: Developed the following packages in the programming language of MATHEMATICA for the project “THEOREMA” (leader: Prof. Bruno Buchberger): equational prover, TPTP to THEOREMA converter, unification procedures for various theories with sequence variables, unification for higher-order patterns, interface between THEOREMA and external deduction systems.
6. In 1998–1999: Project “Proving and Solving over the Reals” (leader: Dr. Josef Schicho): A solver for multivariate polynomial strict inequational constraints, written in C.