

# 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.), Institute of Computational Mathematics, Georgian Academy of Sciences.
- 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

- 2018, March: Visiting fellowship of the University of Liverpool, UK.
- 2016: Elsevier Outstanding Reviewer Recognition, Journal of Computer and System Sciences.
- 2015, April–May: Visiting fellowship of the University of Liverpool, UK.
- 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. Symbolic Computation Techniques for Unranked Terms and Hedges. *Habilitation thesis*. Johannes Kepler University, Linz, Austria, 2011.  
Reviewers: Prof. Maria Paola Bonacina (University of Verona, Italy), Prof. Dr. Jürgen Giesl (RWTH Aachen, Germany), Prof. Tetsuo Ida (University of Tsukuba, Japan), Prof. Jan Willem Klop (VU University Amsterdam, The Netherlands), Prof. Dr. Manfred Schmidt-Schauß (Goethe-Universität Frankfurt am Main, Germany), Prof. Dr. Franz Winkler (Johannes Kepler University, Linz, Austria).
2. 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.
3. 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.
- 2006–2011: 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 and generalization, rule-based programming, automated reasoning, rewriting, symbolic computation techniques for unranked terms and their applications.

## Publications

### Edited Books, Journal Special Issues, Proceedings

1. J. H. Davenport, T. Kutsia. Foreword. *J. Symbolic Computation*. 90:1–2, 2019. (Special Issue on Symbolic Computation in Software Science.)
2. J. Blömer, I. Kotsireas, T. Kutsia, D. Simos (editors). Mathematical Aspects of Computer and Information Sciences. *Proc. 7th International Conference, MACIS 2017*. November 15–17, Vienna, Austria. Volume 10963 of the Lecture Notes in Computer Science. Springer, 2017.
3. A. Bouhoula, B. Buchberger, L. Kovács, T. Kutsia. Foreword. *J. Symbolic Computation*. 69:1–2, 2015. (Special Issue on Symbolic Computation in Software Science.)
4. T. Kutsia, A. Voronkov (editors). Proceedings of the 6th International Symposium on Symbolic Computation in Software Science, SCSS 2014. EPiC Series, Volume 30. EasyChair, 2014.
5. L. Kovács, T. Kutsia (editors). 6th International Workshop on Automated Specification and Verification of Web Systems, WWV 2010. EPiC Series, Volume 18. EasyChair, 2013.
6. L. Kovács, T. Kutsia (editors). Proceedings of the 5th International Symposium on Symbolic Computation in Software Science, SCSS 2013. EPiC Series, Volume 15. EasyChair, 2013.
7. L. Kovács, T. Kutsia. Editorial. *J. Applied Logic* 10(1):1–2, 2012. (Special Issue on Automated Specification and Verification of Web Systems.)
8. D. Ballis, T. Kutsia. Foreword. *J. Symbolic Computation* 46(2):93–94, 2011. (Special Issue on Automated Specification and Verification of Web Systems.)
9. 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.
10. 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.)
11. H. Anai, K. Horimoto, T. Kutsia (editors). Algebraic Biology. *Proceedings of the 2nd International Conference, AB 2007*. July 2–4, 2007. Hagenberg, Austria. Volume 4545 of the Lecture Notes in Computer Science. Springer, 2007.

### Articles in Journals

12. B. Dundua, T. Kutsia, M. Marin. Variadic Equational Matching in Associative and Commutative Theories. *Journal of Symbolic Computation*. Accepted.
13. D. Cerna, T. Kutsia. Higher-Order Pattern Generalization Modulo Equational Theories. *Mathematical Structures in Computer Science*. 30(6), 627–663, 2020.
14. M. Droste, T. Kutsia, G. Rahonis, W. Schreiner. McCarthy-Kleene fuzzy automata and MSO logics. *Information and Computation*. Vol. 272, 104499, 2020.
15. I. Kotsireas, T. Kutsia, D. E. Simos. Constructing orthogonal designs in powers of two via symbolic computation and rewriting techniques. *Annals of Mathematics and Artificial Intelligence*. 88(1), 213–236, 2020.

16. D. Cerna, T. Kutsia. Idempotent anti-unification. *ACM Transactions on Computational Logic*. 21(2), 10:1–10:32, 2020.
17. S. Alves, B. Dundua, M. Florido, T. Kutsia. Pattern-Based Calculi with Finitary Matching. *Logic Journal of IGPL*. 26(2):203–243, 2018.
18. A. Baumgartner, T. Kutsia. Unranked Second-Order Anti-Unification. *Information and Computation*. 253, part 2, 262–286, 2017.
19. A. Baumgartner, T. Kutsia, J. Levy, M. Villaret. Higher-Order Pattern Anti-Unification in Linear Time. *J. Automated Reasoning*. 58(2):293–310, 2017.
20. B. Dundua, M. Florido, T. Kutsia, and M. Marin. CLP(H): Constraint Logic Programming for Hedges. *Theory and Practice of Logic Programming*. 16(2):141–162, 2016.
21. B. Buchberger, T. Jebelean, T. Kutsia, A. Maletzky, W. Windsteiger. Theorema 2.0: Computer-Assisted Natural-Style Mathematics. *J. Formalized Reasoning*. 9(1):149–185, 2016.
22. T. Kutsia, M. Marin. Regular Expression Order-Sorted Unification and Matching. *J. Symbolic Computation*. 67:42–67, 2015.
23. T. Kutsia, J. Levy, M. Villaret. Anti-Unification for Unranked Terms and Hedges. *J. Automated Reasoning*. 52(2):155–190, 2014.
24. T. Kutsia, J. Levy, M. Villaret. On the Relation Between Context and Sequence Unification. *J. Symbolic Computation*. 45(1):74–95, 2010.
25. 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.
26. T. Kutsia. Flat Matching. *J. Symbolic Computation*. 43(12):858–873, 2008.
27. T. Kutsia. Solving Equations with Sequence Variables and Sequence Functions. *J. Symbolic Computation*. 42(3):352–388, 2007.
28. 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.
29. M. Marin, T. Kutsia. Foundations of a Rule-Based System  $\rho$ Log. *J. Applied Non-Classical Logics*, 16(1–2):151–168, 2006.
30. T. Kutsia. Context Sequence Matching for XML. *Electronic Notes on Theoretical Computer Science*, 157(2):47–65, 2006.
31. 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

32. M. Marin, B. Dundua, T. Kutsia. A Rule-Based System for Computation and Deduction in Mathematics. In: S. Escobar and N. Martí-Oliet, editors. *WRLA 2020 – Rewriting Logic and Its Applications, Revised Selected Papers*. Volume 12328 of Lecture Notes in Computer Science, Springer 2020. 57–74.
33. B. Dundua, T. Kutsia, M. Marin, C. Pau. Constraint solving over multiple similarity relations. In: Z. M. Ariola, editor. *Proceedings of the 5th International Conference on Formal Structures for Computation and Deduction, FSCD 2020*. Volume 167 of Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2020. 31:1–31:18.

34. D. Cerna, T. Kutsia. Unital Anti-unification: Type and Algorithms. In: Z. M. Ariola, editor. *Proceedings of the 5th International Conference on Formal Structures for Computation and Deduction, FSCD 2020*. Volume 167 of Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2020. 27:1–27:20. (Also RISC Technical Report 20-20.)
35. B. Dundua, T. Kutsia, M. Marin, M. Rukhaia. Specification and Analysis of ABAC Policies in a Rule-Based Framework. In: G. Jaiani and D. Natroshvili, editors. *Applications of Mathematics and Informatics in Natural Sciences and Engineering, AMINSE 2019*. Volume 334 of Springer Proceedings in Mathematics & Statistics. Springer, Cham. 2020. 101–116.
36. B. Dundua, T. Kutsia, M. Marin, C. Pau. Extending the  $\rho$ Log Calculus with Proximity Relations. In: G. Jaiani and D. Natroshvili, editors. *Applications of Mathematics and Informatics in Natural Sciences and Engineering, AMINSE 2019*. Volume 334 of Springer Proceedings in Mathematics & Statistics. Springer, Cham. 2020. 83–100.
37. T. Kutsia, C. Pau. Solving Proximity Constraints. In: M. Gabbrielli, editor. *Proceedings of The 29th International Symposium on Logic-based Program Synthesis and Transformation, LOPSTR 2019*. Vol. 12042 of Lecture Notes in Computer Science, Springer, 2020, 107–122. (Also RISC Technical Report 19-06.)
38. B. Dundua, T. Kutsia, M. Marin. Variadic Equational Matching. In: C. Kaliszyk, E. Brady, A. Kohlhase, C. Sacerdoti Coen, editors. *Proceedings of the 12th Conference on Intelligent Computer Mathematics, CICM 2019*. Vol. 11617 of Lecture Notes in Computer Science, Springer, 2019, 77–92.
39. M. Marin, T. Kutsia, B. Dundua. A Rule-based Approach to the Decidability of Safety of  $ABAC_\alpha$ . In: F. Kerschbaum, A. Mashatan, J. Niu, and A. J. Lee, editors. *Proceedings of the 24th ACM Symposium on Access Control Models and Technologies, SACMAT 2019*. ACM 2019, 173–178.
40. D. Cerna, T. Kutsia. A Generic Framework for Higher-Order Generalizations. In: H. Geuvers, editor. *Proceedings of the Fourth Conference on Formal Structures for Computation and Deduction, FSCD 2019*. Volume 131 of Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2019, 10:1–10:19. (Also as RISC Technical Report 19-01.)
41. A. Baumgartner, T. Kutsia, J. Levy, M. Villaret. Term-Graph Anti-Unification. In: H. Kirchner, editor. *Proceedings of the Third Conference on Formal Structures for Computation and Deduction, FSCD 2018*. Volume 108 of Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2018, 9:1–9:16. (Also as RISC Technical Report 18-02.)
42. D. Cerna, T. Kutsia. Higher-Order Equational Pattern Anti-Unification. In: H. Kirchner, editor. *Proceedings of the Third Conference on Formal Structures for Computation and Deduction, FSCD 2018*. Volume 108 of Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2018, 12:1–12:17. (Also as RISC Technical Report 18-01.)
43. M. Droste, T. Kutsia, G. Rahonis, W. Schreiner. MK-Fuzzy Automata and MSO Logics. In: P. Bouyer, A. Orlandini, and P. San Pietro, editors. *Proceedings of the Eighth International Symposium on Games, Automata, Logics, and Formal Verification, GandALF 2017*. Electronic Proceedings in Theoretical Computer Science, 256, pages 106–120.
44. M. Schmidt-Schauss, T. Kutsia, J. Levy, M. Villaret. Nominal Unification of Higher Order Expressions with Recursive Let. In: M. V. Hermenegildo and P. Lopez-Garcia, editors. *Proc. 26th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2016*. Volume 10184 of Lecture Notes in Computer Science. Springer, 2017, 328–344.
45. B. Dundua, T. Kutsia, K. Reisenberger-Hagmayer. An Overview of  $P\rho$ Log. In: Y. Lierler and W. Taha. *Proceedings of the 19th International Symposium on Practical Aspects of Declarative Languages, PADL 2017*. Volume 10137 of Lecture Notes in Computer Science. Springer, 2017, 34–49.

46. B. Dundua, T. Kutsia, K. Reisenberger-Hagmayer. P $\rho$ Log: Combining Logic Programming with Conditional Transformation Systems (Tool Description). In: M. Carro, A. King, N. Saeedloei, and M. De Vos. *Technical Communications of the 32nd International Conference on Logic Programming, ICLP 2016*. Vol. 52 of OpenAccess Series in Informatics (OASICs). Schloss Dagstuhl, 2016, 10.1–10.5.
47. D. Cerna, W. Schreiner, T. Kutsia. Predicting Space Requirements for a Stream Monitor Specification Language. In: Y. Falcone and C. Sanchez, editors. *Proceedings of the 16th International Conference on Runtime Verification, RV 2016*. Volume 10012 of Lecture Notes in Computer Science. Springer, 2016, 136–151.
48. B. Konev, T. Kutsia. Anti-Unification of Concepts in Description Logic  $\mathcal{EL}$ . In: C. Baral, J.P. Delgrande, and F. Wolter, editors. *Proceedings of the 15th International Conference on Principles of Knowledge Representation and Reasoning, KR 2016*. The AAAI Press, 2016, 227–236. (Also as RISC Technical Report 15-20.)
49. D. Cerna, W. Schreiner, T. Kutsia. Space Analysis of a Predicate Logic Fragment for the Specification of Stream Monitors. In: J. H. Davenport and F. Ghourabi, editors. *Proceedings of the 7th International Symposium on Symbolic Computation in Software Science, SCSS 2016*. EPiC Series, Volume 39, EasyChair, 2016, 29–41.
50. M. Marin, T. Kutsia, B. Dundua. A Rewrite-based Computational Model for Functional Logic Programming. In: J. H. Davenport and F. Ghourabi, editors. *Proceedings of the 7th International Symposium on Symbolic Computation in Software Science, SCSS 2016*. EPiC Series, Volume 39, EasyChair, 2016, 95–106.
51. B. Dundua, M. Florido, T. Kutsia. Lambda Calculus with Regular Types. In: *Proceedings of the 17th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2015*. IEEE Computer Society. 2016, 129–136.
52. I. Kotsireas, T. Kutsia, D. Simos. Constructing Orthogonal Designs in Powers of Two: Gröbner Bases Meet Equational Unification. In: M. Fernández, editor. *Proceedings of the 26th International Conference on Rewriting Techniques and Applications, RTA 2015*. Vol. 36 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2015, 241–256.
53. A. Baumgartner, T. Kutsia, J. Levy, M. Villaret. Nominal Anti-Unification. In: M. Fernández, editor. *Proceedings of the 26th International Conference on Rewriting Techniques and Applications, RTA 2015*. Vol. 36 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2015, 57–73. (Also as RISC Technical Report 15-03.)
54. A. Baumgartner, T. Kutsia. A Library of Anti-unification Algorithms. In: E. Fermé, J. Leite, editors. *Logics in Artificial Intelligence – 14th European Conference, JELIA 2014*. Volume 8761 of Lecture Notes in Computer Science. Springer, 2014, 543–557. (Also as RISC Technical Report 14-07.)
55. A. Baumgartner, T. Kutsia. Unranked Second-Order Anti-Unification. In: U. Kohlenbach, editor. *Proceedings of the 21st Workshop on Logic, Language, Information and Computation, WoLLIC 2014*. Volume 8652 of Lecture Notes in Computer Science. Springer, 2014, 66–80. (Also as RISC Technical Report 14-05.)
56. B. Dundua, M. Florido, T. Kutsia, M. Marin. Constraint Logic Programming for Hedges: a Semantic Reconstruction. In: M. Codish and E. Sumii, editors. *Proceedings of the 12th International Symposium on Functional and Logic Programming, FLOPS 2014*. Volume 8475 of Lecture Notes in Computer Science. Springer, 2014, 285–301. (Also as RISC Technical Report 14-02.)
57. A. Baumgartner, T. Kutsia, J. Levy, M. Villaret. A Variant of Higher-Order Anti-Unification. In: F. van Raamsdonk, editor. *Proceedings of the 24th International Conference on Rewriting Techniques and Applications, RTA’13*. Volume 21 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2013, 113–127. (Also as RISC Technical Report 12-19.)

58. T. Kutsia, M. Marin. Solving, Reasoning, and Programming in Common Logic. In: A. Voronkov, editor. *Proceedings of the 13th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2012*. IEEE Computer Society, 2012, 119–126. (Also as RISC Technical Report 12-15.)
59. 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 2011*. Volume 10 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2011, 219–234. (Also as RISC Technical Report 11-03.)
60. 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.
61. T. Kutsia, M. Marin. Order-Sorted Unification with Regular Expression Sorts. In: Christopher Lynch, editor. *Proceedings of the 21st International Conference on Rewriting Techniques and Applications, RTA 2010*. Volume 6 of the Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl, 2010, 193–208.
62. 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 2010*. Volume 6224 of Lecture Notes in Computer Science. Springer, 2010, 328–339.
63. 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 2009. Selected Papers of the Associated Workshops*. Volume 5968 of the Lecture Notes in Computer Science. Springer, 2010, 104–112.
64. 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 2009. Electronic Proceedings in Theoretical Computer Science*. 15, 2010, 32–43.
65. 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 2009*. IEEE Systems, Man, and Cybernetics Society, 2009, 290–295.
66. 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.
67. T. Kutsia, J. Levy, M. Villaret. Sequence Unification Through Currying. In: F. Baader, editor, *Proceedings of the 18th International Conference on Rewriting Techniques and Applications, RTA 2007*. Volume 4533 of the Lecture Notes in Computer Science. Springer, 2007, 288–302.
68. 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 2005*. Volume 3835 of Lecture Notes in Artificial Intelligence. Springer, 2005, 215–229. (Also as RISC Technical Report 05-05.)
69. 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 2005*. Volume 3835 of Lecture Notes in Artificial Intelligence. Springer, 2005, 261–275.



70. T. Kutsia. Solving Equations Involving Sequence Variables and Sequence Functions. In: B. Buchberger, J.A. Campbell, editors. *Proceedings of the 7th International Conference on Artificial Intelligence And Symbolic Computation, AISC 2004*. Volume 3249 Lecture Notes in Artificial Intelligence. Springer, 2004, 157–170. (Also as RISC Technical Report 04-01. Subsumed by the article 27.)
71. T. Kutsia, B. Buchberger. Predicate Logic with Sequence Variables and Sequence Function Symbols. In: A. Asperti, G. Bancerek, A. Trybulec, editors. *Proceedings of the 3rd International Conference on Mathematical Knowledge Management, MKM 2004*. Volume 3119 of Lecture Notes in Computer Science. Springer, 2004, 205–219. (Also as RISC Technical Report 05-17.)
72. T. Kutsia. Equational Prover of Theorema. In: R. Nieuwenhuis, editor, *Proceedings of the 14th International Conference on Rewriting Techniques and Applications, RTA 2003*. Volume 2706 of Lecture Notes in Computer Science. Springer, 2003, 367–379.
73. 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 2002*. Volume 2514 of Lecture Notes in Artificial Intelligence. Springer, 2002, 278–291.
74. 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 2002 - Calculemus 2002 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

75. 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.

## Other Refereed Publications

76. N. Amiridze, T. Kutsia. Anti-Unification and Natural Language Processing. In: A. Asudeh, V. de Paiva, L. Moss, eds. *Fifth Workshop Natural Language and Computer Science, NLCS'18*. July 7, 2018, Oxford, UK. The paper appeared as EasyChair Preprint no. 203, 12 pages.
77. T. Kutsia, C. Pau. Proximity-Based Generalization. In: M. Ayala-Rincon and P. Balbiani, eds., *32nd International Workshop on Unification, UNIF'18*. July 7, 2018, Oxford, UK.
78. D. Cerna, T. Kutsia. Towards Generalization Methods for Purely Idempotent Equational Theories. In: M. Ayala-Rincon and P. Balbiani, eds., *32nd International Workshop on Unification, UNIF'18*. July 7, 2018, Oxford, UK.
79. T. Kutsia, N. Amiridze. Word Search Sequences in Scientific Discussions: Giving Talks in Georgian. In: *Abstracts of the 14th International Pragmatics Conference*. July 26–31, 2015, 552–553, Antwerp, Belgium.
80. A. Baumgartner, T. Kutsia, J. Levy, and M. Villaret. Nominal Anti-Unification. In: T. Kutsia and Ch. Ringeissen, editors, *28th International Workshop on Unification, UNIF'14*. July 13, 2014, 62–69, Vienna, Austria. (Subsumed by the paper 53.)
81. S. Alves, B. Dundua, M. Florido, and T. Kutsia. A Confluent Pattern Calculus with Hedge Variables. In: N. Hirokawa and V. van Oostrom, editors, *2nd International Workshop on Confluence, IWC'13*. June 28, 2013, 41–45, Eindhoven, The Netherlands.
82. T. Kutsia. Anti-Unification: Algorithm and Applications. In: B. Morawska and K. Korovin, editors, *27th International Workshop on Unification, UNIF'13*. June 27, 2013, p.2, Eindhoven, The Netherlands.

83. A. Baumgartner and T. Kutsia. Unranked Anti-Unification with Hedge and Context Variables. In: B. Morawska and K. Korovin, editors, *27th International Workshop on Unification, UNIF'13*. June 27, 2013, 13–21, Eindhoven, The Netherlands.
84. T. Kutsia, M. Marin. Matching of Order-Sorted Terms with Regular Expression Sorts and Second-Order Variables. In: A. Bouhoula and T. Ida, editors, *Proceedings of the Tunisia-Japan Workshop on Symbolic Computation in Software Science, SCSS'09*. September 22–24, Gammarth, Tunisia.
85. T. Kutsia, M. Marin. Order-Sorted Unification with Regular Expression Sorts. In: Ch. Lynch and P. Narendran, editors, *Proceedings of the 23th International Workshop on Unification, UNIF'09*, August 2, 2009, Montreal, Canada. (Subsumed by the paper 61.)
86. 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 25.)
87. 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).
88. 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 30.)
89. 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.
90. T. Kutsia, M. Marin. Unification Procedure for Terms with Sequence Variables and Sequence Functions (Extended Abstract). In: *Proceedings of the 18th International Workshop on Unification, UNIF'04*, Cork, Ireland, July 5, 2004. (Subsumed by the article 27.)
91. T. Kutsia. Unification Modulo Flatness. In: D. Petcu, D. Zaharie, V. Negru, T. Jebelean, editors, *Proceedings 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.)
92. 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.)
93. 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.
94. 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 26.)
95. T. Kutsia, K. Nakagawa. An Interface between Theorema and External Automated Deduction Systems. In: S. Linton and R. Sebastiani, editors, *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.)
96. 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, editors, *Proceedings of 15th International Workshop on Unification*, June 18–19, 2001, Siena, Italy. (Also as SFB Report 01–13, Johannes Kepler University, Linz.)

97. T. Kutsia. Semantics and Proof Theory of Disjunctive Logic Programs with Implicative Goals. In: R. Cooper and Th. Gamkrelidze, editors, *Proceedings of the 2nd International Symposium on Language, Logic and Computation*, Tbilisi, September 15–20, 1997, 160–178, Tbilisi University Press, 1997.

## Technical Reports and Non-Refereed Publications

98. M. Schmidt-Schauss, T. Kutsia, J. Levy, M. Villaret. Nominal Unification of Higher Order Expressions with Recursive Let. Technical report no. 16-03, Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria, 2016.
99. W. Schreiner, D. Cerna, T. Kutsia, M. Krieger, B. Ahmad, H. Otto, M. Rummerstorfer, T. Gössl. Practical Event Monitoring in the LogicGuard Framework. In: M. Sturm, editor, *Embedded World Conference 2016*, February 23–25, 2016, Nuremberg, Germany.
100. W. Schreiner, T. Kutsia, D. Cerna, M. Krieger, B. Ahmad, H. Otto, M. Rummerstorfer, T. Gössl. The LogicGuard Stream Monitor Specification Language. Tutorial and Reference Manual. Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria. Technical report, October 2015.
101. W. Schreiner, T. Kutsia, M. Krieger, B. Ahmad, H. Otto, M. Rummerstorfer. Securing Device Communication by Predicate Logic Specifications. In: Matthias Sturm, editor, *Embedded World Conference 2015*, February 24–26 2015, Nuremberg, Germany.
102. T. Kutsia, A. Voronkov (editors). Short Paper Proceedings of the 6th International Symposium on Symbolic Computation in Software Science, SCSS 2014. Technical report no. 14-11, Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria. 2014.
103. T. Kutsia, W. Schreiner. Verifying the Soundness of Resource Analysis for LogicGuard Monitors (Revised Version). Technical report no. 14-08. Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria. 2014.
104. W. Schreiner, T. Kutsia, M. Krieger, A. Bashar, H. Otto, M. Rummerstorfer. Monitoring Network Traffic by Predicate Logic. Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria. Technical report, September 2014.
105. T. Kutsia, Ch. Ringeissen (editors). Proceedings of the 28th International Workshop on Unification, UNIF 2014. Technical report no. 14-06, Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria. 2014.
106. W. Schreiner, T. Kutsia. A Resource Analysis for LogicGuard Monitors. Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria. Technical report, December 17, 2013.
107. T. Kutsia, W. Schreiner. Verifying the Soundness of Resource Analysis for LogicGuard Monitors, Part 1. Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria. Technical report, December 16, 2013.
108. S. Alves, B. Dundua, M. Florido, T. Kutsia. A Dynamic Pattern Calculus with Hedge Variables. Technical report no. 12-20, Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria. 2012.
109. T. Kutsia, M. Marin. Regular Expression Order-Sorted Unification and Matching. Technical report no. 12-14, Research Institute for Symbolic Computation, University of Linz, Austria. 2012.
110. T. Kutsia, W. Schreiner. Translation Mechanism for the LogicGuard Abstract Language. Technical report no. 12-11, Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria. 2012.

111. T. Kutsia, W. Schreiner. LogicGuard Abstract Language. Technical report no. 12-08, Research Institute for Symbolic Computation, Johannes Kepler University Linz, Austria. 2012.
112. 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, Johannes Kepler University Linz, Austria. 2009.
113. 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.
114. 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.
115. 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.
116. 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.
117. 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.
118. 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.
119. 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.
120. T. Kutsia. G-Resolution Based Programming in Three-Valued Logic (Candidate of Science thesis). Technical Report 95-30, 132 pages, Techninform, Tbilisi, 1995 (in Georgian).
121. 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.
122. 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.

## Research Projects

- Since 2016: Leader of the Project GALA: Generalization Algorithms and Applications. Austrian Science Fund (FWF).
- 2012-2016: Leader of the Project SToUT: Symbolic Computation Techniques for Unranked Terms. Austrian Science Fund (FWF).
- 2015-2018: Leader of the project "Rewriting-based usage control". Georgian Rustaveli National Science Foundation.
- 2012-2015: Leader of the Project "Constraint Logic Programming over Unranked Terms and Hedges with Description Operators", Georgian Rustaveli National Science Foundation.

- 2012–2013: Participant in the Project LogicGuard: The Efficient Checking of Time-Quantified Logic Formulas with Applications in Computer Security. Austrian FFG BRIDGE.
- 2006–2011: Coordinator and the scientific adviser of the activities of the Project SCIENCE (Symbolic Computation Infrastructure for Europe) at RISC. European Commission Framework Program 6 (EC FP6).
- 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.

## Teaching, Guest Lectures, Student Supervision

### 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 (lecture and exercises, with Tudor Jebelean): WS 2013–WS 2019, every other year.
3. Automated reasoning systems: SS 2007, SS 2011, SS 2013.
4. Automated theorem proving I (project seminar, with Bruno Buchberger, Tudor Jebelean, and Wolfgang Windsteiger): WS 2014, WS 2015, 2016–2019 (every semester).
5. Design and analysis of algorithms, WS 2018.
6. Functional programming, SS 2019, SS 2020.
7. Information systems: WS 2007, WS 2008.
8. Logic programming: WS 2002–WS 2019, every year.
9. Programming in Mathematica: SS 2016–SS 2020, every year.
10. Rewriting in computer science and logic: SS 2013–SS 2019, every other year.
11. Selected algorithms (seminar, with Manuel Kauers): WS 2006, WS 2007, SS 2009.
12. Selected algorithms (seminar, with Manuel Kauers, Veronika Pillwein, and Carsten Schneider): SS 2012.
13. Unification theory: SS 2008–SS 2020, every other year.

### International Summer and Training Schools

14. Proving and Solving in Unranked Logical Theories. Summer School “Logic, Language and Artificial Intelligence”. September 2019, Tbilisi, Georgia.
15. Automated Reasoning. Winter School on Theoretical Foundations of Computer Science. February 2019. Tbilisi, Georgia.
16. Solving Equational Problems. Ninth International School on Rewriting (ISR 2017), July 2017. Eindhoven, The Netherlands.

17. Matching, Unification, and Generalizations. Fifth International School on Rewriting (ISR 2012), July 2012, Valencia, Spain.
18. Unification. Seventh International Tbilisi Summer School in Logic and Language, September 2011, Tbilisi, Georgia.
19. Unification. Series of lectures at the Fourth Training School in Symbolic Computation. July 2009, Castle of Hagenberg, Austria.
20. Unification. Series of lectures at the Third Training School in Symbolic Computation. July 2008, Castle of Hagenberg, Austria.
21. 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

22. Selected Topics from Unification Theory. Mini-course at the Departments of Mathematics and Computer Science, University of Brasilia, Brazil. (April 2015)
23. Unification. Guest lectures at the Department of Mathematics and Computer Science, West University of Timisoara, Romania. (November 2011)
24. Unification. Guest lectures at Computer Science Department, University of Tsukuba, Japan. (March 2009)
25. Logic programming. Tbilisi State University, Georgia. (SS 1998)
26. Programming languages. Tbilisi State University, Georgia. (SS 1998)
27. General mathematics. Preparatory courses of Georgian Technical University, Tbilisi, Georgia. (SS 1994)

### Doctoral and Master Student Supervision

- Ongoing: supervision of one PhD and two master theses.
- Completed Phd theses:
  - Alexander Baumgartner (PhD, University of Linz, 2015),
  - Besik Dundua (PhD, University of Porto, 2014).
- Completed MSc theses:
  - Ahmed Taha (MSc, University of Linz, 2019),
  - Ibrahim Hindi (MSc, University of Linz, 2019),
  - Daniel Sebastian San Martin (MSc, University of Linz, 2018),
  - Michaela Stanoiu (MSc, University of Linz, 2018),
  - Salman ElDash (MSc, University of Linz, 2018),
  - Ahmed ElFiky (MSc, University of Linz, 2018),
  - Ching Yi Chang (MSc, University of Linz, 2018),
  - Alia Adli (MSc, University of Linz, 2017),
  - Madalina Diaconu (MSc, University of Linz, 2017),
  - Mohamed El Nemr (MSc, University of Linz, 2017),

- Sin-Jie Wang (MSc, University of Linz, 2017, advising jointly with Bruno Buchberger),
- Andras Merli (MSc, University of Linz and ISI-Hagenberg, 2016),
- Sharif ElHefnawy (MSc, University of Linz and ISI-Hagenberg, 2014),
- Noran Azmy (MSc, University of Linz and ISI-Hagenberg, 2010),
- Diana Maris (MSc, University of Linz and ISI-Hagenberg, 2010).

## Committees

### Program Committees of International Conferences

#### Chairmanship

1. 9th International Symposium on Symbolic Computation in Software Science, SCSS 2020.
2. The 34th International Workshop on Unification, UNIF 2020 (with Andrew A. Marshall).
3. 7th International Conference on Mathematical Aspects of Computer and Information Sciences, MACIS 2017 (with Johannes Blömer).
4. 6th International Symposium on Symbolic Computation in Software Science, SCSS 2014 (with Andrei Voronkov).
5. The 28th International Workshop on Unification, UNIF 2014 (with Christophe Ringeissen).
6. Area co-chair of the 9th International Tbilisi Symposium on Language, Logic and Computation, TbiLLC 2011 (with Jerome Lang).
7. 6th International Workshop on Automated Specification and Verification of Web Systems, WWV 2010 (with Laura Kovács).
8. 5th International Workshop on Automated Specification and Verification of Web Systems, WWV 2009 (with Demis Ballis).
9. Area co-chair of the 8th International Tbilisi Symposium on Language, Logic and Computation, TbiLLC 2009 (with R. Ramanujam).
10. Austrian-Japanese Workshop on Symbolic Computation in Software Science. SCSS 2008 (with Bruno Buchberger und Tetsuo Ida).
11. 2nd International Conference on Algebraic Biology, AB 2007 (with Hirokazu Anai und Katsuhisa Horimoto).
12. 1st Austria–Japan Workshop on Symbolic Computation and Software Verification. SCSV 2007 (with Mircea Marin).

#### Membership

13. 6th International Conference on Formal Structures for Computation and Deduction, FSCD 2021.
14. 30th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2020.
15. 13th Conference on Intelligent Computer Mathematics, CICM 2020.
16. The 4th Working Formal Methods Symposium, FROM 2020.
17. The 22nd International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2020.

18. 33rd International Workshop on Unification, UNIF 2019.
19. The 21st International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2019.
20. 32nd International Workshop on Unification, UNIF 2018.
21. The 20th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2018.
22. 10th Conference on Intelligent Computer Mathematics, CICM 2017.
23. 8th International Symposium on Symbolic Computation in Software Science, SCSS 2017.
24. The 19th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2017.
25. 31st International Workshop on Unification, UNIF 2017.
26. The 18th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2016.
27. 30th International Workshop on Unification, UNIF 2016.
28. 11th Workshop on Logical and Semantic Frameworks, with Applications, LSFA 2016.
29. 7th International Symposium on Symbolic Computation in Software Science, SCSS 2016.
30. 20th International Conference on Logic for Programming Artificial Intelligence and Reasoning, LPAR 2015.
31. 26th International Conference on Rewriting Techniques and Applications, RTA 2015.
32. 29th International Workshop on Unification, UNIF 2015.
33. The 17th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2015.
34. 16th International Symposium on Principles and Practice of Declarative Programming, PPDP 2014.
35. The 16th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2014.
36. 19th International Conference on Logic for Programming Artificial Intelligence and Reasoning, LPAR 2013.
37. 24th International Conference on Rewriting Techniques and Applications, RTA 2013.
38. 5th International Symposium on Symbolic Computation in Software Science, SCSS 2013.
39. The 15th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2013.
40. Conferences on Intelligent Computer Mathematics, CICM 2013.
41. International Symposium on Symbolic Computation in Software Science, SCSS 2012.
42. The 14th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2012.
43. Workshop on Automated Theory Exploration, ATX 2012.



44. 8th International Workshop on Automated Specification and Verification of Web Systems, WWV 2012.
45. The 13th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2011.
46. 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.
47. 7th International Workshop on Automated Specification and Verification of Web Systems, WWV 2011.
48. 20th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2010.
49. 12th International Symposium on Principles and Practice of Declarative Programming, PPDP 2010.
50. 17th International Symposium on on the Integration of Symbolic Computation and Mechanized Reasoning, Calculemus 2010.
51. The 12th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2010.
52. Workshop on Symbolic Computation in Software Science, SCSS 2010.
53. Workshop on Automated Mathematical Theory Exploration, Automatheo 2010.
54. 4th International Conference on Algebraic and Numeric Biology, ANB 2010.
55. 24th International Workshop on Unification, UNIF 2010.
56. 2nd workshop on Practical Aspects of Automated Reasoning, PAAR 2010.
57. Tunisian-Japanese Workshop on Symbolic Computation in Software Science, SCSS 2009.
58. 19th International Conference on Rewriting Techniques and Applications, RTA 2008.
59. 22nd International Workshop on Unification, UNIF 2008.
60. 8th International Workshop on Reduction Strategies in Rewriting and Programming, WRS 2008.
61. 4th International Workshop on Automated Specification and Verification of Web Systems, WWV 2008.
62. 3rd International Workshop on Automated Specification and Verification of Web Systems, WWV 2007.
63. 20th International Workshop on Unification, UNIF 2006.

### Steering Committees

1. Steering committee co-chair, International Symposium on Symbolic Computation in Software Science, SCSS.
2. Steering committee member. International Conference on Mathematical Aspects of Computer and Information Sciences, MACIS.
3. Steering committee member, International Workshop on Unification, UNIF.
4. Steering committee member, International Symposium on Principles and Practice of Declarative Programming, PPDP (2010–2015).

5. Standing committee member, International Tbilisi Symposium on Language, Logic and Computation, TbiLLC.
6. Steering Committee member, International Workshop on Automated Specification and Verification of Web Systems, WWV.

## Examination and Qualification Committees

1. Member of the PhD thesis defense committee (national expert) of Simon Wolfsteiner. Technical University of Vienna. June 2020.
2. Member of the PhD thesis defense committee of Washington Luís Ribeiro de Carvalho Segundo. Universidade de Brasília, Brazil. February 2019.
3. Member of the PhD thesis defense committee of Duy Duc Nguyen. Reviewer of the thesis. Ecole Doctorale Sciences pour l'Ingénieur et Microtechniques (SPIM), Université de Franche-Comté, Besançon, France, January 2017.
4. Member of the habilitation committee of Bernhard Moser. Faculty of Technical and Natural Sciences, Johannes Kepler University Linz. December 2016 – March 2017.
5. Member of the habilitation committee of Wolfgang Windsteiger. Faculty of Technical and Natural Sciences, Johannes Kepler University Linz. December 2014 – March 2015.
6. Member of the PhD thesis defense committee of Adrià Gascón. Department of Languages and Computer Systems, Technical University of Catalonia, Barcelona. May 30, 2014.
7. 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.
8. Member of the PhD thesis examination committee of Jorge Coelho. Department of Computer Science, University of Porto, Portugal. November 28, 2007.
9. Member (in many occasions, chairman) of the final MSc examination committees. Johannes Kepler University International Master's Program in Informatics. Regularly, since 2008.

## Editorship, Reviewing

### Editorial Boards

1. Journal of Symbolic Computation (since 2020).
2. Tbilisi Mathematical Journal (since 2014).

### Editorship

1. Guest co-editor (with James H. Davenport), special issue of the Journal of Symbolic Computation on Symbolic Computation in Software Science, 2019.
2. Proceedings co-editor (with Johannes Blömer, Ilias S. Kotsireas, and Dimitris E. Simos), 7th International Conference on Mathematical Aspects of Computer and Information Sciences, MACIS 2017.
3. Organizing refereeing for submissions to the Journal of Symbolic Computation. Two articles, 2014.
4. Proceedings co-editor (with Andrei Voronkov), 6th International Symposium on Symbolic Computation in Software Science, SCSS 2014.

5. Proceedings co-editor (with Christophe Ringeissen), 28th International Workshop on Unification, UNIF 2014.
6. Guest co-editor (with Adel Bouhoula, Bruno Buchberger, and Laura Kovács), special issue of the Journal of Symbolic Computation on Symbolic Computation in Software Science, 2014.
7. Proceedings co-editor (with Laura Kovács), 5th International Symposium on Symbolic Computation in Software Science, SCSS 2013.
8. Guest co-editor (with Laura Kovács), special issue of the Journal of Applied Logic on Automated Specification and Verification of Web Systems, 2011.
9. Guest co-editor (with Demis Ballis), special issue of the Journal of Symbolic Computation on Automated Specification and Verification of Web Systems, 2010.
10. Guest editor, special issue of the Journal of Symbolic Computation on Symbolic Computation in Software Science, 2009.
11. Proceedings co-editor (with Demis Ballis), 5th International Workshop on Automated Specification and Verification of Web Systems, WWV 2009.
12. Proceedings co-editor (with Bruno Buchberger and Tetsuo Ida), Austria-Japan Workshop on Symbolic Computation in Software Science, SCSS 2008.
13. Proceedings co-editor (with Hirokazu Anai and Katsuhisa Horimoto), 2nd International Conference on Algebraic Biology, AB 2007.
14. Co-editor of the collection of abstracts (with Mircea Marin), Austria-Japan Workshop on Symbolic Computation and Software Verification, SCSV 2007.

## Reviewing

Refereeing for

- Mathematical Reviews (AMS), Zentralblatt MATH; Computing Reviews.
- Journals: American Mathematical Monthly (2014); Applicable Algebra in Engineering, Communication and Computing (2008), Formal Aspects of Computing (2013), Information and Computation (2011), Journal of Algorithms in Cognition, Informatics and Logic (2009), Journal of Applied Logic (2017), Journal of Applied Non-Classical Logics (2005), Journal of Automated Reasoning (2006, 2015), Journal of Computer and System Sciences (2016, 2020), Journal of Logical and Algebraic Methods in Programming (2020), Journal of Symbolic Computation (2008, 2009, 2013), Linear Algebra and Applications (2011), Logical Methods in Computer Science (2014, 2019), Mathematical Structures in Computer Science (2019, 2020), Mathematics in Computer Science (2019), Science in China Series F: Information Sciences (2009), SIAM Journal on Computing (2010), The Journal of Logic and Algebraic Programming (2012), Theory and Practice of Logic Programming (2007, 2020).
- Georgian National Science Foundation (GNSF) and Shota Rustaveli National Science Foundation (evaluating project proposals).
- Georgian Ministry of Education and Science (evaluation of proposals of research institutes).
- Trond Mohn Foundation, Norway (evaluating project proposals).
- Austrian Academic Exchange Service (OeAD) (evaluating project proposals).
- LIT - Linz Institute of Technology (expert team member).

- Various editions of the international conferences: CADE, Calculemus, CIAC, CICM, CSL, EurAsiaICT, FoSSaCS, FroCoS, FROM, FSCD, IJCAR, ISSAC, JELIA, KI, LATA, LICS, LPAR, MFCS, MKM, RTA, TACAS, TbiLLC, 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

1. Co-organizer of the session on Software for Mathematical Reasoning and Applications at the International Congress on Mathematical Software, ICMS 2018. July 2018. University of Notre Dame, USA.
2. Co-organizer of the session on Software for Mathematical Reasoning and Applications at the International Congress on Mathematical Software, ICMS 2016. July 2016. Berlin, Germany.
3. Co-organizer of the 28th International Workshop on Unification, UNIF 2014. July 13, 2014. Vienna, Austria.
4. Conference chair of the 5th International Symposium on Symbolic Computation in Software Science, SCSS 2013. July 5–6, 2013. Hagenberg, Austria.
5. Conference chair of the 20th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2010. July 23-25, 2010, Hagenberg, Austria.
6. Conference co-chair of the 12th International ACM SIGPLAN Symposium on Principles and Practice of Declarative Programming, PPDP 2010. July 26-28, 2010, Hagenberg, Austria.
7. Member of the organization committee, Sage Days 24, July 17–22, 2010, Hagenberg, Austria.
8. Member of the RISC Summer 2010 organization committee, June–July 2010, Hagenberg, Austria.
9. Coordinator and organizer of the Fifth RISC/SCIENCE Training School in Symbolic Computation, June 28–July 9, 2010, Hagenberg, Austria.
10. Member of the RISC Summer 2009 organization committee, June–July 2009, Hagenberg, Austria.
11. Coordinator and organizer of the Fourth RISC/SCIENCE Training School in Symbolic Computation, June 29–July 10, 2009, Hagenberg, Austria.
12. Co-organizer of the 5th International Workshop on Automated Specification and Verification of Web Systems, WWV'09. July 2009, Hagenberg, Austria.
13. Organization committee chair of the 19th International Conference on Rewriting Techniques and Applications, RTA'08. July 15–17, 2008, Hagenberg, Austria.
14. Member of the RISC Summer 2008 organization committee, July–August 2008, Hagenberg, Austria.
15. Coordinator and organizer of the Third RISC/SCIENCE Training School in Symbolic Computation, July 7–18, 2008, Hagenberg, Austria.
16. Co-organizer of the Austria-Japan Workshop on Symbolic Computation in Software Science. July 12–13, 2008, Hagenberg, Austria.
17. Co-organizer of the 2nd International Conference on Algebraic Biology, AB'07, July 2–4, 2007, Hagenberg, Austria.
18. Member of the RISC Summer 2007 organization committee, June–July 2007, Hagenberg, Austria.

19. Co-organizer of the First Austria–Japan Workshop on Symbolic Computation and Software Verification, July 1, 2007, Linz, Austria.
20. Coordinator and organizer of the Second RISC/SCIENCE Training School in Symbolic Computation, June 24–July 8, 2007, Hagenberg, Austria.
21. Coordinator and organizer of the First RISC/SCIENCE Training School in Symbolic Computation, February 5–18, 2007, Hagenberg, Austria.
22. Co-organizer of the 20th International Workshop on Unification, UNIF’06. August 2006, Seattle, Washington, USA.
23. 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.
24. Member of the Organizing Committee of Tbilisi Symposia on Logic, Language and Computation (TbiLLC’95, TbiLLC’97, TbiLLC’99).

## Research Visits, Invited Talks, Conference Participation

### Research Visits and Invited Talks

1. Invited colloquium talk. Department of Mathematics, University of Brasilia. December 11, 2020. Virtual.
2. Invited talk at the 4th International Conference on Applications of Mathematics and Informatics in Natural Sciences and Engineering, AMINSE 2019, Tbilisi, Georgia. September 23–26, 2019.
3. Invited talk at the 3rd Working Formal Methods Symposium, FROM 2019, Timișoara, Romania. September 3–6, 2019.
4. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. Visit. May 28–30, 2019.
5. Talk at ANDREI-60, the conference dedicated to Andrei Voronkov’s 60’th birthday, Tbilisi, Georgia. May 19–23, 2019.
6. Institute of Computer Science, Goethe University Frankfurt, Germany. Visit. November 5–6, 2018.
7. Invited colloquium talk, Faculty of Computer Science and Mathematics, Goethe University Frankfurt, Germany. November 5, 2018.
8. Invited colloquium talk, Institute of Discrete Mathematics and Geometry, Vienna University of technology, Austria. June 7, 2018.
9. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. Visit. May 24–25, 2018.
10. Department of Computer Science Applied Mathematics, and Statistics, University of Girona, Spain. Visit. May 21–23, 2018.
11. Department of Computer Science, University of Liverpool, UK. Visit. March 19–28, 2018.
12. Invited colloquium talk at the Department of Computer Science, University of Liverpool, UK. March 20, 2018.
13. SBA Research, Vienna, Austria. Visit and talk in the Cyber-Security Lecture Series organized by the Austrian Institute of Technology (AIT), SBA Research, and Technical University of Vienna. September 29, 2016.

14. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. Visit. February 8–11, 2016.
15. SBA Research, Vienna, Austria. Visit. October 27, 2015.
16. Department of Computer Science, University of Liverpool, UK. Visit. April 27–May 7, 2015.
17. Invited colloquium talk at the Department of Computer Science, University of Liverpool, UK. April 30, 2015.
18. Departments of Mathematics and Computer Science, University of Brasilia, Brazil. Visit. March 31–April 14, 2015.
19. Institute of Applied Mathematics, Tbilisi State University, Georgia. Visit. February 18–March 5, 2015.
20. SBA Research, Vienna, Austria. Visit. February 13, 2015.
21. Invited colloquium talk at the Institute of Applied Mathematics, Tbilisi State University, Georgia. August 27, 2014.
22. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. Visit. May 28–29, 2014.
23. Invited colloquium talk at the Department of Computer Science, University of Porto, Portugal. December 20, 2013.
24. Department of Computer Science, University of Porto, Portugal. Visit. December 14–20, 2013.
25. Department of Computer Science and Applied Mathematics, University of Girona, Spain. Visit. July 21–26, 2013.
26. Invited talk at the 27th International Workshop on Unification, UNIF 2013. Eindhoven, The Netherlands. June 27, 2013.
27. Invited talk at the IFIP WG 1.6 (Term Rewriting) meeting. Eindhoven, The Netherlands. June 27, 2013.
28. Institute of Applied Mathematics, Tbilisi State University, Georgia. Visit. April 27–May 9, 2013.
29. Institute of Applied Mathematics, Tbilisi State University, Georgia. Visit. February 2–8, 2013.
30. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. Visit. November 27–December 1, 2012.
31. Invited talk at the seminar on Symbolic Computation in Program Analysis, Specification, and Verification. Beijing, China. October 10, 2012.
32. Institute of Applied Mathematics, Tbilisi State University, Georgia. Visit. August 2–10, 2012.
33. Institute of Applied Mathematics, Tbilisi State University, Georgia. Visit. April 26–May 6, 2012.
34. Department of Mathematics and Computer Science, West University of Timisoara, Romania. Visit. October 30–November 5, 2011.
35. Invited talk at the ESF Strategic Workshop on Correct Software in Web Applications. Hagenberg. September 26, 2011.
36. Invited talk at the Workshop on Logic and Computer Science. Kurt Gödel Research Center, University of Vienna. March 24, 2011.

37. Invited colloquium talk at the Department of Information Systems and Computation, Technical University of Valencia, Spain. November 24, 2010.
38. Department of Information Systems and Computation, Technical University of Valencia, Spain. Visit. November 23–27, 2010.
39. Invited talk at the Japan-Austria Joint Workshop on ICT. Tokyo, Japan. October 18, 2010.
40. Institute of Applied Mathematics, Tbilisi State University, Georgia. Visit. September 12–17, 2010.
41. Invitation to give a talk at the IFIP WG 1.6 (Term Rewriting) meeting, Edinburgh, UK. July 10, 2010.
42. Invited colloquium talk at the Department of Computer Science and Applied Mathematics, University of Girona, Spain. June 1, 2010.
43. Department of Computer Science and Applied Mathematics, University of Girona, Spain. Visit. May 31–June 4, 2010.
44. Invited colloquium talk at the Department of Mathematics and Computer Science, University of Kagoshima, Japan. March 2, 2009.
45. Department of Mathematics and Computer Science, University of Kagoshima, Japan. Visit. March 1–4, 2009.
46. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. Visit. February 23–March 12, 2009.
47. Invited talk at the Austria-Japan Workshop on Symbolic Computation and Software Verification. Kyoto University, Japan. April 18, 2008.
48. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. Visit. April 14–16, 19–21, 2008.
49. Participation and presentation at the Dagstuhl Seminar on Deduction and Decision Procedures. Schloss Dagstuhl, Germany. September 30–October 6, 2007.
50. Invited talk at the SCORE Summer Workshop on Symbolic Computation and Software Verification. Fuji Susono, Japan. September 1, 2007.
51. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. Visit. August 26–September 6, 2007.
52. Invited talk at the Austria-Japan Summer Workshop in Term Rewriting. Obergurgl, Austria. August 23, 2007.
53. Artificial Intelligence Research Institute (IIIA) of the Spanish Scientific Research Council (CSIC), Barcelona, Spain. Visit. May 30–June 3, 2007.
54. Invited talk at the SCORE Winter Workshop on Symbolic Computation and Software Verification. University of Aizu, Aizuwakamatsu, Japan. March 12, 2006.
55. Computer Science Department, University of Aizu, Aizuwakamatsu, Japan. Visit. March 12–14, 2006.
56. Invitation to give a talk at the Workshop on Formal Gröbner Bases Theory of the Special Semester on Gröbner Bases and Related Methods. Linz, Austria. March 5–10, 2006.
57. Computer Science Department, Graduate School of Systems and Information Engineering, University of Tsukuba, Japan. Visit. March 4–20, 2006.
58. Invited talk at the Austria-Japan Summer Workshop in Term Rewriting. Obergurgl, Austria. August 10, 2005.

## Conference Participation

Participation in more than 100 conferences and international meetings.

## Professional Membership

In various periods: Association for Computing Machinery (ACM), Association for Automated Reasoning (AAR), International Pragmatics Association (IPrA), Georgian Mathematicians' Union, Association for Logic Programming.

## Collaboration with the Industry

- Advising joint master projects at the JKU International Master Program on Universal Computing and Business with the IT companies TGW Logistics Group (Wels, 2017–2018), Augmensys GmbH (Linz, 2017–2018), Lenzing AG (Lenzing, 2017–2018), Hofer KG (2018–2019), bet-at-home.com AG (2018–2019), AURIS IT Consult GmbH (2018–2019).
- Advising joint master projects at the JKU International School of Informatics Hagenberg with the IT companies SYSco EDV (Schwertberg, 2014–2015), NESTEC Scharf IT-Solutions OG (St Florian, 2015–2017), and Roomle GmbH (Linz, 2016–2017).
- Participation in a joint project with the company SecureGUARD GmbH (Linz) about the development of a runtime network monitoring system, 2012–2013.

## System Development

1. 2012–2013: Participation in the development of a runtime network monitoring system. Language: F#.
2. Since 2008: P $\rho$ Log: PROLOG implementation of the  $\rho$ Log calculus for rule-based programming. The 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.
3. 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.
4. 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.
5. In 2005–2006: Implemented in PROLOG an algorithm for solving regular context sequence constraints.
6. 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.
7. 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.