

# Curriculum Vitae

## Ruzica Piskac

*address:* Synthesis, Analysis and Automated Reasoning Group    *phone:* +49 681 9303 8901  
Max Planck Institute for Software Systems (MPI-SWS)    *fax:* +49 681 9303 9199  
Campus E 1 4    *email:* piskac@mpi-sws.org  
D-66123 Saarbrücken    *web:* <http://www.mpi-sws.org/~piskac/>  
Germany

### Summary

Ruzica Piskac is tenure-track faculty at the Max Planck Institute for Software Systems (MPI-SWS) and head of the Synthesis, Analysis and Automated Reasoning Group. Her research interests span the areas of software verification, automated reasoning, code synthesis and program termination. A common thread in Ruzica's research is improving software reliability and trustworthiness using formal techniques.

### Work Experience

- [01/2012 – present] Max Planck Institute for Software Systems (MPI-SWS), Germany
  - independent research group leader (*Max-Planck-Forschungsgruppenleiterin*)
  - starting Fall 2012: two PhD students
- [June – September 2008] Microsoft Research, Redmond, WA, USA
  - summer internship, mentor: Nikolaj Bjørner
- [08/2006 – 08/2007] Digital Enterprise Research Institute (DERI), Innsbruck, Austria
  - junior researcher at DERI, Intelligent Reasoning for Integrated Systems (IRIS) cluster
  - research topic: developing a reasoner for a language that uniformly supports ontologies and rules.
  - working in the following EU- or Austrian-funded projects: SEKT (EU IST IP 2003-506826), RW2 and Knowledge Web FP6-507482
- [12/2000 – 09/2002] University of Zagreb, Croatia
  - junior researcher and teaching assistant at the University of Zagreb
  - collaboration with CERN: participating in ALICE project (A Large Ion Collider Experiment)
  - managing a cluster for scientific computing

### Education

- [09/2007 – 12/2011] Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland
  - PhD student at EPFL, Laboratory for Automated Reasoning and Analysis (LARA) group
  - thesis title: “Decision Procedures for Program Synthesis and Verification”, no. 5220 (2011)
  - thesis advisor: Viktor Kuncak
- [10/2002 – 08/2006] Max-Planck-Institut für Informatik, Saarbrücken, Germany
  - first a master student and afterward a PhD student at MPII, Programming Logics Group, advisors: Harald Ganzinger<sup>†</sup>, Andreas Podelski, Hans de Nivelle
  - Master's thesis: “Formal Correctness of Result Checking for Priority Queues”
  - finished Master program with the best grades (1.0/1.0)
- [09/1995 – 12/2000] University of Zagreb, Croatia
  - student of mathematics at the University of Zagreb, Croatia, advisor: Robert Manger.
  - Diploma thesis: “Parallel Algorithms for Sorting and Merging” (in Croatian).
  - Dipl.Ing. degree with Honors, graduated as the first in the class of 81 students

## Honors and Awards

- The Patrick Denantes Prize 2012 winner, awarded annually to the most outstanding master's, doctoral or post-doctoral research project within the school of computer and communication sciences at EPFL
- The Google Anita Borg Memorial Scholarship 2010 winner
- Grace Hopper Conference attendance full scholarship recipient 2008 and 2007
- [2002 – 2006] IMPRS Fellowship for both Master and Ph.D. studies in Computer Science. Max-Planck Institut für Informatik, Saarbrücken, Germany
- Won the most prestigious student's award of Croatia: Chancellor's Award ("Rektorova nagrada"), 2000. for the work in the area of decision making theory.

## Publications

### Theses

1. **Decision Procedures for Program Synthesis and Verification.** *PhD Thesis.* École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, December 2011.
2. **Formal Correctness of Result Checking for Priority Queues.** *Master Thesis.* Universität des Saarlandes, Saarbrücken, Germany, February 2005.

### Journals

1. V. Kuncak, M. Mayer, R. Piskac, P. Suter. **Functional Synthesis for Linear Arithmetic and Sets.** *To appear in STTT.*
2. V. Kuncak, M. Mayer, R. Piskac, P. Suter. **Software Synthesis Procedures.** Communications of the ACM (55), Volume 55, Number 2, p. 103-111, DOI: 10.1145/2076450.2076472 February 2012.
3. R. Piskac, L. de Moura, N. Bjørner. **Deciding Effectively Propositional Logic Using DPLL and Substitution Sets** , Journal of Automated Reasoning, DOI: 10.1007/s10817-009-9161-6, Volume 44, Number 4, p. 401-424, April 2010.
4. P. Saiz, L. Aphécetche, P. Buncic, R. Piskac, J.-E. Revsbech, V. Sego. 2003. **AliEn-ALICE environment on the GRID.** *Nuclear Instruments and Methods in Physics Research Section A*, Volume 502, Issue 2-3, p. 437-440.

### Conferences

1. T. Gvero, V. Kuncak, I. Kuraj, R. Piskac. **Complete Completion using Types and Weights.** *To appear in PLDI 2013.*
2. T. Gvero, V. Kuncak, R. Piskac. **Interactive Synthesis of Code Snippets.** *Proceedings of the 23rd International Conference on Computer Aided Verification (CAV 2011)*, Springer, LNCS Volume 6806, p. 418-423.
3. R. Piskac, T. Wies. **Decision Procedures for Automating Termination Proofs.** *Proceedings of the 12th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2011)*, Springer, LNCS Volume 6538, p. 371-386.
4. V. Kuncak, R. Piskac, P. Suter. **Ordered Sets in the Calculus of Data Structures.** *Proceedings of the 19th Annual Computer Science Logic (CSL 2010)*, Springer, LNCS Volume 6247, p. 34-48.
5. R. Piskac, V. Kuncak. **MUNCH - Automated Reasoner for Sets and Multisets.** *Proceedings of the 5th International Joint Conference on Automated Reasoning (IJCAR 2010)*, Springer, LNAI 6173, p. 149-155.
6. V. Kuncak, M. Mayer, R. Piskac, P. Suter. **Comfusy: A Tool for Complete Functional Synthesis.** *Proceedings of the 22nd International Conference on Computer Aided Verification (CAV 2010)*, Springer, LNCS Volume 6174, p. 430-433.
7. V. Kuncak, M. Mayer, R. Piskac, P. Suter. **Complete Functional Synthesis.** *Proceedings of the ACM SIGPLAN 2010 Conference on Programming Language Design and Implementation (PLDI)*, p. 316-329.
8. V. Kuncak, R. Piskac, P. Suter, T. Wies: **Building a Calculus of Data Structures.** *Proceedings of the 11th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2010)*, Springer, LNCS Volume 5944, p. 26-44.

9. K. Yessenov, R. Piskac, V. Kuncak. **Collections, Cardinalities, and Relations.** *Proceedings of the 11th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2010)*, Springer, LNCS Volume 5944, p. 380-395.
10. T. Wies, R. Piskac, V. Kuncak. **Combining Theories with Shared Set Operations.** *Proceedings of the 7th International Symposium on Frontiers of Combining Systems (FroCoS 2009)*, Springer, LNCS Volume 5749, p. 366-382.
11. R. Piskac, V. Kuncak. **Fractional Collections with Cardinality Bounds.** *Proceedings of the 17th Annual Computer Science Logic (CSL 2008)*, Springer, LNCS Volume 5213, p. 124-138.
12. R. Piskac, V. Kuncak. **Linear Arithmetic with Stars.** *Proceedings of the 20th International Conference on Computer Aided Verification (CAV 2008)*, Springer, LNCS 5123, p. 268-280.
13. R. Piskac, V. Kuncak. **Decision Procedures for Multisets with Cardinality Constraints.** *Proceedings of the Ninth International Conference on Verification, Model Checking and Abstract Interpretation - VMCAI 2008*, Springer, LNCS Volume 4905, p. 218-232.
14. H. de Nivelle, R. Piskac. **Verification of an Off-Line Checker for Priority Queues.** *Proceedings of the Third IEEE International Conference on Software Engineering and Formal Methods (SEFM)*, Koblenz, IEEE computer society press, Washington, 2005, 210-219.
15. L. Caklovic, R. Piskac, V. Segó. 2001. **Improvement of AHP method.** *Mathematical Communications - Supplement No.1 (2001)*, 13-21. (Proceedings of the 8th International Conference on Operational Research - KOI 2000)

## Technical Reports

1. S. Mitrovic, R. Piskac, V. Kuncak **Identifying Maximal Non-Redundant Integer Cone Generators**, Technical Report, available at <http://lara.epfl.ch/w/nicg>, September 2011.
2. R. Piskac, L. de Moura, N. Bjørner. **Deciding Effectively Propositional Logic with Equality**, Technical Report, MSR-TR-2008-181, December 2008.
3. N. Steinmetz, R. Piskac, C. Feier, U. Keller and H. Lausen. D1.3 Report on reasoning techniques and prototype implementation for the WSML-RL and WSML-FOL languages. (published within RW2 project), July 2007.

## Proceedings Editor

1. R. Piskac, F. van Harmelen, N. Zhong. Proceedings of the 6th International Semantic Web Conference and the 2nd Asian Semantic Web Conference Workshop on New forms of reasoning for the Semantic Web: scalable, tolerant and dynamic, Busan, Korea, November 2007.
2. F. van Harmelen, A. Herzig, P. Hitzler, Z. Lin, R. Piskac, G. Qi. Proceedings of the 5th European Semantic Web Conference Workshop on Advancing Reasoning on the Web: Scalability and Commonsense (ARea-2008), Tenerife, Spain, June, 2008.
3. R. Piskac, E. Simperl. Proceedings of the Doctoral Consortium of the 3rd Future Internet Symposium 2010, Berlin, Germany, September 23-24, 2010.

## Professional Activities

- Organizer and PC co-Chair

1. *New forms of reasoning for the Semantic Web: scalable, tolerant and dynamic*, workshop co-located with the 6th International Semantic Web Conference and the 2nd Asian Semantic Web Conference, Busan, Korea, November 2007. Co-organizer with F. van Harmelen and N. Zhong
2. *Advancing Reasoning on the Web: Scalability and Commonsense*, workshop co-located with the 5th European Semantic Web Conference, Tenerife, Spain, June 2008. Co-organizer with F. van Harmelen, A. Herzig, P. Hitzler, Z. Lin and G. Qi
3. *Doctoral Consortium of the 3rd Future Internet Symposium 2010*, Berlin, Germany, September 2010. Education co-Chair together with E. Simperl

- Program Committees

1. The 13th Conference on Formal Methods in Computer-Aided Design (FMCAD 2013)
2. ESEC/FSE 2013 Tool Demos track

3. The 22nd EACSL Annual Conferences on Computer Science Logic (CSL 2013)
  4. The 14th International Workshop on Verification of Infinite-State Systems (INFINITY 2012)
  5. The 3rd Workshop on Practical Aspects of Automated Reasoning (PAAR-2012)
  6. The 18th International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR-18)
  7. STI International Symposium 2010 - Organizing Committee Member
  8. The 4th Asian Semantic Web Conference (ASWC 2009)
  9. The 3rd Asian Semantic Web Conference (ASWC 2008)
  10. The Second International Workshop on New forms of reasoning for the Semantic Web: scalable, tolerant and dynamic (NeForS08)
- Reviewer for
    - Handbook of Model Checking, International Workshop on Verification of Infinite-State Systems (INFINITY 2012), International Workshop on Computer Science Logic (CSL 2012), Workshop on Practical Aspects of Automated Reasoning (PAAR-2012), Journal of Symbolic Computation, STTT Journal, International Conference on Automated Deduction (CADE 2011), European Symposium on Programming (ESOP2011), Symposium on Principles of Programming Languages (POPL 2011), International Conference on Computer Aided Verification (CAV 2012, CAV 2011, CAV 2010), Computer Science Symposium in Russia (CSR 2010), Static Analysis Symposium (SAS 2012, SAS 2011, SAS 2009), Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2012, VMCAI 2009), Asian Semantic Web Conference (ASWC 2009, ASWC 2008), Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR-12, LPAR-08, LPAR-07), International Joint Conference on Automated Reasoning (IJCAR-08), Workshop on Web Semantics (WebS2007), International World Wide Web Conference (WWW2007), Conference on Information Integration and Web-based Applications & Services (iiWAS2006)
  - [September 2008 - present] Managing editor of the CEUR-WS.org proceedings series (<http://CEUR-WS.org/>)
    - over 900 published conference and workshop proceedings

## Presentations

- Conference Presentations
  - CAV 2011, SMT 2011, POPL 2011 (student session), IJCAR 2010, CSL 2008, CAV 2008, VMCAI 2008
- Invited Talks
  - gave talks about research results at IIT Kanpur (2012), the IMPECS Workshop on Program Analysis, Bangalore (2012), Microsoft Research India, Bangalore (2012), the 1st STI Alumni Meeting, STI Austria (2012), RiSE Seminar, IST Austria (2012), an invitational seminar “CP meets CAV” (2012), Dagstuhl seminar 12152 (2012), the Rich models toolkit meeting, Turin (2011), Workshop on Synthesis, Verification, and Analysis of Rich Models - SVARM, Saarbrücken (2011), New York University (2012, 2011), Caltech (2011), Microsoft Research Cambridge (2011), Max-Planck Institute for Software Systems (2011), Seminar on “Deduction at Scale 2011” at the Ringberg Castle (2011), RiSE Seminar, TU Vienna (2011), Student Seminar, University of Freiburg (2011), LogicBlox, Atlanta (2011), Alpine Verification Meeting, Lugano (2010), Dagstuhl seminar 10161 (2010), Université Libre de Bruxelles (2010), Research seminar of the STI International Symposium (2010), Workshop on Formal and Automated Theorem Proving and Applications, Belgrade (2010), The IMDEA Software Institute, Madrid (2010), Meeting of the Action IC0701, Eindhoven (2009), Colorado University, Boulder (2008), Microsoft Research, Redmond (2008), SRI International (2008), Dagstuhl seminar 07401 (2007), University of Zagreb (2007), University of Freiburg (2006), University of Innsbruck (2006), Deduktionstreffen, Koblenz (2005), Dagstuhl seminar 05431 (2005), Deduktionstreffen, Saarbrücken (2004), Logic Seminar at Schloss Ringberg (2003)
- Poster Presentations
  - presented posters at the “Rising Stars in EECS: An Academic Career Workshop for Women”, an invitational workshop at MIT, 2012, the Verification Technology, Systems & Applications Summer School, Luxembourg, 2010, EPFL Research Day (2010 and 2008), Microsoft Research Summer School, Cambridge (2010), The Technical Poster Competition of The Grace Hopper Celebration (2008) - one of four posters that was qualified in the finals, all together more than 100 submissions; “Femmes de Sciences” at EPFL (2008)

## Teaching and Supervising Experience

- Teaching
  - *Seminar on Decision Procedures*, MPI-SWS, Fall 2012 - lecturer
  - lecturer at the *10th International Winter School on MOdelling and VERifying parallel Processes (MOVEP 2012)*, Marseille, December 2012.
  - lecturer (Arbeitsgruppe 3 bei der Akademie XII der Studienstiftung des deutschen Volkes). Topic: *Kann der Computer selbst programmieren?* (synthesis), Papenburg, Spring 2012.
  - lecturer at the *First International SAT/SMT Solver Summer School 2011*, MIT, June 2011.
  - *Vertiefungsseminar*, on the topic of Linked Open Data, University of Innsbruck, Spring 2011 - scientific organizer <sup>3)</sup>
  - *Seminar on Automated Reasoning*, EPFL, Fall 2010 - head teaching assistant <sup>1)</sup>  
Additional duties included preparing course materials, teaching and student supervision
  - *Synthesis, Analysis, and Verification*, EPFL, Spring 2010, 2009, 2008 - head teaching assistant <sup>1)</sup>  
(Spring 2008: the course received the highest grade among master courses, student evaluation: 5.4/6.0)
  - *Vertiefungsseminar*, University of Innsbruck, Spring 2010 - scientific organizer <sup>3)</sup>
  - *Compiler Construction*, EPFL, Fall 2008/09 - head teaching assistant <sup>1)</sup>
  - *Seminar “Master Seminar”*, University of Innsbruck, Fall 2007/08 - scientific organizer <sup>3)</sup>
  - *Seminar “Semantic Systems”*, University of Innsbruck, Spring 2007 - scientific organizer <sup>3)</sup>
  - *Seminar “The Role of Computer Science in Science”*, University of Innsbruck, Fall 2006/07 - scientific organizer <sup>3)</sup>
  - *Introduction to Proof Theory*, University of Saarbrücken, Fall 2005/06 - head teaching assistant <sup>1)</sup>
  - *Verification*, University of Saarbrücken, Fall 2004/05 - head teaching assistant <sup>1)</sup>
  - *Automated Reasoning*, University of Saarbrücken, Spring 2004 - teaching assistant <sup>2)</sup>  
The course was awarded the Teaching Award of the Computer Science Students Association for the summer semester 2004. Duties included grading and leading weekly exercises
  - Explanations:
    - <sup>1)</sup> duties of a head teaching assistant include designing and leading weekly exercise sessions, grading
    - <sup>2)</sup> duties of a teaching assistant include leading weekly exercise sessions, grading
    - <sup>3)</sup> duties of a scientific organizer include topic assignment, student supervision, grading written reports, event organization
- Supervised Students
  - Jose Lopes and Filip Nksic - PhD students, started in October 2012.
  - Mikael Mayer: “Complete Program Synthesis for Linear Arithmetics”, Master Thesis, EPFL, 2010. (completed)

## Language Skills

- Croatian, English, German, Russian

## References

- References available upon request