

# Curriculum Vitae

## Stefan Ratschan

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Academy of Sciences of the Czech Republic  
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September 19, 2024

## 1 Personal Information

Full Name: Stefan Matthias Ratschan  
Academic Degrees: doc. (~ assoc. prof.), Dr. techn. (~Ph.D.), Dipl.-Ing. (~M.Sc.)  
Citizenship: Austrian  
Languages: German (native speaker), English (fluent), Czech (fluent)  
Bosnian/Croatian/Serbian (intermediate), Spanish (passive)

## 2 Education

### **Ph.D. Degree in Computer Science with Distinction** (September 1998)

Ph.D. Thesis: "Approximate Constraint Logic Programming",  
Research Institute for Symbolic Computation (RISC-Linz),  
Johannes Kepler University, Linz, Austria.

### **Diploma Degree in Computer Science** (February 1995)

Diploma Thesis: "RISC-CLP( $\Delta$ ): A Constraint Logic Programming System with Parametric Domain",  
Research Institute for Symbolic Computation (RISC-Linz),  
Johannes Kepler University, Linz, Austria.

### **High School Exam (Matura) with Distinction** (June 1989)

Bundesgymnasium Schärding, Austria

## 3 Employment History

### **Researcher** (July 2006–) and **Department Head** (2013–)

Institute of Computer Science of the Academy of Sciences of the Czech Republic  
Prague, Czech Republic

### **Staff Researcher and Principal Investigator in Transregional Research Center AVACS** (November 2004–June 2006)

Max-Planck-Institut für Informatik  
Saarbrücken, Germany

### **Postdoctoral Research Fellow** (November 2002–October 2004)

Max-Planck-Institut für Informatik  
Saarbrücken, Germany

### **Marie Curie Postdoctoral Fellow** (November 2001–October 2002)

European Union Grant  
"Quantified Constraint Solving in Control Engineering"  
Universitat de Girona, Spain

### **PostDoc** (November 1999–September 2001)

"Numerical and Symbolic Scientific Computing"  
Research Institute for Symbolic Computation (RISC-Linz),  
Johannes Kepler University, Linz, Austria.

**Social Service (“Zivildienst”)** (August 1998–September 1999)

Humanitarian Worker,  
World University Service Austria and University of Sarajevo,  
Bosnia and Herzegovina.

**Research Assistant** (September 1994–June 1998)

Research Institute for Symbolic Computation (RISC-Linz),  
Johannes Kepler University, Linz, Austria.

**Programmer**

Development of various types of business software

## 4 Fundraising and Awards

- Czech Science Foundation Grant GAČR 21-09458S, “Quasi-Decision Procedures for First-Order Theories of Real Functions”, 900 CZK/year, 2021–2023
- Czech Science Foundation Grant GAČR 15-14484S, “Simulation-Based Computation of Robust Invariants of Hybrid Dynamical Systems”, 900 CZK/year, 2015–2018
- Czech Science Foundation Grant GAČR P202/12/J060, “Integrated Verification and Falsification of Hybrid Systems of Industrial Size”, 900 CZK/year, 2012–2014
- Czech Ministry of Education, Youth, and Sports, Grant MŠMT OC10048, “Efficient Handling of Non-linear Numerical Constraints Arising in Automated Reasoning about Rich Models of Computer Systems”, 450K CZK/year, 2010–2012
- Co-proposer and Management Committee member of COST Action IC0901: “Rich-Model Toolkit—An Infrastructure for Reliable Computer Systems”, 2009–2013
- “Verification of Hybrid Systems” 750 CZK/year (201/08/J020, Czech Science Foundation), associated project of transregional research center (Interregio-SFB) AVACS (German science Foundation), 2M€/year, 2008–2010
- Individual Marie Curie Postdoctoral Fellowship (European Union), 2001

## 5 Publications and Talks

- All publications listed below use alphabetic order of authors with the exception of publications marked with †.
- Preprints of most of these publications are available at <http://www.cs.cas.cz/~ratschan/preprints.html>

## 5.1 Edited Collections, Journal Special Issues, and Proceedings

Thao Dang and Stefan Ratschan (editors)

**Proceedings 6th International Workshop on Symbolic-Numeric Methods for Reasoning about CPS and IoT**

Electronic Proceedings in Theoretical Computer Science, Volume 331, 2021

<http://dx.doi.org/10.4204/EPTCS.331>

Stefan Ratschan and Thomas Sturm (editors)

**Constraint Solving and Complex Systems**

journal special issue

Mathematics in Computer Science

Volume 6, Number 4, 2012, p. 345

Georgios Fainekos, Eric Goubault, Sylvie Putot, and Stefan Ratschan (editors)

**Numerical Software Verification**

journal special issue

Mathematics in Computer Science

Volume 5, Number 4, 2011, pp. 357–358

Stefan Ratschan (editor)

**Fourth International Conference on Mathematical Aspects of Computer and Information Sciences—MACIS 2011**

Internal Conference Proceedings, 271 pages

## 5.2 Journal Publications

Jiří Fejlek and Stefan Ratschan

**Computation of Feedback Control Laws Based on Switched Tracking of Demonstrations**

European Journal of Control, to appear

Stefan Ratschan and Jan Kuřátko

**Solving Reachability Problems by a Scalable Constrained Optimization Method**

Optimization and Engineering

Volume 21, 2020, pp. 215–239

Stefan Ratschan

**Converse Theorems for Safety and Barrier Certificates**

IEEE Transactions on Automatic Control

Volume 63, Issue 8, 2018, pp. 2628–2632

Peter Franek, Stefan Ratschan, and Piotr Zgliczynski

**Quasi-decidability of a Fragment of the First-order Theory of Real Numbers**

Journal of Automated Reasoning

Volume 72, 2016, pp. 157–185

Peter Franek and Stefan Ratschan

**Effective Topological Degree Computation Based on Interval Arithmetic**

Mathematics of Computation

Volume 84, 2015, 1265–1290

Stefan Ratschan and Milan Hladík

**Efficient Solution of a Class of Quantified Constraints with Quantifier Prefix Exists-Forall**

Mathematics in Computer Science

Volume 8, Issue 3, 2014, 329–340

Stefan Ratschan

**Safety Verification of Non-linear Hybrid Systems is Quasi-Decidable**

Formal Methods in System Design

Volume 44, Issue 1, 2014, pp. 71-90

Lijun Zhang, Zhikun She, Stefan Ratschan, Holger Hermanns, and Ernst Moritz Hahn

**Safety Verification for Probabilistic Hybrid Systems**

European Journal of Control

Volume 18, Number 6, 2012, pp. 572–587

Stefan Ratschan and Zhikun She

**Providing a Basin of Attraction to a Target Region of Polynomial Systems by Computation of Lyapunov-like Functions**

SIAM J. Control and Optimization

Volume 48, Number 7, 2010, pp. 4377–4394

Martin Fränzle, Christian Herde, Tino Teige, Stefan Ratschan, and Tobias Schubert

**Efficient Solving of Large Non-linear Arithmetic Constraint Systems with Complex Boolean Structure**

Journal on Satisfiability, Boolean Modeling and Computation

Special Issue on SAT/CP Integration

Volume 1, 2007, pp. 209–236

Werner Damm, Guilherme Pinto, and Stefan Ratschan

**Guaranteed Termination in the Verification of LTL Properties of Non-linear Robust Discrete Time Hybrid Systems**

International Journal of Foundations of Computer Science (IJFCS)

Volume 18, Number 1, 2007, pp. 63–86

Stefan Ratschan and Zhikun She

**Safety Verification of Hybrid Systems by Constraint Propagation Based Abstraction Refinement**

ACM Transactions on Embedded Computing Systems

Volume 6, Number 1, 2007, pp. 1–23

Stefan Ratschan

**Efficient Solving of Quantified Inequality Constraints over the Real Numbers**

ACM Transactions on Computational Logic

Volume 7, Number 4, 2006, pp. 723–748

Luc Jaulin, Stefan Ratschan, and Laurent Hardouin

**Set Computation for Nonlinear Control†**

Reliable Computing

Volume 10, Number 1, 2004, pp. 1–26

Stefan Ratschan

**Search Heuristics for Box Decomposition Methods**

Journal of Global Optimization

Volume 24, Number 1, 2002, pp. 51–60

Stefan Ratschan

**Quantified Constraints Under Perturbation**

Journal of Symbolic Computation

Volume 33, Number 4, 2002, pp. 493–505

Stefan Ratschan

**Approximate Quantified Constraint Solving by Cylindrical Box Decomposition**

Reliable Computing

Volume 8, Number 1, 2002, pp. 21–42

Stefan Ratschan

**Convergent Approximate Solving of First-order Constraints by Approximate Quantifiers**

ACM Transactions on Computational Logic

Volume 5, Number 2, 2004, pp. 264–281

Stefan Ratschan

**Uncertainty Propagation in Heterogeneous Algebras for Approximate Quantified Constraint Solving**

Journal of Universal Computer Science,

Volume 6, Number 9, 2000.

### 5.3 Articles in Refereed Conference Proceedings

Tomáš Kolárik, Stefan Ratschan, and Pavel Surynek

**Multi-Agent Path Finding with Continuous Time Using SAT Modulo Linear Real Arithmetic**

ICAART 2024: Proceedings of the 16th International Conference on Agents and Artificial Intelligence, Volume 1, pp. 47–58

Stefan Ratschan

**Deciding Predicate Logical Theories of Real-Valued Functions**

MFCS 2023: 48th International Symposium on Mathematical Foundations of Computer Science

Leibniz International Proceedings in Informatics (LIPIcs) vol. 272

Jiří Fejlek and Stefan Ratschan

**LQR-trees with Sampling Based Exploration of the State Space**

IROS 2023, IEEE/RSJ International Conference on Intelligent Robots and Systems, 2023

Enrico Lipparini and Stefan Ratschan

**Satisfiability of Non-Linear Transcendental Arithmetic as a Certificate Search Problem**

NFM 2023: NASA Formal Methods Symposium, Springer LNCS 13903

Tomáš Kolárik and Stefan Ratschan

**Railway Scheduling Using Boolean Satisfiability Modulo Simulations**

FM 2023: Formal Methods, LNCS 14000

Jiří Fejlek and Stefan Ratschan

**Computing Funnels Using Numerical Optimization Based Falsifiers**

ICRA 2022: IEEE International Conference on Robotics and Automation (ICRA)

Jan Onderka and Stefan Ratschan

**Fast Three-Valued Abstract Bit-Vector Arithmetic**

VMCAI 2022: Verification, Model Checking, and Abstract Interpretation  
Springer LNCS 13182, 2022

Tomáš Kolárik and Stefan Ratschan

**SAT Modulo Differential Equation Simulations**

14th International Conference on Tests and Proofs  
Springer LNCS 12165, 2020

Stefan Ratschan

**Simulation Based Computation of Certificates for Safety of Dynamical Systems**

FORMATS 2017: Formal Modelling and Analysis of Timed Systems  
Springer LNCS 10419, pp. 303–317, 2017

Jan Kuřátko and Stefan Ratschan

**Combined Global and Local Search for the Falsification of Hybrid Systems**

FORMATS 2014: Formal Modelling and Analysis of Timed Systems  
Springer LNCS 8711, pp. 146–160, 2014

Stefan Ratschan

**An Algorithm for Formal Safety Verification of Complex Heterogeneous Systems**

REC 2012: 5th International Conference on Reliable Engineering Computing  
M. Vořechovský, V. Sadílek, S. Seitzl, V. Veselý, R. L. Muhanna, and R. L. Musslen (eds),  
pp. 457–467  
[http://rec2012.fce.vutbr.cz/documents/proceedings/REC2012\\_proceedings.pdf](http://rec2012.fce.vutbr.cz/documents/proceedings/REC2012_proceedings.pdf)

Tomáš Dzetkulič and Stefan Ratschan

**Incremental Computation of Succinct Abstractions For Hybrid Systems**

FORMATS 2011: Formal Modeling and Analysis of Timed Systems  
U. Fahrenberg and S. Tripakis (Eds.): FORMATS 2011, LNCS 6919, pp. 271–285. Springer,  
Heidelberg (2011)

Peter Franek and Stefan Ratschan and Piotr Zgliczynski

**Satisfiability of Systems of Equations of Real Analytic Functions is Quasi-decidable**

MFCS 2011: 36th International Symposium on Mathematical Foundations of Computer Science  
Springer LNCS 6907

Stefan Ratschan

**Safety Verification of Non-linear Hybrid Systems is Quasi-Semidecidable**

TAMC 2010: 7th Annual Conference on Theory and Applications of Models of Computation  
Springer LNCS 6108, pp. 397–408, 2010

Lijun Zhang, Zhikun She, Stefan Ratschan, Holger Hermanns and Ernst Moritz Hahn

**Safety Verification for Probabilistic Hybrid Systems**

CAV 2010: 22nd International Conference on Computer Aided Verification

Springer LNCS 6174, pp. 196–211, 2010

Tomáš Dzetkulič and Stefan Ratschan

**How to Capture Hybrid Systems Evolution Into Slices of Parallel Hyperplanes**

ADHS'09: 3rd IFAC Conference on Analysis and Design of Hybrid Systems, 2009

pages 274–279

Stefan Ratschan and Jan-Georg Smaus

**Finding Errors of Hybrid Systems by Optimising an Abstraction-Based Quality Estimate**

TAP'09: Tests and Proofs, Springer LNCS 5668, pp. 153–168, 2009

Stefan Ratschan and Zhikun She

**Recursive and Backward Reasoning in the Verification of Hybrid Systems**

Proceedings of the 5th Int. Conf. on Informatics in Control, Automation and Robotics (ICINCO'2008)

INSTICC Press, <http://dx.doi.org/10.5220/0001475500650071>

Henning Burchardt and Stefan Ratschan

**Estimating the Region of Attraction of Ordinary Differential Equations by Quantified Constraint Solving**

Proceedings of the 3rd WSEAS International Conference on DYNAMICAL SYSTEMS and CONTROL (CONTROL'07),

WSEAS Press, 2007, 241–246

Felix Klaedtke, Stefan Ratschan and Zhikun She

**Language-Based Abstraction for Hybrid System Verification**

Verification, Model Checking and Abstract Interpretation

Springer LNCS 4349, 2007, 151–166

Stefan Ratschan and Zhikun She

**Providing a Basin of Attraction to a Target Region by Computation of Lyapunov-like Functions**

Proceedings of IEEE International Conference on Computational Cybernetics

2006

Stefan Ratschan and Zhikun She

**Constraints for Continuous Reachability in the Verification of Hybrid Systems**

Proceedings of the 8th International Conference on Artificial Intelligence and Symbolic Computation

Springer LNCS 4120, 2006, 196–210

Stefan Ratschan and Jan-Georg Smaus

**Verification-Integrated Falsification of Non-Deterministic Hybrid Systems**

Proceedings of the 2nd IFAC Conference on Analysis and Design of Hybrid Systems

2006

Werner Damm, Guilherme Pinto and Stefan Ratschan

**Guaranteed Termination in the Verification of LTL Properties of Non-linear Robust Discrete Time Hybrid Systems**

Proceedings of the Third International Symposium on Automated Technology for Verification and Analysis, 2005

Springer LNCS 3707, 2005, 99–113



Stefan Ratschan and Zhikun She

**Safety Verification of Hybrid Systems by Constraint Propagation Based Abstraction Refinement**

Proceedings of the Eighth International Workshop on Hybrid Systems: Computation and Control  
Springer LNCS 3414, 2005, 573–589

Stefan Ratschan

**Solving Existentially Quantified Constraints with One Equality and Arbitrarily Many Inequalities**

Proceedings of the Ninth International Conference on Principles and Practice of Constraint Programming,  
Springer LNCS 2833, 2003, 615–633

Stefan Ratschan and Josep Vehí

**Robust Pole Clustering of Parametric Uncertain Systems Using Interval Methods†**

Robust Control Design 2003 — Proceedings of the 4th IFAC Symposium

Patrizio Colaneri (ed.)

Elsevier Science

2004

Stefan Ratschan

**Continuous First-Order Constraint Satisfaction with Equality and Disequality Constraints**

Proceedings of the Eighth International Conference on Principles and Practice of Constraint Programming,

Springer LNCS 2470, 2002, 680–685

Stefan Ratschan

**Continuous First-Order Constraint Satisfaction**

Artificial Intelligence, Automated Reasoning, and Symbolic Computation 2002, Springer LNCS 2385,  
2002, 181–195

Stefan Ratschan and Luc Jaulin

**Solving Composed First-Order Constraints From Discrete-Time Robust Control†**

Proc. of the Sixth Annual Workshop of the ERCIM Working Group on Constraints

<http://arXiv.org/html/cs/0110012>

2001

## 5.4 Invited Contributions and Editorials

Stefan Ratschan

**Decidability from a Numerical Point of View**

Invited Talk Abstract

Mathematical Aspects of Computer and Information Sciences, Springer LNCS 9582

Stefan Ratschan and Thomas Sturm

**Constraint Solving and Complex Systems—Special Issue Foreword**

Mathematics in Computer Science

Volume 6, Number 4, 2012, p. 345

Georgios Fainekos, Eric Goubault, Sylvie Putot, and Stefan Ratschan

**Numerical Software Verification—Special Issue Foreword**

Mathematics in Computer Science  
Volume 5, Number 4, 2011, pp. 357–358

Stefan Ratschan

**Symbolic-numeric Problems in the Automatic Analysis and Verification of Cyber-physical Systems**

SNC '09: Proceedings of the 2009 Conference on Symbolic Numeric Computation  
ACM, 2009, pp. 7–8

Stefan Ratschan

**Verification of Hybrid Systems**

Newsletter of the European Consortium for Mathematics in Industry, 2006, special issue on result-verifying computations, Andreas Frommer and Bruno Lang (eds.), volume 39, pp. 13–14

Hirokazu Anai and Stefan Ratschan

**Computer Algebra and Control System Design**

Proc. of the Seventh Asian Symposium on Computer Mathematics (ASCM 2005), pp. 54–57  
Sung-il Pae and Hyungju Park (eds.)  
Korea Institute for Advanced Study

## 5.5 Articles in Published Workshop Proceedings

Stefan Ratschan

**Computing ODE-barriers in hyper-rectangles**

2016 Int. Workshop on Symbolic and Numerical Methods for Reachability Analysis (SNR), pp. 1-6  
doi: 10.1109/SNR.2016.7479380

Stefan Ratschan

**Solving Undecidable Problems in the Theory of Real Numbers and Hybrid Systems**

Algorithmic Algebra and Logic 2005  
Proceedings of the Conference in Honor of the 60th Birthday of Volker Weispfenning  
A. Dolzmann, A. Seidl, and T. Sturm (eds.)  
Books on Demand GmbH, Norderstedt

Stefan Ratschan and Zhikun She

**Constraint Based Verification of Hybrid Systems**

Proc. of the Seventh Asian Symposium on Computer Mathematics (ASCM 2005), pp. 66–68  
Sung-il Pae and Hyungju Park (eds.)  
Korea Institute for Advanced Study

## 5.6 Software

Stefan Ratschan and Zhikun She

**HSOLVER**

Verification of hybrid systems  
<http://hsolver.sourceforge.net>  
approximately 430 downloads April 2005-March 2011

Stefan Ratschan

**RSOLVER**

Solver for quantified real-number constraints

<http://rsolver.sourceforge.net>

approximately 2400 downloads April 2005–November March 2011

Stefan Ratschan with Hoon Hong, Andreas Neubacher, Volker Stahl et. al.

**Approximate Quantified Constraint Solving**

## 5.7 Invited Talks and Tutorials

Invited Keynote

**Non-Linear Real Arithmetic with Transcendental Function Symbols: Undecidable but Easy?**

7th International Workshop on Satisfiability Checking and Symbolic Computation

Haifa, Israel

Part of IJCAR 22, at FLOC 2022

Invited Plenary Talk

**Verification Methods: Rigorous Results using Non-rigorous Computation**

High Performance Computing in Science and Engineering (HPCSE), Beskydy, Czech Republic, 2017

Invited Plenary Talk

**Decidability from a Numerical Point of View**

Sixth International Conference on Mathematical Aspects of Computer and Information Sciences

(MACIS), Berlin, 2015

Panel Session Speaker

**The Role of Robustness in Hybrid Systems**

17th International Conference on Hybrid Systems: Computation and Control (HSCC), Berlin, 2014

Invited visiting researcher, 2 weeks, Beihang University, China, 2010

**Non-linear Numerical Constraint Solving**

Automatic Verification and Analysis of Complex Systems

1st AVACS Spring School, Universität Oldenburg, March 2010

**Symbolic-Numeric Problems in the Automatic Analysis and Verification of Cyber-Physical Systems**

Invited Plenary Talk

SNC2009, 3rd International Workshop on Symbolic-Numeric Computation

Kyoto, Japan, 2009

**Interval Computation: Why? When? How?**

Tutorial (2x90min)

Seminar on numerical analysis and winter school (seminář numerické analýzy a zimní škola), SNA'09,

Ostrava, 2009

### **Guaranteed Termination in the Verification of Non-Linear Robust Hybrid Systems**

German Verification Day, Oldenburg, 2005

### **Quantified Constraints Under Perturbation**

Invitational Special Session, Seventh International Conference on Applications of Computer Algebra, Albuquerque, 2001

Various workshop invitations (e.g., "Prague gathering of logicians 2014", numerous Dagstuhl seminars; NII Shonan Meeting; ESI Vienna: "Global Optimization"; ZiF Bielefeld "Mathematical Stability Analysis in Biomechanics and Robotics", ), and invitations to seminar talks (e.g., EPFL Switzerland)

## **5.8 Numerous Talks in Workshops**

## **5.9 Other Publications**

Stefan Ratschan

### **Applications of Quantified Constraint Solving**

<http://arxiv.org/abs/1205.5571>

### **Interview Stefan Ratschan**

In "Vědci a vědkyně v pohybu—o akademické mobilitě" (Marta Vohlídalová a Alice Červinková), Sociologický ústav AV ČR, 2012, pp. 116–124

## **6 Editing, Conference, and other Organizational Activities**

- Vice president of supervisory board, Institute Computer Science, Academy of Sciences of the Czech Republic, 2012–2013
- Steering committee chair of conference series "Mathematical Aspects of Computer and Information Sciences" (MACIS), 2012–2013
- Editorial board member of journal "Mathematics in Computer Science" (Birkhäuser Verlag), 2010–2021
- Member of Subject-area Board Informatics, Faculty of Mathematics and Physics, Charles University in Prague, 2015–
- Member of Board of the doctoral study program Informatics, Faculty of Information Technology, Czech Technical University in Prague, 2015–
- Member of Board of the doctoral study program Control Engineering and Robotics, Faculty of Electrical Engineering, Czech Technical University in Prague, 2017–
- RV 2024: 24th International Conference on Runtime Verification, PC member
- SC<sup>2</sup> 2024: Ninth International Workshop on Satisfiability Checking and Symbolic Computation, PC member.
- ICTAC 2023: 20th International Colloquium on Theoretical Aspects of Computing, PC member
- SNR 2021: 7th International Workshop on Symbolic-Numeric Methods for Reasoning about CPS and IoT (SNR), program co-chair

- SC<sup>2</sup> 2020: Fifth International Workshop on Satisfiability Checking and Symbolic Computation, PC member.
- SNR 2020: 6th International Workshop on Symbolic-Numeric Methods for Reasoning about CPS and IoT (SNR), program co-chair
- SC<sup>2</sup> 2019: Fourth International Workshop on Satisfiability Checking and Symbolic Computation, PC member.
- NSV 2019: 12th International Workshop on Numerical Software Verification, PC member.
- SNR 2019: The Fifth International Workshop on Symbolic-Numeric methods for Reasoning about CPS and IoT, PC member.
- WCGO 2019: 6th World Congress on Global Optimization 2019, Metz, France, PC member.
- LeGO 2018: 14th Int. Workshop on Global Optimization, Leiden, The Netherlands, PC member.
- Associate of EU project H2020-FETOPN-2015-CSA\_712689: SC<sup>2</sup>—Satisfiability Checking and Symbolic Computation, 2016–2018
- NSV 2018: 11th International Workshop on Numerical Software Verification, PC member
- SNR'18: 4th International Workshop on Symbolic and Numerical Methods for Reachability Analysis, PC member
- SETTA 2017: 3rd International Symposium on Dependable Software Engineering: Theories, Tools and Applications, PC member
- SNR'17: 3rd International Workshop on Symbolic and Numerical Methods for Reachability Analysis, PC member
- FORMATS'16: 14th International Conference on Formal Modelling and Analysis of Timed Systems, PC member
- SETTA'16: Second International Symposium on Dependable Software Engineering: Theories, Tools and Applications, Beijing, China, PC member
- SNR 2016: 2nd International Workshop on Symbolic and Numerical Methods for Reachability Analysis, CPSWeeks 2016, PC member
- SETTA'15: First International Symposium on Dependable Software Engineering: Theories, Tools and Applications, Nanjing, China, PC member
- SNR 2015: 1st International Workshop on Symbolic and Numerical Methods for Reachability Analysis, CAV affiliated), PC member
- PESW 2015: The 3rd Prague Embedded Systems Workshop, PC member
- ARCH 2015: 2nd International Workshop on Applied Verification for Continuous and Hybrid Systems, CPSWeek 2015, Seattle
- PESW 2014: The 2nd Prague Embedded Systems Workshop, PC member
- ARCH 2014: 1st International Workshop on Applied verification for Continuous and Hybrid Systems, Cyber Physical Systems Week, Berlin, PC member

- HAS'14: 4th Workshop on Hybrid Autonomous Systems 2014, PC member
- SummerSim'14: 2014 Summer Simulation Multi-Conference (SCS/ACM SIGSIM), Monterey, CA, USA, PC member
- HSCC 2014: Hybrid Systems: Computation and Control, Berlin, Germany, PC member
- MACIS 2013: Fifth International Conference on Mathematical Aspects of Computer and Information Sciences, Nanning, China, PC member
- SCSS 2013: 5th International Symposium on Symbolic Computation in Software Science, Hagenberg, Austria, PC member
- ESW 2013: The 1st Embedded Systems Workshop, Temešvar, Czech Republic, PC member
- ICAPS 2013 workshop on Planning in Continuous Domains, PC member
- HSCC 2013: Hybrid Systems: Computation and Control, PC member
- SVARM & VERIFY Workshop 2012, associated with IJCAR 2012, PC member.
- NSV 2012: Fifth International Workshop on Numerical Software Verification, Berkeley, California, USA, PC member
- HSCC 2012: Hybrid Systems: Computation and Control, PC member
- MACIS 2011: "4th International Conference on Mathematical Aspects of Computer and Information Sciences", Beijing, China, program co-chair
- NSV-2011: "Fourth International Workshop on Numerical Software Verification", associated with CAV 2011, co-organizer
- QiCP'10: Third International Workshop on Quantification in Constraint Programming, St. Andrews, Scotland, 2010, PC Member
- SVARM: Workshop on Synthesis, Verification, and Analysis of Rich Models, Edinburgh, 2010, PC Member
- NSV-3: Third International Workshop on Numerical Software Verification, Edinburgh, 2010, PC Member
- FORMATS'10, 8th International Conference on Formal Modelling and Analysis of Timed Systems, PC Member
- QiCP'08: Second International Workshop on Quantification in Constraint Programming, Sydney, Australia, 2008, PC Member
- International Conference on Mathematical Aspects of Computer and Information Sciences, Beijing, China, 2006, Program Committee Member
- 8-th Asian Symposium on Computer Mathematics (ASCM), Seoul, 2005, co-organizer of Session "Computer Algebra and Control System design"
- Workshop on Interval Analysis and Constraint Propagation for Applications, IntCP 2005, Sitges, Spain, Member of Program Committee and Organizing Committee

- Workshop on Quantification in Constraint Programming, Sitges, Spain, 2005, Program Committee Member
- Workshop on Interval Analysis and Constraint Propagation for Applications, IntCP 2003, Kinsale, Ireland, Committee Member
- Assistance, organization of “First International Symposium on Parallel Symbolic Computation”, 1994, Linz.
- Design and management of a 50K€/year aid program for the universities of Bosnia and Herzegovina in the sector of computer networking.

## 7 Reviewing Activities

- Review of project proposals for Dutch Research Council, Swiss National Science Foundation, and The Royal Society
- Reviewer for numerous journals
- Habilitation committee member for Pavel Parízek (2020)

## 8 Teaching and Communication of Science

### **Computer Assisted Formal Reasoning**

Doctoral course 2021–  
Czech Technical University, Prague

### **Systems Theory**

Semester course WS 2012/2013– (2+1 hours, max. 250 students each)  
Czech Technical University, Prague

### **Formal Methods and Specification**

Semester course SS 2011– (2+1 hours, max. 80 students each)  
Czech Technical University, Prague

### **Systems Modeling and Analysis**

Semester course WS 2010/2011, 2011/12 (2+1 hours)  
Czech Technical University, Prague

### **Two Talks at Czech Week of Science and Technology**

November 2008

### **Hybrid Systems: Modeling, Simulation, Verification**

Semester course WS 2008/2009 (2 hours)  
Charles University, Prague

### **Global Optimization**

Semester course WS 2007/2008 (2 hours)  
Charles University, Prague

### **Solving Constraints over the Real Numbers**

Semester course 2003/04 (2 hours of lecture and 2 hours of exercises per week)  
Universität des Saarlandes, Germany

### **Solving Quantified Real-Number Constraints**

RAAG Summer School on Tools for Real Algebraic Geometry, 2003  
Rennes, France

### **Tutorial on Solving Real First-Order Constraints**

Short Postgraduate Course  
Universitat de Girona, Spain

### **Foundations of Computer Geometry**

1 year course 1998/1999 (2 hours of lectures and 2 hours in lab per week)  
Faculty of Natural Sciences and Mathematics  
University of Sarajevo, Bosnia and Hercegovina

## **9 Supervision**

Ph.D.: Jan Kuřátko (2020), Tomáš Kolárik (2024), Jiří Fejlek (2024)

Master: Vojtěch Hovorka (2013), Tomáš Zrůst (2015), Ondřej Šmíd (2016), Tomáš Mahr (2018), Jiří Fejlek (2018), Libor Vytlačil (2018), Robert Husák (2018), Tomáš Kolárik (2018), Jan Onderka (2020), Martin Bedrna (2024)

Bachelor: Tomáš Makara (2014), Jiří Fejlek (2015), Pavel Frumert (2016), Jakub Kottnauer (2016), Peter Nagy (2023)