

Igor KONNOV

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Formal Methods in Systems Engineering
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Born in 1981. Citizen of Russia, resident of Austria since 2011

Languages: Russian (mother tongue), English (fluent), German (studying B2)

Research interests: software verification, model checking, parameterized model checking,
verification of distributed algorithms, temporal logic of actions (TLA⁺)

Appointments

Vienna University of Technology (TU Wien), Faculty of Informatics, Austria:

Jan 2016 – now. Postdoctoral researcher, principal investigator in the WWTF project APALACHE

Dec 2011 – Dec 2015. Postdoctoral assistant professor (Universitätsassistent, limited contract)

Jul 2011 – Dec 2011. Postdoctoral researcher (Projektassistent)

Moscow State University (MSU), Faculty of Computational Mathematics and Cybernetics, Russia:

Jan 2010 – Jun 2011. Junior research fellow

Dec 2006 – Jan 2010. Pre- and postdoctoral research and teaching assistant

Sytech LLC, Russia: **2006–2010**, Part-time systems architect, **2004–2006**, Software developer

IFirst LLC, Russia: **01.09.2002–15.09.2003**, Part-time programmer

Higher education

Oct 2003– Nov 2008. Moscow State University, Russia: Ph.D. in Computer Science (awarded in **Feb 2009**)

Sep 1998– Jul 2003. Moscow State University, Russia: Specialist (approx. MSc) in Applied Math. & Informatics

With distinction, 97% are the best score: avg. score 1.06 (German scale) = avg. score 4.87 (Russian scale)

Project acquisition and participation

2016–2018. WWTF: Vienna Science and Technology Fund. Project ICT15–103 APALACHE **539k€**

Abstraction-based Parameterized TLA Checker

Role: principal investigator, **with:** J. Widder (co-PI), H. Veith (core team)

Acceptance rate: 10 out of 137 proposals (approx. 7%)

2015–2018. FWF: Austrian National Research Network S11403-N23 SHiNE

Systematic Methods in Systems Engineering

Role: researcher, **Coordinator:** R. Bloem (**3.7 Mio. €**), **PI:** H. Veith

625k€

2011–2014. WWTF: Vienna Science and Technology Fund. Project PROSEED

598k€

Proof Seeding for Software Verification

Role: researcher, **PI:** H. Veith

2010–2014. FWF: Austrian National Research Network S11403-N23 RiSE

Rigorous Systems Engineering

Role: researcher, **Coordinator:** R. Bloem (**3.7 Mio. €**), **PI:** H. Veith

582.8k €

2010–2012. Russian Federal Special-Purpose Programme, Project 14.740.11.0399

approx. **200k €**

Developing a Prototype for Computer Simulation of Real-Time Distributed Systems

Role: responsible for coordination, research agenda, and report writing, **PI:** R.L. Smeliansky

2009–2011. RFBR: Russian Fund for Basic Research, Project Nr. 09–01–00277-a

approx. **32k €**

Structural and Semantic Analysis Using Formal Models of Sequential and Parallel Processes

Role: researcher, **PI:** R.I. Podlovchenko

2006–2009. INTAS: EU research cooperation with the New Independent States, Project Nr. 05–1000008–8144

Practical Formal Verification Using Automated Reasoning and Model Checking

Role: researcher, **Coordinator:** T. Jebelian, **PI:** V.E. Plisko

2006–2008. RFBR: Russian Fund for Basic Research, Project Nr. 06–01–00106-a

approx. **52k €**

Formal Models of Sequential and Parallel Processes and the Analysis of Their Semantic Properties

Role: researcher, **PI:** R.I. Podlovchenko

R&D projects with industry and state-governed companies

2009–2010. *Obfuscation techniques on intermediate code representation*

Computer Systems Lab/MSU

Role: team lead of 1 master student and 1 PhD student, **PI:** R.L. Smeliansky

2007–2008. *Obfuscation techniques for C++*

Computer Systems Lab/MSU

Role: team lead of 1 master student and 1 PhD student, **PI:** R.L. Smeliansky

2008. *Teachable static analysis workbench*

The Open Web Application Security Project (OWASP)

Role: developer, **PI:** D.D. Kozlov

2007–2008. *Static analysis of python web applications for vulnerabilities*

Computer Systems Lab/MSU

Role: developer, **PI:** R.L. Smeliansky

Selected invited talks & lectures (see page 8 for more)

Bertrand Meyer’s Vericlub seminar, U. Toulouse, Toulouse/France

Nov 2016

invited seminar talk *Model checking of threshold-guarded distributed algorithms: beyond reachability*

Rigorous System Design Laboratory, EPFL, Lausanne/Switzerland

Sep 2016

invited seminar talk *Model checking of fault-tolerant distributed algorithms: safety and liveness*

Workshop on Program Semantics, Specification & Verification at CSR’16, St. Petersburg/Russia Jun 2016

invited talk *Model checking of threshold-based fault-tolerant distributed algorithms*

Spring School Logic & Verification, Vienna/Austria

Apr 2016

lectures on *Complete parameterized & bounded model checking of threshold-based fault-tolerant distributed algorithms*

Amazon, Herndon, VA/USA

Jun 2015

invited talk *Model checking of threshold-based fault-tolerant distributed algorithms*

Dagstuhl Seminar: “Distributed Cloud Computing”, Dagstuhl/Germany

Feb 2015

talk *Model checking of threshold-based fault-tolerant distributed algorithms*

Tools & Methods of Program Analysis'14 , Kostroma/Russia invited talk <i>Parameterized model checking of fault-tolerant distributed algorithms by abstraction</i>	Nov 2014
Summer School'14 : “Verification Technology, Systems & Applications”, Luxembourg lectures on <i>Model checking of fault-tolerant distributed algorithms</i> (together with Helmut Veith)	Oct 2014
Dagstuhl Seminar : “Formal Verification of Distributed Algorithms”, Dagstuhl/Germany invited talk <i>Counter attack on Byzantine generals</i>	Apr 2013
Concurrency Seminar , Computing Laboratory, Oxford/UK invited talk <i>An invariant-based approach to the verification of asynchronous parameterized networks</i>	Feb 2011

Teaching experience

Vienna University of Technology (TU Wien)

2013–present . Computer Aided Verification <i>Since 2017, holding the lecture course. Until 2017, reading parts of the lecture course, teaching assistance.</i>	Master students, compulsory, lectures & practicals, 3 ECTS
2013–present . Program and Systems Verification <i>Teaching assistance</i>	Bachelor students, compulsory, lectures & practicals, 6 ECTS
2011–2015 . Formal Methods of Informatics <i>Teaching assistance</i>	Master students, compulsory, lectures & practicals, 6 ECTS

Moscow State University (MSU)

2008–2010 . Software model checking (Dr. Savenkov) <i>Designed the course together with K. Savenkov, read parts of the lecture course, teaching assistance</i>	8th semester, compulsory, lectures & seminars, 32 hrs.
2004 . Seminars on The C Programming Language and UNIX <i>Instructed at all seminars (approx. 20 students)</i>	3rd semester, compulsory, 32 hrs.
2005 . Seminars on Syntax Analysis and C++ <i>Instructed at all seminars (approx. 20 students)</i>	4th semester, compulsory, 32 hrs.
2004 . Operating Systems (Prof. Terekhov) <i>Teaching assistance</i>	3rd semester, compulsory, lectures, 54 hrs.
2003–2011 . Computer Networks (Prof. Smeliansky) <i>Teaching assistance</i>	6th semester, compulsory, lectures, 64 hrs.
2003–2004 . The Java Programming Language <i>Read parts of the lecture course, teaching assistance</i>	optional, lectures, 32 hrs.
2003–2004 . MSU math entrance exams <i>Corrected written math exams, participated in the oral math exams</i>	compulsory

Kazakhstan branch of Moscow State Univ., Astana/Kazakhstan

2011 . Software model checking <i>held the lecture course and the seminars</i>	8th semester, compulsory, lectures & seminars, 32 hrs.
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Tashkent University, Tashkent/Uzbekistan

2011–2013. Participated in EU project CANDI: Teaching Competency and Infrastructure for e-Learning and Retraining

Advising

PhD students (TU Wien):

2016–present. Thanh Hai Tran (advising)

2016–present. Jure Kukovec (advising)

2015–present. Marijana Lazic (informal co-advising)

advisor: Priv.-Doz. Dr. Josef Widder

2011–2014. Annu Gmeiner (informal co-advising)

Parameterized model checking of fault-tolerant distributed algorithms

advisor: Prof. Helmut Veith

Master students:

2016. Jure Kukovec (Univ. Ljubljana)

Extensions of Threshold Automata for Reachability in Parameterized Systems

co-advised with Prof. Andrej Bauer

2015–2016. Thanh Hai Tran (TU Wien)

User-guided predicate abstraction of TLA+ specifications

co-advised with Prof. Helmut Veith

2009–2011. Alexander Mischenko (MSU)

Static Type Analysis of Python Programs on Bytecode Level

2007–2009. Denis Sigaev (MSU)

Detection of Programs Protected from Reverse Engineering

co-advised with A. Kachalin

2008. Alexey Schevchenko (MSU)

Application of Regular Model Checking to Infinite State Systems

2007. Peter Bulychev (MSU)

Game-Theoretic Methods of Protocol Verification

co-advised with Prof. Vladimir Zakharov

Bachelor students:

2016. Stefan Karner (TU Wien)

Model Checking for Adventure Games

2013. Sebastian Neumaier (TU Wien)

A Simple Simulation Language for Distributed Algorithms

2011. Andrey Babak and Anton Artyomov (MSU)

Static Analysis of Python Programs

Community service

Program Committees:

Formal Methods in Computer-Aided Design (FMCAD'17)

Vienna/Austria

Computer Aided Verification'16 (External Reviewer Committee)

Toronto/Canada

Tools & Methods of Program Analysis'17

Moscow/Russia

8th Workshop Program Semantics, Specification, and Verification'17

Moscow/Russia

Parallel, Distributed, and Network-based Processing'17 (Formal approaches track)

St. Petersburg/Russia

Symbolic and Numeric Algorithms for Scientific Computing 2013, 2016, 2017

Timisoara/Romania

Stabilization, Safety, and Security of Distributed Systems'15

Edmonton/Canada

Tools & Methods of Program Analysis'15

St. Petersburg/Russia

Journal and book chapter reviews: TIME (2015), LMCS (2017), ACM ToCL (2017), MICS (2017), Handbook of Model Checking (eds. E. Clarke, T. Henzinger, H. Veith)

Guest editor (with Helmut Veith and Natasha Sharygina): Formal Methods in System Design (Springer) Special issue on Computer Aided Verification'13

Editorial board: Proceedings of the Institute for System Programming of the Russian Academy of Sciences since 2016 [www.ispras.ru/en/proceedings]

External reviewer: TACAS'17, STACS'17, VMCAI'17, MARS'17, ICFEM'16, CONCUR'16, IJCAR'16, LICS'16, EuroPar'16, AAMAS'16, CAV'15, FMCAD'15, TACAS'15, FoSSaCS'15, CAV'14, SAS'14, GandALF'14, ESOP'14, HVC'14, CAV'13, LATA'13, SSS'13, CAV'12, NFM'12, SPIN'12, VMCAI'12, FMICS'11, CSL'11

Workshop chair of CAV'13. Conference on Computer Aided Verification [<http://cav2013.forsyte.at>]

Co-organizer of FRIDA'16. Workshop on Formal Reasoning in Distributed Algorithms, May 17, 2016
Co-located with NETYS'16 [<http://forsyte.at/events/frida2016>]

Co-organizer of FRIDA'15. Workshop on Formal Reasoning in Distributed Algorithms, June 5, 2015
Co-located with FORTE/DisCoTec'15 [<http://discotec2015.inria.fr/workshops/frida-2015/>]

Co-organizer of FRIDA'14. Workshop on Formal Reasoning in Distributed Algorithms, July 23–24, 2014
Co-located with CAV'14 [<http://vs12014.at/frida/>]

Student Award Committee. VCLA International Student Awards 2014–2015

Tools

2012–present. BYMC: model checker of parameterized fault-tolerant distributed algorithms
[<http://forsyte.at/software/bymc>]

2004–2009. CHEAPS: model checker of parameterized asynchronous distributed systems
[<http://lvk.cs.msu.su/~konnov/cheaps>]

Scholarships & sponsored summer schools

2009–2010. Fellowship for young researchers: Faculty of Computational Mathematics and Cybernetics, MSU

2009. Marktoberdorf Summer School *Engineering Methods and Tools for Software Safety and Security*

2008. Marktoberdorf Summer School *Logics and Languages for Reliability and Security*

2005. Microsoft Summer School *Mathematics and Programming: from Theory Towards Practice*

2003–2005. PhD student scholarship: LSI Logic

Technical Skills

Experience in software systems design, development, and testing.

Languages and Tools: OCaml, Java, Python, C++, Ruby, C, UNIX scripting, cvs/svn/git, L^AT_EX.

Publications and talks

Book

- [1] R. Bloem, S. Jacobs, A. Khalimov, I. Konnov, S. Rubin, H. Veith, and J. Widder. *Decidability of Parameterized Verification*. Vol. 6. 1. Morgan & Claypool, 2015, pp. 1–170. DOI: 10.2200/S00658ED1V01Y201508DCT013.

Book chapter

- [2] A. Gmeiner, I. Konnov, U. Schmid, H. Veith, and J. Widder. “Tutorial on Parameterized Model Checking of Fault-Tolerant Distributed Algorithms”. In: *Formal Methods for Executable Software Models*. LNCS. Springer, 2014, pp. 122–171. DOI: 10.1007/978-3-319-07317-0_4.

Invited paper

- [3] I. Konnov, H. Veith, and J. Widder. “What You Always Wanted to Know About Model Checking of Fault-Tolerant Distributed Algorithms”. In: *Perspectives of System Informatics: PSI 2015, in Memory of Helmut Veith, Revised Selected Papers*. Springer, 2016, pp. 6–21. DOI: 10.1007/978-3-319-41579-6_2.

Journal articles

- [4] I. V. Konnov, H. Veith, and J. Widder. “On the completeness of bounded model checking for threshold-based distributed algorithms: Reachability”. In: *Inf. Comput.* 252 (2017), pp. 95–109. DOI: 10.1016/j.ic.2016.03.006.
- [5] R. Bloem, S. Jacobs, A. Khalimov, I. Konnov, S. Rubin, H. Veith, and J. Widder. “Decidability in Parameterized Verification”. In: *ACM SIGACT News* 47.2 (2016), pp. 53–64. DOI: 10.1145/2951860.2951873.
- [6] D. Y. Volkanov, V. A. Zakharov, D. A. Zorin, V. V. Podymov, and I. V. Konnov. “A combined toolset for the verification of real-time distributed systems”. In: *Programming and Computer Software* 41.6 (2015), pp. 325–335. DOI: 10.1134/S0361768815060080.
- [7] I. Konnov, V. Podymov, D. Volkanov, V. Zakharov, and D. Zorin. “How to Make a Simple Tool for Verification of Real-Time Systems”. In: *Automatic Control and Computer Sciences* 48.7 (2014), pp. 534–542. DOI: 10.3103/S0146411614070232.
- [8] I. V. Konnov. “On application of weaker simulations to parameterized model checking by network invariants technique”. In: *Automatic Control and Computer Sciences* 44.7 (2010), pp. 378–386. DOI: 10.3103/S0146411610070035.
- [9] I. V. Konnov and V. A. Zakharov. “An invariant-based approach to the verification of asynchronous parameterized networks”. In: *Journal of Symbolic Computation* 45.11 (2010), pp. 1144–1162. DOI: 10.1016/j.jsc.2008.11.006.
- [10] I. V. Konnov and V. A. Zakharov. “Using Adaptive Symmetry Reduction for LTL Model Checking”. In Russian. In: *Modelling and Analysis of Information Systems* 17.4 (2010), pp. 78–87. URL: http://www.mathnet.ru/php/archive.phtml?wshow=paper&jrnid=mais&paperid=38&option_lang=eng.
- [11] I. V. Konnov and V. A. Zakharov. “An Approach to the Verification of Symmetric Parameterized Distributed Systems”. In: *Programming and Computer Software* 31.5 (2005), pp. 225–236. DOI: 10.1007/s11086-005-0034-4.

Peer-reviewed conference proceedings

- [12] I. V. Konnov, M. Lazic, H. Veith, and J. Widder. “A short counterexample property for safety and liveness verification of fault-tolerant distributed algorithms”. In: *Proceedings of the 44th ACM SIGPLAN Symposium on Principles of Programming Languages, POPL 2017, Paris, France, January 18-20, 2017*. 2017, pp. 719–734. URL: <http://dl.acm.org/citation.cfm?id=3009860>.
- [13] I. V. Konnov, J. Widder, F. Spegni, and L. Spalazzi. “Accuracy of Message Counting Abstraction in Fault-Tolerant Distributed Algorithms”. In: *Verification, Model Checking, and Abstract Interpretation - 18th International Conference, VMCAI 2017, Paris, France, January 15-17, 2017, Proceedings*. 2017, pp. 347–366. DOI: 10.1007/978-3-319-52234-0_19. URL: <http://forsyte.tuwien.ac.at/static/download/17kwss-accuracy-vmcai.pdf>.
- [14] I. Konnov, T. Kotek, Q. Wang, H. Veith, S. Bliudze, and J. Sifakis. “Parameterized Systems in BIP: Design and Model Checking”. In: *CONCUR 2016*. Vol. 59. LIPIcs. 2016, 30:1–30:16. DOI: 10.4230/LIPIcs.CONCUR.2016.30.
- [15] I. Konnov, H. Veith, and J. Widder. “SMT and POR beat Counter Abstraction: Parameterized Model Checking of Threshold-Based Distributed Algorithms”. In: *CAV (Part I)*. Vol. 9206. LNCS. 2015, pp. 85–102. DOI: 10.1007/978-3-319-21690-4_6.

- [16] I. Konnov, H. Veith, and J. Widder. “On the Completeness of Bounded Model Checking for Threshold-Based Distributed Algorithms: Reachability”. In: *CONCUR 2014*. Vol. 8704. LNCS. 2014, pp. 125–140. DOI: 10.1007/978-3-662-44584-6_10.
- [17] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. “Brief announcement: parameterized model checking of fault-tolerant distributed algorithms by abstraction”. In: *PODC*. 2013, pp. 119–121. DOI: 10.1145/2484239.2484285.
- [18] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. “Parameterized model checking of fault-tolerant distributed algorithms by abstraction”. In: *FMCAD*. 2013, pp. 201–209. DOI: 10.1109/FMCAD.2013.6679411.
- [19] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. “Towards Modeling and Model Checking Fault-Tolerant Distributed Algorithms”. In: *SPIN*. Vol. 7976. LNCS. 2013, pp. 209–226. DOI: 10.1007/978-3-642-39176-7_14.
- [20] I. V. Konnov. “Application of CHEAPS System to Parameterized Model Checking of Distributed Systems”. In Russian. In: *Proc. 3rd All-Russia Conf. on Methods and Techniques of Information Processing*. Moscow, 2009, pp. 116–122. ISBN: 978-5-89407-373-3.
- [21] V. A. Zakharov and I. V. Konnov. “On the Verification of Asynchronous Parameterized Distributed Programs”. In Russian. In: *Proc. 2nd All-Russia Conf. on Methods and Techniques of Information Processing*. MAKS Press, Moscow, 2005, pp. 267–372. ISBN: 5-89407-230-1.
- [22] I. V. Konnov and V. A. Zakharov. “On the Verification of Parameterized Symmetric Distributed Programs”. In Russian. In: *Proc. 1st All-Russia Conf. on Methods and Techniques of Information Processing*. MAKS Press, Moscow, 2003, pp. 395–400. ISBN: 5-89407-163-1.

Invited speaker at conferences and workshops

- [23] I. Konnov. *Model Checking of Threshold-based Fault-Tolerant Distributed Algorithms*. Invited talk at the 7th Workshop on Program Semantics, Specification & Verification, St. Petersburg, Russia, June. 2016. URL: <http://pssv-conf.ru/en/2016/program>.
- [24] I. Konnov. *Parametrized Model Checking of Fault-tolerant Distributed Algorithms by Abstraction*. Tutorial at the International Conference Tools and Methods of Program Analysis, Kostroma, Russia, November. 2014. URL: <http://tmpaconf.org/pasteventsmaterialsen/keynote-speakersen#2014>.

Tutorials

- [25] I. Konnov. *Model Checking of Fault-tolerant Distributed Algorithms*. Tutorial at the Spring School Logic and Verification, Vienna, April. 2016. URL: <http://forsyte.at/events/love2016/>.
- [26] H. Veith and I. Konnov. *Model Checking of Fault-tolerant Distributed Algorithms*. Tutorial at the Summer School on Verification Technology, Systems & Applications, Luxembourg, Luxembourg, October. 2014. URL: <http://resources.mpi-inf.mpg.de/departments/rg1/conferences/vtsa14/>.

Peer-reviewed workshop contributions

- [27] I. Konnov, H. Veith, and J. Widder. *Challenges in Model Checking of Fault-tolerant Designs in TLA+*. Contribution to the 8th International Workshop on Exploiting Concurrency Efficiently and Correctly, San Francisco, CA, USA, July. 2015. URL: <http://multicore.doc.ic.ac.uk/events/ec2/KonnovVeithWidder.pdf>.
- [28] I. Konnov. “CheAPS: a Checker of Asynchronous Parameterized Systems”. In: *WING 2010*. Ed. by A. Voronkov, L. Kovacs, and N. Bjorner. Vol. 1. EPiC Series. EasyChair, 2012, pp. 128–129. URL: <http://www.easychair.org/publications/?page=355792421>.
- [29] I. V. Konnov and V. A. Zakharov. “Using Adaptive Symmetry Reduction for LTL Model Checking”. In: *Proc. International Workshop on Program Semantics, Specification and Verification (PSSV 2010) affiliated with CSR 2010*. 2010, pp. 5–11. URL: <http://csr2010.ksu.ru/PSSV.html>.
- [30] V. Zakharov and I. Konnov. “An Invariant-based Approach to the Verification of Asynchronous Parameterized Networks”. In: *International Workshop on Invariant Generation (WING’07)*. 2007, pp. 41–55. URL: http://www.risc.uni-linz.ac.at/publications/download/risc_3128/proceedings.pdf.

Conference contributions

- [31] V. V. Antonenko and I. V. Konnov. “On the Choice of a Simulation Run-Time Infrastructure based on High-Level Architecture”. In Russian. In: *17th International Conference on Computational Mechanics and Contemporary Application Software Systems 2011 (VMSPPS’2011), Alushta, Ukraine*. 2011, pp. 36–38. ISBN: 978-5-7035-2269-1.

- [32] G. A. Klimov, D. D. Kozlov, and I. V. Konnov. “Static analysis for security of web applications developed in Python”. In Russian. In: *Proc. 5th All-Russia Scientific and Technical Conf. Microsoft technologies in theory and practice of programming*. 2008.
- [33] I. V. Konnov. “The system for verification of parameterized models of asynchronous distributed systems (CHEAPS)”. In Russian. In: *Proc. 5th All-Russia Scientific and Technical Conf. Microsoft technologies in theory and practice of programming*. 2008.

Workshop contributions

- [34] I. Konnov. *Verifying Safety and Liveness of Threshold-guarded Fault-Tolerant Distributed Algorithms*. Talk at the Helmut Veith Memorial Workshop, Obergurgl, Austria, February. 2017. URL: <http://cbr.uibk.ac.at/events/hvw/schedule.php>.
- [35] I. Konnov. *SMT and POR beat Counter Abstraction: Parameterized Model Checking of Threshold-based Distributed Algorithms*. Workshop contribution at Alpine Verification Meeting, Attersee, Austria, May. 2015.
- [36] A. B. Glonina, I. Konnov, V. V. Podymov, D. Y. Volkanov, V. A. Zakharov, and D. A. Zorin. *An experience on using simulation environment DYANA augmented with UPPAAL for verification of embedded systems defined by UML statecharts*. Contribution to the CAV workshop VES13, St. Petersburg, Russia, July. 2013. URL: <http://forsyte.at/wp-content/uploads/ves13-gkpvzz.pdf>.
- [37] I. Konnov. *Parameterized Model Checking by Network Invariants: the Asynchronous Case*. Contribution to: LICS Workshop AISS, Dubrovnik, Croatia, June 2012. 2012. URL: <http://forsyte.at/wp-content/uploads/12konnov-aiss.pdf>.
- [38] I. Konnov, H. Veith, and J. Widder. *Who is afraid of Model Checking Distributed Algorithms?* Contribution to the 5th International Workshop on Exploiting Concurrency Efficiently and Correctly, Berkeley, CA, USA, July 2012. 7 citations excl. self-citations. 2012. URL: <http://forsyte.at/wp-content/uploads/2012/07/ec2-konnov.pdf>.
- [39] I. V. Konnov and O. Letichevsky. “Model Checking GARP Protocol using Spin and VRS”. In: *International Workshop on Automata, Algorithms, and Information Technologies*. 2010. DOI: 10.1007/s10559-010-9244-8.

Invited Seminar Talks

- [40] I. Konnov. *Model Checking of Fault-tolerant Distributed Algorithms: Safety and Liveness*. Invited talk at the Seminar of Rigorous System Design Laboratory, Lausanne, Switzerland, September. 2016.
- [41] I. Konnov. *Model Checking of Threshold-based Fault-tolerant Distributed Algorithms*. Invited talk at the Seminar on Foundations of Mathematics and Theoretical Computer Science, Ljubljana University, Ljubljana, Slovenia, May. 2016.
- [42] I. Konnov. *Model Checking of Threshold-Guarded Distributed Algorithms: Beyond Reachability*. Invited talk at the Vericlub Seminar (Bertrand Meyer), Toulouse, France, November. 2016.
- [43] I. Konnov. *Model Checking of Threshold-based Fault-tolerant Distributed Algorithms*. Invited talk at Amazon, Herndon, VA, USA, June. 2015.
- [44] I. Konnov. *Model checking of threshold-based fault-tolerant distributed algorithms*. Talk at the Dagstuhl Seminar on Distributed Cloud Computing, Dagstuhl, Germany, February. 2015.
- [45] I. Konnov. *SMT and POR beat Counter Abstraction*. Invited talk at the RiSE Seminar at Institute of Science and Technology Austria, Klosterneuburg, Austria, April. 2015.
- [46] I. Konnov. *On Completeness of Bounded Model Checking for Threshold-based Distributed Algorithms: Reachability*. Talk at the Seminar on Theoretical Problems in Programming, Moscow State University, Moscow, Russia, February. 2014.
- [47] I. Konnov. *Counter Attack on Byzantine Generals*. Talk at the Dagstuhl Seminar on Formal Verification of Distributed Algorithms, Dagstuhl, Germany, April. 2013.
- [48] I. Konnov. *Counter Attack on Byzantine Generals*. Talk at the Seminar on Theoretical Problems in Programming, Moscow State University, Moscow, Russia, February. 2013.
- [49] I. Konnov. *Who is Afraid of Model Checking Distributed Algorithms*. Talk at the PUMA/RiSE Seminar, Goldegg, Austria, September. 2012.
- [50] I. Konnov. *An invariant-based approach to the verification of asynchronous parameterized networks*. Talk at the Concurrency Seminar, Computing Laboratory, Oxford University, Oxford, UK, February. 2011.

- [51] I. Konnov. *Two Techniques of Parameterized Model Checking and Symmetry Reduction*. Talk at the RiSE Seminar, TU Vienna, Vienna, Austria, April. 2011.
- [52] I. V. Konnov. *CheAPS: Parameterized Model Checking Tool*. Joint Workshop of Microsoft Research and Institute for System Programming Russian Academy of Sciences, Moscow, June 2009. 2009.

Technical reports

- [53] I. Konnov, M. Lazic, H. Veith, and J. Widder. *A Short Counterexample Property for Safety and Liveness Verification of Fault-Tolerant Distributed Algorithms*. Extended version of the POPL'17 paper including the proofs. 2016. URL: <http://arxiv.org/abs/1608.05327>.
- [54] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. *Counter Attack on Byzantine Generals: Parameterized Model Checking of Fault-tolerant Distributed Algorithms*. Oct. 2012. URL: <http://arxiv.org/abs/1210.3846>.
- [55] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. *Starting a Dialog between Model Checking and Fault-tolerant Distributed Algorithms*. Oct. 2012. URL: <http://arxiv.org/abs/1210.3839>.
- [56] P. Bulychev, I. V. Konnov, and V. A. Zakharov. "Computing (bi)simulation relations preserving CTL^*_X for ordinary and fair Kripke structures". In: *Mathematical Methods and Algorithms, Institute of Systems Programming of the Russian Academy of Sciences*. Vol. 12. 2006, pp. 59–76. URL: <http://discopal.ispras.ru/pdfs/issue-2006-12/cs-isp-sbornik.pdf>.
- [57] I. Konnov and V. Zakharov. "On the verification of asynchronous parameterized networks of communicating processes by model checking". In: *Mathematical Methods and Algorithms, Institute of Systems Programming of the Russian Academy of Sciences*. Vol. 12. 2006, pp. 37–58. URL: <http://discopal.ispras.ru/pdfs/issue-2006-12/cs-isp-sbornik.pdf>.