

Igor KONNOV

Vienna, Austria

Homepage: konnov.github.io

Work email: [igor at interchain.io](mailto:igor@interchain.io)

Personal email: [igor.konnov at gmail.com](mailto:igor.konnov@gmail.com)

Born in 1981. Married, with one child. Citizen of Russia, permanent resident of Austria

Languages: English (fluent), German (ÖSD Zertifikat B2), Russian (mother tongue), French (beginner)

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

Appointments

Informal Systems GmbH / Interchain Foundation, Vienna, Austria:

Oct 2019 – present. Senior Research Scientist

INRIA Nancy — Grand Est, Nancy, France:

Mar 2018 – Sep 2019 (leave of absence). Researcher (permanent, chargé de recherche de classe normale)

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

Jan 2016 – Feb 2018. 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 (m.n.s.)

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, degrees, and titles

Dec 2019. Vienna University of Technology (TU Wien), Austria: Privatdozent — Habilitation in Computer Science

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

2016–2019. WWTF: Vienna Science and Technology Fund. Project ICT15–103 APALACHE

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%)

539k€

TU Wien

2015–2018. FWF: Austrian National Research Network S11403-N23 SHiNE <i>Systematic Methods in Systems Engineering</i>	TU Wien
Role: researcher, Coordinator: R. Bloem (3.7 Mio. €), PI: H. Veith	625k €
2011–2014. WWTF: Vienna Science and Technology Fund. Project PROSEED <i>Proof Seeding for Software Verification</i>	598k €
Role: researcher, PI: H. Veith	TU Wien
2010–2014. FWF: Austrian National Research Network S11403-N23 RiSE <i>Rigorous Systems Engineering</i>	TU Wien
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 <i>Developing a Prototype for Computer Simulation of Real-Time Distributed Systems</i>	approx. 200k €
Role: responsible for coordination, research agenda, and report writing, PI: R.L. Smeliansky	MSU
2009–2011. RFBR: Russian Fund for Basic Research, Project Nr. 09–01–00277-a <i>Structural and Semantic Analysis Using Formal Models of Sequential and Parallel Processes</i>	approx. 32k €
Role: researcher, PI: R.I. Podlovchenko	MSU
2006–2009. INTAS: EU research cooperation with the New Independent States, Project Nr. 05–1000008–8144 <i>Practical Formal Verification Using Automated Reasoning and Model Checking</i>	MSU
Role: researcher, Coordinator: T. Jebelian, PI: V.E. Plisko	
2006–2008. RFBR: Russian Fund for Basic Research, Project Nr. 06–01–00106-a <i>Formal Models of Sequential and Parallel Processes and the Analysis of Their Semantic Properties</i>	approx. 52k €
Role: researcher, PI: R.I. Podlovchenko	MSU

R&D projects with industry and state companies

2009–2010. <i>Obfuscation techniques on intermediate code representation</i>	Computer Systems Lab/MSU
Role: team lead of 1 master student and 1 PhD student, PI: R.L. Smeliansky	
2007–2008. <i>Obfuscation techniques for C++</i>	Computer Systems Lab/MSU
Role: team lead of 1 master student and 1 PhD student, PI: R.L. Smeliansky	
2008. <i>Teachable static analysis workbench</i>	The Open Web Application Security Project (OWASP)
Role: developer, PI: D.D. Kozlov	
2007–2008. <i>Static analysis of python web applications for vulnerabilities</i>	Computer Systems Lab/MSU
Role: developer, PI: R.L. Smeliansky	

Selected invited talks & lectures

VMCAI Winter School , New Orleans, LA/USA tutorial <i>Model checking of distributed algorithms: from classics towards Tendermint blockchain</i>	Jan 2020
Dagstuhl Seminar 18211: “Formal Methods and Fault-Tolerant Distributed Computing: Forging an Alliance” Dagstuhl/Germany, invited tutorial <i>What my computer can find about your distributed algorithm</i>	May 2018
Bertrand Meyer’s Vericlub seminar , U. Toulouse, Toulouse/France invited seminar talk <i>Model checking of threshold-guarded distributed algorithms: beyond reachability</i>	Nov 2016

Rigorous System Design Laboratory, EPFL , Lausanne/Switzerland	Sep 2016
invited seminar talk <i>Model checking of fault-tolerant distributed algorithms: safety and liveness</i>	
Workshop on Program Semantics, Specification & Verification at CSR'16 , St. Petersburg/Russia	Jun 2016
invited talk <i>Model checking of threshold-based fault-tolerant distributed algorithms</i>	
Spring School Logic & Verification , Vienna/Austria	Apr 2016
lectures on <i>Complete parameterized & bounded model checking of threshold-based fault-tolerant distributed algorithms</i>	
Amazon , Herndon, VA/USA	Jun 2015
invited talk <i>Model checking of threshold-based fault-tolerant distributed algorithms</i>	
Dagstuhl Seminar : “Distributed Cloud Computing”, Dagstuhl/Germany	Feb 2015
talk <i>Model checking of threshold-based fault-tolerant distributed algorithms</i>	
Tools & Methods of Program Analysis'14 , Kostroma/Russia	Nov 2014
invited talk <i>Parameterized model checking of fault-tolerant distributed algorithms by abstraction</i>	
Summer School'14 : “Verification Technology, Systems & Applications”, Luxembourg	Oct 2014
lectures on <i>Model checking of fault-tolerant distributed algorithms</i> (together with Helmut Veith)	
Dagstuhl Seminar : “Formal Verification of Distributed Algorithms”, Dagstuhl/Germany	Apr 2013
invited talk <i>Counter attack on Byzantine generals</i>	
Concurrency Seminar , Computing Laboratory, Oxford/UK	Feb 2011
invited talk <i>An invariant-based approach to the verification of asynchronous parameterized networks</i>	

Teaching experience

Vienna University of Technology (TU Wien)

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

Moscow State University (MSU)

2008–2010. Software model checking (Dr. Savenkov)	8th semester, compulsory, lectures & seminars, 32 hrs.
<i>Designed the course together with K. Savenkov, read parts of the lecture course, teaching assistance</i>	
2004. Seminars on The C Programming Language and UNIX	3rd semester, compulsory, 32 hrs.
<i>Instructed at all seminars (approx. 20 students)</i>	
2005. Seminars on Syntax Analysis and C++	4th semester, compulsory, 32 hrs.
<i>Instructed at all seminars (approx. 20 students)</i>	
2004. Operating Systems (Prof. Terekhov)	3rd semester, compulsory, lectures, 54 hrs.
<i>Teaching assistance</i>	

- 2003–2011.** Computer Networks (Prof. Smeliansky) 6th semester, compulsory, lectures, 64 hrs.
Teaching assistance
- 2003–2004.** The Java Programming Language optional, lectures, 32 hrs.
Read parts of the lecture course, teaching assistance
- 2003–2004.** MSU math entrance exams compulsory
Corrected written math exams, participated in the oral math exams

Kazakhstan branch of Moscow State Univ., Astana/Kazakhstan

- 2011.** Software model checking 8th semester, compulsory, lectures & seminars, 32 hrs.
held the lecture course and the seminars

Tashkent University, Tashkent/Uzbekistan

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

Advising

PhD students (TU Wien): Associated Faculty of Doctoral College LogiCS [logic-cs.at]

- 2016–present.** Thanh Hai Tran (advising) with Priv.-Doz. Dr. Josef Widder
- 2016–present.** Jure Kukovec (advising) with Priv.-Doz. Dr. Josef Widder
- 2015–2019.** Frau Dr. Marijana Lazić (co-advising) with Priv.-Doz. Dr. Josef Widder
Reduction techniques for parameterized model checking and synthesis of fault-tolerant distributed algorithms
- 2011–2014.** Frau Dr. Annu Gmeiner (informal co-advising) advisors: Prof. Helmut Veith and PD. Dr. Josef Widder
Parameterized model checking of fault-tolerant distributed algorithms

Master students:

- 2019.** Viktor Sergeev (Univ. of Lorraine)
Bounded Model Checking of Liveness Properties of TLA+ Specifications co-advised with Stephan Merz
- 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:

- 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

Conference organization:

PC co-chair of CONCUR 2020 in Vienna	[concur2020.forsyte.at]
Artifact evaluation chair: Computer-Aided Verification (CAV'18)	[cavconference.org/2018]
Workshop chair: Computer-Aided Verification (CAV'13)	[cav2013.forsyte.at]

Program Committees:

ACM Symposium on Principles of Distributed Computing (PODC'18)	London/UK
Formal Methods in Computer-Aided Design (FMCAD) 2017 & 2018	Vienna/Austria & Austin/TX, US
Computer Aided Verification'16 (External Reviewer Committee)	Toronto/Canada
Symbolic and Numeric Algorithms for Scientific Computing 2013, 2016, and 2017	Timisoara/Romania
Stabilization, Safety, and Security of Distributed Systems'15	Edmonton/Canada
Intl. Conf. on Verification & Evaluation of Computer & Comm. Systems (VECoS'18)	Grenoble/France
Intl. Symposium on Formal Approaches to Parallel and Distributed Systems (4PAD) 2018 & 2019	Orléans/France & Dublin/Ireland
Workshop on Methods and Tools for Rigorous System Design (MeTRiD'18)	Thessaloniki/Greece
Tools & Methods of Program Analysis 2015 & 2017	St. Petersburg & Moscow/Russia
Workshop on Program Semantics, Specification, and Verification 2017–2019	Russia
Parallel, Distributed, and Network-based Processing'17 (Formal approaches track)	St. Petersburg/Russia

Journal and book chapter reviews: FMSD (2018), Computing (2018), LMCS (2017), ACM ToCL (2017), MAIS (2017), MiCS (2017), TIME (2015),
Handbook of Model Checking (eds. E. Clarke, T. Henzinger, H. Veith)

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

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

External reviewer: FSTTCS'17, QEST'17, 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

Student Award Committee. VCLA International Student Awards 2014–2015

Tools

2016–present. APALACHE: symbolic model checker for TLA⁺ [forsyte.at/software/apalache]

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

2004–2009. CHEAPS: model checker of parameterized asynchronous distributed systems
[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

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] J. Kukovec, T.-H. Tran, and I. Konnov. “Extracting symbolic transitions from TLA+ specifications”. In: *Science of Computer Programming* 187 (2020), p. 102361. DOI: <https://doi.org/10.1016/j.scico.2019.102361>.
- [5] I. Konnov. “**Review:** Edmund M. Clarke, Thomas A. Henzinger, Helmut Veith, and Roderick Bloem (eds): Handbook of model checking - Springer International Publishing AG, Cham, Switzerland, 2018”. In: *Formal Asp. Comput.* 31.4 (2019), pp. 455–456. DOI: 10.1007/s00165-019-00486-z.
- [6] I. Konnov, J. Kukovec, and T. Tran. “TLA+ model checking made symbolic”. In: *PACMPL* 3.OOPSLA (2019), 123:1–123:30. URL: <https://doi.org/10.1145/3360549>.
- [7] I. V. Konnov, H. Veith, and J. Widder. “On the completeness of bounded model checking for threshold-based distributed algorithms: Reachability”. In: *Information and Computation* 252 (2017). (**Extended version of the conference paper** I. Konnov, H. Veith, J. Widder. “On the Completeness of Bounded Model Checking for Threshold-Based Distributed Algorithms: Reachability”. In *Concurrency Theory – 25th International Conference, CONCUR*, 2014, pp. 125–140), pp. 95–109. DOI: 10.1016/j.ic.2016.03.006.
- [8] I. Konnov, M. Lazic, H. Veith, and J. Widder. “Para²: Parameterized Path Reduction, Acceleration, and SMT for Reachability in Threshold-Guarded Distributed Algorithms”. In: *Formal Methods in System Design* (2017). (**Extended version of the conference paper** I. Konnov, H. Veith, J. Widder. “SMT and POR Beat Counter Abstraction: Parameterized Model Checking of Threshold-Based Distributed Algorithms”. In *Computer-Aided Verification*, vol. 9206, LNCS, 2015, pp. 85–102.) DOI: 10.1007/s10703-017-0297-4. URL: <https://link.springer.com/article/10.1007/s10703-017-0297-4>.
- [9] 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.
- [10] 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.

- [11] 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.
- [12] 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.
- [13] 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.
- [14] 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.
- [15] 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

- [16] N. Bertrand, I. Konnov, M. Lazic, and J. Widder. “Verification of Randomized Consensus Algorithms Under Round-Rigid Adversaries”. In: *CONCUR 2019*. Vol. 140. LIPIcs. 2019, 33:1–33:15. DOI: 10.4230/LIPIcs.CONCUR.2019.33.
- [17] I. Stoilkovska, I. Konnov, J. Widder, and F. Zuleger. “Verifying Safety of Synchronous Fault-Tolerant Algorithms Bounded Model Checking”. In: *TACAS*. 2019, pp. 357–374. DOI: 10.1007/978-3-030-17465-1_20.
- [18] I. Konnov and J. Widder. “ByMC: Byzantine Model Checker”. In: *Leveraging Applications of Formal Methods, Verification and Validation. Distributed Systems*. Cham: Springer International Publishing, 2018, pp. 327–342. DOI: 10.1007/978-3-030-03424-5_22. URL: <https://hal.inria.fr/hal-01909653>.
- [19] J. Kukovec, I. Konnov, and J. Widder. “Reachability in Parameterized Systems: All Flavors of Threshold Automata”. In: *29th International Conference on Concurrency Theory, CONCUR 2018, September 4-7, 2018, Beijing, China*. 2018, 19:1–19:17. DOI: 10.4230/LIPIcs.CONCUR.2018.19. URL: <https://doi.org/10.4230/LIPIcs.CONCUR.2018.19>.
- [20] J. Kukovec, T. Tran, and I. Konnov. “Extracting Symbolic Transitions from TLA^+ Specifications”. In: *Abstract State Machines, Alloy, B, TLA, VDM, and Z*. 2018, pp. 89–104. DOI: 10.1007/978-3-319-91271-4_7. URL: http://forsyte.at/wp-content/uploads/abz2018_full.pdf.
- [21] 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>.
- [22] 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.
- [23] M. Lazic, I. Konnov, J. Widder, and R. Bloem. “Synthesis of Distributed Algorithms with Parameterized Threshold Guards”. In: *OPODIS*. Vol. 95. LIPIcs. 2017, 32:1–32:20. URL: <https://doi.org/10.4230/LIPIcs.OPODIS.2017.32>.
- [24] I. Konnov, T. Kotek, Q. Wang, H. Veith, S. Bliudze, and J. Sifakis. “Parameterized Systems in BIP: Design and Model Checking”. In: *27th International Conference on Concurrency Theory, CONCUR 2016, August 23-26, 2016, Québec City, Canada*. Vol. 59. LIPIcs. 2016, 30:1–30:16. DOI: 10.4230/LIPIcs.CONCUR.2016.30.
- [25] 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.
- [26] 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.
- [27] 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.
- [28] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. “Parameterized model checking of fault-tolerant distributed algorithms by abstraction”. In: *Formal Methods in Computer-Aided Design, FMCAD 2013, Portland, OR, USA, October 20-23, 2013*. 2013, pp. 201–209. DOI: 10.1109/FMCAD.2013.6679411.

- [29] A. John, I. Konnov, U. Schmid, H. Veith, and J. Widder. “Towards Modeling and Model Checking Fault-Tolerant Distributed Algorithms”. In: *Model Checking Software - 20th International Symposium, SPIN 2013, Stony Brook, NY, USA, July 8-9, 2013*. Vol. 7976. LNCS. 2013, pp. 209–226. DOI: 10.1007/978-3-642-39176-7_14.
- [30] 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.
- [31] 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.
- [32] 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

- [33] 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>.
- [34] 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/pastevenstmaterials/en/keynote-speakers/en#2014>.

Tutorials

- [0] I. Konnov. *Model checking of distributed algorithms: from classics towards Tendermint blockchain*. Tutorial at VMCAI Winter School, New Orleans, LA, USA, January. 2020. URL: <https://popl20.sigplan.org/home/VMCAI-2020>.
- [35] I. Konnov. *What my computer can find about your distributed algorithm*. Tutorial at the Dagstuhl seminar 18211 “Formal Methods and Fault-Tolerant Distributed Computing: Forging an Alliance”, Dagstuhl, Germany, May. 2018. URL: <https://www.dagstuhl.de/en/program/calendar/semhp/?semnr=18211>.
- [36] 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/>.
- [37] 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

- [38] I. Konnov, J. Kukovec, and T.-H. Tran. *BmcMT: Bounded Model Checking of TLA+ Specifications with SMT*. Contribution to TLA+ Community Meeting, Oxford, UK, July. 2018. URL: <http://tla2018.loria.fr/contrib/konnov.pdf>.
- [39] I. Konnov and S. Merz. *Model Checking of Fault-Tolerant Distributed Algorithms: from Classics towards Contemporary*. Contribution to DSN Workshop on Byzantine Consensus and Resilient Blockchains, Luxembourg City, Luxembourg, June. 2018. URL: <https://bcrb18.fim.uni-passau.de/shortpapers/bcrb18-konnov-merz.pdf>.
- [40] 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>.
- [41] I. Konnov. “CheAPS: a Checker of Asynchronous Parameterized Systems”. In: *WING 2010*. Ed. by A. Voronkov, L. Kovacs, and N. Björner. Vol. 1. EPiC Series. EasyChair, 2012, pp. 128–129. URL: <http://www.easychair.org/publications/?page=355792421>.
- [42] 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>.
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Conference contributions

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- [45] 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.
- [46] 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

- [47] I. Konnov. *Making TLA+ model checking symbolic*. Talk at VeriDis + Matryoshka workshop, Amsterdam, Netherlands. June 2019. URL: <http://matryoshka.gforge.inria.fr/matryoshka2019/index.html>.
- [48] I. Konnov. *Towards symbolic model checking of fault-tolerant designs in TLA+*. Talk at the Helmut Veith Memorial Workshop, Obertauern, Austria, January. 2018. URL: <http://hvw2018.cs.uni-salzburg.at/schedule>.
- [49] 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>.
- [50] 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.
- [51] 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/vs13-gkpzz.pdf>.
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- [53] 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>.
- [54] 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

- [55] I. Konnov. *Bounded Model Checking of TLA+ Specifications with SMT*. Invited talk at ANR “FREDDA” meeting, Univ. Paris-Diderot, Paris, France. 2019. URL: <https://www.irif.fr/fredda/meetings.html>.
- [56] I. Konnov. *Making TLA+ model checking symbolic*. Talk at NETYS workshop on Verification of Distributed Systems, Marrakech, Morocco. June 2019. URL: <http://goto.ucsd.edu/~gleissen/vds-test/>.
- [57] I. Konnov. *TLA+ Model Checking Made Symbolic*. Talk at LARA seminar, EPFL, Lausanne, Switzerland, November. 2019.
- [58] I. Konnov. *Synthesizing Distributed Algorithms with Parameterized Threshold Guards*. Talk at the NETYS Workshop on Verification of Distributed Systems, Essaouira, Morocco, May. 2018. URL: <http://netys.net/VDS2018.html>.
- [59] J. Widder and I. Konnov. *Logical Methods for the Correctness of Distributed Algorithms*. RISE PI talk at “Alpine Verification Meeting”, Wagrain, Austria, September. 2018. URL: <https://avm2018.iaik.tugraz.at/program/>.
- [60] I. Konnov. *Model checking of distributed algorithms for LARGE-scale systems*. Interview talk at INRIA (awarded 1 of 4 researcher positions (CR1) at INRIA), Paris, France, May. 2017.
- [61] I. Konnov. *Verifying Safety and Liveness of Threshold-guarded Fault-Tolerant Distributed Algorithms*. Talk at LORIA/INRIA seminar, Nancy, France, May. 2017.
- [62] 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.

- [63] 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.
- [64] I. Konnov. *Model Checking of Threshold-Guarded Distributed Algorithms: Beyond Reachability*. Invited talk at the Vericlub Seminar (Bertrand Meyer), Toulouse, France, November. 2016.
- [65] I. Konnov. *Model Checking of Threshold-based Fault-tolerant Distributed Algorithms*. Invited talk at Amazon, Herndon, VA, USA, June. 2015.
- [66] I. Konnov. *Model checking of threshold-based fault-tolerant distributed algorithms*. Talk at the Dagstuhl Seminar on Distributed Cloud Computing, Dagstuhl, Germany, February. 2015. URL: <https://www.dagstuhl.de/en/program/calendar/semhp/?semnr=15072>.
- [67] 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.
- [68] 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.
- [69] I. Konnov. *Counter Attack on Byzantine Generals*. Talk at the Dagstuhl Seminar on Formal Verification of Distributed Algorithms, Dagstuhl, Germany, April. 2013. URL: <https://www.dagstuhl.de/de/programm/kalender/semhp/?semnr=18211>.
- [70] I. Konnov. *Counter Attack on Byzantine Generals*. Talk at the Seminar on Theoretical Problems in Programming, Moscow State University, Moscow, Russia, February. 2013.
- [71] I. Konnov. *Who is Afraid of Model Checking Distributed Algorithms*. Talk at the PUMA/RiSE Seminar, Goldegg, Austria, September. 2012.
- [72] 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.
- [73] I. Konnov. *Two Techniques of Parameterized Model Checking and Symmetry Reduction*. Talk at the RiSE Seminar, TU Vienna, Vienna, Austria, April. 2011.
- [74] 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

- [75] N. Bertrand, I. Konnov, M. Lazic, and J. Widder. *Verification of Randomized Distributed Algorithms under Round-Rigid Adversaries*. Nov. 2018. URL: <https://hal.inria.fr/hal-01925533>.
- [76] 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>.
- [77] 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>.
- [78] 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>.
- [79] 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>.
- [80] 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>.