Viktor Kunčak

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School of Computer & Communications Sciences, INR 318
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Research Interests: Formal Verification, Automated Reasoning

Work Experience Summary

2012-	**Associate Professor**, leader of Laboratory for Automated Reasoning and Analysis School of Computer and Communication Sciences EPFL (École Polytechnique Fédérale de Lausanne), Switzerland
Spring 2022	**Visiting Professor** ISTA (Institute of Science and Technology Austria)
2007-2012	**Tenure-Track Assistant Professor** School of Computer and Communication Sciences EPFL (École Polytechnique Fédérale de Lausanne), Switzerland
Summer 2002	**Research Intern**, Microsoft Research, Redmond, WA

Education

2001-2007	**Massachusetts Institute of Technology, Cambridge, USA** Ph.D. in Computer Science (degree date February 2007), GPA 5.0/5.0 Thesis: Modular Data Structure Verification Advisor: Prof. Martin Rinard
2000-2001	**Massachusetts Institute of Technology, Cambridge, USA** M.Sc. in Computer Science, Minor in Physics, September 2001, GPA 5.0/5.0 Thesis: Designing an Algorithm for Role Analysis Advisor: Prof. Martin Rinard
1996-2000	**University of Novi Sad, Serbia** B.Sc. in Computer Science, GPA 10.0/10.0, Best Student of the University Award Thesis: Modular Interpreters in Haskell Advisor: Prof. Mirjana Ivanović

Keynotes at Conferences and Invited Presentations

- Stainless tutorial at **ASPLOS** 2022 (with Georg Schmid, Nicolas Voirol, Mario Bucev)
- Invited Tutorial: Formal Methods in Computer Aided Design (**FMCAD**) 2021
- Keynote: **Lambda Days** Krakow, 14 February 2020
- Keynote: **Scala Days** Copenhagen, 2017
- Keynote: Interactive Theorem Proving (**ITP**), 2016
- Keynote: 7th NASA Formal Methods Symposium (**NFM**), April 2015
- Keynote: 24th International Symposium on Logic-Based Program Synthesis and Transformation (**LOPSTR**), September 2014
- Invited Talk: 3rd Workshop on Synthesis (**SYNT**), July 2014
- Keynote: International Colloquium on Automata, Languages, and Programming (**ICALP**), 8-11 July 2014, Copenhagen, Denmark
- Distinguished Lecture, Max-Planck Institute for Software Systems, February 2014
- Keynote: Runtime Verification (**RV**), 2013

- Keynote: Satisfiability Modulo Theories (SMT), with CAV, July 2011, USA,
  http://lara.epfl.ch/~kuncak/talks/smt11-keynote.pdf
- Keynote: Intermediate Verification Languages, with CADE, August 2011, PL
- Keynote: Interactions, Games and Protocols (iWIGP), with ETAPS, March 2011, DE
- Practical Synthesis (PSY), with CAV, July 2011, USA
- Keynote: 19th Annual Conference on Computer Science Logic (**CSL**), August 2010, Brno, CZ
- Invited Tutorial: Verification, Model Checking and Abstract Interpretation (**VMCAI**), 2010
- Symposium "Reactive Modeling in Science and Engineering", May 2010, IST Austria
- Keynote: Aliasing, Confinement and Ownership in Object-Oriented Programming, July 2009
- Keynote: KeY Symposium, May 2009, Speyer, DE
- Automated Deduction: Decidability, Complexity, Tractability (ADDCT), July 2007, Bremen, DE
- Dagstuhl Seminars (including seminars 03101, 05431, 07401, 09301, 09411, 09501) and COST Action meetings
- The above does not include conference talks or talks given at the occasion of visiting universities and research labs, such as: Caltech, CMU, Cornell, IBM T.J. Watson Research Center, IRIF (CNRS & Université de Paris), ISTA, LIAFA (Paris VII), LSV (ENS Cachan), Microsoft Research (Redmond, Cambridge), MIT, MPI for Software Systems and MPI for Computer Science (Saarbrücken), New York University, Northeastern University, Stanford University, Toyota Technological Institute at Chicago, TU Dresden, TU München, UC Berkeley, University of Illinois (Urbana-Champaign), University of Maryland, University of Novi Sad, UT Austin, Verimag (Grenoble).

PC Co-Chair, Journal Editorial Boards, Scientific Event Organization

Co-chair for

- **CAV 2017**, Int. Conf. Computer Aided Verification,
- **SYNT 2015**, Workshop on Synthesis,
- **FMCAD 2014**, Int. Conf. Formal Methods in Computer-Aided Design (also local organizer)
- **VMCAI 2012**, Int. Conf. Verification, Model Checking, and Abstract Interpretation

(Past) **Associate Editor** of the **ACM Transactions** on Programming Languages and Systems (TOPLAS). **Workshop initiator and co-organizer**:

- Machine Learning for Programming (MLP) collocated with FLOC 2018 in Oxford
- Workshop on Synthesis, Verification, and Analysis of Rich Models (SVARM) 2010, 2011, 2012.
- Summer School on Software Synthesis, Dagstuhl, August 2011.

An initiator of an **international COST Action** to establish formats for verification and synthesis (Rich Model Toolkit), 20 countries, 50 research groups (http://richmodels.epfl.ch/, COST Action IC0901). Participation as Management Committee member for Switzerland in COST actions IC0701 and CA20111 (EuroProofNet).

Co-organized Summer School: Software Synthesis, Dagstuhl, August 2011

Publication chair: FMCAD 2011 (Formal Methods in Computer-Aided Design)

Conference program committee member for 30+ conference instances:

- ACM Conf. Programming Language Design and Implementation (**PLDI 2023, PLDI 2021, PLDI 2020, PLDI 2014 ERC, PLDI 2013 ERC, PLDI 2011, PLDI 2010 ERC, PLDI 2007)**
- SPLASH/OOPSLA (**OOPSLA 2021, OOPSLA 2020, OOPSLA 2019 ERC, OOPSLA 2012 ERC**)
- European Conference on Object-Oriented Programming (**ECOOP 2021, ECOOP 2009**), ACM Conf. Principles of Programming Languages (**POPL 2016, POPL 2012 ERC, POPL 2011**),

- Computer Science Logic and Logic in Computer Science **(CSL-LICS 2014, CSL 2012, 2011)**

- Static Analysis Symposium **(SAS 2014, SAS 2011)**,

- Conference on Automated Deduction / International Joint Conference on Automated Reasoning **(CADE/IJCAR 2014,2011,2010,2008)**,

- 40th International Colloquium on Automata, Languages, and Programming **(ICALP 2013)**,

- Computer Aided Verification **(CAV 2012)**,

- European Symposium on Programming **(ESOP 2011)**,

- Conf. Verification, Model Checking, and Abstract Interpretation **(VMCAI 2011)**,

- Runtime Verification **(RV 2011)**,

- Formal Methods in Computer-Aided Design **(FMCAD 2011)**,

- ASM, Alloy, B and Z Conference **(ABZ 2010)**,

- Frontiers of Combining Systems **(FroCoS 2009)**,

- International Conference on Compiler Construction **(CC 2009)**,

- 35th International Conference on Current Trends in Theory and Practice of Computer Science **(SOFSEM 2009)**,

- Int. Conf. on Logic for Programming, Artificial Intelligence and Reasoning **(LPAR 2006, LPAR 2007)**,

- Int. Conf. Formal Verification of Object-Oriented Software **(FoVeOOS)**

Conf.Researchr page: `https://conf.researchr.org/profile/conf/viktorkuncak`

PC member of workshops: Scala Workshop 2013, Partial Evaluation and Program Manipulation **(PEPM 2010)**, Bytecode Semantics, Verification, Analysis and Transformation **(BYTE-CODE 2010)**, Java Technology for Real-time and Embedded Systems **(JTRES 2010)**, Heap Analysis and Verification **(HAV 2007)**, Automated Deduction: Decidability, Complexity, Tractability**(ADDCT 2007)**, Automatic Program Verification **(APV 2009)**,

Graduated 15 doctoral students (one co-advised):

1. Rodrigo Raya (2023)
2. Georg S. Schmid (2022), Stripe
3. Romain Edelmann (2021), Gymnase de Burier (Switzerland)
4. Emmanouil Koukoutos (2019), Google LLC
5. Nicolas Charles Yves Voirol (2019), Google LLC
6. Mikaël Mayer (2017), Amazon Web Services
7. Ravichandhran Kandhadai Madhavan (2017), Apple Inc.
8. Regis Blanc (2017), Google LLC
9. Etienne Kneuss (2016), CTO and partner at IMMOMIG SA
10. Tihomir Gvero (2015), Itecor, CreditSuisse, then Owner of Gvero's Pintokyo Games
11. Eva Darulova (2014), tenured **Associate Professor** at **Uppsala University**
12. Giuliano Losa (2014, co-advised with Rachid Guerraoui), Galois, Inc.
13. Hossein Hojjat (2013), **tenure-track faculty** at Rochester Institute of Technology and Tehran Institute for Advanced Studies
14. Philippe Suter (2012), IBM Research, then Two Sigma
15. Ruzica Piskac (2011), Donna L. Dubinsky **Associate Professor** (with tenure), **Yale** University

Current doctoral students (one co-advised):

1. Samuel Chassot

2. Sankalp Gambhir

3. Matthieu Bovel (co-advised with Martin Odersky)

4. Simon Guilloud

5. Dragana Milovančević

Doctoral thesis committee member for over 25 Ph.D. theses, primarily at EPFL.

Approved Research Projects:

period	amount	co-PIs	source	number
2024-2027	356'985 CHF	none	SNSF	200021_219474
2023-2024	171'835 CHF	Simon Felix (Ateleris GmbH)	SEFRI, ESA	
2022-2023	30'000 CHF	Dragana Milovancevic	EPFL DRIL	
2021-2024	452'187 CHF	none	SNSF	200021_197288
2020-2021	247'880 CHF	Laszlo Etesi (Ateleris GmbH)	SEFRI, ESA	ESOVER
2017-2020	639'839 CHF	none	SNSF	200021_175676
2015-2018	105'000 CHF	Srdjan Škrbić M.Odersky, D.Mašulović	SNSF SCOPES	IZ74Z0_160453
2015–2016	164'465 CHF	none	SNSF	200020_159949
2012–2017	1'739'200 CHF	none	EC ERC StG	PE6-306484-IMPRO
2013–2016	205'390 CHF	none	SNSF	200021_144503
2013–2013	23'000 CHF	none	SNSF	200020_146649
2013–2013	36'340 CHF	Rachid Guerraoui	SNSF	200020_144502
2012–2012	44'850 CHF	none	SNSF	200020_138204
2011–2013	103'098 CHF	Rachid Guerraoui	SNSF	200021_132188
2010–2013	104'980 CHF	Predrag Janičić	SNSF SCOPES	IZ73Z0_127979
2010–2013	190'383 CHF	none	SNSF	200021_132176
2009–2013	400'000 CHF	many	www.cost.eu	Action IC0901
2008–2012	1'086'000 CHF	M.Odersky, T.Henzinger	Microsoft	ICES ProgLab.NET
2008–2012	147'385 CHF	none	SNSF	200021_120433

Reviewed proposals for major funding agencies in Switzerland, USA, Austria, Sweden, Israel, France, and the Netherlands.

Courses (co)designed and (co)taught at EPFL:

- Computer Language Processing (compilers), 3rd year, 2008–

- Formal Verification: master's level, 2007–

- Software Construction, 2nd year, co-teaching with C. Pit-Claudel and M. Odersky

- Functional Programming, 2nd year, co-teaching with M. Odersky

- Parallelism and Concurrency, 2nd year, co-teaching with M. Odersky

- Doctoral Seminar on Automated Reasoning, Fall 2010.

- Co-produced Coursera **MOOC** "Parallel Programming", visited by over 100'000 learners and completed by thousands of students from all over the world.

EPFL Committee Service:

- Open Research Data program of the EPF Domain, a committee member (2021-)

- EPFL Open Science Fund evaluation panel member (2019)

- Member of the Commission on the Status of Women Faculty at EPFL (2019-2020)

- Responsible faculty for admissions to MSc program in Computer Science section (past, around 5 years)

- IC PhD admissions committee member (EDIC) (admissions process, student progress, doctoral curriculum), 2009–2014

- Faculty Recruiting Committee (multiple years)

- EPFL Commission de recherche (research comission), 4-5 years from February 2013

- Commission d'enseignement SIN, a few years from Fall 2012

- EPFL Human Research Ethics Committee, 10.2013-01.2014

- Co-organized IC Research Day with George Candea, James Larus, Martin Odersky (theme: The Future of Software)

- Co-organized IC Summer Research Institute (SuRI) 2011, with Rüdiger Urbanke **`http://suri.epfl.ch/past/2011`** (coordinated three-week seminar involving prominent invited speakers from all areas of computer and communication sciences; within these three weeks organized a focused week "Models and Tools for Reliable Systems", with invited speakers including C.A.R. Hoare, Aarti Gupta, Sharad Malik, Predrag Janičić, Rupak Majumdar, Darko Marinov, David Monniaux, Radu Iosif, Barbara Jobstmann, and J Strother Moore).

Publication List

Statistics: The ultimate answer to a number N of my papers cited at least N times is 42, according to Google scholar: `http://scholar.google.com/citations?user=kmoklesAAAAJ`
At least 34 of these most cited papers were published after I started my research group at EPFL.

In terms of `http://csrankings.org`, my areas of research is in two categories: *Programming languages* (under *Systems*) and *Logic and verification* (under *Theory*) and my years of research activity are from 2000.

[1] **Orthologic with axioms**.
Simon Guilloud and Viktor Kunčak.
Proc. ACM Program. Lang. (POPL), jan 2024.

[2] **Interpolation and quantifiers in ortholattices**.
Simon Guilloud, Sankalp Ghambhir, and Viktor Kunčak.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*. Springer International Publishing, 2024.

[3] **On the complexity of convex and reverse convex prequadratic constraints**.
Rodrigo Raya, Jad Hamza, and Viktor Kuncak.
In *24th Int. Conf. Logic for Programming, Artificial Intelligence and Reasoning (LPAR)*, 2023.

[4] **Lisa – a proof assistant embedded in scala**.
Simon Guilloud, Sankalp Ghambir, and Viktor Kunčak.
In *Interactive Theorem Proving (ITP)*, 2023.

[5] **Formula normalizations in verification**.
Simon Guilloud, Mario Bucev, Dragana Milovančević, and Viktor Kunčak.
In *Computer-Aided Verification (CAV)*, 2023.

[6] **Proving and disproving equivalence of functional programming assignments**.
Dragana Milovančević and Viktor Kunčak.
In *ACM SIGPLAN Conf. Programming Language Design and Implementation (PLDI)*, 2023.

[7] **Formally verified Quite OK Image format**.
Mario Bucev and Viktor Kunčak.
In *Formal Methods in Computer-Aided Design (FMCAD)*, 2022.

[8] **From verified Scala to STIX file system embedded code using Stainless**.
Jad Hamza, Simon Felix, Viktor Kunčak, Ivo Nussbaumer, and Filip Schramka.
In *NASA Formal Methods (NFM)*, 2022.

[9] **Equivalence checking for orthocomplemented bisemilattices in log-linear time**.
Simon Guilloud and Viktor Kunčak.
In *TACAS*, 2022.

[10] **Generalized arrays for Stainless frames**.
Georg Stefan Schmid and Viktor Kunčak.
In Bernd Finkbeiner and Thomas Wies, editors, *Verification, Model Checking, and Abstract Interpretation (VMCAI)*. Springer International Publishing, 2022.

[11] **NP satisfiability for arrays as powers**.
Rodrigo Raya and Viktor Kunčak.
In Bernd Finkbeiner and Thomas Wies, editors, *Verification, Model Checking, and Abstract Interpretation (VMCAI)*. Springer International Publishing, 2022.

[12] **Zippy LL(1) parsing with derivatives**.
Romain Edelmann, Jad Hamza, and Viktor Kunčak.
In *ACM SIGPLAN Conf. Programming Language Design and Implementation (PLDI)*, 2020.

[13] **System FR: Formalized foundations for the Stainless verifier**.
Jad Hamza, Nicolas Voirol, and Viktor Kunčak.
Proc. ACM Program. Lang, November 2019.

[14] **Minimal synthesis of string to string functions from examples**.
Jad Hamza and Viktor Kunčak.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2019.

[15] **Bidirectional evaluation with direct manipulation**.
Mikaël Mayer, Viktor Kunčak, and Ravi Chugh.
Proc. ACM Program. Lang, November 2018.

[16] **Solving quantified linear arithmetic by counterexample-guided instantiation**.
Andrew Reynolds, Tim King, and Viktor Kuncak.
Formal Methods in System Design (FMSD), 2017.

[17] **Refutation-based synthesis in SMT**.
Andrew Reynolds, Viktor Kuncak, Cesare Tinelli, Clark Barrett, and Morgan Deters.
Formal Methods in System Design (FMSD), 2017.

[18] **Proactive Synthesis of Recursive Tree-to-String Functions from Examples**.
Mikaël Mayer, Jad Hamza, and Viktor Kuncak.
In Peter Müller, editor, *31st European Conference on Object-Oriented Programming (ECOOP 2017)*, volume 74 of *Leibniz International Proceedings in Informatics (LIPIcs)*, Dagstuhl, Germany, 2017. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik.

[19] **Towards a compiler for reals**.
Eva Darulova and Viktor Kuncak.
ACM Trans. Program. Lang. Syst. (TOPLAS), March 2017.

[20] **Contract-based resource verification for higher-order functions with memoization**.
Ravichandhran Madhavan, Sumith Kulal, and Viktor Kuncak.
In *ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages (POPL)*, 2017.

[21] **An update on deductive synthesis and repair in the leon tool**.
Manos Koukoutos, Etienne Kneuss, and Viktor Kuncak.
In *5th Workshop on Synthesis*, 2016.

[22] **Translating scala programs to isabelle/hol (system description)**.
Lars Hupel and Viktor Kuncak.
In *International Joint Conference on Automated Reasoning (IJCAR)*, 2016.

[23] **Programming with enumerable sets of structures**.
Ivan Kuraj, Viktor Kuncak, and Daniel Jackson.
In *ACM SIGPLAN SPLASH Conference on Programming (OOPSLA Research Paper)*, 2015.

[24] **Synthesizing Java expressions from free-form queries**.

Tihomir Gvero and Viktor Kuncak.
In *ACM SIGPLAN SPLASH Conference on Programming (OOPSLA Research Paper)*, 2015.

[25] **Automating grammar comparison**.
Ravichandhran Madhavan, Mikael Mayer, Sumit Gulwani, and Viktor Kuncak.
In *ACM SIGPLAN SPLASH Conference on Programming (OOPSLA Research Paper)*, 2015.

[26] **Deductive program repair**.
Etienne Kneuss, Manos Koukoutos, and Viktor Kuncak.
In *Computer-Aided Verification (CAV)*, 2015.

[27] **Counterexample guided quantifier instantiation for synthesis in SMT**.
Andrew Reynolds, Morgan Deters, Viktor Kuncak, Cesare Tinelli, and Clark Barrett.
In *Computer-Aided Verification (CAV)*, 2015.

[28] **Counter-example complete verification for higher-order functions**.
Nicolas Voirol, Etienne Kneuss, and Viktor Kuncak.
In *Scala Symposium*, 2015.

[29] **Sound reasoning about integral data types with a reusable SMT solver interface**.
Régis Blanc and Viktor Kuncak.
In *Scala Symposium*, 2015.

[30] **Interactive synthesis using free-form queries (tool demonstration)**.
Tihomir Gvero and Viktor Kuncak.
In *International Conference on Software Engineering (ICSE)*, 2015.

[31] **Developing verified software using Leon (invited contribution)**.
Viktor Kuncak.
In *NASA Formal Methods (NFM)*, 2015.

[32] **Induction for SMT solvers**.
Andrew Reynolds and Viktor Kuncak.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2015.

[33] **Synthesizing functions from relations in Leon (invited contribution)**.
Viktor Kuncak, Etienne Kneuss, and Emmanouil Koukoutos.
In *Logic-Based Program Synthesis and Transformation (LOPSTR)*, 2014.

[34] **Scife: Scala framework for effcient enumeration of data structures with invariants**.
Ivan Kuraj and Viktor Kuncak.
In *Scala Workshop*, 2014.

[35] **Checking data structure properties orders of magnitude faster**.
Emmanouil Koukoutos and Viktor Kuncak.
In *Runtime Verification (RV)*, 2014.

[36] **Verifying and synthesizing software with recursive functions (invited contribution)**.
Viktor Kuncak.
In *41st International Colloquium on Automata, Languages, and Programming (ICALP)*, 2014.

[37] **Symbolic resource bound inference for functional programs**.
Ravichandhran Madhavan and Viktor Kuncak.
In *Computer Aided Verification (CAV)*, 2014.

[38] **Sound compilation for reals**.
Eva Darulova and Viktor Kuncak.
In *ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages (POPL)*, 2014.

[39] **Synthesis modulo recursive functions**.
Etienne Kneuss, Viktor Kuncak, Ivan Kuraj, and Philippe Suter.
In *Systems, Programming, Languages and Applications: Software for Humanity (SPLASH)*, 2013.

[40] **Game programming by demonstration**.
Mikaël Mayer and Viktor Kuncak.
In *SPLASH Onward!*, 2013.

[41] **Interpolation for synthesis on unbounded domains**.
Viktor Kuncak and Régis Blanc.
In *Formal Methods in Computer-Aided Design (FMCAD)*, 2013.

[42] **Synthesis of fixed-point programs**.
Eva Darulova, Viktor Kuncak, Rupak Majumdar, and Indranil Saha.
In *Embedded Software (EMSOFT)*, 2013.

[43] **Effect analysis for programs with callbacks**.
Etienne Kneuss, Viktor Kuncak, and Philippe Suter.
In *Fifth Working Conference on Verified Software: Theories, Tools and Experiments*, 2013.

[44] **Classifying and solving Horn clauses for verification**.
Philipp Rümmer, Hossein Hojjat, and Viktor Kuncak.
In *Fifth Working Conference on Verified Software: Theories, Tools and Experiments*, 2013.

[45] **Executing specifications using synthesis and constraint solving (invited talk)**.
Viktor Kuncak, Etienne Kneuss, and Philippe Suter.
In *Runtime Verification (RV)*, 2013.

[46] **An overview of the Leon verification system: Verification by translation to recursive functions**.
Régis William Blanc, Etienne Kneuss, Viktor Kuncak, and Philippe Suter.
In *Scala Workshop*, 2013.

[47] **Automatic synthesis of out-of-core algorithms**.
Andrej Spielmann, Andres Nötzli, Christoph Koch, Viktor Kuncak, and Yannis Klonatos.
In *SIGMOD*, 2013.

[48] **Disjunctive interpolants for Horn-clause verification**.
Philipp Rümmer, Hossein Hojjat, and Viktor Kuncak.
In *Computer Aided Verification (CAV)*, 2013.

[49] **Complete completion using types and weights**.
Tihomir Gvero, Viktor Kuncak, Ivan Kuraj, and Ruzica Piskac.
In *ACM SIGPLAN Conf. Programming Language Design and Implementation (PLDI)*, 2013.

[50] **Software verification and graph similarity for automated evaluation of students' assignments**.
Milena Vujošević-Janičić, Mladen Nikolić, Dušan Tošić, and Viktor Kuncak.
Information and Software Technology, 2013.

[51] **Reductions for synthesis procedures**.
Swen Jacobs, Viktor Kuncak, and Phillippe Suter.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2013.

[52] **Certifying solutions for numerical constraints**.
Eva Darulova and Viktor Kuncak.
In *Runtime Verification (RV)*, 2012.

[53] **Accelerating interpolants**.
Hossein Hojjat, Radu Iosif, Filip Konečný, Viktor Kuncak, and Philipp Rümmer.
In *Automated Technology for Verification and Analysis (ATVA)*, 2012.

[54] **A verification toolkit for numerical transition systems (tool paper)**.
Hossein Hojjat, Filip Konecny, Florent Garnier, Radu Iosif, Viktor Kuncak, and Philipp Ruemmer.
In *16th Int. Symp. Formal Methods (FM)*, 2012.

[55] **Synthesis for unbounded bitvector arithmetic**.
Andrej Spielmann and Viktor Kuncak.
In *International Joint Conference on Automated Reasoning (IJCAR)*, LNAI. Springer, 2012.

[56] **Speculative linearizability**.
Rachid Guerraoui, Viktor Kuncak, and Giuliano Losa.

In *ACM SIGPLAN Conf. Programming Language Design and Implementation (PLDI)*, 2012.

[57] **Software synthesis procedures**.
Viktor Kuncak, Mikaël Mayer, Ruzica Piskac, and Philippe Suter.
Communications of the ACM, 2012.

[58] **Functional synthesis for linear arithmetic and sets**.
Viktor Kuncak, Mikael Mayer, Ruzica Piskac, and Philippe Suter.
Software Tools for Technology Transfer (STTT), 2012.

[59] **Deciding functional lists with sublist sets**.
Thomas Wies, Marco Muñiz, and Viktor Kuncak.
In *Verified Software: Theories, Tools and Experiments (VSTTE)*, LNCS, 2012.

[60] **Development and evaluation of LAV: an SMT-based error-finding platform**.
Milena Vujošević-Janičić and Viktor Kuncak.
In *Verified Software: Theories, Tools and Experiments (VSTTE)*, LNCS, 2012.

[61] **Constraints as control**.
Ali Sinan Köksal, Viktor Kuncak, and Philippe Suter.
In *38th ACM SIGACT-SIGPLAN Symp. Principles of Programming Languages (POPL)*, 2012.

[62] **Trustworthy numerical computation in Scala**.
Eva Darulová and Viktor Kuncak.
In *ACM SIGPLAN SPLASH Conference on Programming (OOPSLA Research Paper)*, 2011.

[63] **Satisfiability modulo recursive programs**.
Philippe Suter, Ali Sinan Köksal, and Viktor Kuncak.
In *Static Analysis Symposium (SAS)*, 2011.

[64] **An efficient decision procedure for imperative tree data structures**.
Thomas Wies, Marco Muñiz, and Viktor Kuncak.
In *Computer-Aideded Deduction (CADE)*, 2011.

[65] **Scala to the power of Z3: Integrating SMT and programming**.
Ali Sinan Köksal, Viktor Kuncak, and Philippe Suter.
In *Computer-Aideded Deduction (CADE) Tool Demo*, 2011.

[66] **Interactive synthesis of code snippets**.
Tihomir Gvero, Viktor Kuncak, and Ruzica Piskac.
In *Computer Aided Verification (CAV) Tool Demo*, 2011.

[67] **Sets with cardinality constraints in satisfiability modulo theories**.
Philippe Suter, Robin Steiger, and Viktor Kuncak.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2011.

[68] **Towards complete reasoning about axiomatic specifications**.
Swen Jacobs and Viktor Kuncak.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2011.

[69] **Phantm: PHP analyzer for type mismatch (research demonstration)**.
Etienne Kneuss, Philippe Suter, and Viktor Kuncak.
In *ACM SIGSOFT Conference on Foundations of Software Engineering (FSE)*, 2010.

[70] **Runtime instrumentation for precise flow-sensitive type analysis**.
Etienne Kneuss, Philippe Suter, and Viktor Kuncak.
In *International Conference on Runtime Verification (RV)*, 2010.

[71] **Synthesis for regular specifications over unbounded domains**.
Jad Hamza, Barbara Jobstmann, and Viktor Kuncak.
In *Formal Methods in Computer-Aided Design (FMCAD)*, 2010.

[72] **Ordered sets in the calculus of data structures (invited paper)**.
Viktor Kuncak, Ruzica Piskac, and Philippe Suter.
In *Computer Science Logic (CSL)*, 2010.

[73] **Munch - automated reasoner for sets and multisets (system description)**.
Ruzica Piskac and Viktor Kuncak.
In *Int.Joint Conf. Automated Reasoning (IJCAR)*, 2010.

[74] **Comfusy: Complete functional synthesis (tool presentation)**.
Viktor Kuncak, Mikael Mayer, Ruzica Piskac, and Philippe Suter.
In *Computer-Aided Verification (CAV)*, 2010.

[75] **Complete functional synthesis (selected for ACM Communications Research Highlights)**.
Viktor Kuncak, Mikael Mayer, Ruzica Piskac, and Philippe Suter.
In *ACM Conf. Programming Language Design and Implementation (PLDI)*, 2010.

[76] **Test generation through programming in UDITA (ACM Distinguished Paper Award)**.
Milos Gligoric, Tihomir Gvero, Vilas Jagannath, Sarfraz Khurshid, Viktor Kuncak, and Darko Marinov.
In *ACM/IEEE International Conference on Software Engineering (ICSE)*, 2010.

[77] **Predicting and preventing inconsistencies in deployed distributed systems**.
Maysam Yabandeh, Nikola Knežević, Dejan Kostić, and Viktor Kuncak.
ACM Transactions on Computer Systems (TOCS), 2010.

[78] **Building a calculus of data structures**.
Viktor Kuncak, Ruzica Piskac, Philippe Suter, and Thomas Wies.
In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2010.

[79] **Collections, cardinalities, and relations**.
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Silvia Ghilezan and Viktor Kuncak.
In *XIV Conference on Applied Mathematics (PRIM)*, June 2000.

Awards

- System based on [27] (implemented by other co-authors) won first place in 2 out of 3 tracks in SyGuS synthesis competition
- Communications of ACM Research Highlight, based on [75]
- ACM SIGSOFT Distinguished Paper, 2010, for [76]

Early Achievements

- Best Student of University of Novi Sad in Class of 2000.
- Aleksandar Popović Award for Best Science Project (*Modular Interpreters in Haskell*, Advisor: Prof. Mirjana Ivanović), University of Novi Sad, 2000.
- Student of the Year of Faculty of Science, University of Novi Sad, 2000.
- Mileva Marić-Einstein Award for accomplishments in Computer Science, University of Novi Sad, 1999
- Awards of Excellence for Student Projects (*Early Deadlock Prevention*, Advisor: Prof. Zoran Budimac), University of Novi Sad, 1999; (*Herbrand's Theorem and the Resolution Method*, Advisor: Prof. Gradimir Vojvodić), University of Novi Sad, 1998
- Fellowship of the Serbian Foundation for Scientific Youth Development, 1995-1998
- University of Novi Sad Fellowship, 1998-2000
- Honorable Mention, 27th Int. Physics Olympiad, Oslo, Norway, 1996, First prizes on National Physics Competition of FR Yugoslavia in 1992, 1994 and 1996.

Software

The following is a selection of open-source software developed by our lab released publically on GitHub. I have supervised and coordinated the development, which was actually carried out by members of my research group.

- Lisa: proof assistant based on set theory, `https://github.com/epfl-lara/lisa` (recent project)
- Stainless: Verification Framework for Scala, `https://github.com/epfl-lara/stainless` (long-term project developed by many group members)
- Inox: Solver for Higher-Order Functional Programs, `https://github.com/epfl-lara/inox` (used by Stainless, developed by Nicolas Voirol)
- System FR: a calculus for dependent types with refinements formalized in Coq proof assistant, `https://github.com/epfl-lara/systemfr` (work of Dr. Jad Hamza)
- Scallion: LL(1) parsing combinator library for Scala, `https://github.com/epfl-lara/scallion` (work of Romain Edelmann)
- Leon: System for Verification, Synthesis, Repair, `https://github.com/epfl-lara/leon` (multi-year and multi-person past project)
- LeonWeb: Web-interface for Leon, `https://github.com/epfl-lara/leon-web`
- Welder: Interactive Theorem Proving based on Inox, `https://github.com/epfl-lara/welder`
- ScalaZ3: DSL in Scala for Constraint Solving with Z3, `https://github.com/epfl-lara/ScalaZ3`
- Nugget: Neural-Network Guided Expression Transformation `https://github.com/epfl-lara/nugget` (developed by Romain Edelmann)

- Analyzing and Comparing Context-Free Grammars, `https://github.com/epfl-lara/GrammarComparison`

- GrammarWeb: An online tutoring system for context-free grammars, `https://github.com/epfl-lara/grammar-web`