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Resume

Name: Ofer Strichman
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Date and place of Birth: September 4, 1968, Israel
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Academic Degrees

- Ph.D. Computer Science, Weizmann Institute of Science, Rehovot, Israel. Advisor: Amir Pnueli. (2001)
- M.Sc. Industrial Engineering / Operations Research and Systems Analysis, Technion, Haifa, Israel. Advisor: Ron Goldring. (1995)
- B.Sc. Industrial Engineering, Technion, Haifa, Israel. (1991)

Academic Appointments

- Industrial Engineering / Information Systems Engineering, Technion, Haifa, Israel.
  - Joseph Gruenblat Chair in production engineering: 2020 –
  - Professor: 2017 –
  - Associate professor: 2009 –2017
  - Senior lecturer: 2003 – 2009
- Microsoft Research, Redmond, WA, USA.
  - Visiting Scientist: Aug. 2010 – Oct 2010 (part of sabbatical).
- Software Engineering Institute, Carnegie Mellon University, Pittsburgh, USA
  - Nov. 2010 – Aug. 2011 (part of sabbatical)
- Software Engineering Institute, Carnegie Mellon University, Pittsburgh, USA
  - Visiting scientist: Almost every summer since 2005.
- Computer Science, Carnegie-Mellon University, Pittsburgh, USA. (Sponsor: Edmund Clarke.)
  - Visiting scientist (Post-doctorate): 2001 – 2003

Professional Experience

- Rafael – Developer of optimization algorithms (2018-2019).
- IBM Haifa Research Lab
  - Consultant to the formal methods group: 2003 – 2008
  - Part-time researcher with the formal methods group: 1999 – 2001
- Israel Defense Forces / Manpower Division
  - Project–manager: 1996 – 1997
  - Information systems section, Head: 1994 – 1996
  - System analysis section (Operations research / Information systems): 1991 – 1994

Technology-Transfer

In the list below a reference [#] refers to the list of proceedings articles, and [#p] to the list of patents.

- The method suggested in (33) for optimal choice of algorithms portfolios, is now used in the defense industry.
- *Incremental Satisfiability* described in [1p,9] is now in very broad use in both the industry and the academia.
- The algorithms suggested in papers [6] and [9] were reimplemented in at least the following companies: Intel, IBM, NEC, Compaq and OFFIS.
- The algorithm suggested in paper [25] was re-implemented in Intel.
- The results of my M.Sc. thesis were used in Nokia Intl.
- The algorithm suggested in [28] was reimplemented in Synopsys.
- The algorithm described in [47] was reimplemented in Jasper (now Cadence) and is part of their commercial tool.
- The algorithms described in [44] is used in Intel and the Technion (part of the course scheduling system).

Research Interests

Formal verification of finite-state systems, model-checking and bounded model-checking. Decision procedures for first-order theories in the Satisfiability Modulo Theories (SMT) framework; SAT and CSP; Program equivalence checking.

Honors

- The 2021 Computer Aided Verification (CAV) award, "For pioneering contributions to the foundations of the theory and practice of satisfiability modulo theories (SMT)".
- The HaifsCSP Constraints Satisfaction (CSP) solver won two gold medals and one silver in the 2016 CSP solvers competition (called "the *Minizinc* challenge"), corresponding to three out of four tracks, including the main track. Developed by my student Michael Veksler.
- The HaifaMUC and HaifaHLMUC solvers for extracting small unsatisfiable cores won (each) first place in the competition dedicated to this problem (affiliated with SAT'11). There were 11 competing solvers from 6 research groups. Developed by my student Vadim Ryvchin.
- Google Research award, 2015.
- Gutwirth award, 2006.
- Three Intel faculty awards, 2004, 2005 (in 2005 for two separate projects).
- IBM faculty award, 2005.

(Professional):

- The (sub)project reported in [3] won the "project of the year" prize given by the Israel Engineering Association.
- IDF Outstanding Officer Award (1995).
- IDF Manpower Division Outstanding Officer Award (1993 and 1994).

Publications [1]

Theses

1. Ofer Shtrichman. The Logic Assurance system – a system for improving real-time systems' reliability. Master's thesis, Technion, Haifa, Israel, 1995.

2. Ofer Shtrichman. *Efficient decision procedures for validation.* PhD thesis, Weizmann Institute of Science, Rehovot, Israel, 2001.

Refereed papers in professional journals

Published/in press:

1. E. Darel, P. Sofer, I. Molcho, and O. Shtrichman. A two-tier hierarchical scheduler for the micro-electronic industry. *Int. J. of Production Economic*, 25, 1991.
2. A. Pnueli, M. Siegel, and O. Shtrichman. The code validation tool (CVT)- automatic verification of a compilation process. *Software Tools for Technology Transfer (STTT)*, 2(2):192–201, 1999.
3. Ofer Shtrichman, Rami Ben-Haim, and Moshe Pollatschek. Reengineering of a multi-station recruitment office by use of simulation. *Interfaces*, 31(4):61–70, Jul-Aug 2001.
4. A. Pnueli, Y. Rodeh, O. Strichman, and M. Siegel. The small model property: How small can it be? *Information and computation*, 178(1):279–293, October 2002.
5. Ofer Strichman. Accelerating bounded model checking of safety properties. *Formal Methods in System Design (FMSD)*, 24(1), Jan 2004.
6. Sagar Chaki, Ed Clarke, Alex Groce, Joel Ouaknine, Ofer Strichman, and Keren Yorav. Efficient verification of sequential and concurrent C programs. *Formal Methods in System Design (FMSD)*, 25(2-3):129–166, Sep - Nov 2004.
7. Ed Clarke, Anubhav Gupta, and Ofer Strichman. SAT based counterexample-guided abstraction-refinement. *Transactions on Computer Aided Design (TCAD)*, 23(7):1113 – 1123, July 2004.
8. E. Clarke, D. Kroening, J. Ouaknine, and O. Strichman. Computational challenges in bounded model checking. *Software Tools for Technology Transfer (STTT)*, 7(2):174 – 183, Apr. 2005.
9. Yoav Rodeh and Ofer Strichman. Building small equality graphs for deciding equality logic with uninterpreted functions. *Information and Computation*, 204:26 – 59, 2006.
10. A. Groce, S. Chaki, D. Kroening, and O. Strichman. Error explanation with distance metrics. *Software Tools for Technology Transfer (STTT)*, 8(3):229 – 247, June 2006.
11. Roman Gershman , Maya Koifman , and Ofer Strichman. An approach for extracting a small unsatisfiable core. *Formal Methods in System Design (FMSD)*, 33:1 – 27, 2008. Published online (Springer-Link) on March 14^{th}, 2007.
12. Sagar Chaki and Ofer Strichman. Three optimizations for assume-guarantee reasoning with L*. *Formal Methods in System Design (FMSD)*, 32(3):267–284, 2008.
13. Benny Godlin and Ofer Strichman. Inference rules for proving the equivalence of recursive procedures. *Acta Informatica*, 45(6):403 – 439, 2008.
14. Roman Gershman and Ofer Strichman. Haifasat: a SAT solver based on an abstraction/refinement model. *J. on Satisfiability, Boolean Modeling and Computation (JSAT)*, 6:33–51, 2008.
15. Vadim Ryvchin and Ofer Strichman. Local restarts in SAT solving. *Constraint Programming Letters*, 4:3–13, 2008.

[1] Prior to mid-2001 I spelled my name "Shtrichman", hence the two different spellings in the list of publications.

16. Randal E. Bryant, Daniel Kroening, Joël Ouaknine, Sanjit A. Seshia, Ofer Strichman, and Bryan Brady. An abstraction-based decision procedure for bit-vector arithmetic. *Software Tools for Technology Transfer (STTT)*, 11:95 – 104, 2009.
17. Daniel Kroening and Ofer Strichman. A framework for satisfiability modulo theories. *Formal Aspects of Computing Journal (FACJ)*, 21(5):485–494, 2009.
18. Hana Chockler and Ofer Strichman. Before and after vacuity. *Formal Methods in System Design (FMSD)*, 34(1):37 – 58, 2009.
19. Arie Matsliah and Ofer Strichman. Underapproximation for model-checking based on universal circuits. *Information and Computation*, 208(4):315 – 326, 2010.
20. Laurent Fournier, Ekaterina Kutsy , Ofer Strichman, and Avi Ziv. A probabilistic analysis of coverage methods. *ACM Transactions on Design Automation of Electronic Systems (ACM TDAES)*, 16(4), 2011.
21. Omer Bar-Ilan, Oded Fuhrmann, Shlomo Hoory, Ohad Shacham, and Ofer Strichman. Reducing the size of resolution proofs in linear time. *STTT*, 13(3):263–272, 2011.
22. Benny Godlin and Ofer Strichman. Regression verification: proving the equivalence of similar programs. *Software Testing, Verification and Reliability*, 23(3):241–258, 2013.
23. Hana Chockler, Arie Gurfinkel, and Ofer Strichman. Beyond vacuity: Towards the strongest passing formula. *Formal Methods in Systems Design*, 43:552–571, 2013.
24. Alexander Nadel, Vadim Ryvchin , and Ofer Strichman. Accelerated deletion-based extraction of minimal unsatisfiable cores. *Journal on Satisfiability, Boolean Modeling and Computation (JSAT)*, (9):27–51, 2014.
25. Ilya Gertsbakh, Ofer Strichman, and Radislav Vaisman . Model counting of monotone CNF formulas with Spectra. *INFORMS Journal on Computing*, 27, 2015.
26. Dima Elenbogen , Shmuel Katz, and Ofer Strichman. Proving mutual termination. *Formal Methods in System Design*, 47(2):204–229, 2015.
27. Sagar Chaki, Arie Gurfinkel, and Ofer Strichman. Regression verification for multi-threaded programs (with extensions to locks and dynamic thread creation). *Formal Methods in Systems Design*, 47(3):287–301, 2015.
28. Michael Veksler and Ofer Strichman. Learning general constraints in CSP. *Artificial Intelligence*, 238:135—153, 2016.
29. Ofer Strichman. Near-optimal course scheduling at the technion. *Interfaces*, 47(6):537–554, 2017.
30. Dor Cohen and Ofer Strichman. The impact of entropy and solution density on selected SAT heuristics. *Entropy*, 20(9):713, 2018.
31. Nir Drucker, Hsi-Ming Ho, Joël Ouaknine, Michal Penn, and Ofer Strichman. Cyclic-routing of unmanned aerial vehicles. *Journal of Computer and System Science*, 103:18–45, 2019.
32. Hana Chockler, Pascal Kesseli, Daniel Kroening, and Ofer Strichman. Learning the language of software errors. *J. Artificial Intelligence Research.*, 67:881–903, 2020.
33. Ofer Strichman Yair Nof . Optimal algorithm portfolios for computationally hard real-time problems. *Annals of Mathematics and Artificial Intelligence*, Aug. 2020. https://doi.org/10.1007/s10472-020-09704-4.
34. Roderick Bloem, Hana Chockler, Masoud Ebrahimi, and Ofer Strichman. Vacuity in synthesis. *Formal Methods in Systems Design*, 2021. (accepted).

Books

1. Daniel Kroening and Ofer Strichman. *Decision procedures – an algorithmic point of view.* Theoretical computer science series. Springer, May 2008. (A second edition was published in Jan. 2017)

2. Ofer Strichman. *Efficient Decision Procedures for Validation.* Lambert Academic Publishing, 2009 (A republication of my PhD).

3. (Editor) Ofer Strichman and Stefan Szeider, editors. *Theory and Application of Satisfiability Testing (SAT'10)*, volume 6175 of *LNCS*, Edinburgh, July 2010. Springer

4. (Editor) Ofer Strichman and Rachel Tzoref-Brill, editors. *Hardware and Software: Verification and Testing - 13th International Haifa Verification Conference, HVC 2017, Haifa, Israel, November 13-15, 2017, Proceedings*, volume 10629 of *Lecture Notes in Computer Science*. Springer, 2017

5. (Editor) Alexander Ivrii and Ofer Strichman, editors. *Formal Methods in Computer-Aided Design (FMCAD).* TU-Wien academic press, Sep. 2020

Book chapters

1. A. Pnueli, M. Siegel, and O. Shtrichman. *Translation Validation: From SIGNAL to C*, volume 1710 of *LNCS State-of-the-Art Survey*, pages 231–255. Springer, 1999.
2. A. Biere, A. Cimatti, E.M. Clarke, O. Strichman, and Y. Zue. *Bounded Model Checking*, volume 58 of *Advances in computers*. Academic Press, 2003.

Refereed papers in conference/workshop proceedings

Published:

1. Ofer Shtrichman and Ron Goldring. The 'Logic-Assurance' system - a tool for testing and controlling real-time systems. In *proc. of the Eighth Israeli Conference on computer systems and sofware engineering (ICCSSE'97)*, June 1997.
2. Amir Pnueli, Ofer Shtrichman, and Michael Siegel. Translation validation: From DC+ to C. In *Proceedings of the International Workshop on Current Trends in Applied Formal Method: Applied Formal Methods*, volume 1641 of *LNCS*, pages 137 – 150, 1998.
3. A. Pnueli, M. Siegel, and O. Shtrichman. Translation validation for synchronous languages. In K.G. Larsen, S. Skyum, and G. Winskel, editors, *Proc. of the 25th Int. Colloq. Automata, Languages and Programming (ICALP'98).*, volume 1443 of *LNCS*, pages 235–246. Springer, 1998.
4. A. Pnueli, M. Siegel, and O. Shtrichman. The code validation tool (CVT)- automatic verification of code generated from synchronous languages. In B. Steffen, editor, *Proc. of the Software Tools for Technology Transfer (STTT'98)*, 1998.
5. A. Pnueli, Y. Rodeh, O. Shtrichman, and M. Siegel. Deciding equality formulas by small-domains instantiations. In *Proc.* 11^{th} *Intl. Conference on Computer Aided Verification (CAV'99)*, LNCS. Springer, 1999 (ranked #1 paper from over 150 submissions).
6. Ofer Shtrichman. Tuning SAT checkers for bounded model checking. In E.A. Emerson and A.P. Sistla, editors, *Proc.* 12^{th} *Intl. Conference on Computer Aided Verification (CAV'00)*, LNCS. Springer, 2000.
7. P.Baufreton, F.Dupont, T.Lesergent, M.Segelken, O. Strichman, H.Brinkmann, and K.Winkelmann. Safeair: Advanced design tools for aircraft systems and airborne software. In *Intl. conference on Dependable systems and networks (DSN'01)*, Goteborg, Sweden, June 2001.

8. Y. Rodeh and O. Shtrichman. Finite instantiations in equivalence logic with uninterpreted functions. In *Computer Aided Verification (CAV'01)*, pages 144–154, 2001.
9. Ofer Shtrichman. Prunning techniques for the SAT-based bounded model checking problem. In *proc. of the 11th Conference on Correct Hardware Design and Verification Methods (CHARME'01)*, Edinburgh, September 2001.
10. A. Pnueli, Y. Rodeh, and O. Shtrichman. Range allocation for equivalence logic. In *Proc.* 21^{st} *conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'01)*, Bangalore, India, 2001.
11. O. Strichman, S.A. Seshia, and R.E. Bryant. Deciding separation formulas with SAT. In E. Brinksma and K.G. Larsen, editors, *Proc.* 14^{th} *Intl. Conference on Computer Aided Verification (CAV'02)*, volume 2404 of *LNCS*, pages 209–222, Copenhagen, Denmark, July 2002. Springer.
12. E.M. Clarke, A. Gupta, J. Kukula, and O. Strichman. SAT based abstraction-refinement using ILP and machine-learning techniques. In *Proc.* 14^{th} *Intl. Conference on Computer Aided Verification (CAV'02)*, volume 2404 of *LNCS*, pages 265–279, Copenhagen, Denmark, July 2002. Springer.
13. E. Clarke and O. Strichman. A failed attempt to optimize variable ordering with tools for constraints solving. In *Workshop on Constraints in Formal Verification (CFV'02)*, September 2002.
14. Ofer Strichman. On solving Presburger and linear arithmetic with SAT. In *Formal Methods in Computer-Aided Design (FMCAD'02)*, pages 160 – 170, Portland, Oregon, Nov 2002.
15. D. Kroening and O. Strichman. Efficient computation of recurrence diameters. In *Proc.* 4^{th} *Intl. Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI'03)*, volume 2575 of *LNCS*, pages 298–309, NYU, New-York, January 2003. Springer.
16. Sagar Chaki, Edmund Clarke, Alex Groce, and Ofer Strichman. Predicate abstraction with minimum predicates. In E. Tronci D. Geist, editor, *Proc.* 12^{th} *Conference on Correct Hardware Design and Verification Methods (CHARME'03)*, volume 2860 of *LNCS*, pages 19–34, 2003.
17. E.M. Clarke, D. Kroening, J. Ouaknine, and O. Strichman. Completeness and complexity of bounded model checking. In *VMCAI'04*, volume 2937 of *LNCS*, pages 85 – 96, Venice, Italy, Jan 2004.
18. Daniel Kroening, Joel Ouaknine, Sanjit Seshia, and Ofer Strichman. Abstraction-based satisfiability solving of Presburger arithmetic. In *Proc.* 16^{th} *Intl. Conference on Computer Aided Verification (CAV'04)*, number 3114 in LNCS, pages 308–320, Boston, MA, July 2004. Springer.
19. Muralidhar Talupur, Nishant Sinha, Ofer Strichman, and Amir Pnueli. Range-allocation for separation logic. In Rajeev Alur and Doron Peled, editors, *Proc.* 16^{th} *Intl. Conference on Computer Aided Verification (CAV'04)*, number 3114 in LNCS, pages 148–161, Boston, MA, July 2004. Springer.
20. Alex Groce, Sagar Chaki, and Ofer Strichman. Explaining abstract counterexamples. In *Foundations of Software Engineering (SIGSOFT-FSE-12)*, pages 73–82, October-November 2004.
21. Orna Grumberg, Flavio Lerda, Ofer Strichman, and Michael Theobald. Proof-guided underapproximation-widening for multi-process systems. In *Proc. of the 32nd ACM sysposium on Principles of programming languages (POPL '05)*, pages 122–131. ACM Press, 2005.
22. Roman Gershman and Ofer Strichman. Cost-effective hyper-resolution for preprocessing CNF formulas. In Toby Walsh and Fahiem Bacchus, editors, *Theory and Applications of Satisfiability Testing (SAT)*, pages 423–429, 2005.
23. Anubhav Gupta and Ofer Strichman. Abstraction refinement for bounded model checking. In K. Etessami and S. Rajamani, editors, *Proc.* 17^{th} *Intl. Conference on Computer Aided Verification (CAV'05)*, volume 3576 of *LNCS*, pages 112–124, Edinburgh, July 2005. Springer.

24. Orly Meir* and Ofer Strichman. Yet another decision procedure for equality logic. In K. Etessami and S. Rajamani, editors, *Proc.* 17^{th} *Intl. Conference on Computer Aided Verification (CAV'05)*, volume 3576 of *LNCS*, pages 307–320, Edinburgh, July 2005. Springer.
25. Amir Pnueli and Ofer Strichman. Reduced functional consistency of uninterpreted functions. In *Pragmatics of Decison Procedures for Automated Reasoning (PDPAR)*, number 898 in ENTCS, 2005.
26. Roman Gershman and Ofer Strichman. Haifasat: A new robust SAT solver. In Yaron Wolfsthal Shmuel Ur, Eyal Bin, editor, *First International Haifa Verification Conference (HVC'05)*, volume 3875 of *LNCS*, pages 76 – 89. Springer, 2005.
27. Roman Gershman , Maya Koifman , and Ofer Strichman. Deriving small unsatisfiable cores with dominators. In *Proc.* 18^{th} *Intl. Conference on Computer Aided Verification (CAV'06)*, number 4144 in LNCS, pages 109–122, 2006.
28. Randal E. Bryant, Daniel Kroening, Joel Ouaknine, Sanjit A. Seshia, Ofer Strichman, and Bryan Brady. Deciding bit-vector arithmetic with abstraction. In Orna Grumberg and Michael Huth, editors, *13th Intl. Conf. on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'07)*, volume 4424 of *LNCS*, pages 358–372, March 2007.
29. Sagar Chaki and Ofer Strichman. Optimized L*-based assume-guarantee reasoning. In Orna Grumberg and Michael Huth, editors, *13th Intl. Conf. on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'07)*, volume 4424 of *LNCS*, pages 276–291. Springer, 2007.
30. Benny Godlin and Ofer Strichman. Regression verification - a practicel way to verify programs. In Bertrand Meyer and Jim Woodcock, editors, *Verified Software: theories, tools, experiments (VSTTE'05)*, volume 4171 of *LNCS*, pages 496–501, 2005. conf in 2005, published in 2007.
31. Mirron Rozanov and Ofer Strichman. Generating minimum transitivity constraints in p-time for deciding equality logic. In *Satisfiability Modulo Theoies (SMT'07)*, 2007.
32. Hana Chockler and Ofer Strichman. Easier and more informative vacuity checks. In *Formal Methods and Models for Codesign (MEMOCODE'07)*, pages 189–198. IEEE and ACM, 2007.
33. Arie Matsliah and Ofer Strichman. Underapproximation for model-checking based on random cryptographic constructions. In *Proc.* 19^{th} *Intl. Conference on Computer Aided Verification (CAV'07)*, volume 4590 of *LNCS*, pages 339–351. Springer, 2007.
34. Vadim Ryvchin and Ofer Strichman. Local restarts. In *Proc. of the 11th International Conference on Theory and Applications of Satisfiability Testing (SAT'08)*, volume 4996 of *LNCS*, pages 271–276, China, June 2008. Springer.
35. Dan Goldwasser , Ofer Strichman, and Shai Fine. A theory-based decision heuristic for DPLL(T). In *Proc. 12th Intl. Conference on Formal Methods in Computer-Aided Design (FMCAD'08)*, pages 93 – 100. IEEE, 2008.
36. Hana Chockler, Arie Gurfinkel, and Ofer Strichman. Beyond vacuity: Towards the strongest passing formula. In A. Cimatti and R. Jones, editors, *Proc. 12th Intl. Conference on Formal Methods in Computer-Aided Design (FMCAD'08)*, pages 188 – 195. IEEE, 2008.
37. Omer Bar-Ilan, Oded Fuhrmann, Shlomo Hoory, Ohad Shacham, and Ofer Strichman. Linear-time reductions of resolution proofs. In Hana Chockler and Alan Hu, editors, *Haifa Verification Conference (HVC'08)*, volume 5394 of *LNCS*, pages 114 – 128, 2008.
38. Michael Ryabtsev and Ofer Strichman. Translation validation: from Simulink to C. In Ahmed Bouajjani and Oded Maler, editors, *Proc.* 21^{st} *Intl. Conference on Computer Aided Verification (CAV'09)*, LNCS, pages 696–701, 2009.
39. Benny Godlin and Ofer Strichman. Regression verification. In 46^{th} *Design Automation Conference (DAC)*, 2009.

40. Sagar Chaki, Arie Gurfinkel, and Ofer Strichman. Decision diagrams for linear arithmetic. In *FMCAD*, LNCS. Springer, 2009.

41. Michael Veksler and Ofer Strichman. A proof-producing CSP solver. In *The Twenty-Fourth AAAI Conference on Artificial Intelligence*, pages 204 – 209. AAAI Press, 2010.

42. Hana Chockler, Arie Gurfinkel, and Ofer Strichman. LTL vacuity checking. In *Haifa Verification Conference*, 2010.

43. Sagar Chaki, Arie Gurfinkel, and Ofer Strichman. Time-bounded analysis of real-time systems. In *Proc. of 11th Formal Methods in Computer Aided Design (FMCAD'11)*, 2011.

44. Vadim Ryvchin and Ofer Strichman. Faster extraction of high-level minimal unsatisfiable cores. In *SAT*, pages 174–187, 2011.

45. Daniel Kroening, Joël Ouaknine, Ofer Strichman, Thomas Wahl, and James Worrell. Linear completeness thresholds for bounded model checking. In *CAV*, pages 557–572, 2011.

46. Sagar Chaki, Arie Gurfinkel, and Ofer Strichman. Regression verification for multi-threaded programs. In *Proc. of 13th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI'12)*, 2012.

47. Alexander Nadel, Vadim Ryvchin , and Ofer Strichman. Preprocessing in incremental sat. In Alessandro Cimatti and Roberto Sebastiani, editors, *Theory and Applications of Satisfiability Testing (SAT)*, volume 7317 of *LNCS*, pages 256–269. Springer, 2012.

48. Dima Elenbogen , Shmuel Katz, and Ofer Strichman. Proving mutual termination of programs. In Armin Biere, editor, *Haifa Verification Conference (HVC)*, 2012.

49. Sagar Chaki, Arie Gurfinkel, Soonho Kong, and Ofer Strichman. Compositional sequentialization of periodic programs. In Roberto Giacobazzi, Josh Berdine, and Isabella Mastroeni, editors, *VMCAI*, volume 7737 of *Lecture Notes in Computer Science*, pages 536–554. Springer, 2013.

50. Alexander Nadel, Vadim Ryvchin , and Ofer Strichman. Efficient mus extraction with resolution. In *Proc. of 13th Formal Methods in Computer Aided Design (FMCAD)*, 2013.

51. Sagar Chaki, Arie Gurfinkel, and Ofer Strichman. Verifying periodic programs with priority inheritance locks. In *Proc. of 13th Formal Methods in Computer Aided Design (FMCAD)*, 2013.

52. Batya Kenig, Avigdor Gal, and Ofer Strichman. A new class of lineage expressions over probabilistic databases computable in p-time. In Weiru Liu, V. S. Subrahmanian, and Jef Wijsen, editors, *Scalable Uncertainty Management - 7th International Conference, SUM 2013*, volume 8078 of *LNCS*, pages 219–232. Springer, 2013.

53. Alexander Nadel, Vadim Ryvchin , and Ofer Strichman. Ultimately incremental SAT. In Carsten Sinz and Uwe Egly, editors, *Theory and Applications of Satisfiability Testing - SAT 2014 - 17th International Conference, Held as Part of the Vienna Summer of Logic, VSL 2014, Vienna, Austria, July 14-17, 2014. Proceedings*, volume 8561 of *Lecture Notes in Computer Science*, pages 206–218. Springer, 2014.

54. Michael Veksler and Ofer Strichman. Learning general constraints in CSP. In *12'th International Conference on Integration of Artificial Intelligence (AI) and Operations Research (OR) techniques in Constraint Programming (CPAIOR)*, pages 410 – 426, 2015.

55. Martin Chapman, Hana Chockler, Pascal Kesseli, Daniel Kroening, Ofer Strichman, and Michael Tautschnig. Learning the language of error. In Bernd Finkbeiner, Geguang Pu, and Lijun Zhang, editors, *Automated Technology for Verification and Analysis - 13th International Symposium, ATVA 2015*, volume 9364 of *Lecture Notes in Computer Science*, pages 114–130. Springer, 2015.

56. Alexander Ivrii, Vadim Ryvchin, and Ofer Strichman. Mining backbone literals in incremental SAT - A new kind of incremental data. In Marijn Heule and Sean Weaver, editors, *Theory and Applications of Satisfiability Testing - SAT - 18th International Conference, Austin, TX, USA,*

September 24-27, 2015, Proceedings, volume 9340 of *Lecture Notes in Computer Science*, pages 88–103. Springer, 2015.

57. Nir Drucker , Michal Penn, and Ofer Strichman. Cyclic routing of unmanned aerial vehicles. In *Conference on Integration of Artificial Intelligence (AI) and Operations Research (OR) techniques in Constraint Programming (CPAIOR)*, 2016.
58. Ofer Guthmann , Ofer Strichman, and Anna Trostanetski. Minimal unsatisfiable core extraction for satisfiability modulo theories. In *Formal methods in Computer Aided Design (FMCAD'16) - 16th International Conference*, 2016.
59. Ofer Strichman and Maor Veitsman. Regression verification for unbalanced recursive functions. In John S. Fitzgerald, Constance L. Heitmeyer, Stefania Gnesi, and Anna Philippou, editors, *FM 2016: Formal Methods - 21st International Symposium*, volume 9995 of *LNCS*, pages 645–658, 2016.
60. Roderick Bloem, Hana Chockler, Masoud Ebrahimi, and Ofer Strichman. Synthesizing non-vacuous systems. In *International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2017.
61. Gabriel A. Moreno, Ofer Strichman, Sagar Chaki, and Radislav Vaisman. Decision-making with cross-entropy for self-adaptation. In *The 12th International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)*, 2017.
62. Roderick Bloem, Hana Chockler, Masoud Ebrahimi, and Ofer Strichman. Synthesizing reactive systems using robustness and recovery specifications. In *FMCAD*, pages 147–151. IEEE, 2019.
63. Alexander Ivrii and Ofer Strichman. Exploiting isomorphic subgraphs in SAT. In *Proc. of Formal Methods in System Design (FMCAD)*, 2021.

Patents

1. Ofer Shtrichman. Sharing information between instances of a propositional satisfiability (SAT) problem, Dec 2000. US patent US2002/0123867 A1.
2. Oded Fuhrmann, Ohad Shacham, and Ofer Strichman. Clause and proof tightening, 2007. disclosure IL8-2006-0241.
3. Arie Matsliah and Ofer Strichman. Device, system and method of underapproximated model-checking, 2007. disclosure IL9-2007-0078 (EMPK P-10121-US).

Highlights

The figures mentioned below refer to July 2021.

- 6181 citations, H-index = 37.
- Gutwirth award (a Technion research award).
- Made major contributions to a field called Bounded Model-checking, with proceedings articles [6] and [9], and book chapter [2]. These articles are cited 200, 178 and 1227 times, respectively. The first two are single-authored.
- Invented *incremental satisfiability*. Published it originally as a patent (see patent [1]), and later in proceedings article [9]. Today it is used as a standard term in the SAT and verification community, almost always without citing the above. The terms "incremental SAT" and "incremental satisfiability" have 2370 hits on Google scholar. There is now a track in the annual SAT competition that is dedicated to this problem.

- Invented a technique now called "phase-saving" in[9], although the name was given to it seven years later by a different author that reinvented it. Most citations go to the other paper. A very similar concept was also known before in the CSP world. The term has 637 hits on Google scholar.

- Article [37] from 2008 (currently cited by 39), led to an establishment of a research group called 'Amadeus Vienna-Nancy Joint Project on Proof Compression'. In addition to publishing on the topic, they started annual workshops (4 so far) and maintain several pages on the topic in Wikipedia.

- Won (together with my student Vadim Ryvchin) 1st place in two categories of the SAT'11 competition: *minimal unsatisfiable set* and *group-level minimal unsatisfiable set*. There was no competition in this category since, and our tools HaifaMUC and HaifaHLMUC are still considered the best.

- Won (together with my student Michael Veksler) two gold medals and one silver in the CSP annual competition (called "the *Minizinc* challenge"), corresponding to three out of four tracks, including the main track.

- The book 'decision-procedures' is a standard the-facto in graduate-level courses dedicated to the field of formal reasoning. It sold over 1200 hard-copies and there were 16,283 individual paid chapter downloads as of March 2016. This is the #1 best-seller in hard copy of Springer's *theoretical-computer science* series, in the last decade (2006 – 2016), and among the top 25% in all of their CS books, both in hard-copy and downloads. We are aware of 40 courses around the world that list the book as their textbook (including a Technion's CS seminar based on it). There are very few courses dedicated to the field that do *not* use this book. From conversations with colleagues and students it seems that almost every graduate who enters this field uses this book. The book was praised in reviews in four top journals: *Zentralblatt MATH*, *ACM Computing Reviews*, *Mathematical Reviews*, and *Journal of Automated Reasoning*. A 2nd edition was published in 2017.

- Seven Technology-transfer cases, as described under 'Technology-transfer'.

- The algorithm published in [30] was selected as one of the few benchmarks for comparing quantum computing to normal computers, by the company *D-Wave*.