

CURRICULUM VITAE

Cesare Tinelli

Computer Science

Jan 2017 – July 2026

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EDUCATION AND PROFESSIONAL HISTORY

Higher Education

- 1999 **Ph.D.**, Computer Science, University of Illinois at Urbana-Champaign
1995 **M.S.**, Computer Science, University of Illinois at Urbana-Champaign
1990 **B.S.**, Computer Science, *magna cum laude*, Università degli Studi di Bari, Italy

Professional and Academic Positions

- 2012 – present **Professor**, Department of Computer Science, The University of Iowa
2005 – 2012 **Associate Professor**, Department of Computer Science, The University of Iowa
1999 – 2005 **Assistant Professor**, Department of Computer Science, The University of Iowa
1999 – 1999 **Visiting Lecturer**, Department of Computer Science, University of Illinois at Urbana-Champaign

Honors and Awards

- 2026 – 2031 **Erich Funke Professorship**, the University of Iowa.
2026 **Rance-Cleaveland Test-of-Time Tool Award**, European Joint Conferences on Theory & Practice of Software (ETAPS), for cvc5.
2024 – 2026 **F. Wendell Miller Professorship**, the University of Iowa.

- 2024 **Distinguished Tutorial Award**, Formal Methods Symposium (FM), with 6 coauthors.
- 2019 – 2024 **F. Wendell Miller Professorship**, the University of Iowa.
- 2022 **SCP Best Tool Paper Award**, European Joint Conferences on Theory & Practice of Software (ETAPS), with 16 coauthors.
- 2021 **Conference award**, Computer-Aided Verification Conference (CAV), “for pioneering contributions to the foundations of the theory and practice of SMT”, with 20 others.
- 2021 **EATCS Best Paper Award nominee**, European Joint Conferences on Theory & Practice of Software (ETAPS), with 4 coauthors.
- 2019 **Best Paper honorable mention**, Conference on Formal Methods in Computer-Aided Design, with 4 co-authors
- 2016 **Best Paper Award**, Conference on Formal Methods in Computer-Aided Design
- 2010 **Conference award**, Haifa Verification Conference. (“For playing a pivotal and continuous role in building and promoting the SMT community.”)
- 2003 **CAREER Award**, National Science Foundation

Memberships

- 1998 – present Association for Automated Reasoning
- 2022 – present Association for Computing Machinery

Student Mentoring

PhD — Advisor and Committee Chair

- Aug 2023 – present Rajiv, Shweta; pre Comp
- Aug 2023 – present Sabharwal, Kartik; pre Comp
- Aug 2022 – present Robert, Lorch; post Comp
- Jan 2018 – Aug 2025 Mohamed, Mudathir; graduated; later at U. of Iowa
- Aug 2017 – Dec 2024 Viswanathan, Arjun; graduated; later at Union College
- Aug 2013 – Dec 2018 Meng, Baoluo; graduated; later at GE Aerospace

PhD — Committee Member

- 2022 – present Ingle, Apoorv; post dissertation proposal
- 2022 – present Hubers, Alexander; post dissertation proposal
- 2021 – 2024 Cantor, Anthony; graduated
- 2021 – 2024 Marmaduke, Andrew; graduated; later post-doc at UIowa
- 2020 – 2023 Echeverria, Mitziu; graduated
- 2020 – 2023 Jenkins, Christa; graduated; later post-doc at SUNY Stonybrook
- 2016 – 2019 McCleary, Ryan; graduated; later at Grand View University

2016 – 2017 Lai, Farley; graduated; later at NEC Laboratories

PhD — External Committee Member

2025 – 2025 Feng, Nick, U. of Toronto, Canada; graduated; later at AWS
 2024 – 2025 Spallitta, Giuseppe, U. of Trento, Italy; graduated; later at Rice U.
 2024 – 2024 Lipparini, Enrico, U. of Genova, Italy; graduated; later at U. of Cagliari
 2023 – 2023 Yu, (Emily) Zhengqi, J. Kepler U. of Linz, Austria; graduated; later at ISTA
 2022 – 2022 Magnago, Enrico, U. of Trento, Italy; graduated; later at Amazon S3
 2022 – 2022 Schurr, Hans-Jörg, U. of Lorraine, France; graduated; later at U. of Iowa
 2021 – 2022 Gianola, Alessandro, Free U. of Bolzano, Italy; graduated; later at U. of Lisbon
 2021 – 2022 Bugariu, Alexandra, ETH Zurich, Switzerland; graduated; later at MPI-SWS
 2020 – 2020 Todorov, Vassil, U. of Paris-Saclay, France; graduated; later at PSA Peugeot Citroën
 2020 – 2020 Boutonnet, Rémy, U. of Grenoble, France; graduated; later at CNRS, Bordeaux
 2019 – 2019 Jonas, Martin, Masaryk U., Czech Rep.; graduated; later at FBK
 2019 – 2019 Trentin, Patrick, U. of Trento, Italy; graduated; later at AWS
 2017 – 2017 Baudart, Guillaume, ENS and U. of Paris, France; graduated; later at IBM Watson

Professional Mentoring

Postdoctoral Researchers

Aug 2025 – present Mohammed, Mudathir, PhD, U. of Iowa; Computer Science, U. of Iowa; supervising
 Aug 2022 – Dec 2025 Schurr, Hans-Jörg, PhD, U. of Lorraine, France; Computer Science, U. of Iowa; supervised; later at KU Leuven
 Sep 2018 – Mar 2021 Arif, Fareed, PhD, U. College Dublin; Computer Science, U. of Iowa; co-supervised with O. Chowdhury; later at Oxford U., Intel
 Feb 2017 – Aug 2020 Larraz, Daniel, PhD, T.U. of Barcelona; Computer Science, U. of Iowa; supervised; later at U. of Iowa
 Oct 2017 – Aug 2019 Barbosa, Haniel, PhD, U. of Lorraine; Computer Science, U. of Iowa; supervised; later at UFMG
 Sep 2014 – Jan 2017 Champion, Adrien, PhD, U. of Toulouse; CS, U. of Iowa; supervised; later at U. of Tokyo, OCamlPro

Research Scientists

Aug 2020 – present Larraz, Daniel, PhD, T.U. of Barcelona; Computer Science, U. of Iowa; supervising
 Apr 2016 – present Reynolds, Andrew; Computer Science, U. of Iowa, supervising

SCHOLARSHIP

Publications

Refereed Articles

- [1] O. Israel et al., “Checking regular expressions in cvc5 proofs,” in *Automated Reasoning - 13th International Joint Conference, IJCAR 2026, Lisbon, Portugal, July 26-29, 2026, Proceedings, Part I*, A. Biere, C. Lutz, and S. Negri, Eds., ser. Lecture Notes in Computer Science, vol. 16688, Springer, 2026, pp. 267–275. DOI: [10.1007/978-3-032-32589-1_16](https://doi.org/10.1007/978-3-032-32589-1_16)
- [2] L. Kondylidou, A. Reynolds, J. Blanchette, and C. Tinelli, “Enumerating choice terms in model-based quantifier instantiation,” in *Tools and Algorithms for the Construction and Analysis of Systems - 32nd International Conference, TACAS 2026, Held as Part of the International Joint Conferences on Theory and Practice of Software, ETAPS 2026, Turin, Italy, April 11-16, 2026, Proceedings, Part I*, S. Junges and G. Katz, Eds., ser. Lecture Notes in Computer Science, vol. 16505, Springer, 2026, pp. 295–314. DOI: [10.1007/978-3-032-22752-2_15](https://doi.org/10.1007/978-3-032-22752-2_15)
- [3] T. Mascarenhas et al., “Formalization of a proof calculus for incremental linearization for satisfiability modulo nonlinear arithmetic and transcendental functions,” in *Proceedings of the 15th ACM SIGPLAN International Conference on Certified Programs and Proofs, CPP 2026, Rennes, France, January 12-13, 2026*, K. Stark, Y. Zakowski, N. Swamy, and N. Tabareau, Eds., ACM, 2026, pp. 216–230. DOI: [10.1145/3779031.3779111](https://doi.org/10.1145/3779031.3779111)
- [4] A. Reynolds, H. Schurr, M. Soldevila, H. Barbosa, C. W. Barrett, and C. Tinelli, “Ethos: A fast proof checker for the eunoia logical framework,” in *Automated Reasoning - 13th International Joint Conference, IJCAR 2026, Lisbon, Portugal, July 26-29, 2026, Proceedings, Part I*, A. Biere, C. Lutz, and S. Negri, Eds., ser. Lecture Notes in Computer Science, vol. 16688, Springer, 2026, pp. 305–314. DOI: [10.1007/978-3-032-32589-1_19](https://doi.org/10.1007/978-3-032-32589-1_19)
- [5] A. Reynolds et al., “The cooperating proof calculus: Comprehensive proofs for an SMT solver,” in *Computer Aided Verification - 38th International Conference, CAV 2026, Lisbon, Portugal, July 26-29, 2026, Proceedings, Part II*, E. Darulova, A. W. Lin, and P. Rümmer, Eds., ser. Lecture Notes in Computer Science, vol. 16683, Springer, 2026, pp. 188–212. DOI: [10.1007/978-3-032-32526-6_9](https://doi.org/10.1007/978-3-032-32526-6_9)
- [6] H. Schurr et al., “Exploring the SMT-LIB benchmark library,” in *Tools and Algorithms for the Construction and Analysis of Systems - 32nd International Conference, TACAS 2026, Held as Part of the International Joint Conferences on Theory and Practice of Software, ETAPS 2026, Turin, Italy, April 11-16, 2026, Proceedings, Part I*, S. Junges and G. Katz, Eds., ser. Lecture Notes in Computer Science, vol. 16505, Springer, 2026, pp. 150–169. DOI: [10.1007/978-3-032-22752-2_8](https://doi.org/10.1007/978-3-032-22752-2_8)
- [7] D. Amrollahi et al., “Towards SMT solver stability via input normalization,” in *Proceedings of the 25th Conference on Formal Methods in Computer-Aided Design, FMCAD 2025, Menlo Park, CA, USA, October 6-10, 2025*, A. Irfan and D. Kaufmann, Eds., TU Wien Academic Press, 2025. DOI: [10.34727/2025/ISBN.978-3-85448-084-6_14](https://doi.org/10.34727/2025/ISBN.978-3-85448-084-6_14)
- [8] Z. Berger et al., “Bit-precise reasoning with parametric bit-vectors,” in *28th International Conference on Theory and Applications of Satisfiability Testing, SAT 2025, Glasgow, Scotland, August 12-15, 2025*, J. Berg and J. Nordström, Eds., ser. LIPIcs, vol. 341, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2025, 4:1–4:24. DOI: [10.4230/LIPICS.SAT.2025.4](https://doi.org/10.4230/LIPICS.SAT.2025.4)

- [9] M. D. P. Dar et al., “Saecred: A state-aware, over-the-air protocol testing approach for discovering parsing bugs in SAE handshake implementations of COTS wi-fi access points,” in *IEEE Symposium on Security and Privacy, SP 2025, San Francisco, CA, USA, May 12-15, 2025*, M. Blanton, W. Enck, and C. Nita-Rotaru, Eds., IEEE, 2025, pp. 3691–3709. DOI: [10.1109/SP61157.2025.00211](https://doi.org/10.1109/SP61157.2025.00211)
- [10] H. Lachnitt et al., “Improving the SMT proof reconstruction pipeline in Isabelle/HOL,” in *16th International Conference on Interactive Theorem Proving, ITP 2025, Reykjavik, Iceland, September 28 - October 1, 2025*, Y. Forster and C. Keller, Eds., ser. LIPIcs, vol. 352, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2025, 26:1–26:22. DOI: [10.4230/LIPICS.ITP.2025.26](https://doi.org/10.4230/LIPICS.ITP.2025.26)
- [11] A. Mohamed et al., “lean-smt: An SMT tactic for discharging proof goals in Lean,” in *Computer Aided Verification - 37th International Conference, CAV 2025, Zagreb, Croatia, July 23-25, 2025, Proceedings, Part III*, R. Piskac and Z. Rakamaric, Eds., ser. Lecture Notes in Computer Science, vol. 15933, Springer, 2025, pp. 197–212. DOI: [10.1007/978-3-031-98682-6_11](https://doi.org/10.1007/978-3-031-98682-6_11)
- [12] M. Mohamed, N. Feng, A. Reynolds, C. Tinelli, C. W. Barrett, and M. Chechik, “Solving set constraints with comprehensions and bounded quantifiers,” in *Proceedings of the 25th Conference on Formal Methods in Computer-Aided Design, FMCAD 2025, Menlo Park, CA, USA, October 6-10, 2025*, A. Irfan and D. Kaufmann, Eds., TU Wien Academic Press, 2025. DOI: [10.34727/2025/ISBN.978-3-85448-084-6_16](https://doi.org/10.34727/2025/ISBN.978-3-85448-084-6_16)
- [13] C. W. Barrett et al., “Satisfiability Modulo Theories: A beginner’s tutorial,” in *Formal Methods - 26th International Symposium, FM 2024, Milan, Italy, September 9-13, 2024, Proceedings, Part II*, A. Platzer, K. Y. Rozier, M. Pradella, and M. Rossi, Eds., ser. Lecture Notes in Computer Science, **Distinguished Tutorial Award**, vol. 14934, Springer, 2024, pp. 571–596. DOI: [10.1007/978-3-031-71177-0_31](https://doi.org/10.1007/978-3-031-71177-0_31)
- [14] C. Johannsen et al., “The MoXI model exchange tool suite,” in *Computer Aided Verification - 36th International Conference, CAV 2024, Montreal, QC, Canada, July 24-27, 2024, Proceedings, Part I*, A. Gurfinkel and V. Ganesh, Eds., ser. Lecture Notes in Computer Science, vol. 14681, Springer, 2024, pp. 203–218. DOI: [10.1007/978-3-031-65627-9_10](https://doi.org/10.1007/978-3-031-65627-9_10)
- [15] H. Lachnitt et al., “IsaRare: Automatic verification of SMT rewrites in Isabelle/HOL,” in *Tools and Algorithms for the Construction and Analysis of Systems - 30th International Conference, TACAS 2024, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2024, Luxembourg City, Luxembourg, April 6-11, 2024, Proceedings, Part I*, B. Finkbeiner and L. Kovács, Eds., ser. Lecture Notes in Computer Science, vol. 14570, Springer, 2024, pp. 311–330. DOI: [10.1007/978-3-031-57246-3_17](https://doi.org/10.1007/978-3-031-57246-3_17)
- [16] R. Lorch, D. Larraz, C. Tinelli, and O. Chowdhury, “A comprehensive, automated security analysis of the Uptane automotive over-the-air update framework,” in *The 27th International Symposium on Research in Attacks, Intrusions and Defenses, RAID 2024, Padua, Italy, 30 September 2024- 2 October 2024*, E. Losiouk, A. Brighente, M. Conti, Y. Aafer, and Y. Fratantonio, Eds., ACM, 2024, pp. 594–612. DOI: [10.1145/3678890.3678927](https://doi.org/10.1145/3678890.3678927)
- [17] M. Mohamed, A. Reynolds, C. Tinelli, and C. W. Barrett, “Verifying SQL queries using theories of tables and relations,” in *LPAR 2024: Proceedings of 25th Conference on Logic for Programming, Artificial Intelligence and Reasoning, Port Louis, Mauritius, May 26-31, 2024*, N. S. Bjørner, M. Heule, and A. Voronkov, Eds., ser. EPIc Series in Computing, vol. 100, EasyChair, 2024, pp. 445–463. DOI: [10.29007/RLT7](https://doi.org/10.29007/RLT7)
- [18] N. Tsiskaridze, C. W. Barrett, and C. Tinelli, “Generalized optimization modulo theories,” in *Automated Reasoning - 12th International Joint Conference, IJCAR 2024, Nancy, France, July 3-6, 2024, Proceedings, Part I*, C. Benz Müller, M. J. H. Heule, and R. A. Schmidt, Eds., ser. Lecture Notes in Computer Science, vol. 14739, Springer, 2024, pp. 458–479. DOI: [10.1007/978-3-031-63498-7_27](https://doi.org/10.1007/978-3-031-63498-7_27)

- [19] A. Abate et al., “Synthesising programs with non-trivial constants,” *J. Autom. Reason.*, vol. 67, no. 2, p. 19, 2023. DOI: [10.1007/S10817-023-09664-4](https://doi.org/10.1007/S10817-023-09664-4)
- [20] H. Barbosa, C. Keller, A. Reynolds, A. Viswanathan, C. Tinelli, and C. W. Barrett, “An interactive SMT tactic in Coq using abductive reasoning,” in *LPAR 2023: Proceedings of 24th International Conference on Logic for Programming, Artificial Intelligence and Reasoning, Manizales, Colombia, 4-9th June 2023*, R. Piskac and A. Voronkov, Eds., ser. EPIc Series in Computing, vol. 94, EasyChair, 2023, pp. 11–22. DOI: [10.29007/432M](https://doi.org/10.29007/432M)
- [21] H. Barbosa et al., “Generating and exploiting automated reasoning proof certificates,” *Commun. ACM*, vol. 66, no. 10, pp. 86–95, 2023. DOI: [10.1145/3587692](https://doi.org/10.1145/3587692)
- [22] B. Ekici, A. Viswanathan, Y. Zohar, C. Tinelli, and C. W. Barrett, “Formal verification of bit-vector invertibility conditions in Coq,” in *Frontiers of Combining Systems - 14th International Symposium, FroCoS 2023, Prague, Czech Republic, September 20-22, 2023, Proceedings*, U. Sattler and M. Suda, Eds., ser. Lecture Notes in Computer Science, vol. 14279, Springer, 2023, pp. 41–59. DOI: [10.1007/978-3-031-43369-6_3](https://doi.org/10.1007/978-3-031-43369-6_3)
- [23] H. Lachnitt et al., “Automatic verification of SMT rewrites in Isabelle/HOL,” in *Proceedings of the 21st International Workshop on Satisfiability Modulo Theories (SMT 2023) co-located with the 29th International Conference on Automated Deduction (CADE 2023), Rome, Italy, July, 5-6, 2023*, S. Graham-Lengrand and M. Preiner, Eds., ser. CEUR Workshop Proceedings, vol. 3429, CEUR-WS.org, 2023, p. 78. [Online]. Available: <https://ceur-ws.org/Vol-3429/abstract14.pdf>
- [24] D. Larraz, R. Lorch, M. Yahyazadeh, M. F. Arif, O. Chowdhury, and C. Tinelli, “CRV: automated cyber-resiliency reasoning for system design models,” in *Formal Methods in Computer-Aided Design, FMCAD 2023, Ames, IA, USA, October 24-27, 2023*, A. Nadel and K. Y. Rozier, Eds., IEEE, 2023, pp. 209–220. DOI: [10.34727/2023/ISBN.978-3-85448-060-0_29](https://doi.org/10.34727/2023/ISBN.978-3-85448-060-0_29)
- [25] A. Mohamed, A. Reynolds, C. W. Barrett, and C. Tinelli, “A procedure for SyGuS solution fitting via matching and rewrite rule discovery,” in *Formal Methods in Computer-Aided Design, FMCAD 2023, Ames, IA, USA, October 24-27, 2023*, A. Nadel and K. Y. Rozier, Eds., IEEE, 2023, pp. 189–198. DOI: [10.34727/2023/ISBN.978-3-85448-060-0_27](https://doi.org/10.34727/2023/ISBN.978-3-85448-060-0_27)
- [26] A. Ozdemir, G. Kremer, C. Tinelli, and C. W. Barrett, “Satisfiability modulo finite fields,” in *Computer Aided Verification - 35th International Conference, CAV 2023, Paris, France, July 17-22, 2023, Proceedings, Part II*, C. Enea and A. Lal, Eds., ser. Lecture Notes in Computer Science, vol. 13965, Springer, 2023, pp. 163–186. DOI: [10.1007/978-3-031-37703-7_8](https://doi.org/10.1007/978-3-031-37703-7_8)
- [27] K. Y. Rozier, N. Shankar, C. Tinelli, and M. Y. Vardi, “Developing an open-source, state-of-the-art symbolic model-checking framework for the model-checking research community,” in *Formal Methods in Computer-Aided Design, FMCAD 2023, Ames, IA, USA, October 24-27, 2023*, A. Nadel and K. Y. Rozier, Eds., IEEE, 2023, p. 1. DOI: [10.34727/2023/ISBN.978-3-85448-060-0_4](https://doi.org/10.34727/2023/ISBN.978-3-85448-060-0_4)
- [28] Y. Sheng, Y. Zohar, C. Ringeissen, A. Reynolds, C. W. Barrett, and C. Tinelli, “Combining stable infiniteness and (strong) politeness,” *J. Autom. Reason.*, vol. 67, no. 4, p. 34, 2023. DOI: [10.1007/S10817-023-09684-0](https://doi.org/10.1007/S10817-023-09684-0)
- [29] Y. Sheng et al., “Reasoning about vectors: Satisfiability modulo a theory of sequences,” *J. Autom. Reason.*, vol. 67, no. 3, p. 32, 2023. DOI: [10.1007/S10817-023-09682-2](https://doi.org/10.1007/S10817-023-09682-2)
- [30] A. Wilson, A. Nötzli, A. Reynolds, B. Cook, C. Tinelli, and C. W. Barrett, “Partitioning strategies for distributed SMT solving,” in *Formal Methods in Computer-Aided Design, FMCAD 2023, Ames, IA, USA, October 24-27, 2023*, A. Nadel and K. Y. Rozier, Eds., IEEE, 2023, pp. 199–208. DOI: [10.34727/2023/ISBN.978-3-85448-060-0_28](https://doi.org/10.34727/2023/ISBN.978-3-85448-060-0_28)

- [31] H. Barbosa et al., “Cvc5: A versatile and industrial-strength SMT solver,” in *Tools and Algorithms for the Construction and Analysis of Systems - 28th International Conference, TACAS 2022, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2022, Munich, Germany, April 2-7, 2022, Proceedings, Part I*, D. Fisman and G. Rosu, Eds., ser. Lecture Notes in Computer Science, **SCP Best Tool Paper Award**, vol. 13243, Springer, 2022, pp. 415–442. DOI: [10.1007/978-3-030-99524-9_24](https://doi.org/10.1007/978-3-030-99524-9_24)
- [32] H. Barbosa et al., “Flexible proof production in an industrial-strength SMT solver,” in *Automated Reasoning - 11th International Joint Conference, IJCAR 2022, Haifa, Israel, August 8-10, 2022, Proceedings*, J. Blanchette, L. Kovács, and D. Pattinson, Eds., ser. Lecture Notes in Computer Science, vol. 13385, Springer, 2022, pp. 15–35. DOI: [10.1007/978-3-031-10769-6_3](https://doi.org/10.1007/978-3-031-10769-6_3)
- [33] G. Kremer, A. Reynolds, C. W. Barrett, and C. Tinelli, “Cooperating techniques for solving nonlinear real arithmetic in the cvc5 SMT solver (system description),” in *Automated Reasoning - 11th International Joint Conference, IJCAR 2022, Haifa, Israel, August 8-10, 2022, Proceedings*, J. Blanchette, L. Kovács, and D. Pattinson, Eds., ser. Lecture Notes in Computer Science, vol. 13385, Springer, 2022, pp. 95–105. DOI: [10.1007/978-3-031-10769-6_7](https://doi.org/10.1007/978-3-031-10769-6_7)
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- [36] Y. Zohar et al., “Bit-precise reasoning via int-blasting,” in *Verification, Model Checking, and Abstract Interpretation - 23rd International Conference, VMCAI 2022, Philadelphia, PA, USA, January 16-18, 2022, Proceedings*, B. Finkbeiner and T. Wies, Eds., ser. Lecture Notes in Computer Science, vol. 13182, Springer, 2022, pp. 496–518. DOI: [10.1007/978-3-030-94583-1_24](https://doi.org/10.1007/978-3-030-94583-1_24)
- [37] D. Larraz, M. Laurent, and C. Tinelli, “Merit and blame assignment with Kind 2,” in *Formal Methods for Industrial Critical Systems - 26th International Conference, FMICS 2021, Paris, France, August 24-26, 2021, Proceedings*, A. Lluch-Lafuente and A. Mavridou, Eds., ser. Lecture Notes in Computer Science, vol. 12863, Springer, 2021, pp. 212–220. DOI: [10.1007/978-3-030-85248-1_14](https://doi.org/10.1007/978-3-030-85248-1_14)
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- [40] A. Niemetz, M. Preiner, A. Reynolds, C. W. Barrett, and C. Tinelli, “On solving quantified bit-vector constraints using invertibility conditions,” *Formal Methods Syst. Des.*, vol. 57, no. 1, pp. 87–115, 2021. DOI: [10.1007/s10703-020-00359-9](https://doi.org/10.1007/s10703-020-00359-9)

- [41] A. Niemetz, M. Preiner, A. Reynolds, C. W. Barrett, and C. Tinelli, “Syntax-guided quantifier instantiation,” in *Tools and Algorithms for the Construction and Analysis of Systems - 27th International Conference, TACAS 2021, Luxembourg City, Luxembourg, March 27 - April 1, 2021, Proceedings, Part II*, J. F. Groote and K. G. Larsen, Eds., ser. Lecture Notes in Computer Science, vol. 12652, Springer, 2021, pp. 145–163. DOI: [10.1007/978-3-030-72013-1_8](https://doi.org/10.1007/978-3-030-72013-1_8)
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- [8] A. Wilson, A. Nötzli, A. Reynolds, C. Tinelli, and C. W. Barrett, *Cvc5-cloud (version 1)*, Jun. 2024. DOI: [10.5281/ZENODO.11645296](https://doi.org/10.5281/ZENODO.11645296)
- [9] H. Lachnitt et al., *Isarare: Automatic verification of SMT rewrites in isabelle/hol (version 1)*, Oct. 2023. DOI: [10.5281/ZENODO.10048664](https://doi.org/10.5281/ZENODO.10048664)

Software

- | | |
|----------------|---|
| 2022 – present | cvc5, an open-source automatic theorem prover for satisfiability modulo theories (SMT) problems (https://cvc5.github.io) |
| 2014 – present | Kind 2, an open-source, multi-engine automatic model checker for synchronous reactive systems (https://kind2-mc.github.io/kind2/) |
| 2009 – 2021 | CVC4, an open-source automatic theorem prover for satisfiability modulo theories (SMT) problems (https://cvc4.github.io) |

Grants and Contracts

Current

- 2025 – 2026 *Unrestricted gift in support of continued research and development of cvc5.*
 Funded by Amazon Web Services. Award amount: \$400K. Investigators:
 C. Tinelli, PI; A. Reynolds, co-PI.

- 2024 – 2027 *PEGISUS: Proof EnGineering and Integration with Satisfiability modUlo the-
orie*. Funded by DARPA. Award amount: \$7.4M. Investigators: C. Barrett
(Stanford U., prime contractor), PI; C. Tinelli, PI; G. Morris, co-PI; K. Kosa-
ian, co-PI; H. Barbosa (UFMG), PI; Y. Zohar (Bar-Ilan U.), PI. Iowa portion:
\$1.5M.
- 2024 – 2026 *Conference: 2024 Formal Methods in the Field PI Meeting.*
Funded by NSF. Award amount: \$100K. Investigators: C. Tinelli, PI; K. Kosa-
ian, co-PI, G. Morris; co-PI.

Completed

- 2024 – 2025 *Unrestricted gift in support of continued research and development of cvc5.*
Funded by Amazon Web Services. Award amount: \$400K. Investigators:
C. Tinelli, PI; A. Reynolds, co-PI.
- 2023 – 2025 *POSE: Phase II: An Open-Source Ecosystem for the cvc5 SMT Solver.*
Funded by NSF. Award amount: \$1.5M. Investigators: C. Barrett (Stanford
U.), PI; C. Tinelli, co-PI. Iowa portion: \$575K.
- 2022 – 2025 *Control Automation Research.* Funded by AFRL. Award amount: \$669K. In-
vestigators: C. Tinelli, PI; D. Larraz, co-PI.
- 2023 – 2024 *Unrestricted gift in support of continued research and development of cvc5.*
Funded by Amazon Web Services. Award amount: \$300K. Investigators:
C. Tinelli, PI; A. Reynolds, co-PI.
- 2022 – 2023 *PEARLS: Proof Engineering, Adaptation, Repair, and Learning for Software.*
Funded by AFRL. Investigators: B. Meng, PI (GEGR); C. Tinelli, co-PI. Iowa
portion: \$26K.
- 2022 – 2023 *Unrestricted gift in support of continued research and development of cvc5.*
Funded by Amazon Web Services. Award amount: \$300K. Investigators:
C. Tinelli, PI; A. Reynolds, co-PI.
- 2022 – 2023 *Unrestricted gift in support of research on SMT tools and their applications.*
Funded by Certora. Award amount: \$120K. Investigators: C. Tinelli, PI;
A. Reynolds, co-PI.
- 2017 – 2023 *CI-SUSTAIN: StarExec: Cross-Community Infrastructure for Logic Solving.*
Funded by NSF. Award amount: \$1,057,491. Investigators: A. Stump, PI;
C. Tinelli, co-PI. G. Sutcliffe, PI (U. of Miami). Iowa portion: \$610,641. Ex-
tended in Fall 2021.
- 2020 – 2023 *CCRI: Medium: Collaborative Research: Open-Source, State-of-the-Art Sym-
bolic Model-Checking Framework.*
Funded by NSF. Investigators: K. Rozier, PI (ISU); M. Vardi, PI (Rice); B.
Dutertre, PI (SRI); C. Tinelli, co-PI. Iowa portion: \$90K.
- 2021 – 2022 *Unrestricted gift in support of continued research and development of cvc5.*
Funded by Amazon Web Services. Award amount: \$300K. Investigators:
C. Tinelli, PI; A. Reynolds, co-PI.
- 2021 – 2022 *Unrestricted gift in support of extending and improving the cvc5 SMT solver for
software verification.*

- Funded by Novi/Facebook. Award amount: \$75K. Investigators: C. Tinelli, PI; A. Reynolds, co-PI.
- 2020 – 2022 *FMitF: Track II: Strengthening the integration of the CVC4 SMT solver in the Coq proof assistant.*
Funded by NSF. Award amount: \$100K. Investigators: C. Tinelli, PI.
- 2020 – 2021 *User-guided reasoning about nonlinear equations.*
Funded by Tel Aviv University. Award amount: \$25K. Investigators: C. Tinelli, PI; A. Reynolds, co-PI.
- 2020 – 2021 *Unrestricted gift in support of extending CVC4 to the theory of sequences.*
Funded by Novi/Facebook. Award amount: \$75K. Investigators: C. Tinelli, PI; A. Reynolds, co-PI.
- 2020 – 2021 *Unrestricted gift in support of continued research and development of CVC4.*
Funded by Amazon Web Services. Award amount: \$100K. Investigators: C. Tinelli, PI; A. Reynolds, co-PI.
- 2018 – 2022 *VERDICT: Verification Evidence & Resilient Design In anticipation of Cyber-security Threats.*
Funded by DARPA. Award amount: \$5M. Investigators: M. Durling, PI (GEGR); C. Tinelli, PI; O. Chowdhury, co-PI. Iowa portion: \$809K.
- 2017 – 2021 *VADD: Verified Application Debloating and Delaying.*
Funded by ONR. Investigators: J. Hendrix, PI (Galois); C. Tinelli, PI; C. Barrett, PI (Stanford). Iowa portion: \$399,537.
- 2019 – 2020 *Unrestricted gift in support of continued research and development of CVC4.*
Funded by Amazon Web Services. Award amount: \$150K. Investigators: C. Tinelli, PI; A. Reynolds, co-PI.
- 2018 – 2020 *HERMES: A Hybrid Efficient Reasoning Method for Explainable and Scalable formal methods*
Funded by DARPA. Award amount: \$6M. Investigators: A. Pinto, PI (United Technologies); C. Tinelli, PI; C. Barrett, PI (Stanford). Iowa portion: \$730,430.
- 2018 – 2019 *Unrestricted gift in support of continued research and development of CVC4.*
Funded by Amazon Web Services. Award amount: \$100K. Investigators: C. Tinelli, PI; A. Reynolds, co-PI.
- 2018 – 2019 *Unrestricted gift in support of MVD'18 workshop.*
Funded by Rockwell Collins. Award amount: \$2,6K. Investigator: C. Tinelli, PI.
- 2018 – 2019 *Unrestricted gift in support of MVD'18 workshop.*
Funded by United Technologies. Award amount: \$2.5K. Investigator: C. Tinelli, PI.
- 2018 – 2019 *Unrestricted gift in support of MVD'18 workshop.*
Funded by General Electric. Award amount: \$1K. Investigator: C. Tinelli, PI.
- 2015 – 2019 *Myriad: Automatic Software Diversity for Execution-Time Protection.*
Funded by DARPA. Award amount: \$2.5M. Investigators: D. Melski, PI (Gram-matech); C. Tinelli, PI; C. Barrett, PI (Stanford). Iowa portion: \$566,815.
- 2014 – 2018 *Contract-based compositional verification for outsourced flight critical systems.*

- Funded by NASA. Award amount: \$1,386,307. Investigators: T. Kahsai, PI (CMU/NASA); C. Tinelli, PI. Iowa portion: \$523,144.
- 2017 – 2018 *Unrestricted gift in support of continued research and development of CVC4.*
Funded by GE Global Research. Award amount: \$95K. Investigator: C. Tinelli, PI.
- 2017 – 2017 *Unrestricted gift in support of MVD 2017 workshop.*
Funded by Rockwell Collins. Award amount: \$5K. Investigator: C. Tinelli, PI.

Invited Lectures and Conference Presentations

National — Invited Talks

- Dec 2025 *Shining a light on Kind 2 — A full-featured, high-performance model checker with a rich modeling language*, Collins Aerospace, online.
- Feb 2020 *Synthesis from within: automated synthesis inside an SMT solver*, University of California at San Diego, La Jolla, CA.
- Apr 2018 *Solving Alloy Constraints with an SMT Solver for Relational Logic*. Workshop on the Future of Alloy. MIT. Boston, MA
- Jun 2017 *Model Finding for Recursive Functions in SMT*. MIT. Boston, MA
- Jun 2017 *Proof Certificates for SMT-based Model Checkers for Infinite-state Systems*. Northeastern University. Boston, MA

International — Keynote Talks

- Aug 2024 SAT 2024: Int'l Conf. on Satisfiability, *Scalable Proof Production and Checking in SMT*, Pune, India
- July 2023 MOSCA 2023: Meeting on String Constraints and Applications, *Designing a Fast and Trustworthy String Solver*, Paris, France
- Aug 2020 Newton Institute Workshop on Verified Software, *(Canceled due to COVID-19)*, Cambridge, UK
- Aug 2019 CADE-27: 27th Int'l Conf. on Automated Deduction, *Counter-Model-based Quantifier Instantiation to Quantifier Elimination in SMT*, Natal, Brazil.
- Jul 2018 VSTTE 2018: 10th Working Conf. on Verified Software: Theories, Tools, and Experiments, *Contract-based Compositional Verification of Infinite-State Reactive Systems*. Oxford, UK
- Jul 2018 Vampire Theorem Prover Workshop, *Counterexample-Guided Quantifier Instantiation in Logical Theories*. Oxford, UK
- Sep 2017 FroCoS 2017: Int'l Symposium on Frontiers of Combining Systems. *Designing Extensible Theory Solvers*. Brasília, Brazil
- Sep 2017 PxTP 2017: Workshop on Proof eXchange for Theorem Proving, *Increasing automation in Coq via trustworthy cooperation with external automated reasoners*. Brasília, Brazil

International — Invited Talks

- Jul 2025 VMW 2025: Verification Mentoring Workshop, *A whirlwind introduction to Satisfiability Modulo Theories and its applications*, Zagreb, Croatia.
- May 2023 UPDATE/MIMOS 2023: Workshop on Embedded Systems Design & Updates, *A contract language for Lustre models*, Uppsala, Sweden.
- July 2022 CAV 2022: 34th Int'l Conference on Computer Aided Verification, acceptance speech for CAV 2021 award, Haifa, Israel.
- Aug 2020 Verification Beyond 2020, *SMT: achievements, challenges and opportunities*. on-line.
- Sep 2019 *Synthesis from within: implementing automated synthesis inside SMT solvers*. Max Planck Institute for Software Systems. Kaiserslautern, Germany.
- Jun 2019 *Logic-based methods for model-checking of infinite-state systems*, Technische Universität Dresden. Dresden, Germany.
- May 2019 ANDREI-60: Automating New-Era Deductive Reasoning Event in Iberia, *Counter-model-based quantifier Instantiation in SMT*. University of Tbilisi, Tbilisi, Georgia.
- Feb 2019 *Advances in quantifier instantiation in logical theories*, Max-Planck-Institut für Informatik, Saarbrücken, Germany.

International — Invited Lectures and Tutorials

- Aug 2025 SAT/SMT/AR Summer School 2025. University of St Andrews, St Andrews, UK
- Aug 2024 2024 Marktoberdorf Summer School on Engineering Secure and Dependable Software Systems. FORTISS, Herrsching am Ammersee, Germany
- Jun 2024 2024 Summer School on Formal Techniques, SRI, Menlo Park, CA, USA
- Aug 2022 2022 Marktoberdorf Summer School. FORTISS, Marktoberdorf, Germany (*Canceled due to COVID-19*)
- Aug 2020 2020 Marktoberdorf Summer School. FORTISS, Marktoberdorf, Germany. (*Canceled due to COVID-19*)
- Apr 2019 ETAPS 2019: European Joint Conf. on Theory and Practice of Software, *An overview of Satisfiability Modulo Theories and its applications*. ETAPS, Prague, Czech Republic.
- Aug 2017 SC2 Summer School 2017, *Foundations of Satisfiability Modulo Theories*. Saarbrücken, Germany

SERVICE

Profession

Associate Editor

- 2007 – present The Journal of Automated Reasoning
- 2018 – present Progress in Computer Science Foundations and Applied Logic (Book Series)

Steering Committee Member

- 2020 – 2024 SMT, Int'l Workshop on Satisfiability Modulo Theories
- 2009 – 2019 MVD, Midwest Verification Day workshop

Coordinator

- 2002 – present SMT-LIB initiative

Program Committee Chair

- 2023 CADE-29, Int'l Conf. on Automated Deduction

Program Committee Member

- 2026 FMCAD 2026 Student Forum, 2026, Graz, Austria
- 2026 DASC 2026, Orlando, FLA, USA
- 2026 CAV 2026, Lisbon, Portugal
- 2026 IJCAR 2026, Lisbon, Portugal
- 2025 SMT 2025, Glasgow, UK
- 2025 TACAS 2025, Hamilton, Canada
- 2023 SBFN 2023, Manaus, Brazil
- 2023 Overlay 2023, Rome, Italy
- 2023 SC² 2023, Tromsø, Norway
- 2023 CADE-29, Rome, Italy
- 2023 TACAS 2023, Paris, France
- 2022 HILT 2022, Ann Arbor, MI, USA
- 2022 TACAS 2022, Munich, Germany
- 2022 VMCAI 2022, Philadelphia, PA, USA
- 2021 ATVA 2021, Gold Coast, Australia
- 2021 CAV 2021, Los Angeles, CA, USA
- 2021 SMT 2021, Los Angeles, CA, USA
- 2021 NFM 2021, Norfolk, VA, USA
- 2020 IJCAR 2020, Paris, France
- 2020 SMT 2020, Paris, France
- 2019 FMCAD 2019, San Jose, CA, USA
- 2019 FroCoS 2019, London, UK
- 2019 CAV 2019, New York, NY, USA
- 2019 SMT 2019, Lisbon, Portugal
- 2018 LPAR-22, Awassa, Ethiopia
- 2018 IJCAR 2018, Oxford, UK
- 2018 ITP 2018, Oxford, UK

- 2018 NFM 2018, Newport News, VA, USA
- 2017 TABLEAUX 2017, Brasília, Brazil

Co-organizer

- 2024 FMitF 2024: 2nd PI meeting of the NSF Formal Methods in the Field program, Iowa City, IA, USA
- 2024 OSSyM: Workshop on Open-Source, Symbolic Model-Checking Framework for the Model-Checking Research Community, Montreal, Canada
- 2019 Dagstuhl Seminar 19371: Deduction Beyond Satisfiability, Wadern, Germany
- 2018 Midwest Verification Day 2018, Iowa City, IA, USA
- 2017 Dagstuhl Seminar 17371: Deduction Beyond First-Order Logic, Wadern, Germany

Journal Reviewer

- 2024 Software Tools and Technology Transfer
- 2023 Software Tools and Technology Transfer
- 2022 Journal on Satisfiability, Boolean Modeling and Computation
- 2021 ACM Surveys
- 2019 Journal of Symbolic Computation
- 2019 Transactions on Programming Languages and Systems

Conference/Workshop Reviewer¹

- 2020 ACM/IEEE Symposium on Logic in Computer Science
- 2018 ACM SIGPLAN Symposium on Principles of Programming Languages

¹Excludes reviews done as program committee member.