

List of Publications

2025-03-15

Statistics: h-index 11; 5 journal papers and 24 peer-reviewed conference papers in prestigious venues, including the **Proceedings of the ACM on Software Engineering** and **IEEE Transactions on Computers**.

My five recent and most important publications are highlighted in boldface.

Books

1. Nian-Ze Lee. *Stochastic Boolean Satisfiability: Decision Procedures, Generalization, and Applications*. PhD thesis, 2021. doi: [10.6342/NTU202101397](https://doi.org/10.6342/NTU202101397).

Journal Papers

1. Dirk Beyer, Nian-Ze Lee, and Philipp Wendler. **Interpolation and SAT-Based Model Checking Revisited: Adoption to Software Verification**. *Journal of Automated Reasoning*, 69(1):5, 2025. doi: [10.1007/s10817-024-09702-9](https://doi.org/10.1007/s10817-024-09702-9).
2. Dirk Beyer, Po-Chun Chien, Marek Jankola, and Nian-Ze Lee. **A Transferability Study of Interpolation-Based Hardware Model Checking for Software Verification**. *Proceedings of the ACM on Software Engineering*, 1(FSE):90:1–90:23, 2024. doi: [10.1145/3660797](https://doi.org/10.1145/3660797).
3. Marie-Christine Jakobs and Nian-Ze Lee. Summary of the eighth international workshop on CPAchecker (CPAchecker 2023). *ACM SIGSOFT Software Engineering Notes*, 49(2):25–26, 2024. doi: [10.1145/3650142.3650150](https://doi.org/10.1145/3650142.3650150).
4. Nian-Ze Lee and Jie-Hong R. Jiang. Constraint solving for synthesis and verification of threshold logic circuits. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 40(5):904–917, 2021. doi: [10.1109/TCAD.2020.3015441](https://doi.org/10.1109/TCAD.2020.3015441).
5. Nian-Ze Lee and Jie-Hong R. Jiang. Towards formal evaluation and verification of probabilistic design. *IEEE Transactions on Computers*, 67(8):1202–1216, 2018. doi: [10.1109/TC.2018.2807431](https://doi.org/10.1109/TC.2018.2807431).

Conference Papers (with published proceedings)

1. Zhengyang Lu, Po-Chun Chien, Nian-Ze Lee, and Vijay Ganesh. Algorithm selection for word-level hardware model checking (student abstract). In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2025. Preprint available via https://www.sosy-lab.org/research/pub/2025-AAAI.Algorithm_Selection_for_Word-Level_Hardware_Model_Checking_Student_Abstract.pdf.
2. Salih Ates, Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. MoXlchecker: An extensible model checker for MoXI. In *Proceedings of the International Conference on Verified Software: Theories, Tools, and Experiments*, LNCS 15525. Springer, 2025. Preprint available via <https://doi.org/10.48550/arXiv.2407.15551>.
3. Dirk Beyer and Nian-Ze Lee. The transformation game: Joining forces for verification. In *Principles of Verification: Cycling the Probabilistic Landscape - Essays Dedicated to Joost-Pieter Katoen on the Occasion of His 60th Birthday, Part III*, LNCS 15262, pages 175–205. Springer, 2024. doi: [10.1007/978-3-031-75778-5_9](https://doi.org/10.1007/978-3-031-75778-5_9).
4. Daniel Baier, Dirk Beyer, Po-Chun Chien, Marie-Christine Jakobs, Marek Jankola, Matthias Kettl, Nian-Ze Lee, Thomas Lemberger, Marian Lingsch Rosenfeld, Henrik Wachowitz, and Philipp Wendler. Software verification with CPAchecker 3.0: Tutorial and user guide. In *Proceedings of the International Symposium on Formal Methods*, LNCS 14934, pages 543–570. Springer, 2024. doi: [10.1007/978-3-031-71177-0_30](https://doi.org/10.1007/978-3-031-71177-0_30).
5. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. **Augmenting Interpolation-Based Model Checking with Auxiliary Invariants**. In *Proceedings of the International Symposium on Model Checking Software*, LNCS 14624, pages 227–247. Springer, 2024. doi: [10.1007/978-3-031-66149-5_13](https://doi.org/10.1007/978-3-031-66149-5_13).
6. Zsófia Ádám, Dirk Beyer, Po-Chun Chien, Nian-Ze Lee, and Nils Sirrenberg. **Btor2-Cert: A Certifying Hardware-Verification Framework Using Software Analyzers**. In *Proceedings of the International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, LNCS 14572, pages 129–149. Springer, 2024. doi: [10.1007/978-3-031-57256-2_7](https://doi.org/10.1007/978-3-031-57256-2_7).
7. Po-Chun Chien and Nian-Ze Lee. CPV: A circuit-based program verifier (competition contribution). In *Proceedings of the International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, LNCS 14572, pages 365–370. Springer, 2024. doi: [10.1007/978-3-031-57256-2_22](https://doi.org/10.1007/978-3-031-57256-2_22).

8. Daniel Baier, Dirk Beyer, Po-Chun Chien, Marek Jankola, Matthias Kettl, Nian-Ze Lee, Thomas Lemberger, Marian Lingsch-Rosenfeld, Martin Spiessl, Henrik Wachowitz, and Philipp Wendler. CPAChecker 2.3 with strategy selection (competition contribution). In *Proceedings of the International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, LNCS 14572, pages 359–364. Springer, 2024. doi: [10.1007/978-3-031-57256-2_21](https://doi.org/10.1007/978-3-031-57256-2_21).
9. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. CPA-DF: A tool for configurable interval analysis to boost program verification. In *Proceedings of the IEEE/ACM International Conference on Automated Software Engineering*, pages 2050–2053. IEEE, 2023. doi: [10.1109/ASE56229.2023.00213](https://doi.org/10.1109/ASE56229.2023.00213).
10. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Bridging hardware and software analysis with Btor2C: A word-level-circuit-to-C translator. In *Proceedings of the International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, LNCS 13994, pages 152–172. Springer, 2023. doi: [10.1007/978-3-031-30820-8_12](https://doi.org/10.1007/978-3-031-30820-8_12).
11. Nian-Ze Lee and Jie-Hong R. Jiang. **Dependency Stochastic Boolean Satisfiability: A Logical Formalism for NEXPTIME Decision Problems with Uncertainty**. In *Proceedings of the AAAI Conference on Artificial Intelligence*, pages 3877–3885. AAAI Press, 2021. doi: [10.1609/aaai.v35i5.16506](https://doi.org/10.1609/aaai.v35i5.16506).
12. Jie-Hong R. Jiang, Victor N. Kravets, and Nian-Ze Lee. Engineering change order for combinational and sequential design rectification. In *Proceedings of the Design, Automation & Test in Europe Conference & Exhibition*, pages 726–731. IEEE, 2020. doi: [10.23919/DATE48585.2020.9116504](https://doi.org/10.23919/DATE48585.2020.9116504).
13. Siang-Yun Lee, Nian-Ze Lee, and Jie-Hong R. Jiang. Searching parallel separating hyperplanes for effective compression of threshold logic networks. In *Proceedings of the International Conference on Computer-Aided Design*, pages 1–8. ACM, 2019. doi: [10.1109/ICCAD45719.2019.8942143](https://doi.org/10.1109/ICCAD45719.2019.8942143).
14. Nian-Ze Lee, Paolo Arcaini, Shaukat Ali, and Fuyuki Ishikawa. Stability analysis for safety of automotive multi-product lines: A search-based approach. In *Proceedings of the Genetic and Evolutionary Computation Conference*, pages 1241–1249. ACM, 2019. doi: [10.1145/3321707.3321755](https://doi.org/10.1145/3321707.3321755).
15. Victor N. Kravets, Nian-Ze Lee, and Jie-Hong R. Jiang. Comprehensive search for ECO rectification using symbolic sampling. In *Proceedings of the Annual Design Automation Conference*, pages 71:1–71:6. ACM, 2019. doi: [10.1145/3316781.3317790](https://doi.org/10.1145/3316781.3317790).
16. Shaukat Ali, Paolo Arcaini, Ichiro Hasuo, Fuyuki Ishikawa, and Nian-Ze Lee. Towards a framework for the analysis of multi-product lines in the automotive domain. In *Proceedings of the International Workshop on Variability Modelling of Software-Intensive Systems*, pages 12:1–12:6. ACM, 2019. doi: [10.1145/3302333.3302345](https://doi.org/10.1145/3302333.3302345).
17. Akihisa Yamada, Clovis Eberhart, Fuyuki Ishikawa, and Nian-Ze Lee. Scenario sampling for cyber physical systems using combinatorial testing. In *Proceedings of the International Conference on Software Testing, Verification and Validation Workshops*, pages 198–199. IEEE, 2019. doi: [10.1109/ICSTW.2019.00053](https://doi.org/10.1109/ICSTW.2019.00053).
18. Siang-Yun Lee, Nian-Ze Lee, and Jie-Hong R. Jiang. Canonicalization of threshold logic representation and its applications. In *Proceedings of the International Conference on Computer-Aided Design*, pages 85:1–85:8. ACM, 2018. doi: [10.1145/3240765.3240785](https://doi.org/10.1145/3240765.3240785).
19. Nian-Ze Lee, Yen-Shi Wang, and Jie-Hong R. Jiang. Solving exist-random quantified stochastic Boolean satisfiability via clause selection. In *Proceedings of the International Joint Conference on Artificial Intelligence*, pages 1339–1345. IJCAI Organization, 2018. doi: [10.24963/ijcai.2018/186](https://doi.org/10.24963/ijcai.2018/186).
20. Ai Quoc Dao, Nian-Ze Lee, Li-Cheng Chen, Mark Po-Hung Lin, Jie-Hong R. Jiang, Alan Mishchenko, and Robert K. Brayton. Efficient computation of ECO patch functions. In *Proceedings of the Annual Design Automation Conference*, pages 51:1–51:6. ACM, 2018. doi: [10.1145/3195970.3196039](https://doi.org/10.1145/3195970.3196039).
21. Nian-Ze Lee, Victor N. Kravets, and Jie-Hong R. Jiang. Sequential engineering change order under retiming and resynthesis. In *Proceedings of the International Conference on Computer-Aided Design*, pages 109–116. IEEE, 2017. doi: [10.1109/ICCAD.2017.8203767](https://doi.org/10.1109/ICCAD.2017.8203767).
22. Nian-Ze Lee, Yen-Shi Wang, and Jie-Hong R. Jiang. Solving stochastic Boolean satisfiability under random-exist quantification. In *Proceedings of the International Joint Conference on Artificial Intelligence*, pages 688–694. IJCAI Organization, 2017. doi: [10.24963/ijcai.2017/96](https://doi.org/10.24963/ijcai.2017/96).
23. Nian-Ze Lee, Hao-Yuan Kuo, Yi-Hsiang Lai, and Jie-Hong R. Jiang. Analytic approaches to the collapse operation and equivalence verification of threshold logic circuits. In *Proceedings of the International Conference on Computer-Aided Design*, pages 5:1–5:8. ACM, 2016. doi: [10.1145/2966986.2967001](https://doi.org/10.1145/2966986.2967001).
24. Nian-Ze Lee and Jie-Hong R. Jiang. Towards formal evaluation and verification of probabilistic design. In *Proceedings of the International Conference on Computer-Aided Design*, pages 340–347. IEEE, 2014. doi: [10.1109/ICCAD.2014.7001372](https://doi.org/10.1109/ICCAD.2014.7001372).

Technical Reports

1. Daniel Baier, Dirk Beyer, Po-Chun Chien, Marie-Christine Jakobs, Marek Jankola, Matthias Kettl, Nian-Ze Lee, Thomas Lemberger, Marian Lingsch Rosenfeld, Henrik Wachowitz, and Philipp Wendler. Software verification with CPAchecker 3.0: Tutorial and user guide (extended version). *arXiv/CoRR*, 2409, 2024. doi: [10.48550/arXiv.2409.02094](https://doi.org/10.48550/arXiv.2409.02094).
2. Salih Ates, Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. MoXlchecker: An extensible model checker for MoXI. *arXiv/CoRR*, 2407(15551), July 2024. doi: [10.48550/arXiv.2407.15551](https://doi.org/10.48550/arXiv.2407.15551).
3. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Augmenting interpolation-based model checking with auxiliary invariants (extended version). *arXiv/CoRR*, 2403(07821), March 2024. doi: [10.48550/arXiv.2403.07821](https://doi.org/10.48550/arXiv.2403.07821).
4. Dirk Beyer, Nian-Ze Lee, and Philipp Wendler. Interpolation and SAT-based model checking revisited: Adoption to software verification. *arXiv/CoRR*, 2208(05046), July 2022. doi: [10.48550/arXiv.2208.05046](https://doi.org/10.48550/arXiv.2208.05046).
5. Nian-Ze Lee and Jie-Hong R. Jiang. Dependency stochastic Boolean satisfiability: A logical formalism for NEXPTIME decision problems with uncertainty. *arXiv/CoRR*, 1911(04112), February 2021. doi: [10.48550/arXiv.1911.04112](https://doi.org/10.48550/arXiv.1911.04112).

Submitted Manuscripts

1. Salih Ates, Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Bridging hardware and software analysis with Btor2C: A word-level-circuit-to-C translator. *International Journal on Software Tools for Technology Transfer*. Invited submission, conditionally accepted on 2025-02-03.
2. Zhengyang Lu, Po-Chun Chien, Nian-Ze Lee, Arie Gurfinkel, and Vijay Ganesh. Btor2-Select: A learning-based algorithm selection framework for hardware model checking. In *Proceedings of the International Conference on Computer Aided Verification*. Springer, 2025. Submitted on 2025-01-31.
3. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Augmenting interpolation-based model checking with auxiliary invariants. *International Journal on Software Tools for Technology Transfer*. Invited submission, submitted on 2024-10-25.

Reproduction Packages

1. Dirk Beyer, Po-Chun Chien, Marek Jankola, and Nian-Ze Lee. Reproduction package for FSE 2024 article ‘A transferability study of interpolation-based hardware model checking for software verification’. Zenodo, 2024. doi: [10.5281/zenodo.11070973](https://doi.org/10.5281/zenodo.11070973).
2. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Reproduction package for SPIN 2024 submission ‘Augmenting interpolation-based model checking with auxiliary invariants’. Zenodo, 2024. doi: [10.5281/zenodo.10548594](https://doi.org/10.5281/zenodo.10548594).
3. Zsófia Ádám, Dirk Beyer, Po-Chun Chien, Nian-Ze Lee, and Nils Sirrenberg. Reproduction package for TACAS 2024 article ‘Btor2-Cert: A certifying hardware-verification framework using software analyzers’. Zenodo, 2024. doi: [10.5281/zenodo.10548597](https://doi.org/10.5281/zenodo.10548597).
4. Zsófia Ádám, Dirk Beyer, Po-Chun Chien, Nian-Ze Lee, and Nils Sirrenberg. Reproduction package for TACAS 2024 submission ‘Btor2-Cert: A certifying hardware-verification framework using software analyzers’. Zenodo, 2023. doi: [10.5281/zenodo.10013059](https://doi.org/10.5281/zenodo.10013059).
5. Po-Chun Chien and Nian-Ze Lee. CPV: A circuit-based program verifier. Zenodo, 2023. doi: [10.5281/zenodo.10203472](https://doi.org/10.5281/zenodo.10203472).
6. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Reproduction package for ASE 2023 article ‘CPA-DF: A tool for configurable interval analysis to boost program verification’. Zenodo, 2023. doi: [10.5281/zenodo.8245821](https://doi.org/10.5281/zenodo.8245821).
7. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Reproduction package for TACAS 2023 article ‘Bridging hardware and software analysis with BTOR2C: A word-level-circuit-to-C translator’. Zenodo, 2023. doi: [10.5281/zenodo.7551707](https://doi.org/10.5281/zenodo.7551707).
8. Dirk Beyer, Nian-Ze Lee, and Philipp Wendler. Reproduction package for JAR article ‘Interpolation and SAT-based model checking revisited’. Zenodo, 2023. doi: [10.5281/zenodo.8245824](https://doi.org/10.5281/zenodo.8245824).
9. Dirk Beyer, Po-Chun Chien, and Nian-Ze Lee. Reproduction package for TACAS 2023 submission ‘Bridging hardware and software analysis with BTOR2C: A word-level-circuit-to-C translator’. Zenodo, 2022. doi: [10.5281/zenodo.7303732](https://doi.org/10.5281/zenodo.7303732).
10. Nian-Ze Lee. Reproduction package for doctoral dissertation ‘Stochastic Boolean satisfiability: Decision procedures, generalization, and applications’. Zenodo, 2021. doi: [10.5281/zenodo.5084146](https://doi.org/10.5281/zenodo.5084146).