Po-Chun Chien

Curriculum Vitae

2024-07-23

Coordinates

Affiliation: Institute of Informatics, LMU Munich,
Oettingenstr. 67,
80538 Munich, Germany

Webpage: www.sosy-lab.org/people/chien/
Email: po-chun.chien@sosy.ifi.lmu.de
ORCID: 0000-0001-5139-5178

Research Interests

- Formal Methods: New algorithms and tools for the verification of computational systems
- Electronic Design Automation: Logic synthesis and optimization of hardware digital circuits
- Machine Learning: Application to formal verification and logic synthesis

Skills

- Programming: C/C++, Java, Python, Verilog, Shell script, Cadence SKILL, MATLAB
- Natural Language: Mandarin Chinese (native), English (IELTS 7.5, TOEFL 103)

Education

since 2021 — Ph.D. in Informatics (Computer Science), LMU Munich, Munich, Germany
- Advisor: Prof. Dirk Beyer
- Funding: DFG Research Training Group *ConVeY* (GRK 2428)

2018 – 2020 — M.Sc. in Electronics Engineering, National Taiwan University (NTU), Taipei, Taiwan
- Advisor: Prof. Jie-Hong Roland Jiang
- Overall GPA: 4.22 / 4.30

2015 – 2018 — B.Sc. in Electrical Engineering, National Taiwan University, Taipei, Taiwan
- Overall GPA: 4.16 / 4.30 (top 5 %)

Academic Employment

since 2021 — Doctoral Researcher (advisor: Prof. Dirk Beyer) at LMU Munich, Munich, Germany

2018 – 2021 — Research and Teaching Assistant (advisor: Prof. Jie-Hong Roland Jiang) at National Taiwan University, Taipei, Taiwan

Industrial Employment

2018 — Summer Intern at MediaTek, Hsinchu, Taiwan

Honors & Awards

Academic Awards

2024 — ACM SIGSOFT Distinguished Paper Award and Best Artifact Award at the ACM Intl. Conference on the Foundations of Software Engineering (FSE)

2024 — Distinguished Artifact Award at the Intl. Conference on Tools and Algorithms for the Construction and Analysis of System (TACAS)

2024 — Best Paper Award at the Intl. Symposium on Model Checking Software (SPIN)

2020 — Chinese Institute of Electrical Engineering Thesis Award

2020 — Graduate Institute of Electronics Engineering Outstanding Master's Thesis Award

2020 — Institute of Information & Computing Machinery Master's Thesis Excellence Award

2020 — Lam Research Master's Thesis Excellence Award at NTU

2016 – 2017 NTU Presidential Award (2 semesters)

Contest Awards

2023, 2024 2nd place overall in the Intl. Competition on Software Verification (SV-COMP)
2022 3rd place overall in the Intl. Competition on Software Verification (SV-COMP)
2021 2nd place in the programming contest of the Intl. Workshop on Logic & Synthesis
2019 1st place in CADathlon at the Intl. Conference on Computer-Aided Design (ICCAD)
2019 1st place in the Formosa Grand Challenge "Taking with AI" (domestic)

Scholarships

2018 – 2020 NTU-GIEE Scholarship (4 semesters)
2017 – 2018 TSMC-NTU Scholarship (2 semesters)

Publications

My publications can be found on DBLP and Google Scholar. Three most important ones are listed below.

1. 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), 2024. doi: 10.1145/3660797. **[ACM SIGSOFT Distinguished Paper Award]**.
2. 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 (SPIN)*. Springer, 2024. **[Best Paper Award]**.
3. 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 (TACAS)*, LNCS 13994, pages 152–172. Springer, 2023. doi: 10.1007/978-3-031-30820-8_12.

Software Projects

- BTOR2-CERT: A certifying hardware-verification framework using software analyzers
  https://gitlab.com/sosy-lab/software/btor2-cert
  - BTOR2C: A translator from word-level circuits to C programs
    https://gitlab.com/sosy-lab/software/btor2c
  - BTOR2-VAL: A witness validator for word-level hardware model checking
    https://gitlab.com/sosy-lab/software/btor2-val

  Role: principle designer, maintainer, and developer
- CPV: A circuit-based program verifier
  https://gitlab.com/sosy-lab/software/cpv
  Role: principle designer, maintainer, and developer
- MOXICHECKER: An Extensible Model Checker for MoXI
  https://gitlab.com/sosy-lab/software/moxichecker
  Role: principle designer, maintainer, and developer
- CPACHECKER: A configurable software Verification framework
  https://cpachecker.sosy-lab.org/
  Role: developer
- BENCHCLOUD: A cloud platform for scalable performance benchmarking
  https://vcloud.sosy-lab.org/
  Role: maintainer and developer
- BENCHEXEC: A framework for reliable benchmarking and resource measurement
  https://github.com/sosy-lab/benchexec
  Role: contributor
- COVERITEAM: A tool for on-demand composition of cooperative verification systems
  https://gitlab.com/sosy-lab/software/coveriteam
  Role: contributor

- EXT-FOLDING: A circuit-folding interface for the logic synthesis system ABC
  https://github.com/NTU-ALComLab/ext-folding
  Role: principle designer and developer
- FRINGEDT: An implementation of binary decision tree Learning with fringe-feature extraction
  https://github.com/Po-Chun-Chien/FringeDT
  Role: principle designer and developer
- LUT-NET: A tool for learning a network of lookup tables from binary input patterns
  https://github.com/Po-Chun-Chien/LUT-Net
  Role: principle designer and developer

Student Mentoring

2023	Zhengyang (John) Lu, Google Summer of Code PhD student, University of Waterloo Topic: Adaptive Algorithm Selection for Btor2 Verification Tasks
2023	Zsófia Ádám, Erasmus Program Internship student, Budapest University of Technology and Economics Topic: Correctness Witness Validation for Programs Translated from Hardware Models
2023	Nils Sirrenberg, LMU Bachelor's Thesis Bachelor student, LMU Munich Topic: Certifying Software Violation Witnesses for Hardware Verification Tasks via Simulation-Based Validation
2023	Jia Sun, Google Summer of Code Bachelor student, Kyoto University Topic: Reverse Program Synthesis for Backward Reachability Analysis
2023	Salih Ates, LMU Bachelor's Thesis Bachelor student, LMU Munich Topic: Improving Array Encoding in Hardware-to-Software Translation

Teaching Experience

I have been a teaching assistant for the following courses.

Graduate Courses

Summer 2024	Software Engineering Internship (instructor: Prof. Dirk Beyer)
Summer 2023	Software Engineering Internship (instructor: Prof. Dirk Beyer)
Summer 2022	Software Engineering Internship (instructor: Prof. Dirk Beyer)
Winter 2021	Software Verification (instructor: Prof. Dirk Beyer)
Fall 2018	Deep Learning for Human Language Processing (instructor: Prof. Hung-Yi Lee and Prof. Yun-Nung Chen)
Spring 2018	Advanced Deep Learning (instructor: Prof. Hung-Yi Lee and Prof. Yun-Nung Chen)

Graduate Seminars

Summer 2024	Algorithms for Model Checking (instructor: Prof. Dirk Beyer)
Winter 2023	Algorithms for Model Checking (instructor: Prof. Dirk Beyer)

Undergraduate Courses

Summer 2021	Software Development Internship (instructor: Prof. Dirk Beyer)
Spring 2020	Introduction to Electronic Design Automation (instructor: Prof. Jie-Hong Roland Jiang)
Spring 2019	Introduction to Electronic Design Automation (instructor: Prof. Jie-Hong Roland Jiang)

Undergraduate Seminars

Winter 2022	Software Verification: Tools and Techniques (instructor: Prof. Dirk Beyer)

Professional Activities

Conference / Workshop Organization

2024	Organizer of the International Workshop on CPACHECKER (in preparation)
2022	Student Volunteer at the European Joint Conferences on Theory and Practice of Software (ETAPS)

Conference Referee (co/sub-reviewer)

2024	International Conference on the Foundations of Software Engineering (FSE)
	International Conference on Software Engineering (ICSE)
	International Symposium on Formal Methods (FM)
2023	International Conference on Computer Design (ICCD)
	International Conference on Computer Aided Verification (CAV)
	International Conference on Automated Software Engineering (ASE)
2022	NASA Formal Methods Symposium (NFM)
	International Symposium on Software Reliability Engineering (ISSRE)
	Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)
2021	International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)
2020	Design Automation Conference (DAC)
	International Conference on Computer-Aided Design (ICCAD)

Artifact Evaluation Committee

2024	International Conference on Computer Aided Verification (CAV)
	International Symposium on Automated Technology for Verification and Analysis (ATVA)

Google Summer of Code

2023, 2024	Org admin and mentor for Software and Computational Systems Lab at LMU Munich

References

1. Prof. Dirk Beyer, LMU Munich, https://www.sosy-lab.org/people/beyer/
2. Prof. Jie-Hong Roland Jiang, National Taiwan University, http://cc.ee.ntu.edu.tw/~jhjiang/
3. Nian-Ze Lee Ph.D., LMU Munich, https://www.sosy-lab.org/people/lee/

Additional references are available on request.