

Zsófia Ádám

Computer scientist · PhD Student

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🎓 Education and Degrees

- 2023– **Software Engineering PhD**, *Budapest University of Technology and Economics, Department of Artificial Intelligence and Systems Engineering.*
- 2022–2023 **Software Engineering MSc**, *Budapest University of Technology and Economics, Thesis: Extending the Capabilities of the CEGAR Model Checking Algorithm* 📄.
- 2018–2022 **Software Engineering BSc**, *Budapest University of Technology and Economics, Thesis: Efficient Techniques for Formal Verification of C Programs* 📄.

🌐 Experience



- 2023, 2024 **LMU, Munich, Germany**, Research Stay.
Summer I spent two months working on validation of correctness proofs of hardware and software modelcheckers at the Software Systems Laboratory under the supervision of Prof. Dr. Dirk Beyer, Nian-Ze Lee and Po-Chun Chien.
- 2022 **CERN, Meyrin, CH**, CERN Summer Student.
Summer I learned about and worked on PLC verification, mainly requirement formalization as part of the Industrial Control Systems Group in the Beam Department for two months.
- 2021 **thyssenkrupp Components Technology Hungary, Budapest, HU**, Software Engineering Intern
Summer at thyssenkrupp.
Developing rules for C verification with static analyzer based on the in-house coding guidelines.

💡 Skills and Interests

- Research model checking, formal methods, CEGAR, tool development, model transformations for verification, portfolios and algorithm selection
- Development Java, Kotlin, C/C++, git, CI, Python, Bash
- Languages Hungarian (native), English (advanced), German (intermediate)

📄 Selected Publications

- TACAS 2024 **Btor2-Cert: A Certifying Hardware-Verification Framework Using Software Analyzers**, 📄
Zs. Ádám, et al.
- TACAS (SV-COMP) 2024 **ConcurrentWitness2Test: Test-Harnessing the Power of Concurrency (Competition Contribution)**, 📄
L. Bajczi, et al.
- TACAS (SV-COMP) 2024 **EmergenTheta: Verification Beyond Abstraction Refinement (Competition Contribution)**, 📄
L. Bajczi, et al.
- NFM 2023 **From Natural Language Requirements to the Verification of Programmable Logic Controllers**, 📄
Zs. Ádám, et al.
- FormaliSE 2022 **C for yourself: comparison of front-end techniques for formal verification**, 📄
L. Bajczi, Zs. Ádám, Hajdu, V. Molnár.

TACAS **Theta: portfolio of CEGAR-based analyses with dynamic algorithm selection (Competition Contribution)**, 
SV-COMP 2022 *Zs. Ádám, et al.*
ORCID  0000-0003-2354-1750
MTMT Publication list on MTMT, 10077295

Open Source Contributions

Theta Contributor Algorithmic improvement of CEGAR, researching portfolio strategies, development of a C software model checking frontend.
Btor2-Cert Contributor Certified verification of hardware circuits utilizing software model checkers. Translation of software proofs back to the hardware circuit.
PLCverif Contributor Integrated the Formal Requirement Elicitation Tool (FRET) into the PLC verification tool PLCverif developed at CERN.
Gazer Contributor Added features and benchmarked Gazer, a BMC verification tool developed at ftsrg

Academic Services

2024 iFM Subreviewer
2023 FormaliSE Subreviewer
2022 ISSRE-W Subreviewer
2021, 2022, 2023, 2024 SV-COMP (TACAS) Subreviewer
2024 SEFM Artifact Evaluation PC
2022 CAV Artifact Evaluation Subreviewer

Awards and Scholarships

2024 "EKÖP" Research Scholarship
2023–2027 "DKÖP" Doctoral Excellence Fellowship Programme Scholarship
2023 "ÚNKP" Research Scholarship
2023 First place at the National Scientific Students' Associations Conference (Formal Methods Category)
2022 First place at the Scientific Students' Associations Conference (Embedded Systems Category)
2021 Second place at the Scientific Students' Associations Conference (Software Category)
2022 "ÚNKP" Research Scholarship
2021–2023 National Academic Scholarship
2021–2023 Scholarship of the Faculty of BME-VIK

Teaching

Courses Software Techniques (in German and Hungarian) · Software and Systems Verification course · Systems Modeling · Software Project Laboratory · Systems Engineering · Basics of Programming 1 (in German) · Digital Technology
Student Advised 1 BSc Student (successfully graduated)
Advisor

Volunteering

- 2017–2019 **Skool**, *Budapest, HU*, Mentor & Programming Tutor.
Teaching young girls on introductory programming workshops to motivate them to take part in IT related fields.
- 2023–2024 **Girls' STEM Day**, *Budapest, HU*, Presenter.
I was a presenter at the university faculty's open lab program.
- 2017, 2018, **Researcher's Night**, *Budapest, HU*, Presenter at Demos.
2024 I presented demos at the demonstration organized by my research group (ftsrg) at the university.