Zsófia Ádám

Computer scientist · PhD Student

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Education and Degrees

2023– **Software Engineering PhD**, *Budapest University of Technology and Economics*.

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 Summer **LMU**, *Munich, Germany*, Research Stay.
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 Summer **CERN**, *Meyrin, CH*, CERN Summer Student.
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 Summer **thyssenkrupp Components Technology Hungary**, *Budapest, HU*, Software Engineering Intern 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 SV-COMP 2022 **Theta: portfolio of CEGAR-based analyses with dynamic algorithm selection (Competition Contribution)**,
Zs. Ádám, et al.

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MTMT Publication list on MTMT, 10077295

Awards and Scholarships

2023 "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

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

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

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.