

# Ákos Hajdu

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## 🎓 Education and Degrees

- 2016– **PhD student/candidate**, *Budapest University of Technology and Economics*.  
Advisor: Zoltán Micskei  
Dissertation: Effective Domain-Specific Formal Verification Techniques (expected to defend Nov. 2020)
- 2014–2016 **Computer Engineering MSc**, *Budapest University of Technology and Economics*.  
Thesis: A Survey on CEGAR-based Model Checking 📄
- 2010–2014 **Computer Engineering BSc**, *Budapest University of Technology and Economics*.  
Thesis: Extensions to the CEGAR Approach on Petri Nets 📄

## 🌐 Internships and Research Visits

- 2019 **SRI International**, *New York City, USA*, Internship, 12 weeks.  
Formalizing and verifying advanced data structures in Solidity. 🐙 📄 🗨️
- 2018 **SRI International**, *New York City, USA*, Internship, 12 weeks.  
Developing solc-verify, a formal verification tool for Solidity smart contracts. 🐙 📄 🗨️
- 2017 **McGill University**, *Montréal, Canada*, Research visit, 8 weeks.  
Working on functional verification for cyber-physical systems. 🗨️
- 2015 **CERN**, *Geneva, Switzerland*, Summer student programme, 10 weeks.  
Developing code generation in ROOT, a data analysis framework for the experiments. 🐙 📄
- 2013 **evopro Innovation**, *Budapest, Hungary*, Internship, 6 weeks.  
Modeling and analyzing public transportation networks using Petri nets. 📄

## 💡 Skills and Interests

- Research Formal methods, model checking, static analysis, SAT/SMT, compilers  
Verification and analysis of software, smart contracts and system models  
Tool and framework development  
Experimental evaluation and data analysis
- Tools Theta 🐙, Gazer 🐙, solc-verify 🐙, PetriDotNet 📄, ROOT 🐙, PLCVerif 🦋
- Development Java, C#, C, C++, R, Python, Git, CI
- Languages Hungarian (native), English (advanced), German (intermediate)













## ⚙️ Selected Research Projects

- 2019– **MCaaS**, *with IncQuery Labs and NASA JPL*.  
Model Checking as a Service: cloud-based, push-button model checking for SysML statecharts.
- 2019– **ADVANCE** 📄.  
Addressing Verification and Validation Challenges in Future Cyber-Physical Systems.
- 2016–2020 **MTA-BME Lendület** 📄, *Hungarian Academy of Sciences*.  
Functional verification for cyber-physical systems.
- 2017–2018 **CERN-BME Collaboration** 📄.  
Application of formal methods to verify industrial PLC code at CERN.

## Awards and Scholarships

- 2019 **Scholarship of the New National Excellence Program**, *Ministry for Innov. and Technology.*
- 2016, 2018 **National Scholarship for Young Talents**, *National Talent Programme.*
- 2014, 2016 **Pro Progressio Thesis Award**, *Outstanding BSc (2014) and MSc (2016) thesis of the faculty.*
- 2013 – 2015 **Scholarship of the Republic of Hungary.**

## Selected Publications

- ESOP'20 **SMT-Friendly Formalization of the Solidity Memory Model**,  
*Á. Hajdu, D. Jovanović*,  .
  - JAR'19 **Efficient Strategies for CEGAR-Based Model Checking**,  
*Á. Hajdu, Z. Micskei*, .
  - VSTTE'19 **solc-verify: A Modular Verifier for Solidity Smart Contracts**,  
*Á. Hajdu, D. Jovanović*,  .
  - SCP'18 **Industrial Applications of the PetriDotNet Modelling and Analysis Tool**,  
*A. Vörös, D. Darvas, Á. Hajdu, A. Klenik, K. Marussy, V. Molnár, T. Bartha, I. Majzik*, .
  - FMCAD'17 **Theta: a Framework for Abstraction Refinement-Based Model Checking**,  
*T. Tóth, Á. Hajdu, A. Vörös, Z. Micskei, I. Majzik*,  .
  - PN'15 **New search strategies for the Petri net CEGAR approach**,  
*Á. Hajdu, A. Vörös, T. Bartha*,  .
- Full lists  [hajduakos.github.io/publications.html](http://hajduakos.github.io/publications.html)  [scholar.google.com/citations?user=7z74iO8AAAAJ](https://scholar.google.com/citations?user=7z74iO8AAAAJ)

## Professional Activities and Services

- PC member TAP'20-AE, VMCAI'20-AE, OpenMBEE@MODELS'20
- Subreviewer MODELS'20, VSTTE'19, HASE'19, LADC'18, SRDS'17
- Volunteer DISC'19, AVM'17, SRDS'16, ICACON'15, DSN'13

## Teaching

- Current Blockchain Technologies and Applications, Formal Methods, Integration and Verification Techniques, Software and Systems Verification, Software Development Laboratory 2, Software Verification and Validation, Systems Engineering Laboratory 1-2
- Former Basics of Programming 1-2, Databases, Intelligent Systems Supervision, IT Engineering Laboratory 2, Software Laboratory 1-2

## Summer Schools and Seminars

- 2018 **Winter School on Blockchains and Cryptocurrencies**, *Jerusalem, Israel.*
- 2016 **Dependable Software Systems Engineering Summer School**, *Marktobendorf, Germany.*
- 2016 **SAT/SMT/AR Summer School**, *Lisbon, Portugal.*
- 2016 **Spring School on Logic and Verification**, *Vienna, Austria.*
- 2015 **Automatic Verification and Analysis of Complex Systems**, *Oldenburg, Germany.*
- 2014 **Verification Technology, Systems and Applications**, *Luxembourg, Luxembourg.*
- 2014 **Huawei Telecom Seeds for the Future**, *Beijing/Shenzhen, China.*
- 2013 **Mathematics for Scientific Programming**, *Oberwolfach, Germany.*