

Zoltán Micskei | Curriculum Vitae

✉ micskeiz@mit.bme.hu • 🌐 mit.bme.hu/~micskeiz • in zoltanmicskei
📧 micskeiz • 🏠 micskeiz • 🆔 0000-0003-1846-261X • 🐦 micskeiz

Education and Degrees

- **PhD degree (summa cum laude)**
Budapest University of Technology and Economics 2005–2008
Dissertation: “Languages and frameworks for specifying test artifacts”, 2013
- **MSc degree (with honor)**
Budapest University of Technology and Economics, Fault-tolerant Systems specialization 2000–2005

Positions

- **Associate professor (tenured)**: Budapest University of Technology and Economics 2017–
- **Assistant professor**: Budapest University of Technology and Economics 2013–2017
- **Lecturer**: Budapest University of Technology and Economics 2009–2013
- **Research associate**: Budapest University of Technology and Economics 2008–2009
- **Associate consultant**: Microsoft Consulting Services Hungary 2005

Leadership roles

- **Leader**: Critical Systems Research Group (ftsrg) 2019–
- **Member**: Council of the Faculty (the highest decision making committee of the Faculty) 2019–
- **Specialization coordinator**: Systems Engineering Specialization (BSc) 2018–

Research experience

Research statement: My main area is software testing, specializing in model-based and code-based test generation. My goal is to produce advanced, but practical testing tools and methods. I favor empirical research methods and open science principles.

Selected publications

📖 Full list • 🔍 Google Scholar • 🏛️ MTMT

- D. Honfi, Z. Micskei. “Classifying generated white-box tests: an exploratory study”, *Software Quality Journal (SQJ)*, 27:3, pp. 1339–1380, 2019. doi 10.1007/s11219-019-09446-5
- Á. Hajdu, Z. Micskei. “Efficient Strategies for CEGAR-Based Model Checking”. *Journal of Automated Reasoning (JAR)*, pp. 1–41, 2019. doi 10.1007/s10817-019-09535-x
- L. Cseppentő, Z. Micskei. “Evaluating code-based test input generator tools”, *Software Testing, Verification and Reliability (STVR)*, 27:6, pp. 1–24, 2017. doi 10.1002/stvr.1627
- Z. Micskei and H. Waeselynck. “The many meanings of UML 2 Sequence Diagrams: a survey”, *Software and Systems Modeling (SoSyM)*, 10:4, pp. 489–514, 2011. doi 10.1007/s10270-010-0157-9
- Z. Micskei, I. Majzik, H. Madeira, M. Vieira, N. Antunes, A. Avritzer. “Robustness Testing Techniques and Tools”, *Resilience Assessment and Evaluation of Computing Systems*, Springer, 2012. doi 10.1007/978-3-642-29032-9_16

Research datasets and tools

- **MBT**: dataset on model-based testing (MBT) and code-based test generation tools 📖
- **Autolocator**: a tool for automatically isolating dependencies during test generation 🔄
- **SETTE**: a framework for evaluating and comparing test input generator tools 🔄

Research projects.....

International research projects (site leader, PI)

- **Environment for model-based rigorous adaptive co-design and operation of CPS** **Site leader**
2020–2022
EU ITEA3 18039, EMBrACE, 17 partners, own funding 93k €
- **Addressing Verification and Validation Challenges in Future CPS (ADVANCE)** **Site leader**
2019–2022
EU H2020 RISE 823788, 7 partners, own funding 138k €
- **Arrowhead Tools for Engineering of Digitalisation Solutions** **Co-PI**
2019–2022
EU H2020 ECSEL 823788, 80 partners, own funding 257k €
PI for BME: Pál Varga

International research projects (contributor)


- **Reconfigurable ROS-based Resilient Reasoning Robotic Cooperating Systems (R5-COP)** **Task leader**
2014–2017
EU ARTEMIS 621447, 30 partners, project total costs 13M €
Led the development of a model-based regression testing method for autonomous systems.
- **Resilient Reasoning Robotic Co-operating Systems (R3-COP)** **Researcher**
2010–2013
EU ARTEMIS 100233, 27 partners, project total costs 17.5M €
Co-developed a method for generating test contexts for autonomous robots.
- **Security Engineering for lifelong Evolvable Systems (SecureChange)** **Researcher**
2009–2010
EU FP7 231101, 15 partners, project total funding 5M €
Coordinated the dissemination activities of the project.
- **Highly DEpendable ip-based NETworks and Services (HIDENETS)** **Researcher**
2006–2008
EU FP6 026979, 8 partners, project total funding 2.5M €
Co-developed TERMOS, a test requirement language for mobile systems. 📄
- **Resilience for Survivability in IST (ReSIST)** **Researcher**
2006–2008
EU FP6 026764 Network of Excellence, 21 partners, project total funding 4.5M €
We categorized the semantic choices and formal semantics proposed for UML 2 Sequence Diagrams. 📄

Industrial R&D projects

- **Model Checking as a Service** **Lead**
2019–
IncQuery Labs, Budapest, Hungary
We created cloud-based environment that can verify SysML State Machines using hidden model checkers.
- **Testing Automotive Systems and Code** **Lead**
2017–
thyssenkrupp E/E Competence Center, Budapest, Hungary
- **Verification of Complex Systems** **Lead**
2014–2015
Ericsson Hungary, Budapest, Hungary
We analyzed executable UML languages (fUML, Alf) and their verification aspects.
- **Comparing Robustness of HA middleware** **Researcher**
2005–2006
Nokia Research Center, Finland
Co-developed a method for comparing the robustness of AIS-based middleware. 📄

Tutoring.....

PhD students

- **Ákos Hajdu**: Effective Domain-Specific Formal Verification Techniques (2020), PhD dissertation defended 
- **Dávid Honfi**: Evaluating and Improving White-Box Test Generation (2021)
- **Márton Elekes**: Analyzing and Testing Graph Processing Systems (2020–2024)

MSc and BSc students

- **Student scientific competition**: 3×2^{nd} prize (Faculty level)
- **Thesis works**: I supervised 17 MSc and 25 BSc thesis works. Workplaces of past students include: CERN, thyssenkrupp, Bosch, Ericsson, Morgan Stanley, MSCl.

Research visits.....

- **ResilTech** **Pontedera, Italy**
○ *Visiting researcher at ResilTech, a spinoff of Univ. Firenze for 2 × 1 months.* 2015–2016
- **CNRS-LAAS** **Toulouse, France**
○ *Visiting researcher at the TSF group of CNRS-LAAS research laboratory for 6 × 1 months.* 2006–2007

Awards and scholarships.....

- **Scholarship for the Nation's Young Talents:** National Talent Program (NTP-NFTÖ-16) 2016
- **Schnell László Prize:** Schnell László Foundation 2007
- **Scholarship of the Hungarian Republic:** Ministry of Education 2005

Services to the community.....

I reviewed more than 50 papers as PC member for international conferences or as external reviewer for journals.

Organizational Committee member

- International Symposium on DIStributed Computing (DISC), *General co-chair* 2019
- IEEE High Assurance Systems Engineering Symposium (HASE), *Panel co-chair* 2016
- Int. Workshop on Software Engineering for Resilient Systems (SERENE), *Publicity chair* 2014

Program Committee member

- International Conference on Conceptual Modeling (ER) 2017–2018
- High Assurance Systems Engineering Symposium (HASE) 2016, 2019
- Latin-American Symposium on Dependable Computing (LADC) 2018
- International Conference on System Analysis and Modelling (SAM) 2018
- International Conference on System Design Languages (SDL) 2017
- International Workshop on Executable Modeling (EXE) 2015–2018
- User Conference on Advanced Automated Testing (UCAAT) 2016
- European Dependable Computing Conference (EDCC) 2016
- International Workshop on Software Certification (WoSoCer) 2014
- International Conference on Testing Software and Systems (ICTSS) 2012–2014, 2016

External reviewer for journals

- ACM Transactions on Software Engineering and Methodology (TOSEM), International Journal on Software and Systems Modeling (SoSyM), Journal of Systems and Software (JSS), IEEE Transactions on Reliability (TRel), Software Quality Journal (SQJ), International Journal of Critical Computer-Based Systems (IJCCBS), Reliability Engineering & System Safety (RESS)

Moreover, I served as external reviewer for several conferences (MODELS, DSN PDS, SAC DADS, SRDS, ASE...).

International grant evaluation

- Israeli Science Foundation (ISF): Individual Research Grants, 2018

Participation in PhD defense committees


- Member, secretary: Li YangYuan. "A Method to Process Images Data and Prediction Models for some MapReduce Applications", BME VIK, 2020
- Member, secretary: György Rácz. "New framework for system level synthesis of heterogeneous multiprocessor systems", BME VIK, 2019
- External reviewer: Dénes Bán. "Static Source Code Analysis in Pattern Recognition, Performance Optimization and Software Maintainability", University of Szeged, 2018

Membership in societies.....

- **ACM:** Association for Computing Machinery  2015–
- **NJSZT:** John von Neumann Computer Society 2013–

Teaching experience

I have 15+ years of teaching experience and have developed and taught several undergraduate and graduate courses. I regularly coordinate the work of 5–10 teaching assistants for my courses.

Teaching statement: I prefer to include collaborative, project-based elements in my courses and offer flexibility for the students in their learning experience. See for example my SWSV course. 

Courses (highlights)

- **Software and systems verification (SWSV)** **Lead instructor**
VIMIMA01, MSc, ~100 students 2015–
Led and developed half of the material for the course about testing and test generation.
- **Intelligent system management** **Lead instructor**
VIMIA370, BSc, ~200 students 2009–2016
Led and developed most of the materials for the course on scripting and design for manageability.
- **Virtualization technologies and their applications** **Lead instructor**
VIMIAV89, Elective, ~20 students 2009–2012
Led and developed half of the materials on the different kinds of virtualization (platform, OS, application...)
- **Operating systems** **Instructor**
VIMIA219, BSc, ~400 students 2007–2015
Developed the lecture and laboratory materials for the Windows and virtualization parts of the course.

Teaching excellence

I regularly get high scores in student evaluations, I was in the TOP25 list of our university (~1000 faculty).

- **Excellent Young Teacher of the Faculty** 2016
Student Council of the Faculty of Electrical Engineering and Informatics
The 5000+ students of the Faculty vote for the best teacher among the 200+ faculty members in two categories.
- **Dean's Commendation** 2014
Dean of the Faculty of Electrical Engineering and Informatics
For outstanding teaching activities and developing excellent educational materials.
- **Best Young Teacher of the Department** 2011, 2012
Schnell László Foundation
Awarded to a young faculty of the department (60+ members) for outstanding teaching activities.

Professional experience



In the last 15 years I worked at different levels of the software and systems stack: ranging from configuring blade servers, managing VMware and Windows environments, debugging applications to doing .NET or web development.



Trainings and consulting for companies

- **MBT:** I was one of the first to obtain an ISTQB Model-based Tester certification and I hold accredited trainings.
- **Unit testing:** Training about development testing, test design and mocking.
- **SysML/UML:** Introduction to modeling and model-based development with UML or SysML.

Talks

I regularly speak at professional events to present testing topics or our research results.

- **Overview of testing** 2018, 2019
Test Team Leader seminar, Budapest
- **Empirical Evidence in Software Testing** 2017
Hungarian Software Testing Forum (HUSTEF), Budapest, Hungary, (Poster session) 
- **Evaluating Code-Based Test Input Generator Tools** 2016
User Conference on Advanced Automated Testing (UCAAT), Budapest, Hungary 

- **Model-based testing: goals and use cases**
Software Testing Conference, Budapest, Hungary 2016
- **The Gap Between Academic Research and Industrial Practice in Software Testing**
Hungarian Software Testing Forum (HUSTEF), Budapest, Hungary  2014
- **Generating Unit Tests Automatically from Source Code**
Test&Tea meetup, Budapest, Hungary  2014
- **Testing Autonomous Systems in an EU Project**
Software Testing Conference, Budapest, Hungary 2012
- **Using Model-based Testing in a Research Project**
Software Testing Conference, Budapest, Hungary 2011