

Zoltán Micskei | Curriculum Vitae

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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

Leadership roles

- **Department of Measurement and Information Systems** **Deputy Head**
Responsible for coordinating the R&D activities of the department (40 full-time faculty members) 2022–
- **Critical Systems Research Group (ftsrg)** **Leader**
The group currently consists of 20 members, from which 8 hold a PhD degree. 🌐 2019–
The mission of the group is to develop new methods and tools to help engineers create better systems.
- **Council of the Faculty** **Member**
The highest decision making committee of the Faculty of 300 staff members and 5000 students. 2019–
- **Systems Engineering Specialization (BSc)** **Coordinator**
A 3 semester specialization with the contributions of three departments chosen by 100 students. 2018–

Research experience

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

Awards and scholarships

- **Member**: Hungarian Young Academy 📄 2022
The Academy elects 12 members every year under the age of 40 based on scientific excellence.
- **Ten Year Most Influential Paper**: Journal of Software and Systems Modeling (SoSyM) 📄 2021
Editors-in-Chiefs announce an award for one regular paper having the most influence within the last ten years.
- **Kalmár Award**: John von Neumann Computer Society (NJSZT) 📄 2021
The award recognizes professionals, who have achieved excellent results in the application of computer science.
- **Senior Member**: Association for Computing Machinery (ACM) 📄 2021
For demonstrating performance through technical leadership, and technical or professional contributions.
- **Scholarship for the Nation's Young Talents**: National Talent Program (NTP-NFTÖ-16) 2016
- **Schnell László Prize**: Schnell László Foundation 2007

Selected publications

 Full list •  Google Scholar •  MTMT



- B. Horváth, V. Molnár, B. Graics, A. Hajdu, I. Ráth, A. Horváth, R. Karban, G. Trancho, Z. Micskei: “Pragmatic verification and validation of industrial executable SysML models”, *Systems Engineering*, 1–22, 2023. DOI: [doi](#)
- M. Elekes, V. Molnár, Z. Micskei. “Assessing the specification of modelling language semantics: a study on UML PSSM”, *Software Quality Journal (SQJ)*, 1–43, 2023. [doi](#) 10.1007/s11219-023-09617-5
- Á. Hajdu, Z. Micskei. “Efficient Strategies for CEGAR-Based Model Checking”, *J. of Automated Reasoning (JAR)*, 64, 1051–1091, 2020. [doi](#) 10.1007/s10817-019-09535-x
- D. Honfi, Z. Micskei. “Classifying generated white-box tests: an exploratory study”, *Software Quality Journal (SQJ)*, 27(3), 1339–1380, 2019. [doi](#) 10.1007/s11219-019-09446-5
- L. Cseppentő, Z. Micskei. “Evaluating code-based test input generator tools”, *Software Testing, Verification and Reliability (STVR)*, 27(6), 1–24, 2017. [doi](#) 10.1002/stvr.1627
- Z. Micskei and H. Waeselyncx. “The many meanings of UML 2 Sequence Diagrams: a survey”, *Software and Systems Modeling (SoSyM)*, 10(4), 489–514, 2011. [doi](#) 10.1007/s10270-010-0157-9

Research projects


International collaborative 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 collaborative 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

- **Safety Science and Technology Competence Center** **Co-PI**
2021–2023
BME VIK and thyssenkrupp
With Tamás Dabóczi we coordinate 20 researchers working on safety and security of automotive systems.
- **Model Checking as a Service** **Lead**
2019–2021
IncQuery Labs, Budapest, Hungary
We created a 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

Comparing Robustness of HA middleware

Nokia Research Center, Finland



Co-developed a method for comparing the robustness of AIS-based middleware. 

Researcher

2005–2006

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), PhD dissertation defended 
- **Márton Elekes**: Analyzing and Testing Graph Processing Systems (2020–2024)




Graduate and undergraduate students

- **Student scientific competition**: 1×1^{st} prize (national), 1×1^{st} , 4×2^{nd} , 1×3^{rd} prize (Faculty level)
- **Thesis works**: I supervised 19 MSc and 26 BSc thesis works. Workplaces of past students include: CERN, thyssenkrupp, Bosch, Ericsson, Morgan Stanley, MSCI.

Research visits

- **ResilTech** **Pontedera, Italy**
Visiting researcher at ResilTech in the context of an EU project 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

Research datasets and tools

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

Services to the community

Editorial Board member

- Experimental Results (Cambridge University Press), *Editorial Board Member* 2021–

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

- o 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

- o Natural Sciences and Engineering Research Council of Canada (NSERC): Discovery Grant, 2022
- o Israeli Science Foundation (ISF): Individual Research Grants, 2018

Participation in PhD defense committees


- o External reviewer: Peter Gal (University of Szeged, 2023), Mirko Staderini (University of Firenze, 2022), Nadera Aljawabrah (University of Szeged, 2021), Dénes Bán (University of Szeged, 2018)
- o Member: Khalil Mebarkia (BME, 2023), Omar Al-Debagy (BME, 2022), Márton Vaitkus (BME, 2021), Li YangYuan (BME, 2020), György Rácz (BME, 2019)

Membership in societies

- o **ACM**: Association for Computing Machinery  2015–
- o **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)

- o **Software and systems verification (SWSV)** **Lead instructor**
VIMIMA01, Graduate, ~200 students 2015–
Led and developed half of the material for the course about testing and test generation.
- o **Intelligent system management** **Lead instructor**
VIMIA370, Undergraduate, ~200 students 2009–2016
Led and developed most of the materials for the course on scripting and design for manageability.
- o **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...)
- o **Operating systems** **Instructor**
VIMIA219, Undergraduate, ~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).

- o **Excellent Young Instructor 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.
- o **Dean's Commendation** 2014
Dean of the Faculty of Electrical Engineering and Informatics
For outstanding teaching activities and developing excellent educational materials.
- o **Best Young Instructor 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.

- **Testing the new generation of critical systems**
Thyssenkrupp SUP Conference, Budapest 2022
- **Trustworthy and Explainable Artificial Intelligence**
ITBusiness Inside, Budapest 2022
- **Overview of testing**
Test Team Leader seminar, Budapest 2018, 2019
- **Empirical Evidence in Software Testing**
Hungarian Software Testing Forum (HUSTEF), Budapest, Hungary, (Poster session)  2017
- **Evaluating Code-Based Test Input Generator Tools**
User Conference on Advanced Automated Testing (UCAAT), Budapest, Hungary  2016
- **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