Dániel Szekeres

Curriculum Vitae

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Education

2022–present **PhD**, *BME Doctoral Schools of Informatics*, Budapest,
Efficient Safety Analysis of Critical Embedded Systems

2016–2022 **MSc Degree**, *Budapest University of Technology and Economics*, Budapest, *with honors*
Computer Science, Critical Systems major / Intelligent Systems minor specialisation

2016–2020 **BSc Degree**, *Budapest University of Technology and Economics*, Budapest, *with honors*
Computer Science, Systems Engineering specialization

Master thesis

title *Analysis of probabilistic systems with abstraction refinement*

supervisors Kristóf Marussy

description The aim of this thesis was gathering knowledge about the current probabilistic CEGAR algorithms, implementing one of them in the Theta model checking framework, and evaluating the implementation on existing case studies.

Experience

2019–present **Research Assistant**, *Budapest University of Technology and Economics*, Budapest
Participating in academic and industrial research projects in various safety-critical domains.
- Development of the open-source model checking framework Theta (my main focus being the probabilistic module)
- System modeling in SysML in the automotive domain
- Qualitative and quantitative formal verification tasks in automotive and railway domains

2018–present **Teaching Assistant**, *Budapest University of Technology and Economics*, Budapest
Participated in teaching several different courses through giving lectures, supervising labs, developing teaching materials, developing and grading exam tasks and homeworks. The list of such courses includes:
- Systems Engineering
- Systems Modeling
- Formal Methods
- Cyber-physical Systems
- Critical Architectures Laboratory
- Probability Theory

2016–2017 **Intern (Reliability Analysis)**, *Prolan Irányítástechnika Zrt.*, Budakalász
Quantitative reliability analysis of a SIL4 railway signaling system

2016–2017 **Environment Perception Engineer**, *BME Formula Racing Team*, Budapest
Development of the environment perception subsystem of a self-driving race car based on LiDAR and mono-camera for the Formula Student competition.

Languages

English C1
German B2
Hungarian Native

Publications

[1] Dániel Szekeres and István Majzik. Towards abstraction-based probabilistic program analysis. In *The 13th Conference of PhD Students in Computer Science : Volume of Short Papers*, pages 33–40, 2022.

[2] Dániel Szekeres, Kristóf Marussy, and István Majzik. Tensor-based reliability analysis of complex static fault trees. In *2021 17th European Dependable Computing Conference (EDCC)*, pages 33–40, 2021.

Students' Scientific Conference Papers

2020 Towards tensor-based extrafunctional analysis of complex distributed systems
1st prize

2019 Towards tensor-based reliability analysis of complex safety-critical systems
1st prize