

Daejun Park

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Highlights

Academic Background:

- ▶ CS PhD at UIUC in Formal Verification; 10+ top-tier papers with a Distinguished Paper Award
- ▶ Specialty: practical formal methods for improving software quality, reliability, and security

Industrial Experience:

- ▶ 6+ years in two deep-tech startups, commercializing academic research prototypes
- ▶ Security consulting: found 100+ flaws and vulnerabilities in 15+ high-profile blockchain systems

Professional Experience

Director of Formal Verification, Runtime Verification, Inc., IL	2021 – Present
Technical Lead for Formal Verification, Runtime Verification, Inc., IL	2019 – 2021
Research Intern, Runtime Verification, Inc., IL	2018

- ▶ *Formal verification* of blockchain smart contracts and consensus protocols security.
- ▶ Tech Lead for the team of formal verification engineers and security auditors.

Research Intern, Microsoft Research, WA	Summer 2017
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- ▶ Designed a *verifiable computing* scheme towards secure deep neural network training.

Researcher, Seoul National University, South Korea	2012 – 2013
Software Engineer, Sparrow, Ltd., South Korea	2008 – 2011

- ▶ Primary designer and lead developer for a *static program analysis tool* detecting memory safety errors and security vulnerabilities in embedded systems software.

Education

Ph.D., Computer Science, University of Illinois at Urbana-Champaign, IL	2019
M.S., Electrical Engineering and Computer Science, Seoul National University, South Korea	2008
B.S., Computer Science and Engineering, Seoul National University, South Korea	2006

Publications

- [1] **Language-Parametric Compiler Validation with Application to LLVM.**
Theodoros Kasampalis, Daejun Park, Zhengyao Lin, Vikram S. Adve, and Grigore Rosu. *Proceedings of the Twenty-Sixth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'21)*, 2021.
- [2] **A Learning-Based Approach to Synthesizing Invariants for Incomplete Verification Engines.**
Daniel Neider, P. Madhusudan, Shambwaditya Saha, Pranav Garg, and Daejun Park. *Journal of Automated Reasoning*, Vol.64, No.7, Oct 2020.

- [3] **End-to-End Formal Verification of Ethereum 2.0 Deposit Smart Contract.**
Daejun Park, Yi Zhang, and Grigore Rosu. *Proceedings of the 32nd International Conference on Computer-Aided Verification (CAV'20)*, 2020.
- [4] **A Complete Formal Semantics of x86-64 User-Level Instruction Set Architecture.**
Sandeep Dasgupta, Daejun Park, Theodoros Kasampalis, Vikram S. Adve, and Grigore Rosu. *Proceedings of the 40th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'19)*, 2019.
- [5] **Logistic Regression on Homomorphic Encrypted Data at Scale.**
Kyoohyung Han, Seungwan Hong, Jung Hee Cheon, and Daejun Park. *Proceedings of the Thirty-First AAAI Conference on Innovative Applications of Artificial Intelligence (IAAI'19)*, 2019.
- [6] **A Language-Independent Approach to Smart Contract Verification.**
Xiaohong Chen, Daejun Park, and Grigore Rosu. *Proceedings of the 8th International Symposium on Leveraging Applications of Formal Methods, Verification and Validation (ISoLA'18)*, 2018.
- [7] **A Formal Verification Tool for Ethereum VM Bytecode.**
Daejun Park, Yi Zhang, Manasvi Saxena, Philip Daian, and Grigore Rosu. *Proceedings of the 2018 26th ACM SIGSOFT International Symposium on Foundations of Software Engineering (FSE'18)*, 2018.
- [8] **KEVM: A Complete Formal Semantics of the Ethereum Virtual Machine.**
Everett Hildenbrandt, Manasvi Saxena, Nishant Rodrigues, Xiaoran Zhu, Philip Daian, Dwight Guth, Daejun Park, Yi Zhang, Brandon Moore and Grigore Rosu. *Proceedings of the 2018 IEEE Computer Security Foundations Symposium (CSF'18)*, 2018.
- [9] **Invariant Synthesis for Incomplete Verification Engines.**
Daniel Neider, P. Madhusudan, Pranav Garg, Shambwaditya Saha, and Daejun Park. *Proceedings of the 24th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'18)*, 2018.
- [10] **Semantics-Based Program Verifiers for All Languages.**
Andrei Stefanescu, Daejun Park, Shijiao Yuwen, Yilong Li, and Grigore Rosu. *Proceedings of the 2016 ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'16)*, 2016. **Distinguished Paper Award.**
- [11] **KJS: A Complete Formal Semantics of JavaScript.**
Daejun Park, Andrei Stefanescu, and Grigore Rosu. *Proceedings of the 36th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'15)*, 2015.
- [12] **Global Sparse Analysis Framework.**
Hakjoo Oh, Kihong Heo, Wonchan Lee, Woosuk Lee, Daejun Park, Jeehoon Kang, and Kwangkeun Yi. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, Vol.36, No.3, Sep 2014.

Awards

Feng Chen Memorial Award, University of Illinois at Urbana-Champaign, IL	2017
Distinguished Paper Award, OOPSLA'16, ACM SIGPLAN	2016
Bronze Medal in National Mathematics Competition, South Korea	2000

Last updated: January 14, 2022