

Daejun Park

Research Scientist
Runtime Verification, Inc.
102 E. Main St. #500, Urbana, IL 61801

Email : daejunpark@gmail.com
Web : <https://daejunpark.github.io/>

Research Interests

- **Formal Methods:** *formal verification* of real-world safety-critical systems, from compilers to smart contracts to cryptographic primitives.
- **Security:** application of *verifiable computing* and *homomorphic encryption* in machine learning and blockchain.

Education

Ph.D., Computer Science, University of Illinois at Urbana-Champaign	2013 – 2019
M.S., Computer Science and Engineering, Seoul National University, Korea	2006 – 2008
B.S., Computer Science and Engineering, Seoul National University, Korea	2001 – 2006

Publications

- [1] **Verifiable Computing for Approximate Computation.**
Shuo Chen, Jung Hee Cheon, Dongwoo Kim, and Daejun Park. *Manuscript*, 2019.
- [2] **Cut-Bisimulation and Program Equivalence.**
Daejun Park, Theodoros Kasampalis, Vikram S. Adve, and Grigore Rosu. *Manuscript*, 2019.
- [3] **Cross-Language Program Equivalence with Application to LLVM.**
Theodoros Kasampalis, Daejun Park, Vikram S. Adve, and Grigore Rosu. *Manuscript*, 2019.
- [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 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.
- [7] **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.

- [8] **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.
- [9] **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**
- [10] **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.
- [11] **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.

Work Experience

- Research Scientist**, Runtime Verification, Inc., IL 2018 – Present
- ▶ *Formally verifying* high-profile, security-critical Ethereum smart contracts, as well as blockchain consensus protocols.
- Research Intern**, Microsoft Research, WA Summer 2017
- ▶ Designed a novel *verifiable computing* technique for secure deep neural network training.
- Founding Member & Technical Lead**, Sparrow, Korea 2008 – 2012
- ▶ Designed and implemented *a static program analysis tool* detecting memory safety errors and security vulnerabilities in embedded-system software.

Honors & Awards

- Feng Chen Memorial Award, University of Illinois at Urbana-Champaign 2017
- Distinguished Paper Award at OOPSLA'16 2016
- Korean Government Scholarship 2013–2015
- Honors Scholarship, Seoul National University 2003–2004
- Bronze Medal in National Mathematics Competition 2000

References

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| Grigore Rosu | Kwangkeun Yi |
| Professor | Professor |
| Department of Computer Science | School of Computer Science and Engineering |
| University of Illinois at Urbana-Champaign | Seoul National University |
| Email: grosu@illinois.edu | Email: kwang@ropas.snu.ac.kr |

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