

Jang, Jae-Won

📍 Falls Church, VA 🔒 Top-Secret Clearance (Active) 📧 Email 🎓 Google Scholar 🏠 Website

Education

- **Virginia Tech** Blacksburg, VA
Aug 2018 - July 2024
Ph.D. in Computer Engineering (GPA: 3.74/4.00)
 - Thesis Title: "*Enhancing Software Security through Code Diversification Verification, Control-flow Restriction, and Automatic Compartmentalization*"
 - Research Focus: Software verification, control-flow integrity, and automated compartmentalization.
- **University of South Florida** Tampa, FL
Jan 2014 - Dec 2015
Master of Science in Computer Engineering (GPA: 3.76/4.00)
 - Thesis Title: "*Security of Non-Volatile Memories – Attack Models, Analyses, and Counter-Measures*"
 - Research Focus: Spintronics-based memory security.
- **University of South Florida** Tampa, FL
Aug 2009 - Dec 2013
Bachelor of Science in Computer Engineering (GPA: 3.69/4.00)

Industry Experiences

- MITRE Corporation** McLean, VA
Jan 2025 - Present
Senior Cyber Engineer
 - Developed a modular, containerized framework for automated software supply-chain verification, extending [TruffleHog](#) to improve secret-scanning and dependency-analysis coverage across source repositories.
 - Authored technical documentation and conducted architectural analyses of processor (RISC/CISC) and system design trade-offs to support modernization and performance optimization decisions.
 - Led technology assessments and integration analyses for multi-level security (MLS), producing feasibility, risk, and trade-space evaluations to guide system design decisions.
- Raytheon** State College, PA
Dec 2017 - July 2018
Software Engineer
 - Supported documentation compliance for unclassified deliverables pending clearance activation.
- Intel** Hillsboro, OR
May 2013 - Aug 2013
Undergraduate Intern
 - Development of analytics modules for the AIM Suite project to measure customer engagement with digital displays in the store.
 - Evaluated MongoDB integration for production deployment, assessing scalability, data modeling, and system compatibility.

Academia Experiences

- Research Assistant** Virginia Tech
Aug 2018 - Dec 2024
Research Assistant, Advisor: Dr. Binoy Ravindran, Blacksburg, VA
 - Designed and deployed compiler- and binary-level security mechanisms to enforce control-flow integrity and automated data compartmentalization across untrusted code modules.
 - Integrated the ARM Memory Tagging Extension (MTE) into a compiler toolchain, strengthening runtime memory safety and fault isolation.
 - Implemented static and dynamic taint analysis to identify sensitive data paths and compartmentalization targets, automatically rewriting assembly code to isolate protected data regions.

Penn State University	State College, PA
<i>Teaching Assistant</i>	<i>Aug 2017 - Dec 2017</i>
○ Taught the course CMPSC 122: Intermediate Programming and led discussion sessions.	
Penn State University	State College, PA
<i>Research Assistant, Advisor: Dr. Swaroop Ghosh, State College, PA</i>	<i>Aug 2016 - Aug 2017</i>
○ Researched hardware security and reverse-engineering countermeasures using transistor-level camouflaging and logic obfuscation.	
University of South Florida	Tampa, FL
<i>Research Assistant, Advisor: Dr. Swaroop Ghosh, Tampa, FL</i>	<i>Aug 2013 - July 2016</i>
○ Researched hardware security primitives leveraging CMOS and spintronic memory technologies, exploring MTJ-based techniques to improve PUF stability and STT-MRAM robustness against magnetic/thermal attacks.	

Publication

- **sMVX: Multi-Variant Execution on Selected Code Paths.**
Sengming Yeoh, Xiaoguang Wang, Jae-Won Jang, and Binoy Ravindran. *MIDDLEWARE*, 2024.
- **Verification of Functional Correctness of Code Diversification Techniques.**
Jae-Won Jang, Freek Verbeek, and Binoy Ravindran. *NFM*, 2021.
- **Threshold-Defined Logic and Interconnect for Protection against Reverse Engineering.**
Jae-Won Jang, et al. *TCAD*, Impact Factor: 2.9, 2020.
- **MTJ-based State Retentive Flip-Flop with Enhanced-Scan Capability to Sustain Sudden Power Failure.**
Anirudh Iyengar, Swaroop Ghosh, and Jae-Won Jang. *TCAS-I*, Impact Factor: 5.1, 2019.
- **Overview of Circuits, Systems, and Applications of Spintronics.**
Swaroop Ghosh, Anirudh Iyengar, Seyedhamidreza Motaman, Rekha Govindaraj, Jae-Won Jang, et al. *JETCAS*, Impact Factor: 1.6, 2018.
- **Spintronic PUFs for Security, Trust and Authentication.**
Anirudh Iyengar, Kenneth Ramclam, Swaroop Ghosh, Jae-Won Jang, and Cheng-Wei Lin. *JETC*, Impact Factor: 0.83, 2017.
- **Threshold Defined Camouflaged Gates in 65nm Technology for Reverse Engineering Protection.**
Anirudh Iyengar, Deepak Vontela, Ithihasa Reddy, Swaroop Ghosh, Syedhamidreza Motaman, and Jae-Won Jang. *ISLPED*, 2018.
- **Investigation of Magnetic Field-Based Attacks on Magnetoresistive Random Access Memory.**
Alexander Holst, Jae-Won Jang, and Swaroop Ghosh. *ISQED*, 2017.
- **Performance Impact of Magnetic and Thermal Attack on STTRAM and Low-Overhead Mitigation Techniques.**
Jae-Won Jang and Swaroop Ghosh. *ISLPED*, 2016.
- **Security and Privacy Threats to On-Chip Non-Volatile Memories and Countermeasures.**
Swaroop Ghosh, Nasim Khan, Asmit De, and Jae-Won Jang. *ICCAD*, 2016.
- **Self-Correcting STTRAM under Magnetic Field Attacks.**
Jae-Won Jang, Jongsun Park, Swaroop Ghosh, and Swarup Bhunia. *DAC*, 2015.
- **Design and Analysis of Novel SRAM PUFs with Embedded Latch for Robustness.**
Jae-Won Jang and Swaroop Ghosh. *ISQED*, 2015.

Skills

Languages: Assembly Language (ARM and x86/64), C, C++, Haskell, Python, Rust

Tools: angr, Binary Ninja, CMake, Docker, dyninst, GDB, Ghidra, Intel PIN, LLVM/Clang, QEMU, Radare2