Seyedmohammad Nouraniboosjin

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Professional Summary

Third-year PhD candidate at WPI working at the intersection of machine learning, cryptography, and hardware security. Five peer-reviewed papers at CHES, USENIX WOOT, CASCADE, and IEEE EMC+SIPI. Theoretical contributions include Matrix Rényi Entropy and PAC-style attack-complexity bounds for side-channel analysis. DAC Young Fellow, NEHWS'26 speaker, and organizer of the OPTIMIST PhD forum on AI and side-channel analysis.

Publications

There's Waldo: PCB Tamper Forensic Analysis using Explainable AI on Impedance Signatures
IEEE EMC+SIPI, 2025

Uncertainty Estimation in Neural Network-enabled Side-channel Analysis
CHES, 2026

Too Hot To Be True: Temperature Calibration for NN-assisted SCA
CASCADE, 2026

Swarm in EM Hay: Particle Swarm-guided Probe Placement for EM SCA
USENIX WOOT, 2026

Rock and a Hard Place: Attack Hardness in NN-assisted SCA
Under Review

Research Projects

2025–2026: **How Many Traces Is Enough?** PAC bounds for profiled and non-profiled SCA.

2024–2025: **Information-theoretic Metrics for SCA** (MMD, Rényi entropy).

2024–2025: **Explainable AI for SCA**.

2023–2024: **Confidence Calibration for Deep-learning-based SCA**.

Leadership & Service

- **President,Iranian Student Association, WPI (2023–2025)**: led 42 students; built faculty and administration channels; supported community during crisis period. Represented the community in media.
- **Organizer, OPTIMIST PhD Forum (ongoing)**: 3 sessions, 20 participants; coordinated academic/industry speakers; contributed to roadmap document.
- **Contributor, OPTIMIST Working Group**: co-authored materials on AI acceleration for implementation security testing.
- **Mentor, MQP Team (2024–2025)**: Supervised 4 undergraduate researchers; paper under review at ICONS 2026; releasing 6 open-source GitHub repositories for research artifacts.
- **Teaching Assistant**: WPI ECE 2305, 2312, 2049.
- **Reviewer**: hardware security and applied cryptography venues.

Awards and Honors

Representative of OPTIMIST at NEHWS (2026) • Invited Speaker, NEHWS (2025)
DAC Young Fellow Award (2025) • 3rd Place Poster, NEHWS (2024)

Education

Worcester Polytechnic Institute 2023 - Present
PhD - Electrical and Computer Engineering |Advisor: Prof. Fatemeh Ganji, Vernam lab *Worcester, MA*

Sharif University of Technology 2020 - 2023
M.Sc. - Secure Communications and Cryptography

Skills

Languages and frameworks: Python (PyTorch, scikit-learn), Verilog, MATLAB, C/C++.

Hardware and tools: SCA setups (ChipWhisperer, Riscure/Keysight, ALPhANOV), Linux, Docker, Git.