

Fatemeh Khojasteh Dana

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Education

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- Ph.D. in Electrical and Electronic Engineering, Worcester Polytechnic Institute (WPI),** Sept 2024 – Present
- Research Focus: Embedded Security Engineer, Reliable System Design
 - Current GPA: 4.0/4.0
- M.Sc. in Computer Engineering, Amirkabir University of Technology (AUT)** Sept 2019 – June 2022
- Thesis: Vulnerability Evaluation and Reliability Improvement in LPWAN Devices
- B.Sc. in Computer Engineering, University of Isfahan,** Sept 2015 – Sept 2019
- Thesis: Implementation of a smart parking system

Skills

Programming Languages: C#, C/C++, Python, Bash, JavaScript, SQL
HDLs: Verilog, SystemVerilog, VHDL
Tools: Vivado, ModelSim, Altium Designer, Arduino IDE
Platforms: FPGA, Arduino, Raspberry Pi
Lab Instruments: PHEMOS-X, ALPhANOV, Vector Network Analyzer, Vector Network Analyzer (VNA), Function Generator, Oscilloscope
Soft Skills: Teamwork, Analytical Thinking, Precision, Self-Motivation

Academic Experience

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- Graduate Research Assistant - Vernam Applied Cryptography and Secure Embedded Systems Lab, Worcester Polytechnic Institute (WPI)** Sept 2024 – Present
- Implemented a software and hardware solution using C++ and Verilog to avoid soft and hard errors on FPGA and improve reliability.
 - Developed a Python-based assembler for C/C++ codes to convert assembly instructions into alternative assembly representations to avoid soft error failure.
 - Implemented clock and voltage sensors, AES, and RISC-V using Verilog
 - Worked with UART and JTAG communication protocols
 - Applied TRRespass and BlackSmith to exploit adjacent bit flips, targeting cryptographic keys and GGUF tokenizer dictionaries
 - Analyzed DRAM vulnerabilities and Rowhammer-induced bit flips to assess cryptographic and LLM security risks.
- Teacher Assistant, Worcester Polytechnic Institute (WPI)** Jan 2025 – May 2025
Aug 2025 - Dec 2025
- Served as TA for graduate courses in Digital Signal Processing (DSP) and Cryptography & Security
 - Prepared and graded assignments/exams
 - Supported MATLAB-based labs and signal analysis projects
 - Provided constructive feedback on student reports
- Graduate Research Assistant, Amirkabir University of Technology (AUT)** Sept 2019 – June 2022
- Proposed a fault tolerance system for IoT devices (NB-IoT Technology)
 - Developed and implemented fault-tolerant techniques (e.g., CRC) to improve packet transmission reliability
 - Instructed undergraduate courses (Computer Architecture, Operating Systems, Microprocessors)

- Instructed students in VHDL/Verilog digital design, Linux-based debugging, and microprocessor interfacing
- Demonstrated concepts of concurrency and synchronization (threads, mutexes) in Linux environments
- Guided hands-on sessions with Arduino interfacing for practical hardware education

Industrial Experience

Microsoft Dynamics 365 Developer and Administrator

Sept 2022 – Aug 2024

- Customized Dynamics 365 modules (Sales, Customer Service, Marketing)
- Developed custom plugins/workflows using C# and JavaScript
- Integrated Dynamics 365 with external systems via REST APIs
- Managed system administration, user roles, and data integrity
- Designed reports and dashboards
- Queried and managed data using FetchXML and SQL

Publication

Mitard, K., Monfared, S. K., **Dana, F. K.**, Dumitru, R., Yuval, Y., and Tajik, S., "Chypnosis: Undervolting-based Static Side-channel Attacks," *IEEE Symposium on Security and Privacy*, 2026.

Adiletta, A., Weissman, Z., **Dana, F. K.**, Sunar, B., and Tajik, S., "Rubber Mallet: A Study of High Frequency Localized Bit Flips and Their Impact on Security," *Workshop on DRAM Security (DRAMSec)*, Japan, 2025.

Dana, F. K., Anvari, S. F., and Zarandi, H. R., "A reliability framework for NB-IoT devices: Addressing transient faults and silent data corruptions," *Computers and Electrical Engineering Journal*, Vol. 124, no. 2, p. 110405, 2025.

Dana, F. K., Monfared, S. K., and Tajik, S., "Logical Maneuvers: Detecting and Mitigating Adversarial Hardware Faults in Space," *Workshop on Security of Space and Satellite Systems (SpaceSec)*, USA, 2025.

Awards & Honors

- Accepted as a DAC Young Fellow at the 62nd Design Automation Conference (DAC), June-2025
- Awarded First Place in the poster presentation at the New England Hardware Security Workshop (NEHWS), April-2025

References

Professor Shahin Tajik, Assistant Professor, Department of Electrical and Computer Engineering, Worcester Polytechnic Institute, Email: stjajik@wpi.edu, Phone: 508-831-5239, Relationship: Graduate Supervisor

Professor Berk Sunar, Professor, Department of Electrical and Computer Engineering, Worcester Polytechnic Institute, Email: sunar@wpi.edu, Phone: 508-733-9144, Relationship: Advisor on joint research project

Professor Fatemeh (Saba) Ganji, Assistant Professor, Department of Electrical and Computer Engineering, Worcester Polytechnic Institute, Email: fganji@wpi.edu, Relationship: Course Instructor