

CONTACT INFORMATION

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RESEARCH INTERESTS

Applied Cryptography

Network Security

Machine Learning

EDUCATION

University of South Florida, Tampa, FL, USA

Ph.D., Computer Science (GPA: 3.9/4.0)

Advisor: Dr. Attila Altay Yavuz

Fall 2021 – Present

Expected: Spring 2026

École Polytechnique de Tunisie, Tunis, Tunisia

Bachelor of Engineering, Computer Science and Multi-Disciplinary Sciences

Thesis: Applications of Machine Learning in Networking and IoT

2017 – 2020

Institut Préparatoire aux Études d'Ingénieurs de Monastir, Monastir, Tunisia

Preparatory Classes for Engineering Schools, Mathematics and Physics Track

2015 – 2017

WORK EXPERIENCE

Graduate Research Assistant, University of South Florida, Tampa, FL, USA

Dec 2021 – Present

- Designed and evaluated lightweight and post-quantum IoT authentication protocols
- Developed open-source cryptographic protocols in C/C++ for resource-constrained IoT devices
- Authored more than 8 peer-reviewed publications on secure and efficient IoT authentication protocols

System Administrator, University of South Florida, Tampa, FL, USA

Aug 2023 – May 2024

- Developed real-time monitoring dashboards using Grafana and Prometheus
- Managed and maintained a high-performance computing (HPC) cluster for research workloads
- Automated routine administration tasks with Ansible playbooks to improve efficiency and reliability

Graduate Teaching Assistant, University of South Florida, Tampa, FL, USA

Aug 2021 – Dec 2021

- Delivered several guest lectures to present research outcomes
- Assisted in creating and grading exams for 80+ undergraduate students in IT Data Structures

Software Engineer, Kopileft Services Inc., Tunis, Tunisia

Jan 2021 – Aug 2021

- Developed and maintained web services using Kotlin and Gradle
- Enhanced 50% of the BI reporting infrastructure with PostgreSQL and Java

Research Intern, LAAS-CNRS, Toulouse, France

Feb 2020 – Dec 2020

Advisors: Dr. Khalil Drira, Dr. Hassan Hassan

- Developed and benchmarked RNN models for network traffic prediction

- Designed and implemented early-exit distributed CNN models for heterogeneous IoT devices

Intern, Wevioo Consulting, Tunis, Tunisia

Jun 2019 – Aug 2019

- Designed and implemented an ML solution for handwritten signature verification using a Siamese CNN
- Deployed the system to authenticate bank checks within client infrastructures, enhancing fraud detection

PUBLICATIONS

Journals

- [1] Kiarash Sedghighadikolaei, Attila A. Yavuz, **Saif E. Nouma**, “Signer-Optimal Multiple-Time Post-Quantum Hash-Based Signature for Heterogeneous IoT Systems”, *Internet of Things*, 101694, 2025.
- [2] **Saif E. Nouma**, Attila A. Yavuz, “Post-Quantum Hybrid Digital Signatures with Hardware-Support for Digital Twins”, *ACM Transactions on Multimedia Computing, Communications, and Applications (ACM TOMM)*, Volume 20, Issue 6, pp 1-30, March 2024.

Conferences

- [3] Attila A. Yavuz, Kiarash Sedghighadikolaei, Saleh Darzi, **Saif E. Nouma**, “Beyond Basic Trust: Envisioning the Future of NextGen Networked Systems and Digital Signatures”, *5th IEEE Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (IEEE TPS)*, May 2023, Atlanta, Georgia, USA.
- [4] **Saif E. Nouma**, Attila A. Yavuz, “Lightweight Digital Signatures for Internet of Things: Current and Post-Quantum Trends and Visions”, *6th IEEE Conference on IEEE Conference on Dependable and Secure Computing (IEEE DSC)*, May 2023, Tampa, Florida, USA.
- [5] **Saif E. Nouma**, Attila A. Yavuz, “Practical Cryptographic Forensic Tools for Lightweight Internet of Things and Cold Storage Systems”, *8th ACM/IEEE Conference on Internet of Things Design and Implementation (ACM/IEEE IoTDI)*, May 2023, San Antonio, Texas, USA.
- [6] **Saif E. Nouma**, Attila A. Yavuz, “Post-Quantum Forward-Secure Signatures with Hardware-Support for Internet of Things”, *IEEE International Conference on Communications (IEEE ICC)*, May 2023, Rome, Italy.
- [7] Attila A. Yavuz, **Saif E. Nouma**, Thang Hoang, Duncan Earl, Scott Packard, “Distributed Cyber-infrastructures and Artificial Intelligence in Hybrid Post-Quantum Era”, *4th IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (IEEE TPS)*, December 2022 (virtual).
- [8] Attila A. Yavuz, Duncan Earl, Scott Packard and **Saif E. Nouma**, “Hybrid Low-Cost Quantum-Safe Key Distribution”, *Quantum 2.0 - Optica*, May 2022, MA, USA.

E-Prints

- [1] **Saif E. Nouma**, Attila A. Yavuz, “Lightweight and High-Throughput Secure Logging for Internet of Things and Cold Cloud Continuum”, *arXiv preprint arXiv:2506.08781*, May 2025. (Under review)
- [2] Attila A. Yavuz, Saleh Darzi, **Saif E. Nouma**, “LiteQSign: Lightweight and Quantum-Safe Signatures for Heterogeneous IoT Applications”, *arXiv preprint arXiv:2311.18674*, May 2025. (Under review)
- [3] **Saif E. Nouma**, Attila A. Yavuz, “Lightweight and Resilient Signatures for Cloud-Assisted Embedded IoT Systems”, *arXiv preprint arXiv:2409.13937*, March 2024. (Under review)
- [4] **Saif E. Nouma**, “Applications of Machine Learning (ML) in Networking and IoT”, HAL preprint hal-02932494, July 2020.

PATENTS

[1] Attila A. Yavuz and **Saif E. Nouma**, “*System and Method for Cryptographic Forensic Audits on Lightweight IoT and Digital Archives*”, US Patent US20240007300A1, Filed: June 2023.

[2] Attila A. Yavuz and **Saif E. Nouma**, “*Hardware Supported Authentication and Signatures for Wireless, Distributed and Blockchain Systems*”, US Patent US20230308289A1, Filed: Mar 2023.

GRANTS and AWARDS

| | |
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| Travel: USF International Travel Grant IEEE ICC 2023 | 2023 |
| Total: \$1,500 | |

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| Travel: NSF Student Travel Grant for IEEE ICC 2023 | 2023 |
| Total: \$1,500 | |

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| National Engineering Entrance Exam | 2017 |
| Top 0.5% (Rank 4/800) | |

SERVICES

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| Journal reviewer | |
| IEEE Transactions on Information Forensics and Security (IEEE TIFS) | 2024 |

TECHNOLOGIES

Languages: Python, C/C++, Java, Kotlin, Matlab, SQL (PostgreSQL), R, (C)Make, Gradle, Bash

Frameworks: Docker, CUDA, TensorFlow, PyTorch, Keras, Ansible, Prometheus, Grafana, ns-3, Slurm

Libraries: OpenSSL, WolfSSL, OpenCV, Pandas, NumPy, Scikit-learn, Matplotlib

Embedded Hardware: ARM Cortex-M4, 8-bit AVR (ATmega series)

SELECTED PROJECTS

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|---|------|
| 🔒 High-throughput optimal signatures for secure logging in IoT networks | 2025 |
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| 🔒 Lightweight and breach-resilient authenticated encryption framework for IoT | 2025 |
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| 🔒 Hybrid post-quantum forward-secure signatures for digital twins | 2023 |
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| 🔒 Network traffic prediction using recurrent neural networks (RNNs) | 2020 |
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| 🔒 Task offloading using deep reinforcement learning | 2020 |
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| 🔒 Distributed deep learning inference for edge computing | 2020 |
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SELECTED CERTIFICATES

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|--------------------------------------|------|
| Big Data Engineer, IBM Mastery Award | 2019 |
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| Blockchain Developer, IBM Explorer Award | 2019 |
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| Machine Learning, Coursera | 2019 |
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| Fundamentals of Reinforcement Learning, Coursera | 2019 |
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