

## CONTACT INFORMATION

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## RESEARCH INTERESTS

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Applied Cryptography

Network Security

Machine Learning

## EDUCATION

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**University of South Florida**, Tampa, FL, USA

Fall 2021 – Present

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

Expected: Spring 2026

Advisor: Dr. Attila Altay Yavuz

**École Polytechnique de Tunisie**, Tunis, Tunisia

2017 – 2020

*Bachelor of Engineering, Computer Science and Multi-Disciplinary Sciences*

Thesis: *Applications of Machine Learning in Networking and IoT*

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

2015 – 2017

*Preparatory Classes for Engineering Schools, Mathematics and Physics Track*

## WORK EXPERIENCE

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**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

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### 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 IoT-DI)*, 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

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[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

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

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

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

## SELECTED CERTIFICATES

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