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WORK EXPERIENCE

Assistant professor of computer science
University of North Carolina *Aug 2020 –Currently* *Wilmington, NC*

- On going research projects:
  - **AI-Driven Bird Activity Monitoring for crop protection:** Developing a cyber-physical system for real-time, adaptive monitoring of bird activity using multi-modal sensing (RGB, thermal, acoustic), edge-optimized AI, and autonomous drones. The system supports ecological research and crop protection by enabling resilient, scalable, and intelligent sensing in dynamic environments. Contributions include adaptive machine learning pipelines, transformer-based data fusion, and collaborative unmanned aerial systems.
  - **Doppler-ML Fusion for Anti-Spoofing Navigation:** Developing a GPS-independent maritime localization system that fuses Doppler shift analysis from deterministic satellites with machine learning models to counter GPS spoofing and jamming. The system predicts vessel location by analyzing frequency shifts from known satellite trajectories and refining estimates using ML regressors trained on Doppler patterns. A hybridization algorithm intelligently combines both sources, enhancing accuracy and robustness in GPS-denied environments.
  - **Data Exfiltration from Air-gapped Environments**: Explored techniques for using side channels to extract data from air-gapped environments and Industrial Control Systems (ICS), focusing on security vulnerabilities and potential mitigations.
  - **Ad Hoc Time Synchronization Algorithm:** This project investigates the development of an algorithm that enables participating nodes to synchronize their clocks without relying on a central time server. Time synchronization is critical in the context of security, as it is used for generating cryptographic keys and recording logs. The goal is to design a protocol that maintains accurate timekeeping even in the absence of internet access.
  - **GPS Signal Manipulation for Drone Location**: Introduced a method to control and locate unauthorized drones by manipulating GPS signals using Radio Frequency Software-Defined Radios, addressing security and privacy concerns.
  - **Server-Side User Mobility Prediction**: Created a predictive model using machine learning to analyze server-side traffic patterns, effectively distinguishing between stationary and mobile users to improve network management and public safety.
- Teaching:
  - AI for cybersecurity
  - Security tools development
  - System security
  - Secure programming foundation
  - Industrial cybersecurity

Research Consultant
Lapetus Solutions, Inc *Jan 2022 –Currently* *Wilmington, NC*

- Collaborating on a research project focused on enhancing the security of cargo trucks' CAN Bus systems, sponsored by the Department of Energy and in partnership with Oak Ridge National Laboratory.
- Developing a machine learning-based system for driver identification and intrusion detection through multi-sensor data fusion, leveraging CAN Bus signals, IMU data, heart rate monitoring, and camera feeds to enhance vehicle security and ensure robust driver verification.

Technical Consultant
Duco Experts *May 2024 –Currently* *San Francisco ,CA*

- Engaging in research projects under non-disclosure agreements (NDA) to provide consultancy and author technical reports for prominent technology clients.
- Involvement includes a project focused on enhancing mobile authentication security and another related to safeguarding financial applications.

5G RF Engineer
Netscout *May 2019 –Aug 2020* *Berkeley, CA*

- Create path loss propagation models based on field data for given geographical location desired by the client.
- Analyze incoming field testing data.
- Provide updates and recommendations on current coverage models used in the network by clients.
- Develop Python scripts to aid in automating and organizing large data sets for various analyses.

Teaching/ Research Assistant
Louisiana Tech University *Mar 2017 –May 2019* *Ruston, LA*

Research**:**

- Research in the area of cybersecurity and sensor data fusion.
- Focus on designing unobtrusive multi-factor authentication systems.
- Researching location based access control systems.
- Studying different RF technologies (WIFI, Bluetooth, LTE, UMTS, and GSM) and the possibility of using RF footprints to calculate location.
- Researching cryptography and key generation based on radio frequency signals.
- Designing and building digital systems and test their performance
- Building systems architectures from scratch including crowdsourcing systems, sensor data fusion, and access control systems.

Teaching:

- Advanced computer networks
- Introduction to cyber Engineering

System Engineer
Polaris Wireless *Sep 2014 –Mar 2017* *Mountain View, CA*

- Building network-based mobile location systems by combining measurement data located in mobile devices.
- Measure end to end performance for mobile location systems and ensure reliable and stable behavior.
- Perform root cause analysis of technical issues
- Troubleshooting RF & core network bugs, pcap & M3ua traces analysis, ensuring performance, up-gradation and patches application of telecom Products.
- Scripting and automating different daily manual tasks to increase the team's productivity
- Develop test plan and scenarios to certify equipment and new components for deployment network, including handsets, scanner, spectrum analyzer, analysis software, such as toolkit from Rohde-schwarz, Anite, and Qualcomm.

RF System Engineer
Yupana LLC *Apr 2014 – Aug 2014* *Walnut Creek, CA*

- Prepare field test reports for CDMA, GSM, UMTS and LTE technologies
- Analyze test results, monitor network performance indicators and give recommendation for performance improvement
- Log file analysis and benchmark study
- Identify network issues and troubleshooting coverage holes, RRC connection failure, RRC drops and etc.

EDUCATION

- **PhD in Engineering, Cyberspace concentration** (2016–2019) – Louisiana Tech University
- **Master of Electrical Engineering** (2012–2014) – Louisiana Tech University
- **Bachelor of Electrical Engineering** (2005–2010) – University of Jordan

Professional certificates

- CISSP
- CEH
- CCNA: Routing and switching
- CCNA: security.
- Mobile Location
- OSCP (in progress)

RESEARCH

❖ Publications

- Alamleh, H., Estremera, L. System for Detecting and Jamming Unauthorized Communications Using RF-SDR. 2024 IEEE 15th Annual Ubiquitous Computing, Electronics & Mobile.
- Alamleh, H., Estremera, L. Securing Mobile Finance: Trends, Mitigations, and Best Practice. 2024 IEEE 15th Annual Ubiquitous Computing, Electronics & Mobile.
- Tahat, Z., Gharaibeh, A., Tahat, MZG, Glisson, WB, Alamleh, H., Liu, X. Social Media Fake News Detection Using Machine Learning Models and Feature Extraction Techniques. 2024 IEEE 15th Annual Ubiquitous Computing, Electronics & Mobile.
- Alamleh, H., Karabacak, B. Exploring the Security Landscape of Underwater Positioning and Navigation Systems: An Attack Surface Analysis. 2024 IEEE 49th Conference on Local Computer Networks (LCN), 1-7.
- Alamleh, H., Estremera, L. Secure Media Timestamping: Challenges, Solutions, and Frameworks. Mobilkommunikation; 28. ITG-Fachtagung, 31-34.
- ElSaid, A.A., Godwin, C., AlQahtani, A., Alamleh, H., Hu, W.-c. (March 2024). Advancing Privacy Research: A Novel Realistic Persona-Based Dataset. INTERNATIONAL CONFERENCE IN EMERGING TECHNOLOGIES FOR SUSTAINABILITY AND INTELLIGENT SYSTEMS.
- Alamleh, H., AlQahtani, A.A.S., ElSaid, A.A. (2023). Distinguishing human-written and ChatGPT-generated text using machine learning (pp. 154--158). 2023 Systems and Information Engineering Design Symposium (SIEDS).
- Court, A., Alamleh, H. (2023). Multi-path Data Transmission to Protect Data in Transit (pp. 1--6). 2023 IEEE International Conference on Consumer Electronics (ICCE).
- AlQahtani, A.A.S., Alamleh, H. (2023). Optimizing Smart Home Performance and User Convenience with RSSI-based Proximity Detection (pp. 0319--0325). 2023 IEEE 13th Annual Computing and Communication Workshop and Conference (CCWC).
- Alamleh, H., AlQahtani, A.A.S., Al Smadi, B. (2023). Secure Mobile Payment Architecture Enabling Multi-factor Authentication (pp. 19--24). 2023 Systems and Information Engineering Design Symposium (SIEDS).
- Joseph, P., Alamleh, H. (July (3rd Quarter/Summer) 2023). Smart Closed-Loop Jamming System. The 2023 International Conference on Artificial Intelligence, Robotics, Signal and Image Processing (AIRoSIP).
- Alamleh, H. (March 2023). Counter-surveillance Technique by Diversifying Transmission Links (pp. 1046--1050). 2023 IEEE 13th Annual Computing and Communication Workshop and Conference (CCWC).
- Noyes, M., Alamleh, H. (2022). Input Fuzzing for Network-based Attack Vector on Smartphones (pp. 1--4). 2022 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS).

- AlQahtani, A.A.S., Alamleh, H., Al Smadi, B. (2022). IoT devices proximity authentication in ad hoc network environment (pp. 1--5). 2022 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS).
- AlQahtani, A.A.S., Alamleh, H., Alrawili, R. (2022). Privacy-preserving IoT Data Sharing Scheme (pp. 0428--0432). 2022 IEEE 13th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON).
- Alamleh, H., AlQahtani, A.A.S., Al Smadi, B. (2022). Server-Side Distinction of User Mobility Using Machine Learning on Incoming Data Traffic (pp. 1--4). 2022 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS).
- Alamleh, H., AlQahtani, A.A.S. (2021). Analysis of the design requirements for remote internet-based E-voting systems (pp. 0386--0390). 2021 IEEE World AI IoT Congress (AIIoT).
- AlQahtani, A.A.S., Alamleh, H., Gourd, J. (2021). Ci2fa: Continuous indoor two-factor authentication based on trilateration system (pp. 1--5). 2021 International Conference on COMmunication Systems & NETworkS (COMSNETS).
- Alamleh, H., AlQahtani, A.A.S., Al Smadi, B. (2021). Comparative analysis of underwater positioning and navigation systems (pp. 0763--0767). 2021 IEEE 12th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON).
- Alamleh, H., Roy, N. (2021). Manipulating GPS Signals to Determine the Launch Location of Drones in Rescue Mode (pp. 1--5). 2021 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS).
- Shene, A., Aldridge, J., Alamleh, H. (2021). Privacy-Preserving Zero-effort Class Attendance Tracking System (pp. 1--4). 2021 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS).
- Al Smadi, B., AlQahtani, A.A.S., Alamleh, H. (2021). Secure and fraud proof online payment system for credit cards (pp. 0264--0268). 2021 IEEE 12th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON).
- AlQahtani, A.A.S., Alamleh, H., El-Awadi, Z. (2021). Secure Digital Signature Validated by Ambient User's Wi-Fi-enabled devices (pp. 159--162). 2021 IEEE 5th International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE).
- Alamleh, H., Waters, K., Al Smadi, B. (2021). Server-Side Distinction of Incoming Traffic Transmission Medium Using Machine Learning (pp. 0482--0485). 2021 IEEE 12th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON).
- AlQahtani, A.A.S., Alamleh, H., Gourd, J., Mugasa, H. (2020). 0ei2fa: Zero effort indoor two factor authentication (pp. 253--257). 2020 14th International Conference on Innovations in Information Technology (IIT).
- Alamleh, H., AlQahtani, A.A.S. (2020). A weighting system to build physical layer measurements maps by crowdsourcing data from smartphones. IAES International Journal of Robotics and Automation.
- AlQahtani, A.A.S., Alamleh, H., Gourd, J. (2020). 0EISUA: zero effort indoor secure user authentication. IEEE Access, 8, 79069--79078.
- Alamleh, H., AlQahtani, A.A.S. (2020). A cheat-proof system to validate gps location data (pp. 190--193). 2020 IEEE International Conference on Electro Information Technology (EIT).
- Alamleh, H., AlQahtani, A.A.S., Gourd, J., Mugasa, H. (2020). A weighting system for building RSS maps by crowdsourcing data from smartphones (pp. 152--156). 2020 International Conference on Computing, Networking and Communications (ICNC).
- Alamleh, H., AlQahtani, A.A.S. (2020). Architecture for continuous authentication in location-based services (pp. 1--4). 2020 International Conference on Innovation and Intelligence for Informatics, Computing and Technologies (3ICT).
- AlQahtani, A.A.S., Alamleh, H., Gourd, J. (2020). Bf2fa: Beacon frame two-factor authentication (pp. 357--361). 2020 IEEE International Conference on Communication, Networks and Satellite (Comnetsat).
- Alamleh, H., AlQahtani, A.A.S. (2020). Enforcing Location-based Access Policies Using the Existing IEEE 802.11 Infrastructure (pp. 0727--0731). 2020 11th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON).

- Alamleh, H., Alqahtani, A.A.S., Alamleh, D. (2020). Implementing Variable Power Transmission Patterns for Authentication Purposes (pp. 198--203). Intelligent Computing: Proceedings of the 2020 Computing Conference, Volume 3.
- Zalloum, M., Alamleh, H. (2020). Privacy preserving architecture for healthcare information systems (pp. 429--432). 2020 IEEE International Conference on Communication, Networks and Satellite (Comnetsat).
- Alamleh, H. (2020). Private and Secure Students' Data Sharing in Educational Systems (pp. 158--161). 2020 Sixth International Conference on e-Learning (econf).
- AlQahtani, A.A.S., Alamleh, H., Gourd, J., Alnuhait, H. (2020). Ts2fa: Trilateration system two factor authentication (pp. 1--4). 2020 3rd International Conference on Computer Applications & Information Security (ICCAIS).
- Alamleh, H., AlQahtani, A.A.S. (2020). Two Methods for Authentication Using Variable Transmission Power Patterns (pp. 0355--0358). 2020 10th Annual Computing and Communication Workshop and Conference (CCWC).
- Alamleh, H., Gourd, J. (2020). Unobtrusive Location-based Access Control Utilizing Existing IEEE 802.11 Infrastructure (vol. 1, pp. 157--162). 2020 IEEE Microwave Theory and Techniques in Wireless Communications (MTTW).

❖ Other research activities
- Panelist at Microelectronics Center of North Carolina for AI in Cybersecurity (Date not specified, added as ongoing commitment).
- Panelist at Carolina Cyber Network (transportation security).
- Cyber security Session chair at the 2020 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies.
- Session chair at The 11th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference.
- Reviewer at the IEEE Systems Journal.
- Reviewer at the International conference on Innovation and Intelligence in informatics, computing, and technologies.
- Reviewer at IEEE Access (November 2021 - Present).
- Reviewer at The International Conference on Sustainability and Resilience (November 2021 - Present).
- Reviewer at the 2021 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT) (September 2021 - Present).
- Reviewer at Computers and Electrical Engineering Journal Elsevier (April 2024).
- Reviewer at IEEE Transactions on Dependable and Secure Computing (March 2024).
- Reviewer at IEEE Transactions on Information Forensics & Security (February 2024).
- Session Chair at the International Conference on Computing, Networking and Communications (ICNC 2023) (February 2023).