S H U M O N   A L A M
shalam@pvamu.edu

I. EDUCATION

Ph.D. in Electrical Engineering, Prairie View A&M University, 2012
MS in Telecommunications, Oklahoma State University, 2000
BS in Physics, University of Dhaka, 1997

Non-degree

Post Graduate Program (6 months) in Cloud Computing, University of Texas, Austin, 2023

CISCO CCNA Certification

Advanced OPNET Modeler Certification, OPNET Technologies, USA

IT Decision Guru Quick Start training Certification, OPNET, USA

II. PROFESSIONAL POSITIONS (Industrial /Research):

June 2016 – Current
Research Scientist, SECURE Cyber Security Center of Excellence, Prairie View A&M
University, TX

Aug 2015 – Jun 2016
Cyber Security/Network Analyst, YSO Cyber Security Inc., Houston, TX

Sep 2011- Aug 2015
Senior Electrical Engineer - National Oilwell Varco, TX

Oct 2004 - Sep 2011
Research Associate – Center of Excellence for Communication Systems Technology Research
(CECSTR), TAMU System approved Center at Prairie View A&M University, TX

May-Sep 2000
Member Technical Staff (Intern) - Bell Atlantic, MD, USA

Jan. 1996 – Dec. 1998
Systems/Network Engineer – BDCOM ONLINE LTD, Bangladesh

III. TEACHING EXPERIENCE (Adjunct)

Prairie View A&M University, USA, 2017-Current & 2006-2009
Texas Southern University, Houston, USA, 2014-2016
DeVry University, Houston, USA, 2009-2010

Course Taught (selected): Cybersecurity, Cryptography, Data Communications, Wireless Communications, C++, Computer Network, Cisco Routing and Switching Lab, Discrete Math, Communication Systems, Signal and Systems, Electronics, Mixed Signal, Digital Design, Logic Design, Process Control, Signal Processing, Broadband Technologies, Stochastic, Engineering Math.

IV. ASSISTANTSHIP

Graduate Research Assistant, ECE Dept., Prairie View A&M University, Prairie View, TX, 2002-2004

Graduate Research Assistant, Telecommunications, Oklahoma State University, OK, 1999-2000

V. COMPUTER SKILLS

- *Operating Systems: Windows, UNIX.*
- *Software/Programming: LabVIEW, AutoCAD, C++, TCL, Perl, MATLAB/Simulink, OPNET, Mathematica, PLC programming, Python.*

VI. TEST/VERIFICATION TOOLS

• Spirent's CF20 Traffic Emulator, Agilent's Spectrum Analyzer • Various vendors' oscilloscopes, meters, logic analyzers • Spirent's SR5500 Bidirectional 2X2 MIMO • NI PXI Platform and NI Software For MIMO Test • Spirent's Traffic generator, Lucent's DSLAM (Stinger) • Marconi's ATM Switch • Spirent's Wire Line Simulator • Agilent's Voice Quality Tester, • Various Cisco switches and routers.

VII. PUBLICATIONS (SELECTED ARTICLES)

• **S. Alam**, Y. Alam, S. Cui, C. Akujuobi, "Unsupervised Network Intrusion Detection Using Convolutional Neural Networks," IEEE CCWC 2023, pp.712-717

• **S. Alam**, Y. Alam, S. Cui, C. Akujuobi, & M. Chouikha, "Toward Developing a Realistic DDoS Data set for Anomaly-based Intrusion Detection," 39th IEEE International Conference on Consumer Electronics (ICCE), USA, Jan. 2021.

• Kelechi Eze, Cajetan M. Akujuobi, Shermar Hunter, **Shumon Alam**, Sarhan Musa, and Justin Foreman, "System-Wide Security for the Internet of Things: A Blockchain Approach," IEEE Journal, Submitted April 5, 2021.

• N. Gupta, S. Paiva (eds.), IoT and ICT for Healthcare Applications, EAI/Springer, 2020. **Section: Emerging IoT Technologies in Smart Healthcare**

• K. Eze, C. M. Akujuobi, M. N. O. Sadiku, M. Chouikha, and **S. Alam**, "Blockchain and Internet of Things: Integration Challenges," in Proc. 22nd International Conference on Business Information Systems (BIS), Spain, 2019

• Matthew N. O. Sadiku, **Shumon Alam**, and Sarhan M. Musa (2019). Green Growth. SSRJ International Journal.

• Matthew N. O. Sadiku, **Shumon Alam**, and Sarhan M. Musa (2018). Serverless Computing. International Journal of Recent Scientific Research (IJRSR), 9(8B), 28374-28375

• M. N. O. Sadiku, **S. Alam**, and S. Musa. (2019). "Social Intelligence: A Primer." International Journal of Research - Granthaalayah, 7(9), 213-217.

• M. Sadiku, **S. Alam**, S. Musa, "Intelligent Robotics and Application," International Journal of Trend in Research and Development, vol. 5(1), pp. 101-103, Jan-Feb 2018.

• M. Sadiku, **S. Alam**, S. Musa, "Information Assurance Benefits and Challenges: An Introduction," International Journal of Information & Security, vol. 36, 2017.

• M. Sadiku, **S. Alam**, S. Musa, "A Primer on Cybersecurity," International Journal of Advances in Scientific Research and Engineering, vol. 3 (8), pp. 71- 74, Sep. 2017.

• **S. Alam**, A. Annamalai, C. Akujuobi, "Optimizations of Cooperative Spectrum Sensing With Reporting Errors over Myriad Fading Channels," in Proc 7th IEEE Annual Computing and Communication Workshop and Conference, Jan. 2017.

• **S. Alam**, O. Olabiyi, O. Odejide, and A. Annamalai, "Simplified Performance Analysis of Energy Detectors Over Myriad Fading Channels: Area Under The ROC Curve Approach," International Journal of Wireless and Mobile Networks, vol. 4, no. 4, pp. 33-52, Aug. 2012.

• **S. Alam** and A. Annamalai, "Performance Analysis of Relay Based Cooperative Spectrum Sensing in Fading Channels," International Journal of Wireless and Mobile Networks, vol. 4, no. 5, pp. 105-124, Oct. 2012.

•O. Olabiyi, **S. Alam**, O. Odejide, and A. Annamalai, "A Unified Framework for the Performance Analyses of Diversity Energy Detectors over Fading Channels," International Journal of Autonomous and Adaptive Communications Systems, 2012.

• N. K. Ampah, C. M. Akujuobi, M. N. O. Sadiku, **S. Alam**, "An intrusion detection technique based on continuous binary communication channels," International Journal of Security and Networks, vol. 6, no. (2/3), pp. 174-180, 2011

• **S. Alam**, O. Odejide, O. Olabiyi, A. Annamalai, "Further Results on Area under the ROC Curve of Energy Detectors over Generalized Fading Channels," in Proc. 34th IEEE Sarnoff Symposium, Princeton, NJ, May 3-4, 2011, pp. 1-6.

• A. Annamalai, O. Olabiyi, and **S. Alam**, "Accurate Approximations for the Symbol Error Probability of Cooperative Non-Regenerative Relay Systems over Generalized Fading Channels," in Proc. 7th International Wireless Communication and Mobile Computing Conference (IWCMC), Istanbul, 4-8 July 2011.

• C. M. Akujuobi, M. Sadiku, **S. Alam**, V. Rajaravivarma, "Design, Development, Training, and Implementation of a Mixed Signal Broadband Chip-to-Chip Digital Communication System" in Proc., American Society for Engineering Education Annual Conference & Exposition, Chicago, Illinois, June 18-21, 2006

• C.M. Akujuobi, **S. Alam**, "Development of an Automation Process for ADSL Interoperability and Reliability Tests," in Proc. IEEE 37th Southeastern Symposium on System Theory (SSST), Tuskegee, Alabama, March 20-22, 2005

• K. Rabbani, S. Islam, **S. Alam**, "A novel gas flow sensor based on sound generated by turbulence for spirometry application," in Proc. IEEE Instrumentation and Measurement Technology Conference, 1997, vol.2, pp.1386-1388

VIII. PROPOSALS

Funded:

• **PI**, DoD Grant, Acquisition of Spirent CF20 CyberFlood for Cybersecurity Research and Teaching for Multidisciplinary Engineering at Prairie View A&M University, Award-Amount: $432,854, Period: 8/20/2019-8/19/2022

• **Co-PI**, Advancing Data Analytics Engines for Large Scale Autonomous Cyber Defense, NSA, $111,750.00, 09/2020-08/2022

• **Co-PI**, CC* Network Design: Improve Network on Campus for Research and Education in Agriculture, Science, and Engineering at Prairie View A&M University, Award-Amount: $515,964, Period: 08/15/2018 to 07/31/2023

• **Co-PI**, S&CC Planning: Smart & Connected Rural Communities, NSF, 09/01/2017 to 08/31/2018, US $100,000

Pending:

• **Co-PI**, Collaborative Research: SaTC: EDU: Visualization-Based Cybersecurity Teaching Modules for Underrepresented Students as Next-Generation Leaders, NSF, Amount: $124,939.00, 11/2023-10/2026

• **Co-PI**, Targeted Infusion Project: Enhanced Broadband Research and Education for PVAMU, NSF, Amount: $400,000.00, 09/2023-08/2026

• **Co-PI**, Targeted Infusion Project: Cybersecurity Research and Education for PVAMU, NSF, Amount: $400,000.00, 09/2023-08/2025

• **Co-PI**, Collaborative Research: SaTC: CORE: Medium: Security-aware Resource Management for Serverless Platforms, NSF, Amount: $822,086.00, 07/2023-06/2026

Not Funded

• **Co-PI**, Decentralized Network For Edge Computing. Total Amount: $ 84,000, Period: 09/1/2020 to 02/28/2021

• **Co-PI**, Excellence in Research: An Integrated Design of Blockchain and Edge Computing Security Research for IoT Systems, 09/2023-08/2026, Amount: 400,000

• **Co-PI**, SCC-IRG Track1: Smart and Connected Small Towns and Rural Communities. Total Amount: $ 4,342,260.00, Period: 09/01/2020 to 08/31/2024.

• **Co-PI**, SaTC: EDU: Enhancing Cybersecurity Education by developing Evidence-based Teaching and Training Modules. Total Amount: $ 500,000, Period: 09/01/2020 to 08/31/2023.

• **PI**, Develop a distributed intrusion detection system using a machine learning technique in the cloud platform. Submitted to INTERNET2 (Project: Exploring Clouds for Acceleration of Science (ECAS), Total Amount: $180,628, Period: 06/01/2019- 05/31/2020.

• **PI**, Cybersecurity & Computer Networking Workshop for High School Students. Submitted to Sid W. Richardson Foundation, Total Amount: $50,693, Period: 10/01/2019- 09/30/2020.

IX. SELECTED RESEARCH AND DEVELOPMENT PROJECTS

• Network Intrusion detection and prevention systems
• Network vulnerability testing using Spirent's CyberFlood
• AI/ML-based data analysis
• Cyber threat analysis for IoT systems
• Cisco ASA platform-based site-to-site VPN and SSL VPN functionality implementation
• Firewall implementation for perimeter defense
• VoIP design & implementation
• TCP/IP based Protocol analysis
• Measuring Network performance and Traffic Engineering
• DSL interoperability and reliability assessments
• Sensor network design and simulation
• Design a hybrid network with ATM and Frame Relay
• WAN design for multipoint network
• Design a broadband communications architecture on the Power line
• Integrated Design of Link-Adaptive Cooperative Wireless Networks
• Cross-Layer of Scalable Multimedia with Unequal Error Design Protection & Cooperative Relaying
• Software Defined Radio/Opportunistic Radio Access System
• Multimedia Signal Processing in Research and Education
• Wavelet-based Image Processing
• Wavelet-Based Detection and Estimation of Radar Signals Using Bayes' theorem
• Wavelet-based Algorithm for Vibration Detection in an Aeroelastic System
• Data noise removal and signal conditioning.