S H U M O N A L A M

I. EDUCATION

Ph.D. in Electrical Engineering, Prairie View A&M University, 2012

Dissertation:
Analysis and Optimization of Energy Detectors for Dynamic Spectrum Access.

MS in Electrical Engineering, Prairie View A&M University, 2004

Thesis: Development of a Test process for ADSL Interoperability and Reliability systems.

MS in Telecommunications, Oklahoma State University, 2000

Project: Development of a VoIP Architecture and Management System.

BS in Physics, University of Dhaka, 1997

Thesis:
Development of a new gas flow sensor and a computerized data acquisition, analysis, and display system for respiration measurements and diagnosis of lung disorders.

Non-degree

Post Graduate Program in Cloud Computing (6 months), 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):

Feb 2023 - Present
Research Scientist, College of Engineering, Prairie View A&M University, TX

June 2016 – Jan 2023
Research Scientist Lead, SECURE Cybersecurity Center, 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, Houston, 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
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 Networks, Cisco Routing and Switching Lab, Discrete Math, Electromagnetic Field Theory, 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, and C. Akujuobi, "Data-Driven Network Analysis for Anomaly Traffic Detection," Sensors, vol. 23, no. 19, p. 8174, Sep. 2023, doi: 10.3390/s23198174.

• **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 (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 Projects:

- **Co-PI**, Targeted Infusion Project: Enhanced Broadband Research and Education for PVAMU; NSF; $400,000; 09/2023-09/2026.
- **PI**, Acquisition of Spirent CF20 CyberFlood for Cybersecurity Research and Teaching for Multidisciplinary Engineering at Prairie View A&M University; DoD; $432,854; 8/20/2019-8/19/2022.
- **Senior Research Personnel**, 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; NSF; $515,964; 08/15/2018 to 07/31/2023.
- **Co-PI**, S&CC Planning: Smart & Connected Rural Communities; NSF; $100,000; 09/01/2017 to 08/31/2018.

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
- 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
- Link-Adaptive Cooperative Wireless Networks
- Wireless Cooperative Relaying
- Software Defined Radio/Opportunistic Radio Access System
- Wavelet-based Image Processing
- Wavelet-Based Detection and Estimation of Radar Signals Using Bayes' theorem
- Wavelet-based Algorithm for Vibration Detection
- Data noise removal and signal conditioning.