Shahed Enamul Quadir, Ph.D.

Assistant Professor of Electrical Engineering
Midwestern State University, Wichita Falls, Texas

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SUMMARY

- Electrical Engineering educator and researcher with expertise in hardware security, embedded systems, cyber-physical systems, and engineering education.
- Research interests include hardware trust and authentication, physical unclonable functions (PUFs), embedded and cyber-physical system security, smart grids, renewable energy systems, and engineering education.

EDUCATION

***University of Connecticut*,** Storrs, CT
Doctor of Philosophy in Electrical and Computer Engineering, May 2020
The University of Alabama at Birmingham, AL
Master of Science in Electrical and Computer Engineering, August 2012
***Bangladesh University of Engineering and Technology*,** Dhaka, Bangladesh
Bachelor of Science in Electrical and Electronic Engineering, March 2009

ACADEMIC APPOINTMENTS

Assistant Professor of Electrical Engineering

Midwestern State University, Texas | January 2026 – Present
• Teach undergraduate courses in Embedded Systems, Digital Signal Processing, Control Systems, Electronics Laboratory, Introduction to Engineering, and Senior Design.
• Develop curriculum, laboratories, and assessment materials supporting the Electrical Engineering program.
• Contribute to ABET assessment, continuous improvement, and accreditation preparation for the Electrical Engineering program.
• Mentor undergraduate students in senior design and research projects.
• Collaborate on interdisciplinary research involving cybersecurity, hardware security, LiDAR analytics, and cyber-physical systems.

Assistant Professor of Engineering

Monmouth College, Monmouth, IL | September 2021 – December 2025
• Taught undergraduate engineering courses and laboratories.
• Contributed to ABET assessment, curriculum development, and laboratory development activities.
• Supervised undergraduate research and interdisciplinary senior design projects.
• Developed industry and community partnerships supporting student learning and project opportunities.

Post-doctoral Associate

University of Florida, Gainesville, FL | May 2020 – August 2021
Florida Institute for Cybersecurity Research (FICS Research)
• Conducted research in hardware security and trust as a Postdoctoral Research Associate in FICS Research.

• Contributed to research on analog and mixed-signal hardware security, including analog IP protection, obfuscation, and watermarking.
• Contributed to the CYAN (Center for Enabling Cyber Defense in Analog and Mixed Signal Domain) research program and participated in regular project review and research progress meetings.
• Co-supervised student researchers working on analog/mixed-signal hardware security and IP protection.
• Developed research concepts, performed technical analysis, prepared research materials, and contributed to research presentations and project reports.

Graduate Research Assistant
University of Connecticut, Storrs, CT | January 2014 - May 2020
• Conducted research in hardware security, physical unclonable functions (PUFs), reverse engineering, and anti-tamper technologies.

Signal Analysis and Artificial Intelligence Intern
IMCORP / MathWorks Collaboration, Hartford, CT | January 2019- December 2019

• Applied signal processing, machine learning, and deep learning techniques for underground power cable diagnostics.

Lecturing Experience
Lecturer, North South University, Dhaka, Bangladesh | September 2013 - January 2014
Lecturer, Bangladesh University, Dhaka, Bangladesh | September 2012 - August 2013
Lecturer, IBAIS University, Dhaka, Bangladesh | May 2009 - July 2011

• Taught courses and labs in electrical engineering, electronics, digital systems, signal processing, and control systems.

Graduate Research Assistant
The University of Alabama at Birmingham, AL | August 2011 - August 2012

• Designed low-power analog and mixed-signal circuits for biomedical and sensing applications.

COURSES TAUGHT

Midwestern State University
• EENG 1101 Introduction to Engineering
• EENG 2204 Electronics Laboratory
• EENG 3204 Digital Signal Processing
• EENG 4124 Embedded and Real-Time Systems
• EENG 4183 Senior Design I
• EENG 4253 Control Systems Analysis

Monmouth College
• Introduction to Engineering
• Engineering Computations (MATLAB/Python)
• Circuit Analysis
• Digital Electronics
• Embedded Systems

• CMOS VLSI Design
• Electric Power Machines
• Statics
• Senior Design

University of Connecticut
• ECE 2000 Electrical and Computer Engineering Principles
• General Physics I
• General Physics II
• Physics for Engineers I

Bangladesh Universities
• Electrical Circuits
• Digital Electronics
• Electronic Devices
• Digital Signal Processing
• Control Systems

RESEARCH INTERESTS

• Hardware Security and Trust
• Physical Unclonable Functions (PUFs)
• Embedded Systems and Cyber-Physical Systems Security
• Smart Grid and Renewable Energy Security
• Reverse Engineering and Anti-Tamper Technologies
• FPGA and ASIC Design
• Engineering Education

REFEREED JOURNAL PUBLICATIONS

• M. S. Alam, ***S. E. Quadir***, et al., "*Hardware and Cyber Vulnerabilities in Embedded Systems: An Overview for Power Grids, PV, EVs and Storage Systems,*" IEEE Access, 2025.
• ***S. E. Quadir*** and J. Chandy, "*Integrated Circuit Authentication Based on Resistor and Capacitor Variations of a Low Pass Filter (LoPUF)*." International Journal of High-Speed Electronics and Systems, 2022. 31, 01n04.
• ***S. E. Quadir*** and J. Chandy, "*Key Generation for Hardware Obfuscation Using Strong PUFs*." Cryptography, MDPI, 3(3), 17, 2019.
• ***S. E. Quadir*** and J. Chandy, "*Low Pass Filter PUF: Authentication of Printed Circuit Boards Based on Resistor and Capacitor Variations*." International Journal of High-Speed Electronics and Systems, 27. 03n04, 2018.
• ***S. E. Quadir***, J. Chen, et al., "*A Survey on Chip to System Reverse Engineering*." ACM Journal on Emerging Technologies in Computing Systems (JETC), 2016.

REFEREED CONFERENCE PUBLICATIONS

• ***S. E. Quadir***, Alam M. S., Afshar S., and Arefifar S. A., *Comparative Analysis of PUF Techniques for Enhancing Smart Grid Security*, In Proc. 2026 IEEE International Conference on Electro/Information Technology (EIT), La Crosse, WI, USA, May 21–23, 2026.
• Chowdhury B. S., Alam M. S., and ***S. E. Quadir***, *Cyber–Physical Security Challenges in Hybrid Energy Storage for Renewable–EV Microgrids*, In Proc. 2026 International Conference on Cybersecurity, Digital Forensics and AI Applications (ICCSDFAI), Istanbul, Turkey, June 25–27, 2026. IEEE.

• Alam MS, ***S. E. Quadir***, Afshar S, Arefifar SA. *A Review of Hardware-Based Security Techniques for Cyber-Physical Power Systems*, In Proc. 2025 Interdisciplinary Conference on Electrics and Computer (INTCEC), 2025 September 15, pp. 1-6. IEEE.
• ***S. E. Quadir*** and J. Chandy, "*Embedded Systems Authentication and Encryption Using Strong PUF Modeling*," IEEE International Conference on Consumer Electronics (ICCE), 2020.
• N. Asadi, ***S. E. Quadir***, et al., "*Rapid Nondestructive Reverse Engineering* of *Printed Circuit Boards* by High-Resolution X-ray Tomography," GOMACTech, 2015.
• ***S. E. Quadir***, et al., "*A Low-Power Low-Noise Bioamplifi*er for *Multielectrode Neural Recording Systems,*" IEEE International Symposium on Circuits and Systems (ISCAS), Seoul, Korea, May 20-23, 2012.

SUBMITTED MANUSCRIPTS
• Chowdhury, B. S., Alam, M. S., & ***S. E. Quadir***, *Comprehensive Assessment of Wind Energy Potential and its Impact on Energy Generation and Environmental Emissions*. Accepted for presentation at the 6th Interdisciplinary Conference on Electrics and Computer (INTCEC 2026), Chicago, Illinois, September 24–25, 2026 (accepted).
• Gustafsson, I., ***S. E. Quadir***, Chowdhury, B. S., & Alam, M. S. *A Low-Cost Framework for Counterfeit Integrated Circuit Screening Using Electrical and Physical Inspection Techniques*. Accepted for oral presentation at the 6th Interdisciplinary Conference on Electrics and Computer (INTCEC 2026), Chicago, Illinois, September 24–25, 2026 (accepted).

PRESENTATIONS

Selected Academic and Technical Presentations

• ***Quadir, S. E***. "*Design of an Arithmetic Logic Unit (ALU) for Basic Operations: Addition, Subtraction, Multiplication, and Division*." Technical presentation for engineering students, Monmouth College, Monmouth, IL, May 2025.
• ***Quadir, S. E.*** "*Internet of Things: Sensors and Actuators*." Technical presentation for engineering students covering sensors, actuators, motors, and embedded-system applications, Monmouth College, Monmouth, IL, March 2024.
• ***Quadir, S. E.*** *"Circuits and Electronics: H-Bridge as a Motor Driver*." Technical presentation for engineering students, Monmouth College, Monmouth, IL, October 2023.
• ***Quadir, S. E.*** "*Authentication of Printed Circuit Boards Using Physical Unclonable Functions*." Faculty research presentation/colloquium, Monmouth College, Monmouth, IL, September 2023.
• **CYAN Research Program – Analog IP Protection and Analog IP Watermarking**, Florida Institute for Cybersecurity Research (FICS Research), University of Florida, 2020–2021. Research progress and quarterly project review presentations; Postdoctoral Research Associate and student co-supervisor.

Conference Presentation

• ***Quadir, S. E.,*** and Chandy, J. A. "*Embedded Systems Authentication and Encryption Using Strong PUF Modeling*." IEEE International Conference on Consumer Electronics (ICCE), 2020. Presented by S. E. Quadir.

Graduate Research Presentations

• ***Quadir, S. E.*** "*Physical Unclonable Functions for Authenticating and Preventing Reverse Engineering of Integrated Circuits and Electronics Hardware*." Ph.D. Dissertation Defense, University of Connecticut, 2020.
• ***Quadir, S. E.*** "*Anti-Reverse Engineering Techniques for Integrated Circuits and Electronics Hardware*." Ph.D. Dissertation Proposal, University of Connecticut, 2019.

Student Research Presentations (Mentored)

• Toffoli, G., and ***Quadir, S. E.*** *Exploring Data with Sensors and AI*, UGROW Summer Research Symposium, Midwestern State University, Summer 2026.
• Luna, A., Dolbeare, B., Kern, S., and ***Quadir, S. E***. *Harnessing Solar Power*. Summer Opportunities for Intellectual Activities (SOfIA), Monmouth College, July 2025.
• Borst, X., Rousey, P., Stasko, C., and ***Quadir, S. E.*** *Creating a Physical Unclonable Function Using Multiplexers, Counters, Comparators, and a Ring Oscillator Chain*. Connecticut Symposium on Microelectronics & Optoelectronics, 2024. (Best Poster Award).
• Reis, J., Brauman, B., Chandler, J., and ***Quadir, S. E.*** *Counterfeit Electronic Components Detection Using a Simple Circuit*. Summer Opportunities for Intellectual Activities (SOfIA), Monmouth College, August 12, 2022.

Student Poster Presentations (Mentored)

• Toffoli, G., and **Quadir, S. E.** *Exploring Data with Sensors and AI*. UGROW Posters on the go Forum I (June 18, 2026) and Posters on the go Forum II (June 25, 2026), MSU Texas, Wichita Falls, TX.
• Luna, A., Dolbeare, B., Kern, S., and ***Quadir, S. E***. *Harnessing Solar Power*. Summer Opportunities for Intellectual Activities (SOfIA), Monmouth College, July 2025.
• Hutton, J., Faulk, N., and ***Quadir, S. E***. *Design and Implementation of Solar-Powered Charging*. Monmouth College Scholars' Day, April 2025.
• Henson, T., Brauman, B., Plumer, T., and ***Quadir, S. E.*** *Embedded Systems for Community Solutions: Programming with the MSP430*. Monmouth College Scholars' Day, April, 2025.
• Fitch, N., Durfee, L., Henson, T., Plumer, T., and ***Quadir, S. E.*** *Fortress Defender: An Embedded Systems Home Defense*. Monmouth College Scholars' Day, April 2024.
• Goodrich, E., Maughan, G., Brauman, B., Anderson, S., Fowlkes, J., and ***Quadir, S. E.*** *G.L.O.W. (Growing Light of the World)*. Monmouth College Scholars' Day, April 2024.
• Alcobendas, O., Borst, X., Brent, S., Hild, B., and ***Quadir, S. E.*** *Building an Automated Garbage Collector Vehicle*. Monmouth College Scholars' Day, April 2024.
• Rousey, P., Wilson, R., Stasko, C., and ***Quadir, S. E.*** *Closed Loop Control*. Monmouth College Scholars' Day, April 2023.
• Borst, X., Rousey, P., Stasko, C., and ***Quadir, S. E.*** *Creating a Physical Unclonable Function Using Multiplexers, Counters, Comparators, and a Ring Oscillator Chain*. Monmouth College Scholars' Day, April 2023.
• Gustafsson, I., Brauman, B., Fasano, C. G., and ***Quadir, S. E.*** *Detection of Counterfeit Electronic Components Using a Simple Circuit*. Bulletin of the American Physical Society, 2023.
• Reis, J., Brauman, B., Chandler, J., and ***Quadir, S. E.*** *Counterfeit Electronic Components Detection Using a Simple Circuit*. Summer Opportunities for Intellectual Activities (SOfIA), Monmouth College, August 2022.

Selected Research Poster Presentations

• ***Quadir, S. E.***, and Chandy, J. A. "*Logic Obfuscation and Design Locking for Secured ICs*." Connecticut Symposium on Microelectronics & Optoelectronics, 2019. Best Poster Award.
• ***Quadir, S. E.***, and Chandy, J. A. "*Electronic Authentication Using a Low Pass Filter PUF*." Connecticut Symposium on Microelectronics & Optoelectronics, 2018.
• Guin, U., Rahman, T., Dogan, H., ***Quadir, S. E.***, Asadi, N., Shahbazmohamadi, S., Forte, D., and Tehranipoor, M. "*Comprehensive Addressing of Counterfeit Electronics and Reverse Engineering*." Research poster presentation, Center for Hardware Assurance, Security, and Engineering (CHASE), University of Connecticut, 2015.
• ***Quadir, S. E***., Forte, D., and Tehranipoor, M. "*Chip to System Reverse Engineering*." Research poster presentation, Center for Hardware Assurance, Security, and Engineering (CHASE), University of Connecticut, 2014.

RESEARCH FUNDING AND PROPOSALS

Research Funding

• EURECA Undergraduate Research Grant, Midwestern State University, 2026.
• UGROW Undergraduate Research Award, Midwestern State University, 2026.
• Summer Opportunities for Intellectual Activities (SOfIA) Faculty Research Award, Monmouth College, 2025.
• Summer Opportunities for Intellectual Activities (SOfIA) Faculty Research Award, Monmouth College, 2022.

Laboratory Development / Startup Funding

• Monmouth College, 2022 - Approximately $20,000 Faculty Startup / Laboratory Development Funding. Institutional startup support for establishing laboratory capabilities in hardware security and integrated circuit authentication, including research and instructional equipment supporting undergraduate research.

STUDENT RESEARCH MENTORING

• EURECA Undergraduate Research Program (MSU Texas).
• UGROW Undergraduate Research Program (MSU Texas).
• FPGA PUF Undergraduate Research Projects.
• LiDAR Cybersecurity and Environmental Analytics Projects.
• REU Undergraduate Research Student Co-Mentoring, University of Connecticut, approximately 2018 — Co-mentored an undergraduate student on Physical Unclonable Function (PUF) research based on resistor and capacitor variations; provided guidance on MATLAB modeling, simulation, and analysis.
• Undergraduate Embedded Systems and Hardware Security Projects.

AWARDS AND HONORS

• Faculty Research Startup Funding, Monmouth College and Midwestern State University
• Best poster award, 2019
• Predoctoral Fellowship, University of Connecticut- 2017, 2018, 2019
• Merit Scholarship and Technical Scholarship, Bangladesh University of Engineering and Technology

INSTITUTIONAL SERVICE

• ABET and assessment activities.
• Curriculum development.
• Industrial Advisory Board participation.
• Student recruitment and outreach.
• Senior Design planning and mentoring.

PROFESSIONAL SERVICE

Journal Reviewer:

• MDPI Future Internet
• IEEE TCAS
• Springer Nature Computer Science
• Elsevier Microelectronics Journal
• Elsevier Journal of Parallel and Distributed Computing
• IET Computer
• ACM TODAES

Professional Activities:

• AP Physics Reader, College Board Educational Testing Service (ETS), 2023–Present.

Professional Memberships:

- IEEE
- ASEE

OUTREACH AND COMMUNITY ENGAGEMENT

- YES Camp.
- Robotics Outreach Activities.
- Student Recruitment Activities.
- Prospective Student Visits.
- STEM Outreach Activities.

PROFESSIONAL DEVELOPMENT

- ABET Workshops
- D2L ADA Compliance and Accessibility Training
- Faculty D2L Training
- EURECA Mentor Orientation
- NSF Research Security Training
- CITI Research Training

PROFESSIONAL TOOLS & LANGUAGE EXPERTISE

Languages and Development Tools: Verilog, VHDL, MATLAB, Mathematica, Simulink, Arduino, Raspberry Pi, Assembly Language, Python, C / C++, Code Composer Studio (CCS), MSP430 LaunchPad (TI)
Circuit Simulation Tools: Cadence: Virtuoso Layout Editor, Cadence Allegro PSpice Simulator, HSPICE, Synopsys ICC, Synopsys Design Compiler, LabVIEW, VCS, PrimeTime, ModelSim
FPGA Design: Xilinx ISE, Vivado Design Suite, FPGA Editor
CAD Tools and related Software: Fusion 360, SolidWorks, Ultimaker Cura (3D printing Slicer)
Debugging: Logic Analyzer, Oscilloscopes, Spectrum Analyzer, ChipScope Pro
Operating Systems: Linux, Mac OS, and Microsoft Windows
Scripting Language: TCL, Perl Script, and Bash, and **Standard Architecture:** RISC / MIPS (32 bits)

VOLUNTEER AND OUTREACH ACTIVITIES

- Faculty interviewer and student recruitment volunteer.
- Engineering program outreach for prospective students and families.
- Represented Bengali language and culture during campus outreach events.
- Physics tutor, Physics Learning Resource Center (UConn).
- Mathematics tutor, Student Support Services (UConn).