Irin Akther

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RESEARCH INTERESTS

Trustworthy and privacy-preserving artificial intelligence; explainable AI for cybersecurity; human-centered security and usable privacy; applied machine learning for threat detection and socio-technical systems.

EDUCATION

Doctor of Computer Science (DCS) - In Progress | *2026 – Present*
University of the Potomac, Washington, DC (full-time doctoral student)

- Research focus: explainable AI for cybersecurity and intrusion detection systems.
- Graduate coursework in deep learning with convolutional neural networks (CNNs), machine learning, and AI.

Master of Science, Technology Management (Cybersecurity Concentration) | *2023 – 2025*
Marymount University, Arlington, VA - CGPA 4.00 / 4.00

- Graduate Certificates: Cybersecurity, Data Science, IT Project Management.
- Independent research: intrusion detection (XCAS prototype), insider threat detection, AI governance policy analysis.

Bachelor of Business Administration, Management Information Systems | *2018 – 2022*
University of Dhaka, Bangladesh - CGPA 3.73 / 4.00

- Graduate Scholarship for outstanding academic performance.

PUBLICATIONS AND PEER REVIEW

- Akther, I. (2026). "SHAP-Driven Persona-Adaptive Cybersecurity Alert Explanation: A Multi-Literacy Natural Language Generation Framework for Heterogeneous Users." Under review at ACM Digital Library (Dtrap).
- Akther, I., & Conrad, S. (2026). "Human-Technology Intelligence in Higher Education: What Technology Leaders Actually Know About Making Implementation Work, and What That Means for AI." Under review at Educational Technology & Society.
- Akther, I., Rob, R., & Conrad, S. (2026). "Bridging the Global AI Governance Gap: A Multi-Dimensional Adaptive Framework for Balancing Innovation, Rights, and Accountability." Under review at the International Journal of Computer Information Systems and Industrial Management Applications (IJCISIM).
- Akther, I., & Conrad, S. (2025). "Experiential Learning in Study Abroad: Comparing Online and In-Person Experiences." Journal of Business and Management Studies, 7(4).
- Peer reviewer, Springer/Scopus-indexed journal - 2 manuscripts reviewed to date.

ONGOING RESEARCH

Explainable AI (XAI) for Network Intrusion Detection - manuscript in preparation (working title) | *2025 – Present*
Independent research (patent pending)

- A detection model that cannot explain itself is difficult to trust and difficult to act upon; this manuscript addresses the thin evidence on whether explanations actually improve analyst decisions in intrusion detection settings.
- Built an explainable IDS (Random Forest, SVM, DNN with SHAP/LIME) evaluated on CICIDS2017 (2.8M flows, 15 attack types): 99.86% accuracy, 0.9999 AUC-ROC; detections mapped to MITRE ATT&CK for triage context.
- Filed U.S. Provisional Patent No. 64/092,229 (sole inventor, pro se) covering the attribution pipeline and explanation architecture.

Human-Centered & Persona-Adaptive Security Explanation Across Literacy Levels - manuscript in preparation (working title) | *2025 – Present*

Independent research

- Security explanations tend to assume a single expert reader, yet an explanation calibrated for one audience is frequently useless to another; this manuscript investigates how explanations should adapt to differing levels of technical literacy.
- Designing a SHAP-driven, persona-adaptive NLG framework that tailors alert explanations to novice / IT generalist / SOC analyst tiers; studying how granularity and modality affect comprehension, trust, and analyst decisions.

Trustworthy AI Governance & Insider-Threat Analytics for Critical Infrastructure - manuscript in preparation (working title) | *2025 – Present*

Independent & academic research

- Critical infrastructure operators are adopting AI for monitoring faster than governance practice has matured; this manuscript asks what accountability, transparency, and rights-protective controls should govern analytics applied to employee behavior.
- Applied a fine-tuned BERT Transformer to behavioral log sequences for insider threat detection, using attention heatmaps and token-importance analysis to document decision rationale.
- Researching AI governance and accountability for security monitoring in critical infrastructure (NIST AI RMF, NIST CSF 2.0), including ethical and privacy risks of behavioral analytics.

Doctoral Research - Evolution of CNN Architectures | *2026*

COMP713, University of the Potomac

- Survey paper tracing CNN evolution from LeNet through ResNet to modern AI-based architectures (EfficientNet, ConvNeXt), covering neural architecture search, attention modules, and lightweight models.
- Implemented and analyzed a NumPy-based CNN reimplementation of the classic conv-pool-dense pattern on MNIST.

TECHNICAL SKILLS

Languages: Python, Java, SQL, Shell, HTML

Machine Learning / AI: Scikit-learn, TensorFlow, Keras, SHAP, Pandas, NumPy, Jupyter

Security Tools & Frameworks: Nmap, Nessus, Snort, OpenVAS, Netcat, MITRE ATT&CK, NIST CSF 2.0, NIST SP 800-53, ISO 27001, SOC 2

Data & Visualization: Power BI, Tableau, Streamlit, Matplotlib

Tools & Practices: Git, AWS Lambda, REST APIs, Agile/Scrum, Jira, MS Project

CERTIFICATIONS

- ISC2 Certified in Cybersecurity (CC) - Feb 2024
- Cyber Threat Management - Cisco, Mar 2024
- Certified Scrum Master - Scrum Alliance, Jan 2025
- Social and Behavioral Research - CITI Program, Jul 2024
- AWS Cloud Computing Fundamentals
- CompTIA Security+ - In Progress

PROFESSIONAL EXPERIENCE

Software Developer / Programmer Analyst (Intern) | *Oct 2025 – Jul 2026*

Digitech Inc., Remote, USA

- Developed and maintained Python and Java applications; designed and queried relational databases; integrated RESTful APIs in production systems.
- Participated in Agile/Scrum sprints: requirements gathering, task estimation, peer code review, sprint retrospectives.

Data Analyst | *Aug 2022 – Jun 2023*

SharpCode IT, Dhaka, Bangladesh

- Analyzed large-scale datasets with Python (Pandas, NumPy) and SQL; built predictive models (Random Forest, Linear Regression, Neural Networks).
- Automated ETL pipelines; designed interactive dashboards in Tableau and Power BI.

HONORS AND AFFILIATIONS

- Member - Women in Cybersecurity (WiCyS)
- Equitable Leader Award & Inducted Member - National Society of Leadership and Success (NSLS)
- Graduate Scholarship for Outstanding Academic Performance - University of Dhaka