SHEIKH RABIUL ISLAM
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EDUCATION

- **Tennessee Tech University**, TN, USA

  Ph.D. in Engineering (Computer Science concentration) — 2015 - May 2020

  Dissertation**:** Domain Knowledge Aided Explainable Artificial Intelligence.

  Advisors: William Eberle, Sheikh K. Ghafoor

  MS in Computer Science. — 2015 - 2018

- **Islamic University of Technology**, Bangladesh

  BSc in Computer Science. — 2007 - 2010

RESEARCH INTERESTS

- Explainable Artificial Intelligence
- Fair ML/AI
- Data Mining and Big Data Analytics
- Cyber Security
- Anomaly or Fraud Detection

RESEARCH EXPERIENCE

- **Assistant Professor**, University of Hartford, USA — August 2020 - Present

  Current research interests include Explainable Artificial Intelligence (XAI); fair ML/AI, fraud/anomaly detection; cyber-attack prediction, detection, and mitigation;

- **Visiting International Researcher**, Tennessee Tech University, USA — June 2020 – August 2020

  Wrote a survey paper on Explainable Artificial Intelligence approaches with demonstrations, and collaborated on a grant proposal—NSF Program on Fairness in Artificial Intelligence in Collaboration with Amazon (FAI).

- **Graduate Research Assistant**, Tennessee Tech University, USA — 2018 – May 2020

  Worked on Explainable Artificial Intelligence (XAI) with a focus on uncovering and incorporating useful domain knowledge from an application domain (e.g., Finance, Security) that will enhance the explainability of AI-based complex models.

- **Advanced Short-Term Research Intern**, Oak Ridge National Laboratory (ORNL), USA — Summer 2018

  Worked on an automated and generalized malware detection tool to avoid manual investigations of host logs and a reconfiguration of detector tool.

TEACHING AND MENTORING EXPERIENCE

- **Assistant Professor**, University of Hartford, USA — 2020

  Courses taught in Fall, 2020: Data Structures, Fundamental of Computing, Data Mining, and Information Assurance and Cryptography.

  Scheduled to teach in Spring, 2021: Data Structures, Computer Networks, and Programming Foundations.

- **Graduate Research/Teaching Assistant**, Tennessee Tech University, USA — 2015 - 2019

  Instructed Data Structures and Algorithms course

  Instructed, graded, and tutored following course labs:

  Data Structures and Algorithms Lab

  Introduction to Problem Solving - Computer Programming Lab

  Database Management Systems lab

- **Volunteer***,* Tennessee Tech University*, USA* — 2017

  Worked as a volunteer and substitute mentor in summer boot camp—Governor's School for Emerging Technologies to stimulate STEM education in high school students.

AWARDS AND FELLOWSHIPS

- Student Travel Award, ACM SIGKDD, 2019 — 2019
- GRA from College of Engineering grants recognizing Carnegie classification — 2019 - 2020
- GRA from Cybersecurity Education, Research & Outreach Center (CEROC), Tennessee Tech — 2018 - 2019
- Ivanhoe Foundation Fellowship — 2017

GRANTS

- University of Hartford: 2020-21 Grants to Promote Diversity, Equity, and Inclusion within the Classroom; Accepted Proposal: Introducing Fairness Module in the Data Mining Course; Role: PI; Amount: $2000 — 2020
- NSF Proposal: CRII: III: Domain Knowledge Aided Explainable Artificial Intelligence Decision Framework; Role: PI; Amount: $170,638 (**under review**)

PUBLICATIONS

1. **Sheikh Rabiul Islam** and William Eberle, "Implications of Combining Domain Knowledge in Explainable Artificial Intelligence", **AAAI-MAKE 2021.** — 2021
2. **Sheikh Rabiul Islam,** William Eberle, Sheikh K. Ghafoor, Ambareen Siraj, and Mike Rogers, "Domain Knowledge Aided Explainable Artificial Intelligence for Intrusion Detection and Response ", *AAAI-MAKE* 2020. — 2020
3. **Sheikh Rabiul Islam,** William Eberle, Sheikh K. Ghafoor, " Towards Quantification of Explainability in Explainable Artificial Intelligence Methods", *FLAIRS-33.* — 2020
4. **Sheikh Rabiul Islam,** William Eberle, Sid Bundy, and Sheikh Khaled Ghafoor, "Infusing domain knowledge in AI-based "black box" models for better explainability with application in bankruptcy prediction*"*, *25th ACM SIGKDD, Workshop: Anomaly Detection in Finance, 2019*. — 2019
5. Qian Chen, **Sheikh Rabiul Islam**, Henry Haswell, and Robert A. Bridges, Automated Ransomware Behavior Analysis: Pattern Extraction and Early Detection*, The 2nd International Conference on Science of Cyber Security (SciSec)*, 2019. — 2019
6. **Sheikh Rabiul Islam**, Sheikh Khaled Ghafoor, and William Eberle, "Mining Illegal Insider Trading of Stocks: A Proactive Approach*"*, *IEEE Big Data*, 2018. — 2018
7. Md Mosharaf Hossain, Thomas M. Hines, **Sheikh Rabiul Islam**, Sheikh K. Ghafoor, and Ramakrishnan Kannan, "A Flexible-blocking Based Approach for Performance Tuning of Matrix Multiplication Routines for Large Matrices with Edge Cases", *The 2nd Workshop on* — 2018

Benchmarking, Performance Tuning and Optimization for Big Data Applications (BPOD), IEEE Big Data, 2018.

8. **Sheikh Rabiul Islam**, William Eberle, and Sheikh Khaled Ghafoor, "Credit Default Mining Using Combined Machine Learning and Heuristic Approach*"*, *14th Int. Conference on Data Science (ICDATA'18),* 2018. 2018

9. **Sheikh Rabiul Islam**, William Eberle, and Sheikh Khaled Ghafoor, "Mining Bad Credit Card Accounts from OLAP and OLTP*", ACM International Conference on Compute and Data Analysis (ICCDA'17)*, 2017. 2017

10. Tanzeem Bin Noor, Md Rounok Salehin, **Sheikh Rabiul Islam**, "A clustering scheme for peer-to-peer file searching in mobile ad hoc networks", *International Journal of Advanced Research in Computer and Communication Engineering,* 2012. 2012

POSTERS AND ABSTRACTS

1. **Sheikh Rabiul Islam,** William Eberle, Sid Bundy, and Sheikh Khaled Ghafoor, "Infusing domain knowledge in AI-based "black box" models for better explainability with application in bankruptcy prediction*"*, *25th ACM SIGKDD, Workshop: Anomaly Detection in Finance, 2019*. 2019

2. Tigstu Dullo, Sudershan Gangrade, Ryan Marshall, **Sheikh R. Islam**, Sheikh Ghafoor, ShihChieh Kao, and Alfred J. Kalyanapu, "The Vulnerability of Critical Energy Infrastructures to Climate Change induced Flooding: A Case Study for the Conasauga River basin", *27th Tennessee Water Resources Symposium,* 2018*.* 2018

3. AJ Kalyanapu, TT Dullo, S Gangrade, SC Kao, R Marshall, **SR Islam**, and SK Ghafoor, "Hurricane Harvey Riverine Flooding: Part 1-Reconstruction of Hurricane Harvey Flooding for Harris County, TX using a GPU-accelerated 2D flood model for post-flood hazard analysis", *American Geophysical Union (AGU) Fall Meeting,* 2017. 2017

4. Tigstu TSIGE Dullo, Sudershan Gangrade, Ryan Marshall, **Sheikh R Islam**, Sheikh K Ghafoor, Shih-Chieh Kao, and Alfred J Kalyanapu, "A large-scale simulation of climate change effects on flood regime-A case study for the Alabama-Coosa-Tallapoosa River Basin", *American Geophysical Union (AGU) Fall Meeting,* 2017. 2017

5. TT Dullo, AJ Kalyanapu, S Gangrade, R Marshall, **SR Islam**, SK Ghafoor, SC Kao, and BL Preston, "Development of an Integrated DHSVM-Flood2D-GPU modeling framework - A Case Study for the Alabama-Coosa-Tallapoosa River Basin", *American Geophysical Union (AGU) Fall Meeting,*2016. 2016

SERVICES

- **Program Committee Member,** FLAIRS 34 – Neural Networks and Data Mining Special Track 2021
- **Student Volunteer**, 25th ACM SIGKDD Conference 2019
- **Ad hoc Reviewer,** Expert Systems with Applications - Journal - Elsevier 2019-2020
- **Ad hoc Reviewer,** Journal of Decision Systems 2019
- **Ad hoc Reviewer,** International Journal of Networking and Virtual Organizations 2020
- **Ad hoc Reviewer**, International Conference on Computer Science and Application Engineering (CSAE, 2019) 2019
- **President**, Computer Science Graduate Students Club 2018 - 2019
- **Member**, Computer Science Student Advisory Council 2018 - 2019

- **Member**, IEEE 2018 - 2019
- **Member**, AAAI 2020
- **Participant**, Keep Putnam County Beautiful – Clean Commission 2018
- **Volunteer and Substitute Mentor**, The Governor's School for Emerging Technologies 2017
- **Volunteer**, Integrating Parallel and Distributed Computing in Introductory Programming Classes (iPDC) 2016

TECHNICAL SKILLS

- Programming: Python, C++, Java, PHP, MPI, OpenMP, CUDA, Javascript, and R.
- Data Science: Proficient in Scikit-learn, NLTK, Pandas, and Flask; Familiar with Tensorflow, Keras, D3.js, Highchart, Matlab, and Weka.
- Database: Oracle, MySql, PostgreSQL, and Sqlite3.
- Certification & Training:
    - High-Performance Computing Workshop at ORNL
    - Oracle Database SQL Certified Expert (2013)
    - Red Hat Certified Engineer (RHCE) training course at Base Ltd

REFERENCES

William Eberle

Professor, Department of Computer Science, Tennessee Tech University

1 William L Jones Dr, Cookeville, TN 38505

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Sheikh K. Ghafoor

Professor, Department of Computer Science, Tennessee Tech University

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Phone: 931-372-3687, Email: sghafoor@tntech.edu

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