

## SHEIKH RABIUL ISLAM

**Assistant Professor, Department of Computing Sciences, University of Hartford**

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Directory: <https://www.hartford.edu/directory/arts-science/islam-rabiul-sheikh.aspx>

### 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 Artificial Intelligence
- Data Mining and Big Data Analytics
- Healthcare Analytics
- Cyber Security
- Anomaly or Fraud Detection

### RESEARCH EXPERIENCE

- **Assistant Professor** of Computer Science, University of Hartford, USA August 2020 - Present  
Current research interests include Explainable Artificial Intelligence (XAI); fair ML/AI, fraud/anomaly detection; healthcare analytics, 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 - Present  
*Courses taught:* Data Mining; Information Assurance & Cryptography; Data Structures; Principles of Database Systems; Computer Networks; Foundation of Computing I; Foundation of Computing II; Programming Foundations

*Advising:* advised/advising one masters student, one honors thesis student, multiple honors contract students, multiple preceptors, and undergraduate students.

- **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: 2021-22 Dean's Research and Teaching Grant 2021
- University of Hartford: 2021-22 Grants to Promote Diversity, Equity, and Inclusion within the Classroom 2021
- University of Hartford: 2020-21 Grants to Promote Diversity, Equity, and Inclusion within the Classroom 2020

#### PUBLICATIONS

1. Hong Liu, Chen Zhong, Awny Alnusair, **Sheikh Rabiul Islam**, “FAIXID: A Framework for Enhancing AI Explainability of Intrusion Detection Results Using Data Cleaning Techniques”, *Journal of Network and Systems Management*. 2021
2. Syeda Jannatus Saba, Biddut Sarker Bijoy, Souvika Sarkar, Md Saiful Islam, **Sheikh Rabiul Islam**, Md. Ruhul Amin and Shubhra Kanti Karmaker, “Towards Containing COVID-19 Pandemic by Mining Knowledge from Scientific Literature and Social Media”, *17th Int. Conference on Data Science (ICDATA'21)*. 2021
3. Nazia Tasnim, Md. Istiak Hossain Shihab, Moqsadur Rahman, **Sheikh Rabiul Islam**, Mohammad Ruhul Amin, “Exploring the Scope and Potential of Local Newspaper-based Dengue Surveillance in Bangladesh”, *Joint KDD 2021 Health Day and 2021 KDD Workshop on Applied Data Science for Healthcare*. 2021
4. **Sheikh Rabiul Islam** and William Eberle, “Implications of Combining Domain Knowledge in Explainable Artificial Intelligence”, *AAAI-MAKE, 2021*. 2021
5. Biddut Sarker Bijoy, Syeda Jannatus Saba, Souvika Sarkar, Md Saiful Islam, **Sheikh Rabiul Islam**, Md. Ruhul Amin and Shubhra Kanti Karmaker, “COVID19-Alpha : Spatio-Temporal Visualization of COVID-19 Symptoms through Tweet Analysis”, *ACM IUI '21: 26th International Conference on Intelligent User Interfaces*. 2021

6. Nazia Tasnim, Md. Istiak Hossain Shihab, Moqsadur Rahman, Jillur Rahman Saurav, **Sheikh Rabiul Islam**, "Observing the Unobserved: A Newspaper Based Dengue Surveillance System for the Low-Income Regions of Bangladesh", *The 34th International FLAIRS Conference*. 2021
7. **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
8. **Sheikh Rabiul Islam**, William Eberle, Sheikh K. Ghafoor, "Towards Quantification of Explainability in Explainable Artificial Intelligence Methods", *FLAIRS-33*. 2020
9. **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", *25<sup>th</sup> ACM SIGKDD, Workshop: Anomaly Detection in Finance, 2019*. 2019
10. 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
11. **Sheikh Rabiul Islam**, Sheikh Khaled Ghafoor, and William Eberle, "Mining Illegal Insider Trading of Stocks: A Proactive Approach", *IEEE Big Data*, 2018. 2018
12. 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 Benchmarking, Performance Tuning and Optimization for Big Data Applications (BPOD), IEEE Big Data*, 2018. 2018
13. **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
14. **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 (ICCD'A'17)*, 2017. 2017
15. 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", *25<sup>th</sup> ACM SIGKDD, Workshop: Anomaly Detection in Finance, 2019*. 2019
2. Tigstul 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 Tsigie 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.
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.

## SERVICES

- **Program Committee Member**, FLAIRS 35 – Special Track on Explainability, Bias, and Trust, 2021
- **Program Committee Member**, FLAIRS 35 – Special Track on Neural Networks and Data Mining, 2022
- **Program Committee Member**, AAAI-22 – Twelfth AAAI Symposium on Educational Advances in Artificial Intelligence, 2022
- University of Hartford: **Chair**, CS Cybersecurity Advisory Committee 2021
- University of Hartford: **Chair**, MS in Computer Science Curriculum committee 2021
- University of Hartford: **Member**, A&S Diversity Criteria Working Group 2021
- University of Hartford: **Member**, A&S Curriculum Committee 2021
- **Program Committee Member**, FLAIRS 34 – Neural Networks and Data Mining Special Track 2021
- **Student Volunteer**, 25<sup>th</sup> 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  
 Phone: 931-372-3278, Email: weberle@tntech.edu

### **Sheikh K. Ghafoor**

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