

SHEIKH RABIUL ISLAM

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Department of Computer Science, Tennessee Tech University, Cookeville, TN 38501, USA.

EDUCATION

- **Tennessee Tech University**, TN, USA
Ph.D. in Engineering, with a concentration in Computer Science 2015-present
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
- Data Mining and Big Data
- Cyber Security
- Predictive Modeling
- Anomaly or Fraud Detection

RESEARCH EXPERIENCE

- **Graduate Research Assistant**, Tennessee Tech University, USA 2018-present
Currently working 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

- **Instructor**, Tennessee Tech University 2019
Data Structures and Algorithms: Taught advanced data structures and applications, problem-solving strategies, and algorithm complexities.
- **Graduate Teaching Assistant**, Tennessee Tech University, USA 2015 - 2019
Instructed, graded, and tutored following course labs:
Data Structures and Algorithms Lab
Introduction to Problem Solving - Computer Programming Lab
Database Management Systems lab
- **Substitute Mentor**, 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.

INDUSTRY EXPERIENCE

- **Assistant Manager**, Teletalk Bangladesh Ltd.: Worked independently and collaboratively on multiple software development projects for internal and commercial use. 2011 – 2015
- **Specialist**, Robi Axiata Ltd.: Worked collaboratively on a telecommunication network performance monitoring software for analyzing network performance from a dashboard. 2011

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

PUBLICATIONS

1. **Sheikh Rabiul Islam**, William Eberle, Sheikh K. Ghafoor, Ambareen Siraj, and Mike Rogers, "Domain Knowledge Aided Explainable Artificial Intelligence for Intrusion Detection and Response ", **Accepted** in *AAAI-MAKE* 2020. 2020
2. **Sheikh Rabiul Islam**, William Eberle, Sheikh K. Ghafoor, " Towards Quantification of Explainability in Explainable Artificial Intelligence Methods", **Accepted** in *FLAIRS-33*. 2020
3. **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
4. 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
5. **Sheikh Rabiul Islam**, William Eberle, Sheikh K. Ghafoor, Sid C. Bundy, Douglas A. Talbert, and Ambareen Siraj. "Investigating bankruptcy prediction models in the presence of extreme class imbalance and multiple stages of economy ", **Under review** in *Elsevier Journal: Expert Systems with Applications*, 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 Benchmarking, Performance Tuning and Optimization for Big Data Applications (BPOD), IEEE Big Data*, 2018. 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 (ICCD'A17)*, 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

- **Student Volunteer**, 25th ACM SIGKDD Conference 2019
- **Ad hoc Reviewer**, Expert Systems with Applications - Journal - Elsevier 2019
- **Ad hoc Reviewer**, Journal of Decision Systems 2019
- **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

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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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Ambareen Siraj

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